

Benmiller Drinking Water System  
2022  
Operation and Maintenance  
Annual Report

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MDWL # 080-104, exp Dec. 18/24  
PTTW # 3180-BJKPVH, exp Dec. 12/29  
DWWP # 080-204 issue #4

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## 1.0 INTRODUCTION AND BACKGROUND

The purpose of the 2022 Annual Report is to document the operation and maintenance data for the Benmiller Drinking Water System for review by the Ministry of Environment, Conservation and Parks in accordance with O. Reg. 170/03. This report covers January 1, 2022 to December 31, 2022. A copy of this report will be submitted to the owner to be uploaded to the township's website and can be supplied to interested parties upon request.

## 2.0 DESCRIPTION OF WATER SYSTEM

The Benmiller Drinking Water System (DWS # **220007588**), is characterized as a "secure ground water" system and is classified as a small municipal residential system. The system consists of one well with a rated capacity of 196 m<sup>3</sup>/day, with chlorination treatment. The entire system is located on Concession 1, Part Lot 1, Eastern Division of Ashfield-Colborne-Wawanosh Township. The distribution system serves the community of Benmiller with a population of approximately 60 residents, with approximately 22 customer services, and a 47 guest room Inn and a Community Hall.

The system consists of a Limited Drinking Water System, which is owned by the Township of Ashfield-Colborne-Wawanosh and operated by Veolia Water Canada, the Operating Authority.

Well # 2 was put into service in January 2016, replacing # 1 well. It is a 150 mm drilled well, 70.1 m deep, originally drilled as a monitoring well in 2006. Well # 2 is equipped with a submersible vertical turbine pump rated at 2.5 L/s at 56.4 m TDH.

The well house is equipped with a well pump, flow restrictor limiting flow to 2.27 litres/second, back-up diesel generator, chlorinators, a chlorine contact reservoir, on-line monitoring and alarm generation and auto-dialer.

Back-up power is supplied by one 20 KW, 25 kVA diesel standby generator with automatic transfer switch and 340 L double wall sub-base fuel tank, all installed in an external weatherproof and acoustic enclosure on a concrete pad.

The well house and its equipment have a daily maximum capacity to deliver 196 cubic metres of potable water per day to the Benmiller community. The current water source is one secure deep bedrock well. The well is located on the well house site with a dedicated raw water main feeding the well house.

The water from the well is pumped to a chlorine contact / storage reservoir (7.6 m x 4.6 m x 3.8 m deep) to provide adequate chlorine contact time at maximum flow and before the first consumer, complete with a sampling / service water connection feed back to the pump house.

The well house is monitored by an alarm dialer and is equipped with a data logger that tracks chlorine residuals on the treated water.

The attached distribution system is constructed with a combination of galvanized steel and PVC piping with polyethylene services.

There is no elevated storage to maintain pressure and the system pressure is maintained using pressure tanks and 3 pressure pumps.

The system has no fire hydrants and lacks the capacity to provide fire flows.

Disinfection is achieved on the Benmiller well supply through the use of 6% sodium hypochlorite. In the well house this chemical is added prior to the water entering the chlorine contact reservoir at dosages high enough to achieve both primary and secondary disinfection objectives.

The chlorine dosages range varies with the chlorine demand of the raw water.

The free chlorine residual is monitored at the point of entry to the distribution system, by an on-line chlorine analyzer, with a target residual of > 1.00 mg/l and < 1.30 mg/l.

The Benmiller well supply has 1 PTTW (Permit To Take Water) #3180-BJKPVH issued December 27, 2019, with an expiry date of December 13, 2029, which allows 196 cubic metres per day to be pumped from the well.

The Benmiller Drinking Water System (treatment Subsystem) has maximum flows as specified in the Municipal Drinking Water Licence (MDWL) 080-104 and Drinking Water Works Permit (DWWP) 080-204 Issue #4 . The maximum total daily flow is 196 cubic meters per day.

The treated water is monitored by an on-line chlorine analyzer.

Distribution piping typically ranges in size from 50 mm to 100 mm, and consists of galvanized or PVC piping, with polyethylene service connections.

A 100 mm diameter discharge water main outside the pump house supplies treated water to the Benmiller Estates Subdivision, and two 50 mm discharge water main supplies treated water to the Benmiller Inn.

