

Drinking water systems

Flow summary report 2018

Published March 2019



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List of Acronyms and Definitions

Adverse	Adverse water results are listed in Schedule 16, O. Reg. 170/03 Examples of adverse water results: <ul style="list-style-type: none">• An analytical result that exceeds a health-based water quality standard (O. Reg. 169/03)• Any evidence that disinfection may not have been effective• Low chlorine residuals
CT	Contact time - used in determining level of disinfection treatment
DWWP	Drinking Water Works Permit
CFU	colony forming units
GUDI	groundwater under the direct influence of surface water
L/s	litres per second
MDWL	Municipal Drinking Water Licence
m ³ /d	cubic metres per day
mg/L	milligrams per litre
mL	millilitre
ML/d	Mega (million) litres per day (1 ML = 1000 m ³)
MECP	Ministry of the Environment, Conservation and Parks (Ontario)
O. Reg.	Ontario Regulation
PTTW	Permit to Take Water
Rated Capacity	Volume of treated water that meets all applicable Ontario drinking water quality regulations including the aesthetic water quality objectives and that may be made available by the water treatment plant for delivery to the drinking water system in any 24-hour period
R.R.O.	Revised Regulations Ontario (1990)
SCADA	Supervisory Control and Data Acquisition
SDWA	<i>Safe Drinking Water Act, 2002</i>
WPP	Water Purification Plant
WTP	Water Treatment Plant
MOH	Medical Officer of Health
TC	Total Coliform
CL ₂	Chlorine



1 Introduction

In Ontario, water taking, drinking water treatment and distribution are governed by a number of Acts and Regulations. Additional legally-binding requirements are imposed on the owner/operator of each waterworks through various licenses, permits and approvals. Individual approvals issued by the MECP are site-specific, meaning the conditions of operation are tailored to a facility's characteristics, circumstances and the local environment.

Under Schedule 22 of the Drinking Water Systems Regulation (O. Reg. 170/03), annual summary reports are required to be prepared and distributed to owners of both small and large municipal residential systems. The summary report must be submitted no later than March 31 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 applicable system orders for the reporting period where legislative requirements were not met along with the duration of these events and the resulting corrective measures.

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 and maximum daily flows. The summary must be compared to the rated capacity provided in each system's approval.

The requirement for reporting are identified in Table 1-1.

Table 1-1 Drinking Water System Annual Reports

Report Name	Description	Legislation or Regulation	Submitted to	Annual Due Date
Annual Flow Summary Report for Municipalities	<ul style="list-style-type: none"> • Summary of flows • Description of any failure to meet requirements of an Act, regulations or the system's approval 	O. Reg. 170/03, Schedule 22	Regional Council; available to the public	March 31
Annual Water Quality Report	<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, Section 11	Posted on Halton's website	February 28



Report Name	Description	Legislation or Regulation	Submitted to	Annual Due Date
Water Taking and Transfer Report	<ul style="list-style-type: none"> Electronic submission of water taking data 	O. Reg. 387/04	MECP	March 31
Permit to Take Water Annual Report	<ul style="list-style-type: none"> Reporting conditions set out in individual Permits to Take Water Halton's groundwater systems only 	Permits to Take Water issued under the <i>Ontario Water Resources Act</i>	MECP	March 31
Water Conservation Charges Report	<ul style="list-style-type: none"> Names, addresses and water usage of industrial and commercial water customers which used 50,000 litres of water in a single day in the year 	O. Reg. 450/07	MECP	March 31

The structure of this report is as follows:

Section 2 lists legislation and regulations of significance to drinking water systems and outlines the reporting requirements of O. Reg. 170/03, Schedule 22.

Section 3 provides an overview of Halton's drinking water systems.

Section 4 provides a description of how data is compiled and analyzed for this report.

Sections 5 to 15 include descriptions of each drinking water system, flow data and summaries of adverse water quality incidents.

Section 16 summarizes the MECP drinking water system inspections.

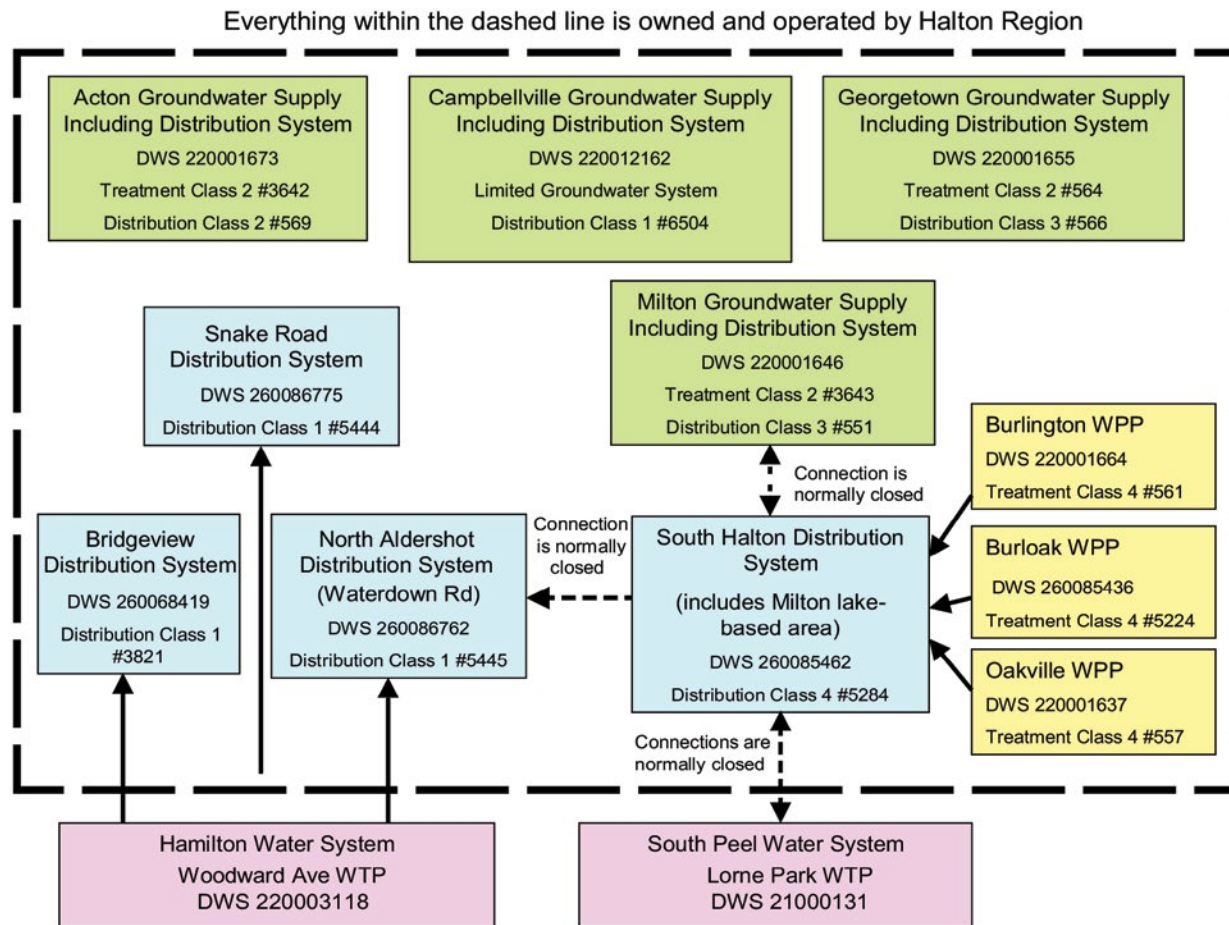
Section 17 includes the conclusions of the report.



