The Corporation of the Municipality of Brighton
Public Works and Environmental Services
Brighton Springs Drinking Water System
67 Sharp Road
Brighton, ON, K0K 1H0

2023 Annual Brighton Springs Drinking Water System Report

Abstract

In accordance with Ontario Regulation 170/03 under the Safe Drinking Water Act, 2002, an Annual Report shall be prepared by Large Municipal Residential Water System Owners by February 28 for each preceding year. This report is a compilation of annual reporting requirements under the Regulation. The System Owner is also required to provide a Summary Report to members of Municipal Council by March 31 each year. This report is a compilation of both the Annual and Summary Report's required by O.Reg.170/03

Contents

2023 Annual Drinking Water System Report

Drinking Water System Information

Drinking Water System Number:	220000807
Drinking Water System Name:	Brighton Springs Drinking Water System
Drinking Water System Owner:	The Corporation of the Municipality of Brighton
Drinking Water System Category:	January 1, 2023 through December 31, 2023

Does your Drinking Water System Service more than 10,000 people?

No.

Is your Annual Report available to the public at no charge on a website?

Yes, please visit www.brighton.ca

Location where Summary Report required under O.Reg.170/03 Schedule 22 will be available for inspection

Public Works and Environmental Services Administration office
67 Sharp Road
Brighton, ON, K0K 1H0

List of Drinking Water Systems that receive all Drinking Water from the Brighton Springs Drinking Water System:

None.

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

- ✓ Public Access/notice via Municipal website
- ✓ Public access/notice via Municipal Social Media Platform(s)

Description of the Drinking Water System

The Brighton Springs Drinking Water System, located at 406 County Road 26, is a Class III Water Distribution & Supply subsystem. The Drinking Water System (DWS) is governed by Drinking Water Works Permit (DWWP) # 135-201 issued on May 21, 2020, and Municipal Drinking Water Licence (MDWL) 135-101 issued on May 21, 2020.

The raw water supply is designated as a Groundwater source (not Groundwater Under the Direct Influence of surface water/GUDI). To continue being designated a Groundwater supply, a Fail-Safe Control System to monitor groundwater hydraulic gradients is required. The Fail-Safe Control System includes deep, intermediate and shallow depth Observation Wells in place adjacent to each of three (3) Production Well's for the purposes of monitoring hydraulic gradients. The Observation Well levels are continuously monitored for possible reductions in hydraulic gradients. Maximum, minimum, and average readings are recorded every 60 minutes. Each Production Well is approximately forty (40) meters deep, and each submersible well pump is permitted to produce 24.9 L/s at TDH of 18.5m. Each day, the duty well is rotated. The second and third wells act as standby pumps in the event water demand requires more water production. Upon well pump start up, water is pumped to a waste detention pond for a pre-determined time to purge the transmission line, then water is allowed to pass through the treatment plant system.

As the Drinking Water System is designated a Groundwater Supply, conventional filtration is not required. Water treatment consists of chlorine disinfection of water supply. The Water Treatment Plant houses a primary and secondary disinfection system consisting of four (4) 100-lb chlorine gas cylinders, chlorinators, weigh scales, vacuum regulators, injectors and appurtenances to facilitate the application of a chlorine solution as water enters two interconnected baffled reservoirs. During normal operation, the reservoirs operate in series, with the ability to isolate one reservoir from the other, if required. The reservoirs have a combined capacity of 5,600 cu.m. Emergency Power is supplied through an 80kW, pad-mounted outdoor standby generator. Water is gravity-fed to residents in Brighton via a single 600mm transmission watermain that runs along County Road 26 before travelling South along County Road 30. The distribution system provides drinking water to approximately 7,000 customers, and Presqu'ile Provincial Park, through a network of approximately 63 km of watermain varying in size from 50mm – 600mm. Watermain material is generally PVC, Asbestos-Cement, Ductile Iron, and Concrete Pressure Pipe. A Pressure monitoring station is located at the entrance to Presqu'ile Provincial Park. The Distribution System has four (4) Pressure Reducing Valves (located strategically in the Distribution System to reduce system pressure) and two (2) Pressure Booster Stations, Lakeview Heights Booster Pumping Station and Dundas Street Booster Pumping Station. Each of the Booster Pumping Stations are located near the north-end of the water distribution system to supplement system pressure to areas of higher elevation.

