

February 2022

Reeve Rilla Race and Council
The Township of Chapple
P.O. Box 4
Barwick, Ontario
POW 1A0

Re: 2021 Annual Summary Report for the Barwick Drinking-Water System

Ontario's Drinking-Water Systems Regulation (O.Reg.170/03), made under the *Safe Drinking Water Act, 2002*, requires that the owner of a drinking water system prepare an annual summary for municipalities on the operation of the system and the quality of its water.

The annual summary must cover the period of January 1st to December 31st in a year and must *be prepared not later than March 31st* of the following year. Pursuant to the legislative requirements, enclosed for your records is the 2021 Annual Summary for the Barwick Drinking-Water System.

Pursuant to the legislative requirements, *Schedule 22 Summary Reports for Municipalities*, the annual summary must:

- (a) list the requirements of the Act, the regulations, the system's approval, 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; and,
- (b) for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure."

- O. Reg. 170/03 s. 22 (2)

"The report must also include the following information for the purpose of enabling the owner of the system to assess the rated capability of their system to meet existing and planned uses of the system:

1. A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.
2. A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5 (4), to the flow rates specified in the written agreement."

-O. Reg. 170/03 s. 22 (3)

In addition, Section 12 (1) - 4 - gives the direction that a copy of the annual summary for the system is given, without charge, to every person who requests a copy and be made available for inspection by any member of the public during normal business hours. The reports should be made available at the office of the municipality, or at a location that is accessible to the users of the water system.

This report was prepared by the Ontario Clean Water Agency on behalf of the Township of Chapple and is based on information kept on record by OCWA at the Barwick Drinking-Water System. The report covers the period January 1st through to December 31st 2021.

Yours truly,



Ty Maurice
Senior Operations Manager
Northwestern Ontario Regional Hub
807-938-5067

Copy to: Peggy Johnson – CAO/Clerk Treasurer
Operations Staff – Barwick Well Supply

2021 Schedule 22 Annual Summary Report

Barwick Drinking-Water System

February 2022

Prepared by the



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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Section 1: Introduction

This report is a summary of water quality information for the Barwick Drinking-Water System, published in accordance with Schedule 22 of Ontario’s Drinking-Water Systems Regulation for the reporting period of January 1st to December 31st 2021. The Barwick Drinking-Water System is categorized as a Small Municipal Residential Drinking Water System.

This report is prepared by The Ontario Clean Water Agency on behalf of the Corporation of the Township of Chapple. A copy of the Summary Report is to be provided to the members of the municipal council by March 31st 2022.

Section 2: What Does This Report Contain?

“The report must,

- (a) list the requirements of the Act, the regulations, the system’s approval, 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; and,

- (b) for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure.”

- O. Reg. 170/03 s. 22 (2)

“The report must also include the following information for the purpose of enabling the owner of the system to assess the rated capability of their system to meet existing and planned uses of the system:

1. A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.

2. A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system’s approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5 (4), to the flow rates specified in the written agreement.”

- O. Reg. 170/03 s. 22 (3)

Section 3: Daily Flow Rates

In accordance with the ***Municipal Drinking Water Licence 285-101 Schedule C: System – Specific Conditions 1.0 Performance Limits***, the Barwick drinking-water system shall not be operated to exceed the rated capacity for maximum flow rate from the treatment subsystem to the distribution system of **950 m³ / day**.

The drinking-water system may be operated temporarily at a rate above the rated capacity where necessary for:

- i) the purposes of fighting a large fire or,
- ii) the maintenance of the drinking-water system

The Barwick Drinking-Water facility operated below the rated capacity of 950m³/day in 2021. The average monthly raw flow rate was 1357.66 m³; the average raw daily flow rate was 44.64 m³, with a maximum raw daily flow rate of 94.83 m³.