2 Halton's Drinking Water Systems

Figure 1 shows Halton Region's operational drinking water systems.

Figure 1 Halton's Drinking Water Systems



3 Annual Water Data

Halton's Public Works Department manages all of Halton's drinking water treatment and distribution systems including surface water intakes, wells, reservoirs, elevated tanks, booster stations and distribution systems. Staff's primary responsibilities are water taking, treatment and distribution in compliance with all applicable legislation and system approvals. Routine water quality testing and continuous monitoring of water quality and quantity is also conducted to ensure compliance.

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 system approvals. Sampling is also conducted in the distribution system primarily for bacteriological indicators and evidence of sustained chlorine residuals. Enhanced sampling programs are defined by Water Treatment Operations, System Operations and the Regional Laboratory for parameters beyond those mandated or at a frequency greater than prescribed by the MECP. This level of water quality monitoring helps protect public health and ensures public confidence in the water supply. As mandated, annual reports summarizing the water quality for each water system are posted on Halton's website for the public to review.

The majority of analysis is conducted by Halton's Regional Laboratory, with some specialized analysis contracted to other accredited laboratories. In accordance with Schedule 16 of O. Reg. 170/03, all notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health. Halton has an *Adverse Water Quality Incidents Procedure* in place that summarizes internal and external reporting requirements as well as ensuring that the appropriate corrective actions are implemented. A summary of notifications in 2018 for each system is provided in this report.



3.2 Flow Data

While water quality is of utmost priority, attention is also directed to flow measurement and data management. In Halton Region, continuous monitoring equipment is used for measuring flow, including the rate and volume of taking. The flow measuring devices are connected to the Supervisory Control and Data Acquisition (SCADA) system for monitoring, alarming and data storage. In addition, the devices are verified in accordance with the manufacturer's specifications, or at least once every year, to help ensure data reliability. The MECP is notified if the flow or volume exceeds a system approval or if there is a problem with any flow monitoring device.

This annual flow report is prepared through retrieval of archived SCADA data and logbook entries. The archived data is then analyzed and used to compile a summary report. The raw water flows are compared to the Permits to Take Water (allowable volume of water to be taken). The treated water volumes are the amounts of water sent into the water distribution systems. These volumes are compared to the plant rated capacities in each Municipal Drinking Water License. The reporting of treated water flows is required by the MECP "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" (O. Reg. 170/03, Schedule 22 (22-2(3)1)).

Halton Region's water systems produced just over 63,336 ML of drinking water in 2018. This marked a slight increase in total production of approximately 2 per cent over the previous calendar year. On average, Halton produced 174 ML of treated water per day in 2018 which is nearly enough to fill 69 Olympic-sized swimming pools with clean, safe drinking water.



4 Burlington Water Purification Plant

4.1 Water System Description

The Burlington Water Purification Plant (WPP) is located at 3249 Lakeshore Road in Burlington. The facility is a conventional filtration purification plant with a process that consists of the Actiflo® process (microsand-enhanced clarification), filtration, fluoridation, optional pH adjustment, ozonation (disinfection and taste and odour control) and chlorination (secondary disinfection). Seasonally, the water is chlorinated at the intake for zebra mussel control. The plant is controlled through a computerized SCADA system that is monitored 24 hours per day, seven days a week. The treated drinking water is pumped into the South Halton Water Distribution System.

Table 4-1 Burlington WPP General Information

Municipal Drinking Water Licence Drinking Water Works Permit	004-104 (South Halton) 004-204
Drinking Water System Number	220001664
Classification	
Class	Treatment Class 4
Certificate Number	561
Service Population	n/a – see South Halton Distribution System
Permit to Take Water	
Number	2581-8QSMHV
Expiry Date	January 31, 2022
Water Taking Permitted	291,000 m ³ /d or 202,083 L/min. (equivalent)
Rated Capacity	263,000 m ³ /d



4.2 2018 Flow Summary

A summary of the flows in 2018 is provided in the following table (4-2). At the Burlington WPP, some water is used in the chemical feed systems and for backwashing filters; thus, the raw water flow may be greater than the treated water flow. The treatment plants are designed to handle peak hour flows and, as such, a comparison of maximum and average daily volumes to permitted levels is not the most accurate representation of available capacity. The figures in Table 4-3 comply with the reporting requirements of the regulation (O. Reg. 170/03, Schedule 22).