List of water treatment chemical(s) used over the Reporting Period

- ✓ Chlorine Gas

Were any significant expenses incurred to:

- ☒ Install required Equipment?
- ☒ Repair required Equipment?
- ☒ Replace required Equipment?

Description of Equipment Upgrades and breakdown of monetary expenses incurred

Preventative Maintenance (PM) activities for inspections, testing and cleaning of equipment is scheduled and completed routinely, along with other lifecycle replacement needs. In addition to the PM activity, the following Capital expenditures were incurred this Reporting Period:

Watermain Reconstruction and Extention – Loyalist Dr.	$ 252,445.54
Watermain Reconstruction – Main St.	$ 1,862,628.95
SCADA Upgrade Final Payment	$ 62,192.94
Distribution System Piping Repairs	$ 48,295.31

Notices submitted in accordance with subsection 18(1) of the Safe Drinking Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to the Spills Action Centre during this Reporting Period:

None.

Microbiological Testing completed in accordance with Schedule 10, 11, or 12 of O.Reg.170/03 during this Reporting Period:

Schedule 10 Microbiological Testing Summary

	Number of Samples	Range of E.Coli (EC) (min-max)	Range of Total Coliform (TC) (min-max)	Number of Heterotrophic Plate Count (HPC)	Range of HPC results (min-max)
Raw Water	156	0 - 0	0 - 0	N/A	N/A
Treated Water	52	0 - 0	0 - 0	52	0 - 10
Distribution	259	0 - 0	0 - 0	104	0 - 122

Operational Testing completed in accordance with Schedule 7, 8, or 9 of O.Reg.170/03 during this Reporting Period:

Schedule 7 Operational Checks Testing Summary

Parameter	Number of Grab Samples	Range of Results (min-max)
Turbidity on Gravity Discharge (NTU[1])	8,760[2]	0.00 – 0.13
Primary Disinfection FAC[3], (mg/L)	8,760	0.96 – 1.27
Secondary Disinfection Total Chlorine [4] (TRC), (mg/L)	365	1.02 – 1.35
Secondary Disinfection FAC, (mg/L)	365	0.97 – 1.29

Summary of additional testing and sampling carried out in accordance with the requirement of an Approval, Order, or other Legal Instrument:

Condition 5.0 of Schedule C of the MDWL #135-101, issue number: 5, requires the municipality to sample from the By-Pass Detention Pond outlet monthly, and test for Total Suspended Solids and Total Chlorine Residual. This sampling and testing are completed to evaluate the waste discharge environmental impact(s).

Condition 1.5 of the MDWL outlines the maximum allowable annual average concentration of Total Suspended Solids and Total Chlorine residual to be discharged to the environment through the By-pass detention pond. Outlined on pg. 7, are sample results measured over the course of the Reporting Period.

On November 19, 2021, the Municipality of Brighton submitted a request to the MECP District Office to suspend sampling at the By-pass Detention Pond due to safety concerns and requested that the approved sampling location be moved to a sample tap (dedicated to the waste discharge line), located inside the water treatment building. On November 29, 2021, the MECP agreed to this move in sampling location. As of December 21, 2021 samples have been collected from the sample tap inside the building.

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[1] NTU stands for Nephelometric Turbidity Unit. This is a unit used to measure the turbidity of a fluid or presence of suspended particles in water.

[2] If Continuous Monitoring is used to satisfy the monitoring required, this number represents the number of samples collected.

[3] FAC stands for Free Available Chlorine. It is defined as the free amount of chlorine available in water to deactivate potentially pathogenic organisms.

