



**The Corporation of the City of Belleville,  
Environmental Services Department**

## 2019 Summary and Annual Reports for Belleville and Point Anne Hamlet Drinking Water Systems

**January 1<sup>st</sup>, 2019 to December 31<sup>st</sup>, 2019**



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## 2019 Summary Report – Belleville

**Drinking Water System Number:** 220001628

**Drinking Water System Name:** Belleville Drinking Water System

**Drinking Water System Owner:** The Corporation of the City of Belleville

**Drinking Water System Category:** Large Municipal Residential

Ontario's Safe Drinking Water Act sets the framework for safe drinking water in the Province of Ontario. Further, Ontario Regulation 170 / 03 (O. Reg. 170 / 03) sets requirements for public waterworks for sampling and testing, levels of treatment, licensing of staff, and notification of authorities and the public about water quality.

This summary report has been prepared in accordance with Schedule 22 of Ontario Regulation 170 / 03. Free copies are available on our website and in person at the Water Operations Centre. We will post notice of availability on our website and / or through the local newspapers.

For further information about provincial drinking water requirements visit the Ministry of Environment [Conservation and Parks website](#) and select "Drinking Water".

## Ontario Regulation 170 / 03, Schedule 22 – Summary Reports for Municipalities

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**This section outlines the requirements of Schedule 22 and how we are achieving them.**

- **Section 22-1** states that this Schedule applies to both large and small municipal residential systems.
  - The Belleville Drinking Water System is a large municipal residential system and as such we will complete and submit a summary report. This summary report is prepared in accordance with Schedule 22 of O. Reg. 170 / 03.
- **Section 22-2 (1)** requires that we complete a Summary Report by March 31<sup>st</sup> of each year and submit it to council members.
  - Each year we prepare a Summary Report to fulfill this requirement. This report covers January 1<sup>st</sup> to December 31<sup>st</sup>, 2019 and was submitted to council prior to March 31<sup>st</sup>, 2020.
- **Section 22-2 (2) (a) and (b)** requires that we provide a list of any requirements that we did not meet at any time during the period covered by the annual report.
  - The Belleville Drinking Water System met all requirements for the period of January 1<sup>st</sup> to December 31<sup>st</sup>, 2019.
  - O. Reg 170 / 03, Section 11 (6) (b) and (d) requires that we prepare any details about adverse water quality incidents and share this with the public. Details about adverse water quality incidents are included as part of every annual report.
- **Section 22-2 (3)** requires us to submit flow summaries and comparisons in relation to the rated flow capacities stated in the system approvals.
  - This report includes the flow summary and flow rate comparisons, found on page 10.
- **Section 22-2 (4)** requires us to provide a copy of this summary report to any municipality that the drinking water system supplies water to.

- The Belleville Drinking Water System supplies water to the Rossmore / Fenwood Gardens Distribution System (WW# 260005008) and we will provide a copy of this summary report to them.
- **Section 22-3** states that we do not have to submit a compliance report for any drinking water systems that comply with Section 22-2.
  - We are compliant with Section 22-2 and therefore, we have not submitted a compliance report.

## Quantities and Flow Rates of Water Taken and Supplied

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**Table 1: Raw Water**

Values in Mega Litres (M.L), unless otherwise noted

<b>Month</b>	<b>Total Monthly Volume</b>	<b>Average Daily Volume</b>	<b>Maximum Daily Value</b>	<b>Minimum Daily Value</b>	<b>Peak Instantaneous Flow Rate (M.L per day)</b>	<b>Peak Instantaneous Flow Rate (Litres per minute)</b>
<b>January</b>	696.150	22.456	26.200	20.450	40.540	28153
<b>February</b>	613.940	21.926	22.640	21.190	37.880	26306
<b>March</b>	963.600	22.374	23.190	21.570	41.460	28792
<b>April</b>	680.200	22.673	23.980	20.270	36.280	25194
<b>May</b>	716.010	23.097	26.020	20.540	39.590	27493
<b>June</b>	763.550	25.452	29.450	22.850	43.600	30278
<b>July</b>	868.780	28.025	30.970	24.640	48.910	33965
<b>August</b>	839.680	27.086	30.050	22.120	49.330	34257
<b>September</b>	732.430	24.414	28.250	20.770	44.690	31035

<b>Month</b>	<b>Total Monthly Volume</b>	<b>Average Daily Volume</b>	<b>Maximum Daily Value</b>	<b>Minimum Daily Value</b>	<b>Peak Instantaneous Flow Rate (M.L per day)</b>	<b>Peak Instantaneous Flow Rate (Litres per minute)</b>
<b>October</b>	694.450	22.402	25.080	20.410	52.540	36486
<b>November</b>	690.100	23.003	25.350	19.780	48.500	33681
<b>December</b>	715.960	23.095	25.140	19.590	42.080	29222

### **Annual Totals:**

- Total Annual Volume = 8704.850 (total sum of January to December values)
- Average Daily Volume overall = 23.834 (total sum of January to December values divided by 12)
- Maximum Daily Value reached = 30.970 (July)
- Minimum Daily Value reached = 19.590 (December)
- Highest Peak Instantaneous Flow Rate (M.L per day) reached = 52.540 (October)
- Highest Peak Instantaneous Flow Rate (Litres per minute) = 36486 (October)



## Table 2: Treated Water

Values in Mega Litres

Month	Total Monthly Volume	Average Daily Volume	Maximum Daily Value	Minimum Daily Value
January	613.730	19.798	21.290	18.170
February	549.040	19.609	20.420	18.790
March	623.620	20.117	21.370	19.200
April	618.180	20.606	22.060	18.340
May	641.380	20.690	22.820	17.720
June	680.040	22.668	26.510	20.090
July	777.120	25.068	28.130	21.520
August	707.640	22.827	25.510	19.450
September	626.580	20.886	24.930	18.000
October	599.000	19.323	21.090	17.700
November	614.530	20.484	22.310	17.550
December	636.170	20.522	22.670	17.550

### Annual Totals:

- Total Annual Volume = 7687.030 (total sum of January to December values)
- Average Daily Volume overall = 21.050 (total sum of January to December values divided by 12)
- Maximum Daily Value reached = 28.130 (July)
- Minimum Daily Value reached = 17.550 (November and December)

## Water Flow Comparisons

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### Raw Water Comparisons

- Maximum daily volume allowed under the current Permit to Take Water (6883-9KRK5R) = **72.640 Mega Litres**
- Peak instantaneous flow rate allowed under the current Permit to Take Water (6883-9KRK5R) = **50.444 Litres per minute**

The Belleville Drinking Water System Actuals for the Year 2019:

- Maximum daily volume = **30.970 Mega Litres**
- Peak instantaneous flow rate = **36486 Litres per minute**

**The Belleville Drinking Water System did not exceed the approved maximum daily volume or peak instantaneous flow rate stipulated in the current Permit to Take Water.**

### Treated Water Comparisons

- Maximum allowable daily volume entering the distribution system under Municipal Drinking Water License 151-101 = **72.700 Mega Litres**

The Belleville Drinking Water System Actuals for the Year 2019:

- Maximum daily volume = **28.130 Mega Litres**

**The Belleville Drinking Water System did not exceed the maximum daily plant volume stipulated in the Municipal Drinking Water License.**

# Belleville Drinking Water System 2019 Annual Report

**Waterworks number 220001628, January 1<sup>st</sup>, 2019 to December 31<sup>st</sup>, 2019**

This report is prepared in accordance with Section 11 of Ontario Regulation 170 / 03. O. Reg. 170 / 03 sets requirements for public waterworks with regards to sampling and testing, levels of treatment, licensing of staff, and notification of authorities and the public about water quality.