Table 4-2 Burlington WPP Flow Summary 2018

Month	Raw Water Flow m ³ /d		Treated Water Flow m ³ /d	
	Maximum Day	Average Day	Maximum Day	Average Day
January	83,247	71,482	75,303	64,337
February	93,620	71,485	86,963	64,776
March	86,802	71,256	79,302	64,787
April	96,284	71,872	88,397	64,970
May	102,320	79,551	92,864	71,746
June	116,074	99,820	105,286	90,308
July	156,534	118,123	141,251	107,485
August	132,241	105,464	118,716	96,444
September	122,431	105,089	109,746	95,295
October	104,546	88,358	95,319	79,747
November	99,059	82,046	90,521	74,419
December	97,221	82,592	87,656	74,707
Annual Average Day		87,262		79,085

Note: The shaded blocks denote the annual maximum daily flows for 2018.



Table 4-3 Burlington WPP Flow Comparison to MDWL and PTTW

Burlington WPP	Raw Water		Treated Water	
	Max. Day	Average Day	Max. Day	Average Day
% PTTW	54%	30%		
% Rated Capacity			54%	30%

4.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and the Medical Officer of Health. In 2018, there was one adverse test result/incident at the Burlington WPP as summarized in Table 4-4.

Table 4-4 Adverse Test Results and Actions – Burlington WPP

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
January 15, 2018	Plant Treated	Sodium = 23.0 mg/L	No Action Required - Reportable every 57 months	January 18, 2018



5 Oakville Water Purification Plant

5.1 Water System Description

The Oakville Water Purification Plant (WPP) is located at 21 Kerr Street in Oakville. This facility is a conventional filtration purification plant with a process that consists of the Actiflo® process (microsand-enhanced clarification), filtration, fluoridation, ozonation (disinfection and taste and odour control) and chlorination (disinfection). Seasonally, the water is chlorinated at the intake for zebra mussel control. The plant is controlled through a computerized SCADA system that is monitored 24 hours per day, seven days a week. The treated drinking water is pumped into the South Halton Water Distribution System.

Table 5-1 Oakville WPP General Information

Municipal Drinking Water Licence	004-104 (South Halton)
Drinking Water Works Permit	004-204
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Drinking Water System Number	220001637
<hr/>	
Classification	
Class	Treatment Class 4
Certificate Number	557
<hr/>	
Service Population	n/a - see South Halton Distribution System
<hr/>	
Permit to Take Water	
Number	3760-AZ8PKN
Expiry Date	July 31, 2028
Water Taking Permitted	155,000 m ³ /d or 107,639 litres/minute (equivalent)
<hr/>	
Rated Capacity:	109,000 m ³ /d



5.2 2018 Flow Summary

A summary of the flows in 2018 is provided in the following table (5-2). At the Oakville WPP, some water is used in the chemical feed systems and for backwashing filters. Thus, the raw water flow is greater than the treated water flow. The treatment plants are designed to handle peak hour flows and, as such, a comparison of maximum and average daily volumes to permitted levels is not the most accurate representation of available capacity. The data presented in Table 5-3 complies with the reporting requirements of the regulation (O. Reg.170/03, Schedule 22).

Table 5-2 Oakville WPP Flow Summary 2018

Month	Raw Water Flow m ³ /d		Treated Water Flow m ³ /d	
	Maximum Day	Average Day	Maximum Day	Average Day
January	70,311	54,727	67,478	51,423
February	66,911	56,688	63,930	49,044
March	67,087	49,920	64,262	50,352
April	64,317	54,594	59,997	49,058
May	103,694	63,765	98,911	60,252
June	105,788	73,260	99,733	68,006
July	105,905	80,190	99,625	73,063
August	97,802	65,011	93,008	58,965
September	83,752	57,192	78,218	53,501
October	59,036	47,752	56,223	41,522
November	62,555	42,968	59,733	42,384
December	66,710	47,337	63,347	41,662
Annual Average Day		58,733		53,269

Note: The shaded blocks denote the annual maximum daily flows for 2018.



Table 5-3 Oakville WPP Flow Comparison to MDWL and PTTW

Oakville WPP	Raw Water		Treated Water	
	Max. Day	Average Day	Max. Day	Average Day
% PTTW	68%	38%		
% Rated Capacity			92%	49%

5.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health. In 2018, there was one adverse test result/incident at the Oakville WPP as summarized in Table 5-4.

Table 5-4 Adverse Test Results and Actions – Oakville WPP

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
January 15, 2018	Plant Treated	Sodium = 23.0 mg/L	No Action Required - Reportable every 57 months	January 18, 2018



6 Burloak Water Purification Plant

6.1 Water System Description

The Burloak Water Purification Plant (WPP) is located at 3380 Rebecca Street, Oakville. This facility is a membrane filtration plant with a process that consists of flocculation, ultra-filtration (via membranes), ultra-violet irradiation, ozonation (disinfection and taste and odour control), fluoridation and chlorination (disinfection). Seasonally, the raw water intake is chlorinated for zebra mussel control. The plant is controlled through a computerized SCADA system that is monitored 24 hours per day, seven days per week. The treated drinking water is pumped into the South Halton Water Distribution System.

Table 6-1 Burloak WPP General Information

Municipal Drinking Water Licence	004-104 (South Halton)
Drinking Water Works Permit	004-204
Drinking Water System Number	260085436
Classification	
Class	Treatment Class 4
Certificate Number	5224
Service Population	n/a - see South Halton Distribution System
Permit to Take Water	
Number	7500-A4ZM5N
Expiry Date	December 31, 2025
Water Taking Permitted	64,000 m ³ /d or 88,889 L/min (Table A in PTTW 7500-A4ZM5N)
Rated Capacity:	55,000 m ³ /d



6.2 2018 Flow Summary

A summary of the flows in 2018 is provided in the following table (6-2). At the Burloak WPP, some water is used in the chemical feed systems and for backwashing filters and subsequently the raw water flow is greater than the treated water flow. The treatment plants are designed to handle peak hour flows and, as such, a comparison of maximum and average daily volumes to permitted levels is not the most accurate representation of available capacity. The data presented in Table 6-3 complies with the reporting requirements of the regulation (O. Reg.170/03, Schedule 22).