[4] While Total Chlorine residual monitoring is not required by Schedule 7 of O.Reg.170/03, it has been municipal past practice to sample and test Total Residual Chlorine (TRC) at the same time Free Chlorine testing takes place.

MDWL Condition 5.0 Monitoring

Monitoring Month	Total Flow to Waste Detention Pond (cu.m.)	Total Suspended Solids (mg/L)	Total Chlorine Residual (mg/L)
January 17, 2023	492.0	2	0
February 14, 2023	318.0	2	0
March 07, 2023	299.0	<2	0
April 04, 2023	331.0	<2	0
May 16, 2023	327.0	<2	0
June 13. 2023	316.0	3	0
July 11, 2023	1094.0	7	0
August 22, 2023	3751.0	4	0
September 19, 2023	4624.0	<2	0
October 17, 2023	1866.0	8	0
November 21, 2023	1452.0	3	0
December 12, 2023	955.0	<2	0
Annual Average	**1319.0**	**<3.25**	**0**

Summary of Inorganic Parameters tested during this Reporting Period[5]

Inorganic Compound Results

Parameter	Sample Date (dd/mmm/yy)	Result Value	Unit of Measure	Exceedance
Antimony	28-NOV-23	<0.6	ug/L	No
Arsenic	28-NOV-23	<0.2	ug/L	No
Barium	28-NOV-23	77.2	ug/L	No
Boron	28-NOV-23	7	ug/L	No
Cadmium	28-NOV-23	<0.003	ug/L	No
Chromium	28-NOV-23	0.72	ug/L	No
Mercury	28-NOV-23	<0.01	ug/L	No
Selenium	28-NOV-23	0.22	ug/L	No
Uranium	28-NOV-23	0.666	ug/L	No
Sodium	25-JAN-22	5.2	ug/L	No
Fluoride	25-JAN-22	<0.1	ug/L	No

[5] In accordance with Schedule 13 of O.Reg.170/03, Owners of a raw water supply that is ground water shall collect samples outlined in Schedule 23 of the Regulation, once every **36 months.**

Parameter	Sample Date (dd/mmm/yy)	Result Value	Unit of Measure	Exceedance
Nitrate	14-FEB-23 09-MAY-23 15-AUG-23 14-NOV-23	2.92 2.91 2.78 2.78	mg/L	No
Nitrite	14-FEB-23 09-MAY-23 15-AUG-23 14-NOV-23	0.003 0.003 0.003 0.003	mg/L	No

Summary of Lead Testing under Schedule 15.1 during this Reporting Period:

Section 15.1-5(9) of O.Reg.170/03. Sampling and testing for lead were taken in Winter 2021/2022 and Summer 2022 Sampling Period and are not due again until 2025. pH and Alkalinity samples were collected in accordance with the Regulation on April 11, 2023 and July 31, 2023 as per their respective sampling periods.

Lead Sampling Results

Sampling Period	Location Type	Number of Samples	Range of Lead Results (ug/L)	Number of Exceedances
Winter Sampling Period[6] January 24/22	Hydrants	3	0.07 – 0.15	0
Summer Sampling Period[7] August 22/22	Hydrants	3	0.01 – 0.75	0

[6] Winter Sampling Period runs from December 15 through April 15

[7] Summer Sampling Period runs from June 15 through October 15

Summary of Organic parameters sampled during this Reporting Period:[8]