The Belleville Drinking Water System also supplies drinking water to the Rossmore / Fenwood Gardens Distribution System. In accordance with Section 11 (2.1) a copy of this report is provided to the Rossmore / Fenwood Gardens Operating Authority.

## Ontario Regulation 170/03, Section 11 – Annual Reports

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**This section outlines the requirements of Section 11 and how we are achieving them.**

- **Section 11 (1):** the owner of a drinking water system must ensure that an annual report is prepared in accordance with this section.
  - This annual report fulfils the requirements of Section 11.
- **Section 11 (2):** the owner of a drinking water system, other than a large municipal residential system or a small municipal residential system
  - The Belleville Drinking Water System is a large municipal residential system and therefore section 11 (2) does not apply to us.
- **Section 11 (2.1):** if a drinking water system is connected to and receives all of its water from another drinking water system, the owner of the system from which the water is obtained shall ensure

that, when the annual report for the system is prepared, a copy of the report is given to the owner of the system that obtains the water.

- The Belleville Drinking Water System supplies water to the Rossmore / Fenwood Gardens Distribution System (WW# 260005008). A copy of this annual report will be provided to them.
- **Section 11 (3):** as a large municipal residential drinking water system, our annual report must cover the period from January 1 to December 31 and be prepared not later than February 28 of the following year.
  - This annual report covers the period from January 1<sup>st</sup> – December 31<sup>st</sup>, 2019 and was prepared prior to February 28<sup>th</sup>, 2020.
- **Section 11 (4):** Applies to non-municipal seasonal residential systems and large non-municipal non-residential systems.
  - The Belleville Drinking Water System is classified as a large municipal residential system and therefore this subsection does not apply.
- **Section 11 (5):** Applies to small non-municipal non-residential systems
  - The Belleville Drinking Water System is classified as a large municipal residential system and therefore this subsection does not apply.
- **Section 11 (6)(a):** Our annual report must contain a brief description of the drinking water system, including a list of water treatment chemicals the system uses during the period covered by the report.
  - A description of the Belleville Drinking Water System can be found in this report beginning on page 16.
- **Section 11 (6)(b):** Our annual report must summarize any reports made to the Ministry under Section 18 (1) of the Act or Section 16-4 of Schedule 16 during the period covered by the report.
  - A chart showing all Adverse Water Quality Incidents and corrective actions can be found on page 21 of this report.

- **Section 11 (6)(c):** Our annual report must summarize the results of the tests required under this Regulation, an approval, or a municipal drinking water license or order (including an OWRA order) during the period covered by the report. If tests regularly required under this Regulation were not required during the current reporting period, summarize the most recent results of those tests.
  - Test results for the Belleville Drinking Water System can be found in this report beginning on page 21.
- **Section 11 (6)(d):** Our annual report must describe any corrective actions taken under Schedule 17 or 18 during the period covered by the report.
  - All corrective actions taken by the Belleville Drinking Water System under Schedule 17 can be found in the chart located on page 21.
- **Section 11 (6)(e):** Our annual report must describe any major expenses incurred during the period covered by the report to install, repair, or replace equipment.
  - A description of major expenses incurred during the period of this report can be found on page 32.
- **Section 11 (6)(f):** Our annual report must include a statement of where a report prepared under Schedule 22 will be available for inspection under Subsection 12 (4).
  - The Belleville Drinking Water System Summary Report, prepared under Schedule 22, can be found on-line at [www.belleville.ca](http://www.belleville.ca) and at the Water Operations Centre.
- **Section 11 (7):** The owner of a drinking water system shall ensure that a copy of an annual report for the system is given, without charge, to every person who requests a copy.
  - Copies of the Belleville Drinking Water System annual report are available to the public, upon request and free of charge, at the Water Operations Centre.
- **Section 11 (8):** If a drinking water system is connected to and receives all of its drinking water from another drinking water system, the owner of the system that obtains the water shall ensure that a copy

of an annual report for the system from which the water is obtained is given, without charge, to every person who requests a copy.

- The Rossmore / Fenwood Gardens Distribution System (WW# 260005008) obtains water from the Belleville Drinking Water System and as such is responsible for this subsection. A copy of the City of Belleville's report is provided to Prince Edward County in accordance with section 11 (2.1).
- **Section 11 (9): Subsections (7) and (8) do not apply to an annual report that is more than two years old.**
  - Annual reports dating back to 2008 for the Belleville Drinking Water System are available to the public, upon request and free of charge, by contacting the Water Operations Centre.
- **Section 11 (9.1):** Every time that an annual report is prepared for a drinking water system, the owner of the system shall ensure that effective steps are taken to advise the users of water from the system that copies are available, without charge, and how a copy may be obtained.
  - The Belleville Drinking Water System utilizes both, the local newspaper and the City of Belleville website ([www.belleville.ca](http://www.belleville.ca)) to inform the public when the annual report is available.
- **Section 11 (10):** If a large municipal residential system serves more than 10,000 people, the owner of the system shall ensure that a copy of every report prepared under this section is available to the public at no charge on a website on the Internet.
  - The Belleville Drinking Water System Annual and Summary Reports are available on-line at [www.belleville.ca](http://www.belleville.ca).
- **Section 11 (11):** Applies to designated facilities under subsection (2)
  - Subsection (2) does not apply to the Belleville Drinking Water System and therefore Section 11 (11) is also not applicable.
- **Section 11 (12) to (17) have been revoked.**

- **Section 11 (18):** If section 12 of Ontario Regulation 459/00 and Section 15 of Ontario Regulation 505/01 did not apply to the owner of a system to which Subsection (5) applies, no report is required to be prepared under Subsection (5) until May 31, 2006 and, despite that subsection, the report required to be prepared not later than May 31, 2006 shall cover the period from June 1, 2005 to March 31, 2006.
  - Subsection (5) does not apply to the Belleville Drinking Water System and therefore this section does not apply.
- **Section 11 (19) has been revoked.**

## **Belleville Plant Description and Water Treatment Process**

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### **Raw Water Intake Facilities**

The source of water for the City of Belleville is the Bay of Quinte south of Sidney Street. A 750mm diameter intake pipe extends 430 meters into the Bay, to a depth of 5.5 meters. A 900mm diameter intake pipe also extends 490 meters into the Bay, to a depth of 5.5 meters. Potassium permanganate is added in the intake for taste and odor control, and as a deterrent to Zebra mussels.

### **Low Lift Pumping Station**

The raw water flows through the intake pipes to the traveling intake screen (10mm mesh) located in the raw water well. This removes large debris such as fish, weeds, and shells. Four low lift pumps (rated for 290 L/s) lift the water from the Bay level to the rapid mix tanks. From the rapid mix tanks, the water will flow by gravity through the various plant processes.

### **Pre-Treatment Facility**

The coagulant is mixed with the raw water flowing through the two trains of two-cell up-flow rapid mix tanks, each with a volume of 245 m<sup>3</sup> and a 5.6 kW propeller type mixer. From the rapid mix tanks, the water will flow by gravity to the coagulation / flocculation process. The pre-treatment process consists of 2 parallel trains.

### **Coagulation**

Aluminum sulphate (alum) is added at the rapid mix tanks, as a coagulant to form a 'floc'. This floc is made up of alum and suspended particles (dirt, color, organics) which are found in raw water. This is the first stage of the coagulation/flocculation process.



The coagulated water/alum solution gently flows by gravity to the three-stage spiral up-flow flocculation tanks, each cell having a volume of 184 m<sup>3</sup>, to a common discharge channel. This water, with floc forming in it, flows by gravity to either the dissolved air flotation process (spring, summer, fall) or the sedimentation process (winter). The flocculation process consists of 3 parallel trains.