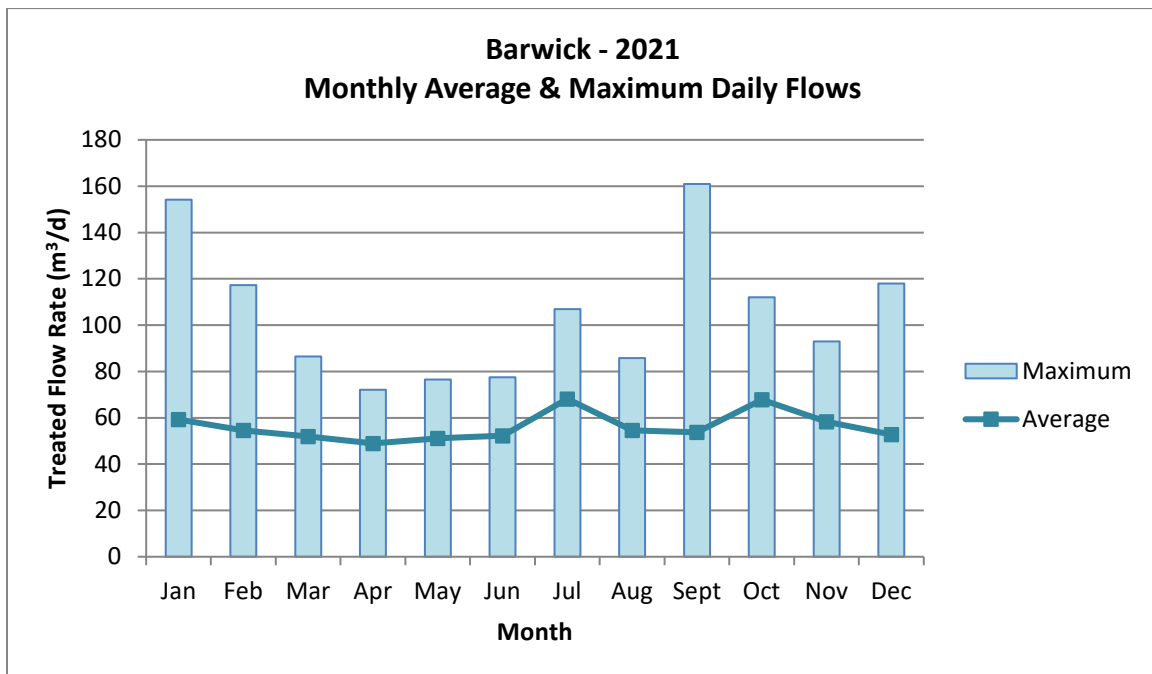
In 2021, the average monthly treated flow rate was 1707.95 m³; the average daily treated flow rate was 56.11 m³; and the maximum daily treated flow rate for the year was 161 m³ representing 16.94% of the allowable daily volume.

A summary of raw and treated flows, including maximum raw flow into the treatment system as well as treated average, maximum and total flow rates are included in the tables below.

The quantity of raw water supplied during the reporting period did not exceed the terms and conditions of the *Permit to Take Water* nor did the flows directed to the treatment system exceed the rated capacity for this system.

Monthly Raw & Treated Flow Rates for 2021

Month	Average Daily Raw Flow Rate (m ³ /d)	Maximum Daily Raw Flow Rate (m ³ /d)	Average Daily Treated Flow Rate (m ³ /d)	Maximum Daily Treated Flow Rate (m ³ /d)	Total Monthly Treated Flow Rate (m ³ /month)
January	44.54	86.7	59.26	154.10	1,837.00
February	44.91	71.3	54.51	117.30	1,526.40
March	35.56	71.6	51.90	86.50	1,608.80
April	38.39	68.2	48.93	72.10	1,468.00
May	42.5	69.2	51.15	76.50	1,585.50
June	40.93	57.9	52.26	77.50	1,567.70
July	52.8	70	68.16	106.90	2,113.10
August	50.43	94.83	54.55	85.80	1,691.20
September	39.99	71.5	53.72	161.00	1,611.50
October	57.39	57.2	67.81	112.00	2,102.20
November	41.79	62.2	58.35	93.00	1,750.40
December	45.86	59.5	52.70	118.00	1,633.60
2021 Total Treated Flows (m ³)				20,495.40	



Section 4: System Failures and Correction

The Ministry of Environment conducted an *announced* inspection of the Barwick Drinking Water System on October 19, 2021. The final inspection report identified ten non-compliances as summarized in the table below.

The 2021 final inspection rating record for the Barwick Drinking Water System was 87.46%.