Organic Compounds results

Parameter	Sample Date (dd/mm/yy)	Result Value	Unit of Measure	Exceedance?
Alachor	28-NOV-23	<0.02	ug/L	No
Atrazine + N-dealkylated metabolites	28-NOV-23	<0.01	ug/L	No
Azinphos-methyl	28-NOV-23	<0.05	ug/L	No
Benzene	28-NOV-23	<0.32	ug/L	No
Benzo(a)pyrene	28-NOV-23	<0.004	ug/L	No
Bromoxynil	28-NOV-23	<0.33	ug/L	No
Carbaryl	28-NOV-23	<0.05	ug/L	No
Carbofuran	28-NOV-23	<0.01	ug/L	No
Carbon Tetrachloride	28-NOV-23	<0.17	ug/L	No
Chlorpyrifos	28-NOV-23	<0.02	ug/L	No
Diazinon	28-NOV-23	<0.02	ug/L	No
Dicamba	28-NOV-23	<0.20	ug/L	No
1, 2-Dichlorobenzene	28-NOV-23	<0.41	ug/L	No
1, 4-Dichlorobenzene	28-NOV-23	<0.36	ug/L	No
1, 2-Dichloroethane	28-NOV-23	<0.35	ug/L	No
1, 1-Dichloroethylene (vinylidene chloride)	28-NOV-23	<0.33	ug/L	No
Dichloromethane	28-NOV-23	<0.35	ug/L	No
2, 4-Dichlorophenol	28-NOV-23	<0.15	ug/L	No
2, 4-Dichlorophenoxy acetic acid (2,4-D)	28-NOV-23	<0.19	ug/L	No
Diclofop-methyl	28-NOV-23	<0.40	ug/L	No
Dimethoate	28-NOV-23	<0.06	ug/L	No
Diquat	28-NOV-23	<1	ug/L	No
Diuron	28-NOV-23	<0.03	ug/L	No
Glyphosate	28-NOV-23	<1	ug/L	No
Malathion	28-NOV-23	<0.02	ug/L	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	28-NOV-23	<0.00012	ug/L	No

[8] In accordance with Schedule 13 of O.Reg.170/03, Owners of a raw water supply that is ground water shall collect samples outlined in Schedule 23 of the Regulation, once every **36 months.**

Parameter	Sample Date (dd/mm/yy)	Result Value	Unit of Measure	Exceedance?
Metolachlor	28-NOV-23	<0.01	ug/L	No
Metribuzin	28-NOV-23	<0.02	ug/L	No
Monochlorobenzene	28-NOV-23	<0.3	ug/L	No
Paraquat	28-NOV-23	<1	ug/L	No
Pentachlorophenol	28-NOV-23	<0.15	ug/L	No
Phorate	28-NOV-23	<0.01	ug/L	No
Picloram	28-NOV-23	<1	ug/L	No
Polychlorinated Biphenyls (PCB)	28-NOV-23	<0.04	ug/L	No
Prometryne	28-NOV-23	<0.03	ug/L	No
Simazine	28-NOV-23	<0.01	ug/L	No
Terbufos	28-NOV-23	<0.01	ug/L	No
Tetrachloroethylene (perchloroethylene)	28-NOV-23	<0.35	ug/L	No
2,3,4, 6-Tetrachlorophenol	28-NOV-23	<0.20	ug/L	No
Triallate	28-NOV-23	<0.01	ug/L	No
Trichloroethylene	28-NOV-23	<0.44	ug/L	No
2,4, 6-Trichlorophenol	28-NOV-23	<0.25	ug/L	No
Trifluralin	28-NOV-23	<0.02	ug/L	No
Vinyl Chloride	28-NOV-23	<0.17	ug/L	No
Trihalomethanes (THM)	29-NOV-23	11.0	ug/L	No
Haloacetic Acid (HAA)	29-NOV-23	5.3	ug/L	No

Inorganic or Organic parameter(s) that have exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards O.Reg.169/03

None.

2023 Summary Report to Council

In accordance with Schedule 22 requirements outlined in Ontario Regulation 170/03, a Summary Report shall be prepared no later than March 31 for the preceding year and supplied to members of municipal Council.

The Report shall list the requirements of the Act, Regulations, Drinking Water Works Permit, Municipal Drinking Water Licence, and any Orders applicable to the system that were not met at any time during the period covered by the Report.