### **Dissolved Air Flotation Facility**

The Dissolved Air Flotation process is used when the Bay of Quinte is free of ice. Daily changing weather conditions, such as wind and rain, cause increases in raw water turbidity. Summer and fall weather promote organic growth, such as algae. The dissolved air flotation process handles these changing conditions very well, with minimal coagulant dose adjustment.

In this process, two separate two-cell dissolved air flotation tanks receive the water from the coagulation/flocculation process. Here, an aerated water solution is bubbled gently through this water, causing the floc to attach to air bubbles and rise to the surface. The cleaner water remains at the bottom of the tank. This cleaner water then flows, by gravity, to the filtration process. The 'float', or residual, is comprised of dirt, organics, some color, bacteria, viruses, and other particulate. It is removed on a scheduled basis and pumped to the on-site waste treatment facility.

The aerated solution is produced on-site by forcing compressed air into treated water, in two 13.5 m<sup>3</sup> saturation tanks. The dissolved air flotation process consists of two parallel trains.

### **Sedimentation**

Sedimentation is used as an alternate to the dissolved air flotation process when the Bay is covered with ice. With ice cover, the raw water quality is relatively constant, and the normal sedimentation process works well. It is also less energy intensive than the dissolved air flotation process.

During the winter months, the flocculated water flows, by gravity, from the coagulation/flocculation process directly to two separate inclined plate settlers, where the floc adheres to the plates, and

eventually becomes heavy enough to slide down the plates as the volume of settled material increases. The cleaner water rises to the top of the plate settler and flows by gravity to the filtration process.

The settled material contains dirt, organics, some color, bacteria, viruses, and other particulate. This waste material is slowly removed from the bottom by a vacuum and pumped to the on-site waste treatment facility.

The sedimentation process consists of two parallel trains.

### **Filtration**

The filtration process consists of twelve (12) parallel granular activated carbon (GAC) gravity filters. These filters receive the water from the dissolved air flotation or sedimentation process. This water arrives on the top of the filter, and then settles through the GAC and sand media by gravity, and any remaining particulate is trapped in this media. The GAC also removes tastes and odors by adsorption. The water settles through the sand media, into the underdrains, and then falls to the chlorine contact chamber. The filters operate in a parallel design and can each filter 6 Mega Litres (ML) of water per day. The filters each have a surface area of 38.5 m<sup>2</sup> and contain a layer of GAC over a layer of sand, supported by stainless steel or clay tile underdrains. The filters are monitored for effluent turbidity, head loss and flow. The filters are cleaned by backwashing every 48 hours using treated city water.

### **Disinfection**

Sodium hypochlorite (hypo) is used to post-disinfect the filtered water in the chlorine contact chamber. A very small amount of hypo is also added at the rapid mixers to maintain plant hygiene. Dosage varies based on the biological demand. This chlorinated water is held for a prescribed time to ensure thorough oxidation of any pathogens. The 'CT' free chlorine residual is monitored.

## **Fluoridation**

After disinfection, fluoride is added to the water to provide dental health protection for consumers.

## **High Lift Pumping Station**

At this point, the treatment process is complete, and the water is safe for consumer use.

Five vertical turbine-type high lift pumps, each rated at 240 L/s, pump the treated water to the consumer via the distribution system. Alternatively, two transfer pumps rate at 81 L/s can be used to pump treated water directly to the Water Treatment Plant Reservoir.

## **Waste Treatment Facility**

The water used to backwash filters, the 'float' from the dissolved air flotation process and the sediment from the plate settles, is dewatered, and concentrated in the on-site waste treatment facility. The thickened sludge is pumped to the City sewage treatment plant for further treatment. The liquid residual, or supernatant, flows by gravity back to the Bay.

## **Computer/SCADA**

Computer technology is used to monitor operations and record data. A Supervisory Control and Data Acquisition (SCADA) system provides communication with, and control of, all plant and reservoir/pumping station operations. Experienced, licensed water treatment operators use this technology to operate the Belleville Water Treatment facility.

## Distribution

The treated water pumped into the distribution system from the High Lift pumping station may go directly to a consumer, or may go to the elevated storage, or one of three storage reservoirs (Water Treatment Reservoir, North Park Reservoir, or Pine Street Reservoir).

The Distribution System is comprised of approximately 224 kilometers of water main, 1264 hydrants, 13,794 service connections and 1,235 ICI customers.

The City of Belleville also supplies water to the County of Prince Edward for the Rossmore / Fenwood Gardens Distribution System (DWSN# 260005008).

## Chemicals Used During This Reporting Period

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- Sodium Hypochlorite
- Aluminum Sulphate
- Hydrofluorosilicic Acid
- Potassium Permanganate
- Sodium Bisulphite

## O. Reg. 170 / 03 Compliance Tests and Reports - Belleville

### Notifications and Corrective Actions – Belleville

In accordance with Schedule 16 and Schedule 17 (O. Reg 170 / 03).

<b>Incident Date</b>	<b>Parameter</b>	<b>Result</b>	<b>Unit of Measure</b>	<b>Corrective Action</b>	<b>Corrective Action Date</b>
August 20 <sup>th</sup> 2019 AWQI 147461	TC	4	cfu/100mL	Flushed and resampled site plus upstream and downstream (August 21 <sup>st</sup> 2019)	August 23 <sup>rd</sup> 2019
September 08 <sup>th</sup> 2019 AWQI 147900	TC	1	cfu/100mL	Flushed and resampled site plus upstream and downstream (September 08 <sup>th</sup> 2019)	September 10 <sup>th</sup> 2019

## Operational Testing – Belleville

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In accordance with Schedule 7 (O. Reg. 170 / 03).

### Notes:

- 8760 denotes results from continuous monitoring
- N.T.U refers to Nephelometric Turbidity Units
- mg/L represents milligrams per litre

<b>Parameter</b>	<b>Number of Samples</b>	<b>Range of Results (minimum to maximum)</b>	<b>Unit of Measure</b>
Turbidity	8760	0.02 – 1.10	N.T.U
Free Chlorine at CT Location	8760	1.08 – 2.65	mg/L
Free Chlorine in Distribution	8760	0.05 – 2.70	mg/L
Fluoride	8760	0.00 – 0.80	mg/L

## Microbiological Testing – Belleville

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In accordance with Schedules 10 and 17 (O. Reg. 170 / 03) and with the Belleville Municipal Drinking Water License.

<b>Water Type</b>	<b>Number of Samples</b>	<b>Range of E. Coli or Fecal Results (minimum to maximum)</b>	<b>Range of Total Coliform Results (minimum to maximum)</b>	<b>Number of H.P.C Samples</b>	<b>Range of H.P.C Results (minimum to maximum)</b>
Raw	53	0 to 29	2 to 400	53	10 to 2000
Treated	53	0 to 0	0 to 0	53	10 to 40
Distribution	845	0 to 0	0 to 4	449	10 to 90

## Chemical Testing – Belleville

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In accordance with Schedule 13 (O. Reg. 170 / 03). Sample results for Schedule 23 and Schedule 24 can be found on starting on page 11 of this report.

### Notes:

- µg/L represents micrograms per litre
- mg/L represent milligrams per litre

<b>Parameter</b>	<b>Number of Samples</b>	<b>Range of Results (minimum to maximum)</b>	<b>Unit of Measure</b>
Trihalomethane	4	38 to 88	µg/L
Haloacetic Acids	4	30.2 to 62.4	µg/L
Nitrate and Nitrite	4	0.1 to 0.3	mg/L
Sodium	4	9.2 to 14.2	mg/L



## Lead Testing Summary – Belleville

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In accordance with Schedule 15.1 (O. Reg. 170 / 03).