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
1	A program for inspecting and exercising valves does not exist	N/A	OCWA will work with the Township to create a valve exercising program with the distribution system which will also incorporate deficiencies found.	In Progress
2	<p>During the review period, the following was observed:</p> <ul style="list-style-type: none"> - the original distribution chlorine residual record did not include the month or year the residuals were taken - the electronic daily sheets included the distribution chlorine residual results, with a complete date; however, they did not include the name of the person who took the sample, the location or the time the sample was taken - the original raw water turbidity sample results did not include the year the turbidity sample was taken 	08-Dec-21	<p>OCWA will ensure to complete a documents review of the sample sheets at the facility and make changes to include an area for the operators to input all necessary information. OCWA will also provide the undersigned inspector a written response along with a copy of the updated sample sheets.</p>	Complete
3	<p>The following issues were also noted during the inspection:</p> <ol style="list-style-type: none"> 1. The bolts on the caps of well #1 and well#2 were not tightened, in addition, the mounding around the casing on well #2 is collapsing on one side. 2. On January 4, 2020, the operator noted in the log book that a manual CT calculation was completed during a period of time when there was increased flow. The log book also stated that CT was achieved; however, the manual calculation was not documented and it is unknown what variables were used to make this determination. 	N/A	<p>OCWA will ensure to create a quarterly work order to ensure that operators are completing quarterly inspections on the wells and ensure that these inspections are logged in the daily log book. OCWA will also ensure that the cap bolts are tightened and that the ground is built up on well 2 to prevent pooling beside the casing. Furthermore, OCWA will ensure that the manual CT SOP is adjusted to add that operators are to enter all parameters to</p>	Complete

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
			the daily log book when completing a manual CT calculation.	
4	<p>The Barwick Municipal Drinking Water Licence (MDWL), Schedule B, section 16.2.8 and section 16.2.9 requires the Operations and Maintenance Manual to include well inspection and maintenance procedures and remedial action plans for situations where a well inspection indicates non-compliance with respect to regulatory requirements and/or risk to raw water well quality. Section 16.4 states that all of the procedures included or referenced within the operations and maintenance manual must be implemented. The facility's Standard Operating Procedure Binder (SOP) has a "Well Field" section. This section includes a well field inspection and maintenance schedule that details operators are to conduct a thorough inspection of the entire well field twice annually and a well contractor is to inspect the wells every 5 years. A licenced well technician last inspected the well field as follows:</p> <p>Well #1 - July 7, 2020 Well #2 - November 5, 2020 Well #4 - September 6, 2020 Well #5 - September 3, 2020</p> <p>Despite the above, it was reported during the inspection that operators are not conducting in-house inspections of the well field, as required by the facility's operating procedure.</p>	28-Jan-22	OCWA will ensure that the operator and manager of the facility review the SOP for well filed inspections and to further ensure compliance with the inspections, OCWA will create a quarterly work order to prompt the operator to complete the well filed inspection	Complete
5	<p>The operations manuals for the continuous treated chlorine analyzer and the filter effluent turbidity analyzer (i.e., Hach) do not suggest a calibration frequency unless required by a regulatory agency. Paragraph 10 of section 6-5, O. Reg. 170/03, indicates that if the manufacturer does not specify the frequency for calibration, system owners must ensure, as often as is necessary, that the chlorine meter is accurate to +/- 0.05 mg/L, if the instrument is reading around 1 mg/L, or proportionately higher if the concentration usually measured is greater than 1 mg/L. This requirement was not met on the following occasions:</p> <ul style="list-style-type: none"> - On May 9, 2021, it was documented in the log book that there was a discrepancy of 0.2 mg/L between the hand held chlorine analyzer and the 	2021/12/8	<p>OCWA will complete an SOP which indicates the frequency of online analyzer verification, under what circumstances the instrument is to be calibrated and how to document properly that these items are taking place.</p> <p>OCWA will also provide to the undersigned inspector the SOP and operator and manager training record that the SOP was reviewed.</p>	Complete