Typical system pressure ranges from 40 P.S.I to 60 P.S.I.

### 3.0 SUMMARY OF WATER QUALITY MONITORING

#### 3.1 Water Treatment Equipment Operation and Monitoring

##### 3.1.1 Point of Entry Chlorine Residual

Chlorine residuals are continuously measured using a HACH CL17 online chlorine analyzer (8760 samples were taken) and verified for accuracy using a hand-held HACH pocket colorimeter.

**Table 1** shows the monthly average of free chlorine residual values on the treated water at the point of entry.

##### 3.1.2 Distribution Chlorine Residual

Chlorine residuals in the distribution system are checked daily using a HACH pocket colorimeter. 364\* distribution chlorine residuals were recorded.

**Table 1.** – Treated and Distribution Chlorine Residuals for Benmiller Drinking Water System

Date	Average Treated Chlorine Residual (mg/L)	Average Distribution Chlorine Residual (mg/L)
Jan	1.37	1.27
Feb	1.37	1.21
Mar	1.23	1.13
Apr	1.30	1.20
May	1.43	1.33
Jun	1.27	1.19
Jul	1.39	1.39
Aug	1.41	1.29
Sep	1.31	1.21
Oct	1.35	1.25
Nov	1.45	1.38
Dec	1.42	1.28
<b>Average</b>	1.35	1.26
<b>Min</b>	1.11	0.33
<b>Max</b>	1.59	1.73
<b># Samples</b>	328	364

\*One Distribution sample was not taken in December due to road closures\*

3.1.3 Turbidity

Turbidity is measured using a HACH pocket turbidimeter. The maximum turbidity measured in the treated water was 0.60 NTU and 0.82 NTU in the raw water.

**Table 2** provides a summary of raw and treated turbidity results.

**Table 2.** – Raw and Treated Water Turbidities for Benmiller Drinking Water System

Date	Average Raw Turbidity (NTU)	Average Treated Turbidity (NTU)
Jan	0.47	0.56
Feb	0.56	0.49
Mar	0.57	0.45
Apr	0.61	0.46
May	0.67	0.51
Jun	0.63	0.51
Jul	0.69	0.53
Aug	0.66	0.60
Sep	0.82	0.54
Oct	0.44	0.54
Nov	0.60	0.48
Dec	0.62	0.52
<b>Average</b>	0.61	0.52
<b>Min</b>	0.44	0.45
<b>Max</b>	0.82	0.60
<b># Samples</b>	30	272

### 3.2 Microbiological Sampling

#### 3.2.1 Raw Water Samples

Raw water samples are taken every two weeks. A total of 27 samples were collected and analyzed for E. Coli and Total Coliforms. Each E. Coli and Total Coliform sample results were 0 cfu/100 ml in the raw water.

**Table 3** provides a summary of bacteriological results performed on the raw water.

**Table 3.** – Microbiological Results for Raw Water at Benmiller Drinking Water System

Date	E. Coli			Total Coliform		
	# Samples	# Samples 0	# Samples ≥1	# Samples	# Samples 0	# Samples ≥1
Jan	2	2	0	2	2	0
Feb	2	2	0	2	2	0
Mar	3	3	0	3	3	0
Apr	2	2	0	2	2	0
May	2	2	0	2	2	0
Jun	3	3	0	3	3	0
Jul	3	3	0	3	3	0
Aug	2	2	0	2	2	0
Sep	3	3	0	3	3	0
Oct	2	2	0	2	2	0
Nov	*1	1	0	1	1	0
Dec	2	2	0	2	2	0
<b>Total</b>	<b>27</b>	<b>27</b>	<b>0</b>	<b>27</b>	<b>27</b>	<b>0</b>

\*noncompliance, a weekly sample was missed



3.2.2 Treated Water (Point of Entry) Samples

One treated water sample from the point of entry is taken every two weeks and analyzed for E.Coli, Total Coliforms and for Heterotrophic Plate Count (HPC). A total of 27 E.Coli and Total Coliforms water samples were collected and analyzed for the above parameters. Each E. Coli and Total Coliform test result from the treated water was 0 cfu/100 ml. The range of HPC results were 0 - 30 cfu/100 ml.

