



**Ontario Clean Water Agency**  
**Agence Ontarienne Des Eaux**

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February 2022

Mayor Harold McQuaker and Council  
The Corporation of the Township of Emo  
P.O. Box 520  
Emo, Ontario  
P0W 1E0

**Re: 2021 Annual Summary Report for the Emo 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 1<sup>st</sup> to December 31<sup>st</sup> in a year and must *be prepared not later than March 31<sup>st</sup>* of the following year. Pursuant to the legislative requirements, enclosed for your records is the 2021 Annual Summary for the Emo 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 Emo and is based on information kept on record by OCWA at the Emo Drinking-Water System. The report covers the period January 1<sup>st</sup> through to December 31<sup>st</sup> 2021.

Yours truly,



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

Copy to: Bridget Foster – CAO/Clerk-Treasurer  
Doug Brown – Interim CAO/Clerk-Treasurer  
Operations Staff – Emo Water Treatment

# 2021 Schedule 22 Annual Summary Report

Emo Drinking-Water System

February 2022

Prepared by the



**Ontario Clean Water Agency**  
**Agence Ontarienne Des Eaux**

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## ***Section 1: Introduction***

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This report is a summary of water quality information for the Emo 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 Emo Drinking-Water System is categorized as a Large Municipal Residential Drinking Water System.

This report is prepared by The Ontario Clean Water Agency on behalf of the Corporation of the Township of Emo. 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?***

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"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

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In accordance with the *Municipal Drinking Water Licence 288-101 Schedule C: System – Specific Conditions 1.0 Performance Limits*, the Emo 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 m<sup>3</sup> / 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 Emo Drinking-Water facility operated below the rated capacity of 950m<sup>3</sup>/day in 2021. The average monthly raw flow rate was 11503.33 m<sup>3</sup>; the average raw daily flow rate was 378.22 m<sup>3</sup>, with a maximum raw daily flow rate of 595 m<sup>3</sup>.

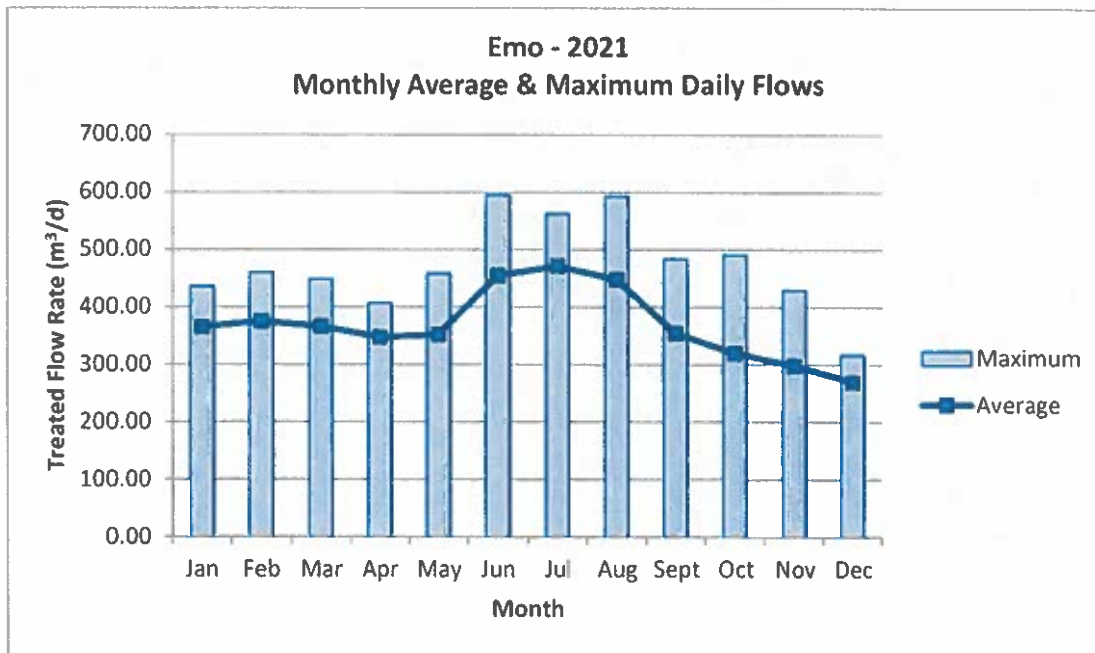
In 2021, the average monthly treated flow rate was 11209.50 m<sup>3</sup>; the average daily treated flow rate was 368.53 m<sup>3</sup>; and the maximum daily treated flow rate for the year was 594 m<sup>3</sup> representing 62.52% of the allowable daily volume.

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* while the maximum daily treated flow rate did exceed the rated capacity for this system.