Table 6-2 Burloak WPP Flow Summary 2018

Month	Raw Water Flow m ³ /d		Treated Water Flow m ³ /d	
	Maximum Day	Average Day	Maximum Day	Average Day
January	38,428	24,449	32,760	19,928
February	36,614	21,539	32,223	17,650
March	36,699	19,643	32,126	15,906
April	55,278	21,680	49,957	17,805
May	36,417	28,283	32,148	24,019
June	37,040	26,663	33,500	22,842
July	20,586	17,674	17,779	15,191
August	54,725	26,002	50,935	23,097
September	18,506	17,667	15,920	15,327
October	18,610	17,627	15,561	14,231
November	19,007	18,148	14,984	14,389
December	30,155	18,851	25,801	15,044
Annual Average Day		21,519		17,952

Note: The shaded blocks denote the annual maximum daily flows for 2018.



Table 6-3 Burloak WPP Flow Comparison to MDWL and PTTW

Burloak WPP	Raw Water		Treated Water	
	Max. Day	Average Day	Max. Day	Average Day
% PTTW	86%	34%		
% Rated Capacity			93%	33%

6.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health. In 2018, there was no adverse test result/incident at the Burloak WPP.



7 South Halton Distribution System

7.1 Water System Description

The South Halton Distribution System is supplied by the Burlington, Oakville and Burloak WPPs. The South Halton Distribution System serves Burlington, Oakville and parts of Milton and Halton Hills, and includes 16 reservoirs/storage tanks: Appleby Line, Bailie, Beaufort, Tyandaga, Brant, Headon, Mount Forest, Washburn, Waterdown, Kitchen, McCraney, Eighth Line, Moore, Burnhamthorpe Tower, Zone 5L and Steeles Avenue Tower in Milton. As the South Halton System is distribution only, it does not require a Permit to Take Water. Flows into the distribution system are reported under the three water purification plants, which provided the treated water in 2018.

Table 7-1 South Halton Distribution System General Information

Municipal Drinking Water Licence	004-104 (South Halton)
Drinking Water Works Permit	004-204
Drinking Water System Number	260085462
Classification	
Class	Distribution Class 4
Certificate Number	5284
Service Population	488,109

7.2 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and the Medical Officer of Health. In 2018, there were seven adverse test results/incidents in the South Halton Distribution System as summarized in Table 7-2. Some reported incidents included more than one test result.



Table 7-2 Adverse Test Results and Actions – South Halton Distribution

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
February 26, 2018	Distribution Distribution Distribution Distribution Distribution Distribution	Sodium = 21.1 mg/L Sodium = 25.9 mg/L Sodium = 21.7 mg/L Sodium = 26.5 mg/L/26.2 mg/L (duplicate) Sodium = 30.5 mg/L/30.2 mg/L (duplicate) Sodium = 24.5 mg/L	No Action Required- Reportable every 57 Months.	March 1, 2018
February 28, 2018	Distribution Distribution	Sodium = 43.8 mg/L/43.6 (duplicate) mg/L Sodium = 27.8 mg/L	No Action Required- Reportable every 57 Months.	March 1, 2018
March 8, 2018	Distribution	Watermain break with evident or suspected contamination.	Watermain isolated and MOH issued Boil Water Advisory. Sample analysis results, collected after repairs and flushing, were within acceptable limits.	March 11, 2018
March 22, 2018	Distribution	Lead = 0.116 mg/L	Resamples collected and results within acceptable limits.	March 29, 2018
May 17, 2018	Distribution	TC = 2 CFU/100 mL	Resamples collected and results within acceptable limits.	May 19, 2018
July 6, 2018	Distribution	TC = 16 CFU/100 mL	Resamples collected and results within acceptable limits.	July 8, 2018
October 17, 2018	Distribution	Cl ₂ = Free 0.03 mg/L	Flushed until System Chlorine Residual restored. Resamples collected and results within acceptable limits.	October 17, 2018



8 Milton Groundwater Supply System

8.1 Water System Description

The Town of Milton is supplied with both groundwater and surface water. Treated surface (Lake Ontario) water from South Halton is pumped to the Steele’s Avenue Water Tower. Under normal operating conditions, lake water and groundwater do not mix in Milton’s distribution system.

The groundwater system consists of two well fields: Kelso and Walkers Line. There are four wells in the Kelso well field that pump raw water into the Kelso Water Treatment Plant. The treatment includes greensand filters for manganese and iron removal and chlorination for disinfection. The water is pumped to the Milton Reservoir. From there, the water flows by gravity into the distribution system. The Walkers Line well field consists of one well with water being disinfected with chlorine and pumped to the Milton Surge Tank. From the surge tank, the water flows by gravity into the distribution system. Fluoride is not added to the Milton groundwater system. The system is controlled through a computerized SCADA system that is monitored 24 hours per day, seven days a week.

Table 8-1 Milton Groundwater System General Information

Municipal Drinking Water Licence	004-104 (South Halton)	
Drinking Water Works Permit	004-204	
Drinking Water System Number	220001646	
Classification		
Class	Treatment Class 2	Distribution Class 3
Certificate Number	3643	551
Service Population	26,974	



Table 8-1 Milton Groundwater System General Information

Permit to Take Water	
Number	87-P-3046
Expiry Date	n/a
Water Taking Permitted	
Kelso	
Kelso Wells 3,4,5 and 6 combined	13,635 m ³ /d
Max. combined for up to 5 days/year	22,730 m ³ /d
Max. combined for up to 10 days/year	20,457 m ³ /d
Max. combined for up to 30 days/year	18,184 m ³ /d
Max. combined for up to 60 days/year	15,911 m ³ /d
Walkers Line	
Walkers Line Well 1	2,618 m ³ /d or 1818 L/min (equivalent)
Walkers Line Well 2	2,946 m ³ /d or 2046 L/min (equivalent)
Max. from Walkers Line 1 and 2	3,180 m ³ /d
Emergency, combined	5,240 m ³ /d for up to 10 days/year
<hr/>	
Rated Capacity	
Kelso WPP	22,670 m ³ /d
Walkers Line	5,240 m ³ /d

8.2 2018 Flow Summary

A summary of the flows in 2018 is provided in the following table. At the Walkers Line site, the treated water flow is the same as the raw water flow. At the Kelso WTP, some water is used for backwashing filters and subsequently the raw water flow is greater than the treated water flow. However, due to rounding of flow data the average treated water may be slightly higher than the average raw water taking for this report. The treatment plants are designed to handle peak hour flows and, as such, a comparison of maximum and average daily volumes to permitted levels is not the most accurate representation of available capacity. The data presented in Table 8-2 complies with the reporting requirements of the regulation (O. Reg. 170/03, Schedule 22).