Table 4 provides a summary of all bacteriological results performed on treated water.

Table 4. – Microbiological Results for Point of Entry at Benmiller Drinking Water System

Date	E. Coli			Total Coliform			HPC		
	# Samples	# Samples 0	# Samples ≥1	# Samples	# Samples 0	# Samples ≥1	# Samples	Safe	Deteriorating
Jan	2	2	0	2	2	0	2	2	0
Feb	2	2	0	2	2	0	2	2	0
Mar	3	3	0	3	3	0	3	3	0
Apr	2	2	0	2	2	0	2	2	0
May	2	2	0	2	2	0	2	2	0
Jun	3	3	0	3	3	0	3	3	0
Jul	3	3	0	3	3	0	3	3	0
Aug	2	2	0	2	2	0	2	2	0
Sep	3	3	0	3	3	0	3	3	0
Oct	2	2	0	2	2	0	2	2	0
Nov	1*	1	0	1	1	0	1	1	0
Dec	2	2	0	2	2	0	2	2	0
<b>Total</b>	<b>27</b>	<b>27</b>	<b>0</b>	<b>27</b>	<b>27</b>	<b>0</b>	<b>27</b>	<b>27</b>	<b>0</b>

\*noncompliance, a weekly sample was missed

3.2.3 Distribution System

Distribution samples are collected every two weeks and tested for E.Coli, Total Coliform and for Heterotrophic Plate Count (HPC). A total of 27 distribution samples were collected and analyzed for the above parameters. All E. Coli and Total Coliform results from the treated water were 0 cfu/100 ml. The range of HPC results were 0 - <10 cfu/100 ml.

**Table 5** provides a summary of all bacteriological samples taken in the distribution system.

**Table 5.** – Microbiological Results for Benmiller Distribution System

Date	E.Coli			Total Coliform			HPC		
	# Samples	# Samples 0	# Samples ≥1	# Samples	# Samples 0	# Samples ≥1	# Samples	Safe	Deteriorating
Jan	2	2	0	2	2	0	2	2	0
Feb	2	2	0	2	2	0	2	2	0
Mar	3	3	0	3	3	0	3	3	0
Apr	2	2	0	2	2	0	2	2	0
May	2	2	0	2	2	0	2	2	0
Jun	3	3	0	3	2	1*	3	3	0
Jul	3	3	0	3	3	0	3	3	0
Aug	2	2	0	2	2	0	2	2	0
Sep	3	3	0	3	3	0	3	3	0
Oct	2	2	0	2	2	0	2	2	0
Nov	*1	1	0	1	1	0	1	1	0
Dec	2	2	0	2	2	0	2	2	0
<b>Total</b>	<b>27</b>	<b>27</b>	<b>0</b>	<b>27</b>	<b>26</b>	<b>*1</b>	<b>27</b>	<b>27</b>	<b>0</b>

**\*See AWQI # 158643 on page 19.**

\*noncompliance, a weekly sample was missed

### 3.3 Chemical Sampling & Testing

#### 3.3.1 Inorganics

One treated water sample is taken every 60 months and tested for inorganics. The most recent samples for the Benmiller Drinking Water System were collected on July 8, 2021 and submitted to the laboratory for analysis of inorganics as listed in Schedule 23. All parameters were found to be within compliance. Inorganics will be sampled and analyzed again on or before July 8, 2026.

Results from 2021 can be found in **Table 6**.

**Table 6.** – Schedule 23 Results for Benmiller Drinking Water System

Parameter	Result (µg/L)	Maximum Allowable Concentration (µg/L)
Antimony	<0.9	6
Arsenic	2.6	10
Barium	77.9	1000
Boron	92	5000
Cadmium	0.004	5
Chromium	0.25	50
Mercury	<0.01	1
Selenium	<0.04	10
Uranium	0.585	20

#### 3.3.2 Lead

Schedule 15.1 of Ontario Regulation 170/03 requires that samples be taken during two seasons: once between December 15 and April 15 and once between June 15 and October 15. The Maximum Allowable Concentration for Lead is 10 µg/L.

Results can be found in **Table 7**.