<b>Location Type</b>	<b>Number of Samples</b>	<b>Range of Results (minimum to maximum)</b>	<b>Number of Exceedances</b>
Lead - Plumbing	0	Not Applicable	0
Lead - Distribution	4	0.00005 to 0.00010	0
Alkalinity - Distribution	8	70 to 81	0
pH - Plumbing	0	Not Applicable	0
pH - Distribution	8	6.9 to 8.0	0

The Belleville Drinking Water System has reached exemption status regarding the Lead Sampling Program. Following the Winter Lead Sampling Period (December 2012 to April 2013) the Belleville Drinking Water System satisfied the requirements of Sections 15.1 to 15.5(9) of Ontario Regulation 170 / 03, and as such began sampling in accordance with Sections 15.1 to 15.5(10).

## Inorganic Testing – Belleville

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In accordance with Schedule 23 (O. Reg. 170 / 03)

### Notes:

- µg/L represents micrograms per litre

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	June 04 <sup>th</sup> 2019	less than 0.09	µg/L	No
Arsenic	June 04 <sup>th</sup> 2019	0.2	µg/L	No
Barium	June 04 <sup>th</sup> 2019	28.2	µg/L	No
Boron	June 04 <sup>th</sup> 2019	15	µg/L	No
Cadmium	June 04 <sup>th</sup> 2019	less than 0.003	µg/L	No
Chromium	June 04 <sup>th</sup> 2019	0.12	µg/L	No
Mercury	June 04 <sup>th</sup> 2019	less than 0.01	µg/L	No
Selenium	June 04 <sup>th</sup> 2019	less than 0.04	µg/L	No
Uranium	June 04 <sup>th</sup> 2019	0.027	µg/L	No

## Organic Testing – Belleville

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In accordance with Schedule 24 (O. Reg. 170 / 03).

### Notes:

- µg/L represents micrograms per litre
- mg/L represent milligrams per litre
- < represents “less than” the value that follows it

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachor	June 04 <sup>th</sup> 2019	<0.02	µg/L	No
Atrazine + N-dealkylated metabolites	June 04 <sup>th</sup> 2019	<0.01	µg/L	No
Azinphos-methyl	June 04 <sup>th</sup> 2019	<0.05	µg/L	No
Benzene	June 04 <sup>th</sup> 2019	<0.32	µg/L	No
Benzo(a)pyrene	June 04 <sup>th</sup> 2019	<0.004	µg/L	No
Bromoxynil	June 04 <sup>th</sup> 2019	<0.33	µg/L	No
Carbaryl	June 04 <sup>th</sup> 2019	<0.05	µg/L	No
Carbofuran	June 04 <sup>th</sup> 2019	<0.01	µg/L	No

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
Carbon Tetrachloride	June 04 <sup>th</sup> 2019	<0.17	µg/L	No
Chlorpyrifos	June 04 <sup>th</sup> 2019	<0.02	µg/L	No
Diazinon	June 04 <sup>th</sup> 2019	<0.02	µg/L	No
Dicamba	June 04 <sup>th</sup> 2019	<0.20	µg/L	No
1,2-Dichlorobenzene	June 04 <sup>th</sup> 2019	<0.41	µg/L	No
1,4-Dichlorobenzene	June 04 <sup>th</sup> 2019	<0.36	µg/L	No
1,2-Dichloroethane	June 04 <sup>th</sup> 2019	<0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	June 04 <sup>th</sup> 2019	<0.33	µg/L	No
Dichloromethane	June 04 <sup>th</sup> 2019	<0.35	µg/L	No
2,4-Dichlorophenol	June 04 <sup>th</sup> 2019	<0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	June 04 <sup>th</sup> 2019	<0.19	µg/L	No
Diclofop-methyl	June 04 <sup>th</sup> 2019	<0.40	µg/L	No
Dimethoate	June 04 <sup>th</sup> 2019	<0.06	µg/L	No

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
Diquat	June 04 <sup>th</sup> 2019	<1	µg/L	No
Diuron	June 04 <sup>th</sup> 2019	<0.03	µg/L	No
Glyphosate	June 04 <sup>th</sup> 2019	<1	µg/L	No
Malathion	June 04 <sup>th</sup> 2019	<0.02	µg/L	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	June 04 <sup>th</sup> 2019	<0.00012	mg/L	No
Metolachlor	June 04 <sup>th</sup> 2019	<0.01	µg/L	No
Metribuzin	June 04 <sup>th</sup> 2019	<0.02	µg/L	No
Monochlorbenzene	June 04 <sup>th</sup> 2019	<0.3	µg/L	No
Paraquat	June 04 <sup>th</sup> 2019	<1	µg/L	No
Pentachlorophenol	June 04 <sup>th</sup> 2019	<0.15	µg/L	No
Phorate	June 04 <sup>th</sup> 2019	<0.01	µg/L	No
Picloram	June 04 <sup>th</sup> 2019	<1	µg/L	No
Polychlorinated Biphenyls (PCB)	June 04 <sup>th</sup> 2019	<0.04	µg/L	No

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
Prometryne	June 04 <sup>th</sup> 2019	<0.03	µg/L	No
Simazine	June 04 <sup>th</sup> 2019	<0.01	µg/L	No
Terbufos	June 04 <sup>th</sup> 2019	<0.01	µg/L	No
Tetrachloroethylene	June 04 <sup>th</sup> 2019	<0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	June 04 <sup>th</sup> 2019	<0.20	µg/L	No
Triallate	June 04 <sup>th</sup> 2019	<0.01	µg/L	No
Trichloroethylene	June 04 <sup>th</sup> 2019	<0.44	µg/L	No
2,4,6-Trichlorophenol	June 04 <sup>th</sup> 2019	<0.25	µg/L	No
Trifluralin	June 04 <sup>th</sup> 2019	<0.02	µg/L	No
Vinyl Chloride	June 04 <sup>th</sup> 2019	<0.17	µg/L	No

## Inorganic or Organic Parameters – Belleville

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Inorganic or organic parameters that exceeded half the standard prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

Based on quarterly samples taken January 15<sup>th</sup>, April 15<sup>th</sup>, July 15<sup>th</sup>, and October 15<sup>th</sup> 2019, our annual average concentration for Trihalomethane is 56.8 µg/L. This exceeds one-half of the Schedule 2 standard, but does not exceed the regulated limit of 100 µg/L.

## Wastewater Sampling – Belleville

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As per Municipal Drinking Water License 151-101.

<b>Parameter</b>	<b>Number of Samples</b>	<b>Range of Results (minimum to maximum)</b>	<b>Unit of Measure</b>	<b>Average</b>
Total Suspended Solids	12	less than 3 to 9	mg/L	4.67
BOD5	12	less than 3	mg/L	less than 3
Total Phosphorus	12	0.01 to 0.08	mg/L	0.03

## Monetary Expenses – Belleville

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Significant monetary expenditures during 2019 include:

1. Replacement of GAC in 3 filters
2. Four plant valve actuator replacements
3. Generator maintenance
4. Intake inspection
5. Insertion valve installation in 600mm main north of plant.
6. BWTP Main Gas Boiler
7. Three VFD ABB Replacement Drives
8. Rotork Pakscan unit replaced/Removed
9. Main electrical breaker replaced
10. SCADA trending upgrades
11. Various online monitoring equipment chemical analyzers
12. Primary and Secondary Communication Circuits

W.D water main replacement projects (with our Engineering department):

- Harvey / Grier St
- Franklin St
- Moira St. (Sidney to Ponton) and Ponton (Moira to Green)



W.D subdivision water main installation projects (with our Engineering department):

- Potters Creek, phase 7
- Bell Creek, phase 3
- Caniff Mills, phase 10
- Settlers Ridge, phase 5
- Heritage Park, phase 6
- Deerfield, phase 7

## 2019 Summary Report – Point Anne

**Drinking Water System Number:** 220004359

**Drinking Water System Name:** Point Anne Hamlet Drinking Water System

**Drinking Water System Owner:** The Corporation of the City of Belleville

**Drinking Water System Category:** Small Municipal Residential

Ontario's Safe Drinking Water Act sets the framework for safe drinking water in the Province of Ontario. Further, Ontario Regulation 170 / 03 (O. Reg. 170 / 03) sets requirements for public waterworks for sampling and testing, levels of treatment, licensing of staff, and notification of authorities and the public about water quality.