Table 8-2 Milton Groundwater System Flow Summary 2018

Month	Milton Total Treated Flow m ³ /d		Walkers Line m ³ /d		Kelso Raw Water m ³ /d		Kelso Treated m ³ /d	
	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day
January	7,889	5,250	646	572	7,588	4,723	7,314	4,679
February	7,487	5,882	621	559	7,465	5,384	6,899	5,323
March	7,562	5,957	586	553	7,180	5,469	7,026	5,404
April	7,172	5,866	1,260	689	6,090	5,067	6,399	5,177
May	12,895	7,742	1,108	887	11,841	6,765	11,962	6,855
June	13,989	9,086	1,139	980	13,193	8,030	12,850	8,106
July	10,096	7,533	1,000	686	9,909	7,049	9,547	6,847
August	9,076	6,691	775	556	8,834	6,380	8,466	6,134
September	10,216	6,306	665	604	10,175	6,094	9,609	5,701
October	7,754	5,485	1,040	822	6,937	4,846	6,802	4,663
November	8,254	5,671	1,217	610	7,956	5,212	7,586	5,061
December	8,546	5,679	773	685	8,226	5,100	7,873	4,994
Annual Average Day		6,429		684		5,843		5,745

Note: The shaded blocks denote the annual maximum daily flows for 2018.



The following tables (8-3 & 8-4) show the maximum day and average day raw water volumes for 2018 in comparison to the permitted water taking (PTTW) and the rated capacity in the MDWL.

Table 8-3 Kelso WPP Flow Comparison to MDWL and PTTW

Kelso WPP	Raw Water		Treated Water	
	Max. Day	Average Day	Max. Day	Average Day
% PTTW	97%	43%		
% Rated Capacity			57%	25%

Table 8-4 Walkers Line Flow Comparison to MDWL and PTTW¹

Walkers Line Wells	Maximum Day Flow	Average Day Flow
% PTTW	40%	22%
% Rated Capacity	24%	13%

In 2018, the maximum flows taken and pumped into the treatment systems were not greater than the values specified in the MDWL and the PTTW.

8.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and the Medical Officer of Health. In 2018, there was one adverse test result/incident in the Milton Drinking Water System as summarized in Table 8-5.



Table 8-5 Adverse Test Results and Actions – Milton Drinking Water System

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
December 7, 2018	Distribution	Other Observation - Watermain break with evident or suspected contamination	Watermain isolated and MOH issued Boil Water. Sample analysis results, collected after repairs and flushing, were within acceptable limits	December 9, 2018

9 Georgetown Water Supply System

9.1 Water System Description

The Georgetown Drinking Water System draws groundwater from three well fields. There are four wells in the Cedarvale well field, two wells in the Princess Anne well field and two wells in the Lindsay Court well field.

The Georgetown WTP treats water from the four Cedarvale Wells with greensand filtration, ultraviolet light for primary disinfection, fluoridation, and chlorination for secondary disinfection. Water from the Princess Anne and Lindsay Court Wells receive treatment at the well sites with chlorination for disinfection and fluoridation. Together, these three sources pump water into the distribution system that includes 22 Side Road Reservoir, Moore Park Booster Station, Todd Road Tower and the Norval Standpipe under a water distribution Class III Certificate (# 566).

The Georgetown system is controlled through a computerized SCADA system that is monitored 24 hours per day, seven days a week.



Table 9-1 Georgetown Water System General Information

Municipal Drinking Water Licence	004-101	
Drinking Water Works Permit	004-201	
Drinking Water System Number	220001655	
Classification		
Class	Treatment Class 2	Distribution Class 3
Certificate Number	564	566
Service Population	39,494	
Permit to Take Water		
Number	4705-AFCJ82	
Expiry Date	December 31, 2021	
Water Taking Permitted		
Cedarvale Well 1A	2,618 m ³ /d	
Cedarvale Well 3A	3,931 m ³ /d	
Cedarvale Well 4	7,854 m ³ /d	
Cedarvale Well 4A	5,890 m ³ /d	
Maximum Daily (Cedarvale Well Field)	12,500 m ³ /d	
Annual Avg. Daily (Cedarvale Wells)	6,972 m ³ /d	
Princess Anne Well 5	4,582 m ³ /d	
Princess Anne Well 6	13,090 m ³ /d	
Annual Average Both PA Wells	6,800 m ³ /d	
Lindsay Court Well 9 and 9B (Combined)	6,545 m ³ /d or 5210 L/min (max. rate)	
Capacity		
Georgetown WPP	13,046 m ³ /d	
Princess Anne Well 5	4,582 m ³ /d	
Princess Anne Well 6	13,080 m ³ /d	
Lindsay Court Well 9A and/9B (Combined)	6,540 m ³ /d	



9.2 2018 Flow Summary

A summary of the flows in 2018 is provided in Table 9-2 on the following page. At the Princess Anne and Lindsay Court wells, the treated water flow is the same as the raw water flow. At the Georgetown WTP (Cedarvale wells), some water is used in the chemical feed systems and for backwashing filters. Thus, the raw water flow is greater than the treated water flow. The treatment plants are designed to handle peak hour flows and, as such, a comparison of maximum and average daily volumes to permitted levels is not the most accurate representation of available capacity. The data presented complies with the reporting requirements of the regulation (O. Reg. 170/03, Schedule 22).