**Table 7.** – Lead Sampling Program Results for Benmiller Drinking Water System

	Lead (µg/L)	pH	Alkalinity (mg/L)
Dec-Apr	0.32	8.03	214
Jun-Oct	0.55	8.03	206

### 3.3.3 Organics

One treated water sample is taken every 60 months and tested for schedule 24 organic parameters. The most recent samples were collected on June 21, 2021. All parameters were found to be within compliance. Organics will be sampled and analyzed again on or before June 21, 2026.

2021 sample results can be found in **Table 8**.

**Table 8.** – Schedule 24 Results for Benmiller Drinking Water System

Parameter	Result (µg/L)	Maximum Allowable Concentration (µg/L)
Benzene	<0.32	1
Carbon Tetrachloride	<0.17	2
1,2-Dichlorobenzene	<0.41	200
1,4-Dichlorobenzene	<0.36	5
1,1-Dichloroethylene	<0.33	14
1,2-Dichloroethane	<0.35	5
Dichloromethane	<0.35	50
Monochlorobenzene	<0.3	80
Tetrachloroethylene	<0.35	30
Trichloroethylene	<0.44	50
Vinyl Chloride	<0.17	1
Diquat	<1	70
Paraquat	<1	10
Glyphosate	<1	280
Polychlorinated Biphenyls	<0.04	3
Benzo(a)pyrene	<0.004	0.01
2,4-dichlorophenol	<0.15	900
2,4,6-trichlorophenol	<0.25	5
2,3,4,6-tetrachlorophenol	<0.20	100
Pentachlorophenol	<0.15	60
Alachlor	<0.02	5
Atrazine+N-dealkylated metabolites	<0.01	5
Atrazine	<0.01	-
De-ethylated atrazine	<0.01	-
Azinphos-methyl	<0.05	20
Carbaryl	<0.05	90
Carbofuran	<0.01	90
Chlorpyrifos	<0.02	90
Diazinon	<0.02	20
Dimethoate	<0.06	20

**Table #8 con't**

Parameter	Result (µg/L)	Maximum Allowable Concentration (µg/L)
Diuron	<0.03	150
Malathion	<0.02	190
Metribuzin	<0.02	80
Phorate	<0.01	2
Prometryne	<0.03	1
Simazine	<0.01	10
Terbufos	<0.01	1
Triallate	<0.01	230
Trifluralin	<0.02	45
2,4-dichlorophenoxyacetic acid	<0.19	100
Bromoxynil	<0.33	5
Dicamba	<0.20	120
Diclofop-methyl	<0.40	9
MCPA	<0.00012	0.00012
Picloram	<1	190

### 3.3.4 Trihalomethanes and Haloacetic Acids

One distribution sample is taken every three months and tested for Trihalomethanes (THMs) and Haloacetic Acids (HAAs). In 2022, samples were collected during the months of February, May, August and November. The Ontario Drinking Water Quality Standard (ODWQS) has set a Maximum Allowable Concentration (MAC) of 100 µg/L for THMs and it is expressed as a running annual average. The RAA for THMs was found to be 7.68 µg/L. The HAA MAC is 80 µg/L. All samples were found to be within compliance.

Refer to **Table 9** for the summary of trihalomethane and haloacetic acid results.

### 3.3.5 Nitrate & Nitrite

One treated water sample is taken every three months and tested for nitrate and nitrite. In 2022, samples were collected during the months of February, May, August and November. The Ontario Drinking Water Quality Standard (ODWQS) has set a Maximum Allowable Concentration (MAC) of 1 mg/L for nitrites and 10 mg/L for nitrates. All results were found to be within compliance.

Refer to **Table 9**:

**Table 9.** – Nitrate, Nitrite, THM and HAA Results at Benmiller Drinking Water System

Date	Nitrate		Nitrite		THMs		HAAs	
	# Samples	Result (mg/L)	# Samples	Result (mg/L)	# Samples	Result (µg/L)	# Samples	Result (µg/L)
Feb 8	1	<0.006	1	<0.003	1	6.9	1	<5.3
May 24	1	<0.006	1	<0.003	1	5	1	<5.3
Aug	1	<0.006	1	<0.003	1	12	1	<5.3
Nov	1	0.009	1	<0.003	1	6.8	1	<5.3
<b>Total</b>	4		4		4		4	
<b>Average</b>		0.006		<0.003		RAA 7.68		<5.3
<b>Maximum</b>		0.009		<0.003				<5.3

### 3.3.6 Sodium

One treated water sample is collected every 60 months and tested for Sodium. O. Reg 170/03 has set a Maximum Acceptable concentration (MAC) of 20 mg/L for Sodium which requires the Medical Office of Health be notified if the concentration exceeds the MAC. These samples were last collected on June 15, 2021 and were found to be 18.5 mg/L, which is within compliance.