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
	<p>on-line analyzer and that the analyzer needs to be cleaned. Records do not indicate that the analyzer was re-calibrated at this time.</p> <p>- On May 26, 2021, it was documented in the log book that the on-line chlorine analyzer was reading 1.14 mg/L and the benchtop instrument was reading 1.22 mg/L (difference of 0.08 mg/L). Records do not indicate that the analyzer was re-calibrated at this time.</p>	2022/01/14		
6	<p>O. Reg. 170/03, Schedule 1, requires that the municipality ensure the water treatment equipment required by O. Reg 170/03, is operated in a manner that achieves the design capabilities it is required to have under that Schedule. The Barwick Well Supply has been determined to be a true groundwater supply (May, 2003); therefore, the minimum level of disinfection required is 2-log (99%) removal or inactivation of viruses before the water is delivered to the first consumer. The Barwick Water Treatment Plant provides a high level of treatment using filtration, water softening and pH control, as well as disinfection with chlorine.</p> <p>To determine whether the disinfection requirements were met continuously throughout the inspection review period, all continuous chlorine and turbidity data, in addition to all days during which alarm events occurred, were reviewed. The logbook was referenced where necessary to interpret variances in the continuous data.</p> <p>CT calculations indicate that under worst case conditions CT can be achieved with the facility's current alarm set points (temp = 0.5 degrees celcius, chlorine residual = 0.25 mg/L, pH = 8, clearwell = 1.5m, both high lift pumps in operation). The minimum chlorine residual observed during the inspection review period was maintained to achieve primary disinfection except on September 24, 2021. On this day, a hydrant was hit causing a break in the distribution system. So much water was lost that the plant could not keep up with production and the distribution</p>	N/A	<p>OCWA will ensure that the operators review the Facility Emergency Plan SOP's along with the CT Calculation SOP and provide training records. This will ensure that operators are able to recognize when CT calculation must be done and the steps to take if CT is not met</p>	Complete

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
	<p>pumps had to be shut down until the area of the break could be isolated. When the distribution pumps resumed operation, the treated water chlorine residual data shows a residual of zero for about 20 minutes, prior to reaching a level that achieved CT. As a result, the facility did not always treat the water as required; however, during this event, the health and safety of the community was protected. The incident was reported as required and a town wide boil water order was delivered to its users.</p>			
7	<p>In accordance with O. Reg. 170/03, Schedule 11, section 11-3, raw water samples must be collected and tested for E.coli and total coliforms, from each production well at least once per month, with at least 20 days and no more than 40 days from when the previous sample was taken. The Barwick water treatment plant currently has 4 production wells. Each well was sampled monthly during the review period; however, on the following occasions, samples were either taken too soon or too far apart:</p> <ul style="list-style-type: none"> - December 2020, wells 1 and 4 were sampled 16 days after they had previously been sampled - March 2021, all wells were sampled 19 days after they had previously been sampled - April 2021, all wells were sampled 42 days after they had previously been sampled 	08-Dec-21	OCWA will create a sample calendar that will keep track of the timeframes that sampling should occur to ensure all sampling parameters are met.	Complete
8	<p>O. Reg. 170/03, Schedule 13, section 13-2(3) requires that sampling for inorganic parameters shall be completed every 60 months, +/- 90 days. This sampling was most recently completed on January 11, 2021, and was previously completed on November 11, 2015. This exceeds the length of time allowed between samples.</p>	08-Dec-21	OCWA will ensure that the inorganic sampling schedule is included on the new sampling calendar.	Complete
9	<p>O. Reg. 170/03, Schedule 7, section 7-3, requires that a raw water sample be taken at least once every month, from each well that is supplying water to the system, and is tested for turbidity. During the review period, the raw water turbidity sample results for October and November 2020 could not be located; therefore, it cannot be confirmed if this sampling took place.</p>	N/A	OCWA will also be including the monthly raw water samples to the new sample calendar.	Complete
10	<p>In accordance with O. Reg. 170/03, Schedule 11, subsection 11-2(1), small municipal residential</p>	12/08/21	OCWA will also ensure that the distribution samples are	Complete

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
	<p>systems must collect at least one distribution sample every two weeks, at least 10 and no more than 20 days since the previous sample was taken, and have it tested for total coliform bacteria, E. coli, and heterotrophic plate count (HPC). A review of sampling data for the inspection review period confirmed that one distribution sample was collected every two weeks and analyzed for total coliform bacteria, E. coli, and HPC, except for the sample taken on January 4, 2021. This sample was taken 7 days after the previous sample had been taken.</p>		included in the new sample calendar.	

Section 5: Conclusion

In the reporting year of 2021, there were two adverse water quality incident (AWQI) reports filed as summarized in the table below.

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Sept 24 2021	Low pressure readings for extended period of time and chlorine analyzer functioning intermittently due to no pressure.			Boil water advisory issued. Water brought in to refill clearwell. Samples required by MOH - 2 clear to remove BWA & then follow up samples in following weeks to ensure public safety	October 6 2021
Dec 24 2021	Sodium result of 102 mg/L	102	mg/L	N/A	January 19 2022

For the operating year of 2021, the Barwick Drinking-Water System was able to meet the demand of water use within the town without exceeding the Municipal Drinking Water Licence and Permit to Take Water.