This summary report has been prepared in accordance with Schedule 22 of Ontario Regulation 170 / 03. Free copies are available on our website and in person at the Water Operations Centre. We will post notice of availability on our website and / or through the local newspapers.

For further information about provincial drinking water requirements visit the Ministry of Environment, [Conservation and Parks website](#) And select "Drinking Water".

## Ontario Regulation 170/03, Schedule 22 – Summary Reports for Municipalities

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**This section outlines the requirements of Schedule 22 and how we are achieving them.**

- **Section 22-1** states that this Schedule applies to both large and small municipal residential systems.
  - The Point Anne Hamlet Drinking Water System is a small municipal residential system and as such we will complete and submit a summary report. This summary report is prepared in accordance with Schedule 22 of O. Reg. 170 / 03.
- **Section 22-2 (1)** requires a Summary Report to be completed by March 31<sup>st</sup> of each year and given to members of council.
  - This summary report covers the period from January 1<sup>st</sup> to December 31<sup>st</sup>, 2019 and was prepared and submitted to council prior to March 31<sup>st</sup>, 2020.
- **Section 22-2 (2) (a) and (b)** requires us to provide a list of any requirements that we did not meet any time during the period covered by this report.
  - The Point Anne Hamlet Drinking Water System met all requirements for the period of January 1<sup>st</sup> to December 31<sup>st</sup>, 2019.
  - As per O. Reg 170 / 03 Section 11(6) (b) and (d), details on adverse water quality incidents can be found in the Point Anne Hamlet Drinking Water System Annual Report.
- **Section 22-2 (3)** requires that we submit a flow summaries and comparisons of flow to rated capacities stated in system approvals.
  - The required flow information can be found beginning on **Page 3** of this report.
  - The comparison of flow rates versus approved rated capacities can be found on **Page 5**.
- **Section 22-2 (4)** requires that a copy of this summary report be given to any municipality that the Drinking Water System supplies water.

- The Point Anne Hamlet Drinking Water System does not supply water to any other system.
- **Section 22-3** states that compliance reports are not required for drinking water systems that comply with Section 22-2.
  - We are compliant with Section 22-2 and therefore, we have not submitted a compliance report.

## Quantities and Flow Rates of Water Taken and Supplied

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**Table 1: Raw Water**

Values in Cubic Metres (C.M), unless otherwise noted

<b>Month</b>	<b>Total Monthly Volume</b>	<b>Average Daily Volume</b>	<b>Maximum Daily Value</b>	<b>Minimum Daily Value</b>	<b>Peak Instantaneous Flow Rate (C.M per day)</b>	<b>Peak Instantaneous Flow Rate (Litres per minute)</b>
<b>January</b>	580.74	18.73	22.23	16.70	32.40	22.50
<b>February</b>	502.16	17.93	21.06	16.15	29.58	20.33
<b>March</b>	557.71	17.99	23.49	16.08	31.44	21.83
<b>April</b>	502.67	16.76	19.04	14.60	30.72	21.83
<b>May</b>	616.20	19.88	27.89	16.93	31.44	21.83
<b>June</b>	716.96	23.90	28.42	11.62	31.44	21.83
<b>July</b>	745.36	24.04	27.23	19.51	31.44	21.83
<b>August</b>	713.27	23.01	27.89	16.27	31.20	21.67
<b>September</b>	608.52	20.28	27.41	16.59	31.20	21.67

<b>Month</b>	<b>Total Monthly Volume</b>	<b>Average Daily Volume</b>	<b>Maximum Daily Value</b>	<b>Minimum Daily Value</b>	<b>Peak Instantaneous Flow Rate (C.M per day)</b>	<b>Peak Instantaneous Flow Rate (Litres per minute)</b>
<b>October</b>	617.06	19.91	23.47	16.42	30.96	21.50
<b>November</b>	626.43	20.88	28.60	16.92	30.72	21.33
<b>December</b>	530.66	17.12	20.17	13.96	30.24	21.00

### **Annual Totals:**

- Total Annual Volume = 7317.74 (total sum of January to December values)
- Average Daily Volume overall = 20.04 (total sum of January to December values divided by 12)
- Maximum Daily Value reached = 28.60 (November)
- Minimum Daily Value reached = 11.62 (June)
- Highest Peak Instantaneous Flow Rate (M.L per day) reached = 32.40 (January)
- Highest Peak Instantaneous Flow Rate (Litres per minute) = 22.50 (January)

## Table : Filtered Water

Values in Cubic Metres (C.M), unless otherwise noted

<b>Month</b>	<b>Total Monthly Volume</b>	<b>Average Daily Volume</b>	<b>Maximum Daily Value</b>	<b>Minimum Daily Value</b>	<b>Peak Instantaneous Flow Rate (C.M per day)</b>	<b>Peak Instantaneous Flow Rate (Litres per minute)</b>
<b>January</b>	510.03	16.45	19.20	14.69	29.28	20.33
<b>February</b>	429.64	15.34	17.69	14.16	27.60	19.17
<b>March</b>	474.19	15.30	19.70	13.80	27.36	19.00
<b>April</b>	436.46	14.55	16.40	12.81	27.60	19.17
<b>May</b>	533.23	17.20	21.57	15.06	27.12	18.83
<b>June</b>	578.19	19.27	22.61	16.66	26.40	18.83
<b>July</b>	605.68	19.54	22.52	16.59	30.00	20.83
<b>August</b>	584.07	18.84	22.91	14.17	31.44	21.83
<b>September</b>	488.55	16.29	22.31	13.62	30.24	21.00
<b>October</b>	485.01	15.65	18.08	12.95	29.28	20.33

<b>Month</b>	<b>Total Monthly Volume</b>	<b>Average Daily Volume</b>	<b>Maximum Daily Value</b>	<b>Minimum Daily Value</b>	<b>Peak Instantaneous Flow Rate (C.M per day)</b>	<b>Peak Instantaneous Flow Rate (Litres per minute)</b>
<b>November</b>	501.79	16.73	23.32	13.39	28.32	19.67
<b>December</b>	461.34	14.88	16.88	13.04	28.08	19.50

### **Annual Totals:**

- Total Annual Volume = 6088.18 (total sum of January to December values)
- Average Daily Volume overall = 16.67 (total sum of January to December values divided by 12)
- Maximum Daily Value reached = 23.32 (November)
- Minimum Daily Value reached = 12.81 (April)
- Highest Peak Instantaneous Flow Rate (M.L per day) reached = 31.44 (August)
- Highest Peak Instantaneous Flow Rate (Litres per minute) = 21.83 (August)



### Table 3: Treated Water

All values in Cubic Metres

Month	Total Monthly Volume	Average Daily Volume	Maximum Daily Value	Minimum Daily Value
January	340.81	10.99	13.52	9.48
February	286.72	10.24	11.49	9.61
March	301.68	9.73	11.25	8.21
April	275.54	9.18	10.99	8.30
May	277.01	8.94	10.33	7.67
June	293.44	9.78	12.10	8.57
July	345.24	11.14	12.99	8.55
August	330.35	10.66	13.76	6.84
September	245.85	8.20	14.73	6.67
October	249.07	8.03	9.88	6.94
November	269.64	8.99	17.44	7.20
December	239.51	7.73	9.17	6.86

#### Annual Totals:

- Total Annual Volume = 3454.86 (total sum of January to December values)
- Average Daily Volume overall = 9.47 (total sum of January to December values divided by 12)
- Maximum Daily Value reached = 17.44 (November)
- Minimum Daily Value reached = 6.67 (September)