The next water sample for Sodium will be collected and analyzed on or before June 15, 2026.

### 3.3.7 Fluoride

One treated water sample is collected at least once every 60 months and tested for Fluoride. The Ontario Drinking Water Quality Standards (ODWQS) have set a **MAC** of **1.5** mg/L. On August 23rd and a resample on Aug. 30th, 2022 samples were collected for this analysis. The samples were both found to be above the **MAC**, 1.92 mg/L and 1.83 mg/L respectively. This is due to high levels of naturally occurring fluoride in the aquifer.

The next water sample for Fluoride will be collected and analyzed in August , 2027.

For more information see:

<http://www.acwtownship.ca/wordpress/wp-content/uploads/2013/09/Benmiller.pdf>.

## 4.0 WATER AND CHEMICAL USAGE

### 4.1 Chemical Usage

39.33 kg of sodium hypochlorite was used to ensure proper disinfection in the distribution system with an average dosage of 3.14 mg/L.

Refer to **Table 10**.

**Table 10.** – Chemical Usage at Benmiller Drinking Water System

Date	Sodium Hypochlorite	
	Total Usage (kg)	Average Dosage (mg/L)
Jan	2.50	3.30
Feb	1.95	2.85
Mar	2.02	2.90
Apr	2.59	3.32
May	5.14	3.12
Jun	4.94	2.97
Jul	4.36	3.07
Aug	4.36	3.09
Sep	3.17	3.00
Oct	2.80	3.13
Nov	2.93	3.57
Dec	2.57	3.38
<b>Total</b>	39.33	
<b>Average</b>		3.14

#### 4.2 Annual Flows

A summary of the water supplied to the distribution system is provided in **Table 11**. This Table provides a breakdown of the monthly flow provided to the distribution system.

Flow meters were calibrated on June 20, 2022 by Iconix and were found to be acceptable.

**Table 11.** – Treated Water Flows for Benmiller Drinking Water System

Date	Total Monthly Flow (m <sup>3</sup> )	Maximum Daily Flow (m <sup>3</sup> )	Average Daily Flow (M <sup>3</sup> )
Jan	741	42	23.90
Feb	672	43	24.00
Mar	699	33	22.55
Apr	792	45	26.40
May	1634	102	52.71
Jun	1674	82	55.80
Jul	1408	60	45.42
Aug	1213	68	39.13
Sep	934	49	31.13
Oct	451	21	14.55
Nov	864	58	28.80
Dec	770	40	25.67
<b>Total</b>	11852		
<b>Max</b>		102	
<b>Average</b>			32.50



## 5.0 IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE

The following summarizes water system improvements and routine and preventative maintenance for the Benmiller Drinking Water System:

### January

- Curb stop repaired

### February

- Annual Generator Inspection
- Raw water line was repaired by Ferguson's plumbing

### May

- Spring flushing of the distribution system occurred
- Water main break- due to construction and Leak in the Gledhill service line

### June

- Flow meters were calibrated on the 20th by Iconix
- New pump and Meter installed by Hopper

### July

- Backflow Preventer was Certified (30th)
- Replaced Hydraulic flow control valve with a fixed rate Dole valve (form 2)
- Repaired wood hatch with steel plate (insects were burrowing thru the wood)

### August

- Backflow preventer was certified by Ferguson Plumbing
- Booster pump #2 was out of service

### September

- Reservoir was drained and Inspected by BMRoss
- Pumps were replace by Hopper
- Reservoir was cleaned, filled and sampled
- Pumps were put back in service

### October

- Replaced existing hydraulic flow control valve with a fixed rate 35USGPM(2.205L/s) Dole valve.
- Forced air heater fan was repaired by Fergusons

## 6.0 MINISTRY OF THE ENVIRONMENT INSPECTIONS AND REGULATORY ISSUES

The most recent inspection conducted by The Ministry of Environment, Conservation and Parks was completed by Ron Burrel on April 21, 2022.