The Report must also include a summary of the quantities and flow rates of potable (drinking) water supplied during the Reporting Period, including monthly average and maximum daily flows. A comparison of these flows to the Rated Capacity and flow rates approved in the system Drinking Water Works Permit, and Municipal Drinking Water Licence, must also be provided.

Prescribed Instruments applicable to the Brighton Springs Drinking Water System

The following list of Acts and Regulations outline the legal instruments which govern daily operation and management of the facility. These are not to be construed as all encompassing of municipal DWS regulatory compliance requirements.

- Safe Drinking Water Act, 2002;
  - O. Reg. 128/04 – Certification of Drinking Water System Operators and WQA;
  - O. Reg. 170/03 – Drinking Water Systems;
  - O. Reg. 169/03 – Ontario Drinking Water Quality Standards;
  - Brighton Springs DWS, Drinking Water Works Permit # 135-201, Issue: 4
  - Brighton Springs DWS, Municipal Drinking Water Licence # 135-101, Issue: 5
- Ontario Water Resources Act, 1990;
  - Permit to take Water # 3210-9P3LCQ, expires October 15, 2024
- Clean Water Act, 2006;
- Environmental Protection Act, 1990

Councillors wishing to obtain a copy of any Act or Regulation are welcome to contact the Water Department, or visit the Ontario Government e-Law website at www.ontario.ca/Laws.

Compliance with Prescribed Instruments, Acts and Regulations

In addition to the Annual Report dataset outlined in the first section of this report, the following activities occurred throughout the Reporting Period.

Safe Drinking Water Act

Drinking Water Quality Management Standard (DWQMS)

SAI global conducted a Systems Audit on September 8, 2023. The Audit Report contained no Nonconformities and, three (3) Opportunities for Improvement. The Drinking Water Staff will evaluate the opportunities for improvement.

The Municipality's Quality Management System Representative conducted an Internal Audit on December 8, 2023 in accordance with DWQMS requirements. Five (5) Opportunities for Improvement were identified. The Drinking Water Staff will evaluate the opportunities for improvement.

SAI global will be conducting an onsite Re-Accreditation Audit in May, 2024. The municipality's Certificate of Accreditation is set to expire on January 6, 2025.

Annual Compliance Inspection Results

On October 23, 2023, the Ministry of Environment, Conservation and Parks Environmental Officer conducted an inspection of the Brighton Springs Drinking Water System. The facility received a 97.22% compliance inspection rating. A Risk Rating of 2.78% was deducted for not conducting organic and inorganic water monitoring requirements within the required frequency. Required Action for the Municipality of Brighton DWS is to create and implement a method or system to be used to notify Drinking Water Staff in the event that a scheduled sample date has been missed. The purpose of this method or system is to support The Municipality of Brighton's Well Supply Chemical Sampling Schedule. The Municipality of Brighton DWS shall submit a copy of the method or system to the issuing Provincial Officer no later than February 15, 2024. Corrective Action has been created, implemented and submitted to the issuing Provincial Officer prior to the Deadline. The MECP also recommended the following:

1) It is highly recommended that The Municipality of Brighton DWS ensure that there are enough staff retained so that all required duties can be carried out effectively and efficiently.
2) The Municipality of Brighton make efforts to promote water conservation and reduce water losses in their system.
3) It is highly recommended that all chemicals be stored within the available containment area.

Drinking Water Works Permit and Municipal Drinking Water Licence

The municipality currently operates in accordance with Issue Number: 4 of DWWP #135-201 issued on May 21, 2020, and Issue Number: 5 of MDWL 135-101 issued on May 21, 2020. The municipality's Licence will expire on May 20, 2025.