## Water Flow Comparisons

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### Raw Water Comparisons

- Maximum daily volume allowed under the current Permit to Take Water (6206-AVJR89) = **108.00 Cubic Metres**
- Peak instantaneous flow rate allowed under the current Permit to Take Water (6206-AVJR89) = **91.00 Litres per minute**

The Point Anne Hamlet Drinking Water System Actuals for the Year 2019:

- Maximum daily volume = **28.60 Cubic Metres**
- Peak instantaneous flow rate = **22.50 Litres per minute**

**The Point Anne Hamlet Drinking Water System did not exceed the approved maximum daily volume or peak instantaneous flow rate stipulated in the current Permit to Take Water.**

### Treated Water Comparisons

- Maximum allowable daily volume entering the distribution system under Municipal Drinking Water License 151-102 = **108 Cubic Metres**

The Point Anne Hamlet Drinking Water System Actuals for the Year 2019:

- Maximum daily volume = **17.44 Cubic Metres**

**The Point Anne Hamlet Drinking Water System did not exceed the maximum daily volume stipulated in the Municipal Drinking Water License.**

## Filtered Water Comparisons

- Maximum allowable flow rate entering the Package Treatment Plant Subsystem Component under Municipal Drinking Water License 151-102 = **75.00 Litres per Minute**
- Maximum allowable flow rate entering the Cartridge Filters Subsystem Component under Municipal Drinking Water License 151-102 = **24.30 Litres per Minute**

The Point Anne Hamlet Drinking Water System Actuals for the Year 2019:

- Package Treatment Plant Maximum Flow Rate = **21.83 Litres per Minute**
- Cartridge Filters Maximum Flow Rate = **20.33 Litres per Minutes**

**The Point Anne Hamlet Drinking Water System did not exceed the maximum flow rates stipulated in the Municipal Drinking Water License.**

# Point Anne Hamlet Drinking Water System 2019 Annual Report

**Waterworks number 220004359, January 1<sup>st</sup>, 2019 to December 31<sup>st</sup>, 2019**

This report has been prepared in accordance with Section 11 of Ontario Regulation 170 / 03. Regulation 170 / 03 sets requirements for public waterworks with regards to sampling and testing, levels of treatment, licensing of staff, and notification of authorities and the public about water quality.

## **Ontario Regulation 170 / 03, Section 11 – Annual Reports**

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**This section outlines the requirements of Section 11 and how we are achieving them.**

- **Section 11 (1)** requires the owner of a drinking water system to prepare an annual report in accordance with this section.
  - This annual report fulfils the requirements of Section 11.
- **Section 11 (2):** “The owner of a drinking water system, other than a large municipal residential system or a small municipal residential system . . .”
  - The Point Anne Hamlet Drinking Water System is a small municipal residential system and therefore Section 11 (2) does not apply.
- **Section 11 (2.1)** states that if a drinking water system is connected to and receives all of its water from another drinking water system, the owner of the system from which the water is obtained shall ensure that, when the annual report for the system is prepared, a copy of the report is given to the owner of the system that obtains the water.
  - There are no drinking water systems connected to the Point Anne Hamlet Drinking Water System.

- **Section 11 (3)** as a small municipal residential drinking water system, our annual report must cover the period from January 1 to December 31 and be prepared not later than February 28 of the following year.
  - This annual report covers the period from January 1<sup>st</sup> – December 31<sup>st</sup>, 2019 and was prepared prior to February 28<sup>th</sup>, 2020
- **Section 11 (4)** : “In the case of non-municipal seasonal residential systems and large non-municipal non-residential systems . . . ”
  - The Point Anne Hamlet Drinking Water System is classified as a small municipal residential system and therefore this section does not apply.
- **Section 11 (5)**: “In the case of small non-municipal non-residential systems . . .”
  - The Point Anne Hamlet Drinking Water System is classified as a small municipal residential system and therefore this section does not apply.
- **Section 11 (6)(a)** requires our annual report to contain a brief description of the drinking water system, including a list of water treatment chemicals the system uses during the period covered by the report.
  - A description of the Point Anne Hamlet Drinking Water System can be found in this report beginning on Page 5.
- **Section 11 (6)(b)** requires our annual report to include summaries of any reports we made to the Ministry under Section 18 (1) of the Act or Section 16 (4) of Schedule 16 during the period covered by the report.
  - A chart showing all Adverse Water Quality Incidents and corrective actions can be found on page 54 of this report.
- **Section 11 (6)(c)** requires our annual report to include summaries of the test results that are required under this Regulation, an approval, or a municipal drinking water licence or order (including

an OWRA order) during the period covered by the report. If tests required under this Regulation were not required during the reportin period, we must summarize the most recent results of tests of that parameter.

- Required test results for the Point Anne Hamlet Drinking Water System can be found in this report beginning on page 54.
- **Section 11 (6)(d)** states that our annual report must describe any corrective actions taken under Schedule 17 or 18 during the period covered by the report.
  - All corrective actions taken by the Point Anne Hamlet Drinking Water System under Schedule 18 can be found in the chart located on page 54.
- **Section 11 (6)(e)** states that our annual report must describe any major expenses incurred during the period covered by the report to install, repair, or replace equipment.
  - A description of major expenses incurred during the period of this report can be found on page 66.
- **Section 11 (6)(f)** requires that, in the case of a large or small municipal residential system, the annual report must include a statement of where a report prepared under Schedule 22 will be available for inspection under Subsection 12(4).
  - The Point Anne Hamlet Drinking Water System Summary Report, prepared under Schedule 22, is available on our website or at the Water Operations Centre.
- **Section 11 (7)** requires the owner of a drinking water system to ensure that a copy of an annual report for the system is given, without charge, to every person who requests a copy.
  - Copies of the Point Anne Hamlet Drinking Water System annual report are available to the public, upon request and free of charge, at the Water Operations Centre.
- **Section 11 (8)** states that if a drinking water system is connected to and receives all of its drinking water from another drinking water system, the owner of the system that obtains the water shall ensure

that a copy of an annual report for the system from which the water is obtained is given, without charge, to every person who requests a copy.

- There are no drinking water systems connected to the Point Anne Hamlet Drinking Water System.
- **Section 11 (9)** states that Subsections (7) and (8) do not apply to an annual report that is more than two years old.
  - Annual Reports dating back to 2008 for the Point Anne Hamlet Drinking Water System are available to the public by contacting the Water Operations Centre.
- **Section 11 (9.1)** states that every time an annual report is prepared for a drinking water system, the owner of the system shall ensure that effective steps are taken to advise users of water from that system that copies are available, without charge, and how a copy may be obtained.
  - The Point Anne Hamlet Drinking Water System utilizes both the local newspaper and the City of Belleville website ([www.belleville.ca](http://www.belleville.ca)) to inform the public of Annual Report availability.
- **Section 11 (10)** states that if a large municipal residential system serves more than 10,000 people, the owner of the system shall ensure that a copy of every report prepared under this section is available to the public at no charge on a website on the Internet.
  - Although the Point Anne Hamlet Drinking Water System serves less than 10,000 people, our Annual and Summary Reports are available on our website.
- **Section 11 (11)** “The obligation to ensure that a report be given to the interested authority for a designated facility under Subsection (2) . . .”
  - Subsection (2) does not apply to the Point Anne Hamlet Drinking Water System and therefore Section 11 (11) does not apply.
- **Section 11 (12) to (17) have been revoked.**
- **Section 11 (18)** states that if Section 12 of Ontario Regulation 459 / 00 and Section 15 of Ontario Regulation 505 / 01 did not apply to the owner of a system to which Subsection (5) applies, no report

is required under Subsection (5) until May 31, 2006. Further, despite Subsection (5), the report required not later than May 31, 2006 shall cover the period from June 1, 2005 to March 31, 2006.