Table 9-2 Georgetown Water System Flow Summary 2018¹

Month	Georgetown System Total Treated Flow m ³ /d (GWPP, PA, LC)		Princess Anne Wells 5 and 6 m ³ /d		Princess Anne 5 m ³ /d		Princess Anne 6 m ³ /d		Lindsay Court 9A and 9B m ³ /d		Lindsay Court Well 9A m ³ /d		Lindsay Court Well 9B m ³ /d		Cedarvale Wells (Georgetown WPP) Total Raw Flow m ³ /d		Georgetown WPP Treated m ³ /d	
	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day
January	14,445	13,116	7,130	3,054	3,137	1,877	7,130	1,177	4,795	3,995	4,795	1,509	4,295	2,486	7,921	6,397	7,622	6,067
February	13,920	12,900	8,231	3,150	3,386	2,222	6,232	929	4,776	3,788	4,776	1,705	4,277	2,083	6,653	6,280	6,410	5,962
March	13,583	12,849	4,841	3,690	3,306	2,643	2,996	1,048	4,947	4,244	4,947	2,095	4,136	2,149	6,566	5,339	6,356	4,915
April	15,512	13,083	7,143	3,492	3,486	2,382	7,143	1,110	5,263	4,726	5,251	2,468	5,200	2,258	8,855	5,154	8,616	4,865
May	17,961	14,442	9,050	5,731	3,484	2,140	7,626	3,592	5,608	5,359	5,603	2,553	5,608	2,806	6,296	3,499	5,985	3,351
June	20,307	16,480	10,439	6,904	3,497	1,807	9,602	5,097	5,618	5,480	5,604	2,867	5,618	2,613	4,444	4,242	4,489	4,096
July	21,697	16,803	10,268	6,916	4,147	1,694	9,614	5,223	5,771	5,558	5,771	2,925	5,622	2,633	8,730	4,539	7,797	4,330
August	17,468	14,641	6,840	4,602	4,147	2,895	4,323	1,707	5,624	5,483	5,345	2,245	5,624	3,238	7,344	4,888	6,411	4,556
September	16,817	14,167	7,028	4,699	4,064	2,563	5,397	2,136	5,704	5,467	5,602	2,172	5,704	3,295	4,503	4,274	4,331	4,001
October	13,908	12,656	5,384	3,414	4,147	2,839	4,800	575	5,637	5,289	5,173	2,922	5,637	2,367	4,363	4,114	4,267	3,952
November	14,821	12,524	4,253	3,251	4,147	2,902	1,880	349	5,613	5,214	5,387	2,728	5,613	2,486	4,500	4,120	6,742	4,059
December	13,989	12,933	4,446	1,401	4,147	1,219	2,065	182	5,615	4,994	5,345	2,369	5,615	2,625	10,162	6,742	8,463	6,537
Annual Average Day		13,883		4,192		2,265		1,927		4,966		2,380		2,587		4,966		4,724

Note: The yellow shaded blocks denote the annual maximum daily flows for 2018.

¹ The use of variable frequency drive pumps, such as those used at both Princess Anne and the Lindsay Court Wells, allow for accurate and consistent flow rates. It is not uncommon to have the same maximum flow rate for several days over the course of the year. Flow meters measure to one decimal place and when rounded, as is the case for the Annual Flow Report, may contribute to similar flow values on several days.



The following tables (9-3 & 9-4) compare the maximum day and average day volumes for 2018 to the permitted water taking (PTTW) and the rated capacity.

Table 9-3 Georgetown WPP Flow Comparison to MDWL and PTTW²

Georgetown WPP	Raw Water		Treated Water	
	Max. Day	Average Day	Max. Day	Average Day
% PTTW	81%	40%		
% Rated Capacity			66%	36%

Table 9-4 Princess Anne and Lindsay Court Well Flow Comparison to MDWL and PTTW²

Facility	Maximum Day Volume	Average Day Volume
Princess Anne Well 5		
% PTTW	91%	62% (Wells 5 and 6 combined)
% Rated Capacity	91%	49%
Princess Anne Well 6		
% PTTW	73%	62% (Wells 5 and 6 combined)
% Rated Capacity	74%	15%
Lindsay Court Well 9A		
% PTTW	88% (Wells 9 and 9B combined)	36%
% Rated Capacity	88%	36%
Lindsay Court Well 9B		
% PTTW	88% (Wells 9 and 9B combined)	40%
% Rated Capacity	87%	40%

In 2018, the maximum flows taken and pumped into the treatment systems were not greater than the values specified in the PTTW and the MDWL.

² The current Georgetown PTTW contains specific conditions for water taking at the Princess Anne and Lindsay Court Well Fields. There is a combined maximum day water taking limit on the Lindsay Court Wells and a maximum annual average daily taking limit placed on the Princess Anne Wells. This has been reflected in the general information for the Georgetown Drinking Water System and the flow comparison chart.



9.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and the Medical Officer of Health. In 2018, there was no adverse test result/incident in the Georgetown Water System.

10 Acton Water Supply System

10.1 Water System Description

The Acton Wells located in the Town of Acton draw groundwater from two separate aquifers. The two Davidson Wells and the Fourth Line Wells (a second well was brought online in 2018) draw from the Amabel Formation, and the Prospect Park Wells (Fairy Lake) draw from a sand-and-gravel aquifer. All of the wells use ultraviolet (UV) light for primary disinfection with chlorination for secondary disinfection. Fluoride is added to the water from all three sources. The Prospect Park facility is equipped with greensand filters for the removal of manganese and iron from the water. Treated water from the three sites is pumped to the Churchill Reservoir and the Acton water distribution system, The Acton system is controlled through a computerized SCADA system that is monitored 24 hours per day, seven days a week.