There were no non-compliances noted. The Inspection Rating was 100%.

An External Systems Audit for Reaccreditation was conducted by SAI Global and issued September 9, 2022, effective September 7, 2022

There were 2 instances of adverse water quality:

- AWQI # 158643 - 3 TC at the Pfrimmer St Sample Station, resamples were all clear of Bacteriologicals
- AWQI # 159756 - Fluoride Exceedance, an information letter from the HPPH was posted on the website (fluoride is naturally occurring in this water system).

There was one Precautionary Boil Water Notice on September 25 for Booster Pump replacements and an internal condition inspection at the wellhouse and reservoir

There were 2 instances of nonconformance:  
One weekly sample was not taken in November  
Daily rounds were not completed

## 7.0 MECP Regulatory Changes

- Proposed amendments to drinking water operator and water quality analyst certification regulations have been issued to address the impacts of emergencies. These include:
  - allowing the Ministry to act quickly to ensure the Province's drinking water is protected during an emergency
  - extending Operator certificates and allowing certain qualified but non-certified staff to temporarily maintain system operations, and would only be enacted during an emergency
  - allowing temporary relief from training and certification requirements

This proposal has been registered with the Environmental Registry of Ontario and the consultation process was closed on July 2, 2021. The outcome of this proposal is expected to be published in 2022.

- Proposed updates to the Director's Directions - Minimum Requirements for Operational Plans - May 2021. The Director's Directions have updated the following:
  - Content Requirements - all referenced documents will be considered part of the Operational Plan.
  - Procedures for version control - version number and revision date is to be embedded in every electronic copy, and recorded on every page of any physical copy
  - Completed copy of Subject System Description Form in Schedule "C" of the Director's Directions
  - Operational Plans are to be submitted to the Director electronically
  - Retention of Operational Plans - Operational Plans that were the subject of an audit by an auditor for the accreditation body shall be retained for a minimum of 10 years
  - Public Disclosure of Operational Plans - shall be made available for viewing by the public either electronically (website) or at the principal place of business, but not in a manner that would threaten the safety, health or quality of the drinking water, or create significant prejudice with the contractual obligations of the Operating Authority or other organization.
  - Operational Plans shall be updated to meet the requirements of the Director's Directions no later than April 1, 2022.



Report Date: February 28, 2023

## **Benmiller Drinking Water System – 2022 Compliance Summary**

This document is a compliance summary for the Benmiller water supply for the year 2022 as per O. Reg. 170/03 Schedule 22. A full summary of the water system's test results, flows and significant activities was submitted in the Annual Report.

### **System Description**

The Benmiller water system is characterized as a “secure ground water” system and is classified as a small municipally owned water system.

The well house and its equipment have a daily maximum capacity to deliver 196.4 cubic meters of potable water per day to the Benmiller community. This was not exceeded during 2022.

A monitoring well, drilled due west of the well house in 2007, was constructed by the Maitland Valley Conservation Association to monitor water movement in the aquifer. It was constructed to municipal production standards. This secure deep bedrock well (Well #2) was put into service in January 2015 including a new well pump and water main, and well #1 was officially abandoned at that time.

The water system is monitored bi-weekly for bacteriological analysis to ensure the integrity of the water coming from the well.

The well house is equipped with a data logger, backup diesel generator, chlorinators, a chlorine contact reservoir, online monitoring and alarm generation to an Autodialer.

The distribution system is constructed of a combination of galvanized steel and PVC piping with polyethylene services.

There is no elevated storage to maintain pressure and the system pressure is maintained using pressure tanks and the three horizontal pumps. There is a backup generator with automatic switchover.

The system has no hydrants and lacks the capacity to provide fire flows.

### **Chemicals Fed**

#### **Disinfectant**

Disinfection was achieved in the Benmiller well supply through the use of 6% sodium hypochlorite. In the well house this chemical was added prior to the water entering the chlorine contact reservoir at dosages high enough to achieve both primary and secondary disinfection objectives. The chlorine average dosages ranged from 2.89 mg/L to 3.56 mg/L, varying with the chlorine demand of the raw water.