- Subsection (5) does not apply to the Point Anne Hamlet Drinking Water System and therefore this section does not apply.

- **Section 11 (19) has been revoked.**



## **Point Anne Hamlet Plant Description and Water Treatment Process**

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### **Raw Water Intake**

The source of water for the Point Anne system is a combination of surface water and groundwater.

The surface water is taken from the Bay of Quinte south of the water treatment plant. A 100mm diameter pipe extends approximately 105m from the raw water intake well into the Bay of Quinte at a depth of approximately 2m below the water surface. Water flows by gravity from the Bay into the raw water intake well. Flow of surface water is controlled with a flow control valve on the intake pipe within the raw water intake well.

Groundwater is able to enter the raw well through an opening that is controlled by a 100mm flow control valve.

With these flow control valves, the source water may be groundwater, surface water or a combination of both. Groundwater may also infiltrate the raw well through uncontrolled cracks or joints.

### **Low Lift Pumping**

Two submersible pumps (each rated at 1.26 L/s) located in the raw water intake well along with associated piping deliver water to either the Package Treatment Unit (Waterboy Unit) or the Cartridge Filter System. Back-up pumps are stored at the Belleville Water Treatment Plant.

### **Cartridge Filter System - Filtration**

The cartridge filter system consists of three roughing filters and one finishing filter. All four filters operate in series. The first filter has a pore-size range of 20 to 1 micron rated for 90% removal. The next two filters have a pore-size range of 1.0 to 0.5 microns rated for 99% removal. The finishing filter is certified to NSF 53 and has an effective pore-size of 1.0 micron and a removal rating of 99.9%.

Pressure sensors and gauges are located on the influent and effluent lines for each cartridge canister. These are used to determine the pressure differential across the filter media allowing operators to monitor the life of the filters.

Water exiting the finishing filter can either go to waste or can go the chlorine contact tank. The effluent from this process is monitored for turbidity with alarms and controls set to divert to waste if turbidity climbs above operational set points.

The rated capacity for this process is 24.3 L/min.

### **Package Treatment Unit - Coagulation**

A chemical feed system consisting of a 150L storage tank and two flow-paced metering pumps feed aluminum sulphate (alum) to the bottom of the rapid mixer tank. Here, the alum mixes with raw water, by means of a mechanical mixer, to begin the formation of floc.

This is the first of the 2-stage coagulation/flocculation process.

### **Package Treatment Unit - Flocculation**

The coagulated water/alum solution flows through a notched weir into the slow mixer/flocculation tank. Here, a mechanical mixer stirs the water slowly to further the formation of the floc.

This floc consists of alum and suspended particles (dirt, color, organics) that are found in the raw water.

This is the second of the 2-stage coagulation/flocculation process.

### **Package Treatment Unit - Sedimentation**

The flocculated water flows through piping to the bottom of inclined plate settlers. Here, the floc adheres to the plates, and eventually becomes heavy enough to slide down the plates, as the volume of settled

material increases. The cleaner water rises to the top of the plate settler and flows hydraulically to the filtration process. The settled material, containing dirt, organics, color, bacteria, viruses, and other particulate, is removed during filter backwashing.

### **Package Treatment - Filtration**

The mixed media filter is used to further remove particulate from the water. The filter consists of sand and anthracite media and is equipped with an under drain system that is connected to two (2) pumps. The first pump is used to deliver water to the chlorine contact tank or to the waste stream. The effluent from this process is monitored for turbidity with alarms and controls set to divert to waste if turbidity climbs above operational set points. The second pump is used to backwash the filter.

### **Disinfection**

Sodium hypochlorite is used to post-disinfect the filtered water in the chlorine contact tank.

The sodium hypochlorite chemical feed system consists of a 20L storage tank and two (2) flow-paced metering pumps, with automatic switch over, to feed hypochlorite to the filtered water as it enters the contact tank. Dosage varies based on the biological demand.

The chlorine contact tank consists of an inlet diffuser, baffles and an overflow effluent collector. The tank volume is 2.2 m<sup>3</sup>. Here, the chlorinated water is held for a prescribed time period to ensure inactivation of any pathogens. The initial and "CT" free chlorine residuals are monitored and recorded.

### **High Lift Storage**

The high lift clear well is a finished water storage area and has a total volume of 23 m<sup>3</sup>. This well receives water from the chlorine contact tank and provides a flooded suction for the high lift pumps.

## **High Lift Pumping**

At this point the treatment process is complete and the water is ready for consumer use.

Two (2) high lift pumps, each capable of delivering approximately 27m<sup>3</sup>/day, deliver water through a common header to the distribution system.

These pumps provide constant positive pressure to the distribution system with the use of controls and automatic starts that are based on pressure control setpoints.

Controls and measures are in place to provide power, such as UPS power, in the event of a power failure.

## **Computer/SCADA**

Computer technology is used to monitor operations and record data. A Supervisory Control and Data Acquisition (SCADA) system provides communication among, and control of, all plant operations. The SCADA system also communicates with the Belleville Water Treatment Plant allowing experienced, licensed water treatment operators to monitor and control the Point Anne Water Treatment Plant.

## **Wastewater**

The water used to backwash the filter and the sediment from the plate settlers is discharged overland through a 100mm diameter discharge pipe to a point approximately 15m from the Bay of Quinte shoreline.

## **Distribution System**

The treated water is delivered directly to the consumer through the distribution system from the high lift pumps. The distribution system is comprised of approximately 208m of 100mm diameter water main. It is a linear network with no looping. There are currently five (5) service connections to the network that

supply thirteen residential properties. There was one municipally-owned non-residential premise (Point Anne Fire Hall) that was connected to the distribution system. The Fire Hall however, was removed from the system in November 2016.

### **Chemicals used over this Reporting Period**

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- Sodium Hypochlorite
- Aluminum Sulphate

## O. Reg. 170 / 03 Compliance Tests and Reports – Point Anne

### Notifications and Corrective Actions – Point Anne

In accordance with Schedule 16 and Schedule 18 (O. Reg 170 / 03)

<b>Incident Date</b>	<b>Parameter</b>	<b>Result</b>	<b>Unit of Measure</b>	<b>Corrective Action</b>	<b>Corrective Action Date</b>
April 09, 2019 AWQI 145173	Sodium	22.0	Mg / L	Resampled April 11, 2019. Letters sent to residents informing of high sodium	April 15, 2019
June 30, 2019 AWQI 146017	Observation of improperly disinfected water	Observation	Not Applicable	Boil water advisory issued. Bacteriological samples taken June 30 2019 to July 03, 2019. Boil water advisory lifted July 05, 2019	July 10, 2019

## Operational Testing – Point Anne

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In accordance with Schedule 7 (O. Reg 170 / 03).

### Notes:

- 8760 denotes results from continuous monitoring
- NTU refers to Nephelometric Turbidity Units
- mg/L represent milligrams per litre

<b>Parameter</b>	<b>Number of Samples</b>	<b>Range of Results (minimum to maximum)</b>	<b>Unit of Measure</b>
Turbidity	8760	0.03 to 0.85	NTU
Free Chlorine at C.T Location	8760	1.13 to 2.95	mg/L
Free Chlorine in Distribution	241	0.74 to 1.82	mg/L
Fluoride	0	No fluoridation	Not Applicable

## Microbiological Testing – Point Anne

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In accordance with Schedule 11 (O. Reg 170 / 03)

<b>Parameter</b>	<b>Number of Samples</b>	<b>Range of E. Coli or Fecal Results (minimum to maximum)</b>	<b>Range of Total Coliform Results (minimum to maximum)</b>	<b>Number of HPC Samples</b>	<b>Range of HPC Results (minimum to maximum)</b>
Raw	53	0 to 48	2 to less than 4000	53	20 to less than 2000
Treated	56	0 to 0	0 to 0	55	greater than 10 to 20
Distribution	56	0 to 0	0 to 0	55	greater than 10 to 40



## Chemical Testing – Point Anne

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In accordance with Schedule 13 (O. Reg 170 / 03). Sample results for Schedule 23 and Schedule 24 can be found starting on page 11 of this report.