Table 10-1 Acton Water System General Information

Municipal Drinking Water Licence	004-102
Drinking Water Works Permit	004-202
Drinking Water System Number	220001673
Classification	
Class	Treatment Class 2 Distribution Class 2
Certificate Number	3642 569
Service Population	10,030



Table 10-1 Acton Water System General Information

Permit to Take Water	
Number	3687-ABKHAP
Expiry Date	December 31, 2021
Water Taking Permitted	
Prospect Park Well 1	3,400 m ³ /d
Prospect Park Well 2	3,400 m ³ /d
Prospect Park Well 1 and 2 (Combined)	3,400 m ³ /d
Davidson Well 1	1,250 m ³ /d
Davidson Well 2	1,250 m ³ /d
Fourth Line Well A	1,309 m ³ /d
Fourth Line Well B	1,309 m ³ /d
Fourth Line Well A and B (Combined)	1,711 m ³ /d
Rated Capacity	
Prospect Park WPP	3,400 m ³ /d
Davidson Well 1 and 2	2,500 m ³ /d
Fourth Line Wells (Wells A and B combined)	1,711 m ³ /d

10.2 2018 Flow Summary

A summary of the flows in 2018 is provided in Table 10-2 on the following page. At the Prospect Park WPP, filter backwash water is withdrawn from the distribution system following the treated water flow meter; therefore, the metered treated water is the same as the raw water flow, but the actual volumes available to the distribution system are less than those shown. At the Davidson and Fourth Line wells, the raw water



flow is the same as the treated water flow to the distribution system.

Table 10-2 Acton Flow Summary 2018

Month	Acton Total Flow m ³ /d		Davidson Wells m ³ /d		4th Line Well A m ³ /d		4th Line Well B m ³ /d		4 th Line Wells A and B m ³ /d		Prospect Park WPP Raw Water m ³ /d		Prospect Park WPP m ³ /d	
	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day	Max Day	Avg Day
January	2,825	2,825	1,743	1,294	676	556	678	574	1,354	1,130	0	0	0	0
February	2,760	2,411	1,501	1,189	775	610	777	612	1,552	1,222	0	0	0	0
March	2,873	2,482	1,635	1,271	777	605	778	606	1,555	1,211	0	0	0	0
April	4,801	2,736	2,332	931	777	489	778	490	1,555	979	2,543	827	2,543	827
May	3,665	3,020	1,897	745	778	253	778	252	1,556	506	2,585	1,770	2,585	1,770
June	4,579	3,226	2,332	624	779	133	778	484	1,557	266	2,594	2,337	2,594	2,337
July	4,012	3,098	1,126	493	364	138	365	139	729	277	2,597	2,328	2,597	2,328
August	3,748	2,858	1,736	438	778	305	778	305	1,555	610	2,115	1,811	2,115	1,811
September	3,709	2,921	1,289	250	535	339	536	340	1,071	680	2,106	1,991	2,106	1,991
October	3,185	2,587	1,994	457	775	183	779	184	1,554	367	2,134	1,764	2,134	1,764
November	3,417	2,544	1,258	407	545	112	547	113	1,092	225	2,223	1,912	2,223	1,912
December	2,883	2,520	879	367	108	19	108	19	216	19	2,183	2,115	2,183	2,115
Annual Avg Day		2,769		705		312		343		624		1,404		1,404



Note: The shaded blocks denote the annual maximum daily flows for 2018.

Table 10-3 compares the maximum day and average day volumes for 2018 to the permitted water taking (PTTW) and the rated capacity.

Table 10-3 Acton Water System Flow Comparison to MDWL and PTTW³

Facility	Maximum Day Volume	Average Day Volume
Davidson Wells		
% PTTW	93%	28%
% Rated Capacity	93%	28%
Fourth Line Well A		
% PTTW	91% (Wells A and B combined)	24%
% Rated Capacity	91% (Wells A and B combined)	18%
Fourth Line Well B		
% PTTW	91% (Wells A and B combined)	26%
% Rated Capacity	91% (Wells A and B combined)	20%
Prospect Park		
% PTTW	76% (Wells 1 and 2 combined)	41%
% Rated Capacity	76% (Wells 1 and 2 combined)	41%

³ The current Acton PTTW contains specific conditions for the Prospect Park and Fourth Line Well Fields. In addition to the water taking limits on the individual wells, there is also combined maximum day water taking limits stated for these sites. This has been reflected in the general information for the Acton Water System and the flow comparison chart. Additionally, Prospect Park Wells were taken out service for well rehabilitation in 2018.



10.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health. In 2018, there was one adverse test result/incident in the Acton Drinking Water System as summarized in Table 10-4.

Table 10-4 Adverse Test Results and Actions – Acton Drinking Water System

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
April 29, 2018	Plant Treated	Low CT	Repairs made to correct issues	May 1, 2018

11 Campbellville Water Supply System

11.1 Water System Description

The Campbellville Well Supply, located in the Town of Milton, services a residential development of approximately 35 households in the village of Campbellville. The supply consists of two wells and the water is disinfected with ultraviolet (UV) light and chlorination. Four pressure tanks provide a small amount of treated water storage and maintain pressure in the distribution system. The Campbellville system is controlled through a computerized SCADA system that is monitored 24 hours per day, seven days a week.



Table 11-1 Campbellville Water System General Information

Municipal Drinking Water Licence Drinking Water Works Permit	004-103 004-203
Drinking Water System Number	220012162
Classification Class	Limited Groundwater System
Certificate Number	Distribution Class 1 #6504
Service Population	145
Permit to Take Water Number Expiry Date Water Taking Permitted Campbellville Well 1 Campbellville Well 2A Total from both wells	6830-9QAQNW December 31, 2019 524 m ³ /d 524 m ³ /d 524 m ³ /d 524 m ³ /d
Rated Capacity	524 m ³ /d

11.2 2018 Flow Summary

A summary of the flows in 2018 is provided in Table 11-2. In the Campbellville system, the treated water flow is the same as the raw water flow. The treatment plants are designed to handle peak hour flows and, as such, a comparison of maximum and average daily volumes to permitted levels is not the most accurate representation of available capacity. The data presented in Table 11-2 complies with the reporting requirements of the regulation (O. Reg. 170/03, Schedule 22).



Table 11-2 Campbellville Drinking Water System Flows 2018

Month	Campbellville Flow m ³ /d	
	Maximum Day	Average Day
January	23	20
February	40	21
March	50	20
April	23	18
May	60	28
June	47	30
July	77	38
August	51	27
September	40	24
October	28	20
November	32	20
December	24	19
Annual Average Day		24

Note: The shaded block denotes the annual maximum daily flow for 2018.