Clean Water Act

The Source Protection Plan was approved by the Minister of Environment, Conservation and Parks on January 1, 2015. The municipality contracts its Risk Management Official/Risk Manager Inspector duties to Lower Trent Conservation. Some work is required to streamline the internal review and approval process, update by-laws, and municipal Emergency Response procedures. Septic inspection at the Water Treatment Plant (WTP) was conducted March 16, 2023

Ontario Water Resources Act

The Municipality currently takes water from a groundwater supply in accordance with Permit to Take Water number 3210-9P3LCQ issued on October 21, 2014. This Permit will expire on October 15, 2024. The municipality is permitted to take water from all three (3) Production Wells at rates up to 1,494 L/min (or 24.9 L/s) for a total daily taking of 6,453,960 L/day. In order to ensure that the non-GUDI conditions are monitored and maintained, a Fail Safe Control System to monitor groundwater hydraulic gradients was designed for the Brighton Well Field.

Throughout the course of the Reporting Period, a maximum daily taking of 3,872 cu.m./day was recorded on May 31, 2023. This Peak Daily Flow accounts for 60% of the Maximum Allowable Taking. Flow rates were maintained below the Max allowable taking, and each individual Production Well took less than 2,151.3 cubic meters that day.

2023 Water Quantities and Flow Rates (Raw Water Assessment)

2023 Raw Water Quantities and Flow Rates

Month	Average Daily Flow (cu.m./day)	Maximum daily Flow (cu.m./day)	Total Monthly Flow (cu.m.)
January	1,925	2,260	59,684
February	1,948	2,369	54,552
March	1,899	2,066	58,876
April	1,993	2,150	59,780
May	2,551	3,872	79,068
June	3,112	3,870	93,354
July	3,008	3,821	93,256
August	2,707	3,383	83,925
September	2,833	3,630	84,992
October	2,189	2,837	67,873
November	1,995	2,115	59,855
December	2,030	2,514	62,941
Annual Average Water Taking	**2,351**	**Total Raw Water Flow**	**858,156**

2023 Water Quantities and Flow Rates (Treated Water Assessment)

2023 Treated Water Quantities and Flow Rates

Month	Average Daily Flow (cu.m./day)	Maximum daily Flow (cu.m./day)	Total Monthly Flow (cu.m.)
January	1,861.4	2,032.5	57,702.8
February	1,892.8	2,300.6	52,999.5
March	1,852.3	1,992.7	57,420.1
April	1,935.5	2,059.1	58,064.1
May	2,485.8	3,691.4	77,059.5
June	3,033.8	3,870.7	91,015.3
July	2,918.5	3,689.7	90,472.0
August	2,527.2	2,785.8	78,343.2
September	2,615.9	3,105.1	78,477.2
October	2,083.7	2,654.0	64,593.8
November	1,905.5	2,029.9	57,164.1
December	1,955.0	2,434.3	60,603.6
Annual Average Daily Flow	**2,255.6**	**Total Treated Water Flows**	**823,915.2**

The Annual Average Daily Flow of water distributed to customers equates to 2,255.6 cu.m./day during this Reporting Period. Condition 1.1 of the MDWL states that, “the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system, shall not exceed 6,454 cu.m./day”. **The measured Annual Average Daily Flow accounts for 35% of this Rated Capacity**.

The Maximum Daily Flow in this Reporting Period was 3,870.7 cu.m./day. This accounts for 60% of the facility Rated Capacity.

Five-year Treated Water Flow evaluation

Over the past five (5) years, the facility has operated at approximately 35%-40% of its Rated Capacity during Average Daily Flows, and approximately 60%-70% during Peak (Max) Daily flow conditions. Figures in the table below illustrate this.

Five-year Flow Evaluation Compared to Rated Capacity

	2019	2020	2021	2022	2023
Calculated Annual Average Daily Flow (AADF) (cu.m./day)	2,347	2,649	2,409	2,432	2,256
AADF % Rated Capacity	**36%**	**41%**	**37%**	**38%**	**35%**
Recorded Maximum Daily Flow (cu/m./day)	4,122	4,599	4,307	4,351	3,871
Maximum Daily Flow % Rated Capacity	**64%**	**71%**	**67%**	**67%**	**60%**