### Notes:

- mg/L represent milligrams per litre
- µg/L represents micrograms per litre

<b>Parameter</b>	<b>Number of Samples</b>	<b>Range of Results (minimum to maximum)</b>	<b>Unit of Measure</b>
Trihalomethane	4	41 to 82	µg/L
Haloacetic Acids	4	36.2 to 66.8	µg/L
Nitrate and Nitrite	4	greater than 0.1 – 2.1	mg/L
Sodium	5	11.3 to 22.8	mg/L
Fluoride	1 (June 13, 2016)	0.1	mg/L

## Lead Testing Summary – Point Anne

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In accordance with Schedule 15.1 (O. Reg 170 / 03)

### Notes:

- mg/L represent milligrams per litre

<b>Location Type</b>	<b>Number of Samples</b>	<b>Range of Results (minimum to maximum)</b>	<b>Unit of Measure</b>	<b>Number of Exceedances</b>
Lead - Plumbing	0	Not Applicable	mg/L	0
Lead - Distribution	0	Not Applicable	mg/L	0
Alkalinity - Distribution	2	81 to 185	mg/L	Not Applicable
pH - Plumbing	0	Not Applicable	Not Applicable	0
pH - Distribution	2	7.3 to 7.8	Not Applicable	0

The Point Anne Hamlet Drinking Water System has reached exemption status in the Lead Sampling Program. Following the Winter Lead Sampling Period (December 2011 to April 2012), the Point Anne Hamlet Drinking Water System satisfied the requirements of Section 15.1-5 (9) of Ontario Regulation 170 / 03 and as such began sampling in accordance with Section 15.1-5 (10).

## Inorganic Testing – Point Anne

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In accordance with Schedule 23 (O. Reg 170 / 03)

### Notes:

- mg/L represent milligrams per litre

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	June 13 <sup>th</sup> , 2016	< 0.0001	mg/L	No
Arsenic	June 13 <sup>th</sup> , 2016	0.0003	mg/L	No
Barium	June 13 <sup>th</sup> , 2016	0.033	mg/L	No
Boron	June 13 <sup>th</sup> , 2016	0.010	mg/L	No
Cadmium	June 13 <sup>th</sup> , 2016	< 0.00002	mg/L	No
Chromium	June 13 <sup>th</sup> , 2016	< 0.002	mg/L	No
Mercury	June 13 <sup>th</sup> , 2016	< 0.00002	mg/L	No
Selenium	June 13 <sup>th</sup> , 2016	< 0.001	mg/L	No
Uranium	June 13 <sup>th</sup> , 2016	< 0.00005	mg/L	No

As per Section 13-2 (3) of Ontario Regulation 170 / 03, small municipal residential systems are required to be sampled and tested for Schedule 23 parameters at least once every 60 months. As such, the next sampling and testing for Schedule 23 parameters for the Point Anne Hamlet Drinking Water System will occur prior to June 13, 2021.

## Organic Testing – Point Anne

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In accordance with Schedule 24 (O. Reg 170 / 03)

### Notes:

- µg/L represents micrograms per litre
- mg/L represent milligrams per litre
- < indicates that the results was “less than” the value that follows it

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachor	January 12, 2016	<0.02	µg/L	No
Atrazine + N-dealkylated metabolites	January 12, 2016	<0.01	µg/L	No
Azinphos-methyl	January 12, 2016	<0.05	µg/L	No
Benzene	January 12, 2016	<0.32	µg/L	No
Benzo(a)pyrene	January 12, 2016	<0.004	µg/L	No

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
Bromoxynil	January 12, 2016	<0.33	µg/L	No
Carbaryl	January 12, 2016	<0.05	µg/L	No
Carbofuran	January 12, 2016	<0.01	µg/L	No
Carbon Tetrachloride	January 12, 2016	<0.16	µg/L	No
Chlorpyrifos	January 12, 2016	<0.02	µg/L	No
Diazinon	January 12, 2016	<0.02	µg/L	No
Dicamba	January 12, 2016	<0.20	µg/L	No
1,2-Dichlorobenzene	January 12, 2016	<0.41	µg/L	No
1,4-Dichlorobenzene	January 12, 2016	<0.36	µg/L	No
1,2-Dichloroethane	January 12, 2016	<0.35	µg/L	No

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
1,1-Dichloroethylene (vinylidene chloride)	January 12, 2016	<0.33	µg/L	No
Dichloromethane	January 12, 2016	<0.35	µg/L	No
2,4-Dichlorophenol	January 12, 2016	<0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	January 12, 2016	<0.19	µg/L	No
Diclofop-methyl	January 12, 2016	<0.40	µg/L	No
Dimethoate	January 12, 2016	<0.03	µg/L	No
Diquat	January 12, 2016	<1	µg/L	No
Diuron	January 12, 2016	<0.03	µg/L	No
Glyphosate	January 12, 2016	<1	µg/L	No

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
Malathion	January 12, 2016	<0.02	µg/L	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	January 12, 2016	<0.00012	mg/L	No
Metolachlor	January 12, 2016	<0.01	µg/L	No
Metribuzin	January 12, 2016	<0.02	µg/L	No
Monochlorbenzene	January 12, 2016	<0.3	µg/L	No
Paraquat	January 12, 2016	<1	µg/L	No
Pentachlorophenol	January 12, 2016	<0.15	µg/L	No
Phorate	January 12, 2016	<0.01	µg/L	No
Picloram	January 12, 2016	<1	µg/L	No

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
Polychlorinated Biphenyls (PCB)	January 12, 2016	<0.04	µg/L	No
Prometryne	January 12, 2016	<0.03	µg/L	No
Simazine	January 12, 2016	<0.01	µg/L	No
Terbufos	January 12, 2016	<0.01	µg/L	No
Tetrachloroethylene	January 12, 2016	<0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	January 12, 2016	<0.20	µg/L	No
Triallate	January 12, 2016	<0.01	µg/L	No
Trichloroethylene	January 12, 2016	<0.44	µg/L	No
2,4,6-Trichlorophenol	January 12, 2016	<0.25	µg/L	No



<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
Trifluralin	January 12, 2016	<0.02	µg/L	No
Vinyl Chloride	January 12, 2016	<0.17	µg/L	No

As per Section 13-4 (3) of Ontario Regulation 170 / 03, small municipal residential systems are required to be sampled and tested for Schedule 24 parameters at least once every 60 months. As such, the next sampling and testing for Schedule 24 parameters for the Point Anne Hamlet Drinking Water System will occur prior to January 12, 2021.

## **Inorganic or Organic Parameters – Point Anne**

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Inorganic or organic parameters that exceeded half the standard prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

Based on quarterly samples taken January 15<sup>th</sup>, April 15<sup>th</sup>, July 16<sup>th</sup>, and October 15<sup>th</sup> 2019, our annual average concentration for Trihalomethane is 59.8 µg / L. This exceeds one-half of the Schedule 2 standard, but does not exceed the regulated limit of 100 µg / L.

## **Monetary Expenses – Point Anne**

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Relatively significant monetary expenditures during 2019 include:

1. Intake inspections
  2. Various online monitoring equipment chemical analyzers
  3. S.C.A.D.A trending upgrades
- Each of these expenditures was included in approved operating or capital budgets.
  - No distribution monetary expenditures occurred in 2019.