The free chlorine residual was monitored at the point of entry to the distribution system with a target residual of 1.00 mg/L. Benmiller's average for 2022 was 1.26 mg/L.



## **Flows**

The Benmiller well supply PTTW ( permit to take water) #3180-BJKPVH was issued December 27, 2019 which allows a maximum of 196 cubic meters per day to be pumped from Well #2 and expires December 13, 2029. This limit was not exceeded in 2022. The average daily water flow was 32.50 m<sup>3</sup>. A full summary of the 2022 flows can be found in the Annual Report.

The Drinking Water Works Permit (DWWP) #080-204 Issue #4 for the Benmiller Drinking Water System was issued on June 19, 2020. The maximum total daily flow is 196 cubic meters per day and the maximum instantaneous flow is 7.6 liters per second. The well is restricted to 2.27 L/s.

The limiting factor regarding flow is chlorine contact time in the chlorine contact reservoir. In order to meet the regulatory CT requirements, increased flows beyond this must have adequate free chlorine residual to counter the decreased retention time in the chlorine contact reservoir.

The combination of maximum flows through the chlorine contact reservoir and minimum free chlorine residuals exiting the contact reservoir did not exceed the limitations in 2022 as recorded by the flow meters and the online chlorine analyzer.

The maximum daily flow in 2022 was 102 cubic meters or 52.04% of capacity.

The 2022 average daily flow was 32.50 cubic meters or 16.58%.

## **Precautionary Boil Water Notices**

There was 1 Precautionary Boil Water notices placed on the Benmiller water system in 2022.

*There was one Precautionary Boil Water Notice on September 25 for Booster Pump replacements and an internal condition inspection at the wellhouse and reservoir*

## **Boil Water Advisory**

There were no Boil Water Advisories issued by the Huron Perth Public Health (HPPH) on the Benmiller water system in 2022.

## **Annual Ontario Ministry of the Environment Inspection**

Ron Burrell, Ministry of the Environment, Conservation and Parks (MECP) Drinking Water Inspector, inspected the water system and examined the water quality and operational records on April 7, 2022. There were 0 non-compliant issues. The rating was 100%.

## **Non Conformance**

There were 2 instances of nonconformance:

One weekly sample was not taken in November

Daily rounds were not completed

## **Adverse Water Quality Indicators**

There were 2 instances of adverse water to report in 2022.

- AWQI # 158643 - 3 TC at the Pfrimmer St Sample Station, resamples were all clear of Bacteriologicals
- AWQI # 159756 - Fluoride Exceedance, an information letter from the HPPH was posted on the website (fluoride is naturally occurring in this water system)



## **Exceedances**

### **Fluoride**

O. Reg. 169/03 (the Ontario Drinking Water Standard) has a MAC (maximum allowable concentration) of 1.5 mg/L for fluoride.

The water from the Benmiller well is monitored every 5 years for fluoride. It has naturally occurring levels that can exceed 1.5 mg/L.

As required by O. Reg. 170/03 Schedule 13 Section 13.9, an AWQI (adverse water quality indicator) is filed every 60 months if required. On August 23rd and a resample on Aug. 30th, 2022 samples were collected for this analysis. The samples were both found to be above the **MAC**, 1.92 mg/L and 1.83 mg/L respectively. . This is due to high levels of naturally occurring fluoride in the aquifer. The next sample for fluoride will be collected in August of 2027.

## **Infrastructure Assessment**

Regular contact is maintained with ACW's representative. The JobsPlus program is continually updated with preventative and corrective maintenance issues. A complete summary can be forwarded to the client upon their request. Through regular communication between the operating authority and the client, capital items are discussed. A list of capital items and concerns for 2022 was forwarded to ACW's representative on October 29, 2021.

The annual Management Review was conducted by the operating authority on September 15, 2022 as per the DWQMS requirement in Element 14. Regular discussions between the client and the operating authority for this water system are continued throughout the year by emails, phone calls, and meetings as per the requirements of Element 15 of the DWQMS.

The Internal Audit was last completed on July 29 - August 23, 2022 and the last Risk Assessment was completed December 30, 2021. An Emergency Response Exercise was conducted by the Municipality in 2022, but Veolia was not asked to participate. .

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