Table 11-3 Campbellville Flow Comparison to MDWL and PTTW

Campbellville WPP	Raw Water		Treated Water	
	Max. Day	Average Day	Max. Day	Average Day
% PTTW	15%	5%		
% Rated Capacity			15%	5%

11.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health. In 2018, there were no adverse test results/incidents in the Campbellville Drinking Water System.



12 Bridgeview Distribution System

12.1 Water System Description

The Bridgeview community distribution system is located at the west end of the City of Burlington, but it is not connected to the South Halton Water Distribution System. Water is supplied by the City of Hamilton through an inter-connection to Hamilton's distribution system on Plains Road. There are approximately 70 homes and businesses in the Bridgeview System.

The City of Hamilton uses chloramination (a combination of chlorine and ammonia) for secondary disinfection in its drinking water system; and so, the water in the Bridgeview distribution system has a combined chlorine residual rather than a free chlorine residual.

In November 2018, the City of Hamilton implemented a new Corrosion Control Program (CCP), approved by the MECP by utilizing low concentrations of orthophosphate. A letter outlining Hamilton's CCP was delivered to all affected Halton residents and select members of Council ahead of the implementation date.

Table 12-1 Bridgeview Distribution System General Information

Municipal Drinking Water Licence Drinking Water Works Permit	004-104 (South Halton) 004-204
Drinking Water System Number	260068419
Classification Class Certificate Number	Distribution Class 1 3821
Service Population	215



12.2 2018 Flow Summary

The water flows in 2018 based on customer meter readings were as follows:

Total annual water consumption: 16,573m³

Average day consumption: 43m³

Since there is no flow limitation in the MDWL for this distribution system, a comparison of flow data with approvals is not required.

12.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health. In 2018, there was one adverse test result/incident in the Bridgeview Water System as summarized in Table 12-2.

Table 12-2 Adverse Test Results and Actions – Bridgeview Drinking Water System

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
May 10, 2018	Distribution	TC = 1 CFU/100 mL	Resamples collected and results within acceptable limits	May 12, 2018



13 Snake Road Distribution System

13.1 Water System Description

The Snake Road distribution system is located at the north end of the City of Burlington, but it is not connected to the South Halton Water Distribution System. Water is supplied by the City of Hamilton through an inter-connection to Hamilton's distribution system on Snake Road. There are approximately 24 homes and businesses in the Snake Road system.

The City of Hamilton uses chloramination (a combination of chlorine and ammonia) for secondary disinfection in its drinking water system; and so, the water in the Snake Road distribution system has a combined chlorine residual rather than a free chlorine residual.

In November 2018, the City of Hamilton implemented a new Corrosion Control Program (CCP), approved by the MECP by utilizing low concentrations of orthophosphate. A letter outlining Hamilton's CCP was delivered to all affected Halton residents and select members of Council ahead of the implementation date.

Table 13-1 Snake Road Distribution System General Information

Municipal Drinking Water Licence Drinking Water Works Permit	004-104 (South Halton) 004-204
Drinking Water System Number	260086775
Classification Class Certificate Number	Distribution Class 1 5444
Service Population	265



13.2 2018 Flow Summary

The water flows in 2018 based on customer meter readings were as follows:

Total annual water consumption: 16,012m³

Average day consumption: 44m³

Since there is no flow limitation in the MDWL for this distribution system, a comparison of flow data with approvals is not required.

13.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health In 2018, there were no adverse test results/incidents in the Snake Road Water System.



14 North Aldershot Distribution System

14.1 Water System Description

The North Aldershot distribution system is located in the north end of the City of Burlington. The system is connected to the South Halton Water Distribution System however the connections are normally closed, thus isolating the two systems. Water is supplied by the City of Hamilton through an inter-connection to Hamilton's distribution system on Waterdown Road. There are approximately 105 homes and businesses in the North Aldershot system.

In November 2018, the City of Hamilton implemented a new Corrosion Control Program (CCP), approved by the MECP by utilizing low concentrations of orthophosphate. A letter outlining Hamilton's CCP was delivered to all affected Halton residents and select members of Council ahead of the implementation date.

Table 14-1 North Aldershot Distribution System General Information

Municipal Drinking Water Licence Drinking Water Works Permit	004-104 (South Halton) 004-204
Drinking Water System Number	260086762
Classification Class Certificate Number	Distribution Class 1 5445
Service Population	280



14.2 2018 Flow Summary

The water flows in 2018 based on customer meter readings were as follows:

Total annual water consumption: 39,415m³

Average day consumption: 108m³

Since there is no flow limitation in the MDWL for this distribution system, a comparison of flow data with approvals is not required.

14.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health. In 2018, there were no adverse water test results/incidents for the North Aldershot Distribution System.

15 Drinking Water System Inspections

During the 2018 MECP inspection cycle, eleven drinking water system inspections were completed. Schedule 22-2(2) of O. Reg. 170/03 stipulates that any cases where the requirements of the SDWA were not met are to be listed in the Flow Summary Report along with the resulting corrective actions. For the inspections conducted in 2018 there were no identified incidents of non-compliance in the Halton Drinking Water Systems.



16 Conclusions

Halton Region continued to provide clean, safe and reliable drinking water to over 560,000 residents in 2018. The total volume of water delivered to consumers in 2018 slightly increased to 63,336 ML compared to 61,927 ML in 2017. As reported by Conservation Halton; the Region experienced a long and cooler than normal spring in 2018, with the exception of an unseasonably warm May, which may have affected demand.

Compliance with regulatory requirements, Municipal Drinking Water Licences and Permits to Take Water continue to be monitored through MECP Inspections, the Region's SCADA system, professional staff and regular reporting mechanisms. In 2018, no regulatory compliance issues related to water quality were identified.

As required under O. Reg. 170/03, this report was prepared and presented to members of Municipal Council prior to March 31. Copies of the report are available in the Regional Municipality of Halton Citizen's Library and posted on Halton's website (www.halton.ca).