### Monthly Raw & Treated Flow Rates for 2021

Month	Average Daily Raw Flow Rate (m <sup>3</sup> /d)	Maximum Daily Raw Flow Rate (m <sup>3</sup> /d)	Average Daily Treated Flow Rate (m <sup>3</sup> /d)	Maximum Daily Treated Flow Rate (m <sup>3</sup> /d)	Total Monthly Treated Flow Rate (m <sup>3</sup> /month)
January	385.35	524.00	365.06	436.00	11317.00
February	394.89	530.00	375.14	460.00	10504.00
March	373.42	434.00	366.29	449.00	11355.00
April	355.97	478.00	347.30	407.00	10419.00
May	355.26	505.00	352.61	459.00	10931.00
June	465.77	575.00	455.13	594.00	13654.00
July	479.19	595.00	471.48	563.00	14616.00
August	453.77	575.00	448.06	593.00	13890.00
September	349.47	489.00	354.27	484.00	10628.00
October	327.19	482.00	319.58	491.00	9907.00
November	301.83	440.00	298.23	430.00	8947.00
December	296.52	332.00	269.23	317.00	8346.00
<b>2021 Total Treated Flows (m<sup>3</sup>)</b>				<b>134,514.00</b>	





## **Section 4: System Failures and Correction**

The Ministry of Environment conducted an *unannounced* inspection of the Emo Drinking Water System on February 18 2021. The 2021 final inspection report identified eight non-conformance as summarized in the table below.

The 2021 final inspection rating record for the Emo Drinking Water System was 77.29%.

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
1	<p><b>The operations and maintenance manuals did not contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.</b></p> <p>O. Reg. 128/04, section 28, requires that operators and maintenance personnel have ready access to comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the subsystem. The current operations manual does not contain plans and drawings of the water treatment plant or the distribution system.</p> <p>The plans/drawing should depict treatment process units, chemical application points and process monitoring/sampling points for each subsystem. The plans/drawing for distribution subsystems should also include water mains, valves, hydrants, and other appurtenances associated with the distribution system. The plans/drawing may depict the entire system as a whole or individual treatment systems as separate drawings. In addition, the description of each treatment process should include the purpose of the process, the equipment included in the process (treatment and monitoring), and how the process/equipment works. More recently, new computer programming (i.e. SDADA and Wonderware) has been installed at the facility and is being used to monitor the drinking water system. The new monitoring equipment is not described in the operations manual.</p>	Sept 30 2021	<p>The implementation of the THM upgrades SBA will be upgrading the OM manuals to current standards. Awaiting the completion of the upgrades to ensure the plant status is captured as it pertains to any and all equipment. DWWP will also be updated. Expected completion is March 2022</p>	In Progress
2	<p><b>The operations and maintenance manuals did not meet the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.</b></p> <p>Schedule B, condition 16.0 in the facility's MDWL, lists the information that is to be included in the operations manual. This includes procedures for monitoring and recording the in-process parameters necessary for the control of any treatment subsystem and for assessing</p>	Sept 30 2021	<p>The implementation of the THM upgrades SBA will be upgrading the OM manuals to current standards. Awaiting the completion of the upgrades to ensure the plant status is captured as it pertains to any and all equipment. DWWP will also be updated. Expected completion is March 2022</p>	In Progress



Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
	<p>the performance of the drinking water system. More recently, the Emo WTP stated using SCADA and Wonderware Programming to monitor in-process parameters. This equipment is not described in the operations manual. In addition, the operations manual is outdated. Over the years equipment has been replaced. Some of these changes have been noted in the manual, but this has been done through crossing sections out and making hand written notes that are difficult to follow.</p>			
3	<p><b>Operators-in-charge had not been designated for all subsystems which comprised the drinking water system.</b></p> <p>O. Reg. 128/04, section 25(1) states that the owner or operating authority of a subsystem or a person authorized by the owner or operating authority shall designate one or more operators as operator-in-charge (OIC) of the subsystem. Section 26 of O. Reg 128/04 (Certification of Drinking Water System Operators and Water Quality Analysts) outlines the responsibilities of an Operator-in-Charge (OIC). If multiple OIC's are esignated during an operational shift, it must be demonstrated what processes each OIC was responsible for. During the review period, two OIC's were consistently listed for an operational shift, but sometimes only one of the OIC's was on-site or made entries in the log book for the day. As a result, it is not clear what duties the other OIC was responsible for when entries were not made by the other OIC.</p>	April 16 2021	Review ORO/OIC letter with operators and have a training record signed	Completed
4	<p><b>All microbiological water quality monitoring requirements for distribution samples were not being met.</b></p> <p>Section 10-2, Schedule 10, O. Reg. 170/03, requires owners and operating authorities of drinking water systems that serve 100,000 people or fewer to ensure that at least eight distribution samples plus one additional distribution sample for every 1000 people served by the system are taken each month. At least one of the samples must be collected each week. All samples must be tested for Escherichia coli (E. coli) and total coliform bacteria and at least 25% of the required samples must be tested for general bacteria populations using heterotrophic plate counts. The population of Emo is approximately 950 people; therefore, at least eight distribution samples are required to be taken every month. As the population nears 1000 people, operators have opted to take, at a minimum, 9 distribution samples every month. This was observed for the review period. In addition, at least 25% of the samples were tested for HPC on a monthly basis. During the review</p>	April 16 2021	Review O.Reg 170.03 Scheduling 10-2 with operations as well as Sampling SOP. A training record will be signed by operators after.	Completed

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
	<p>period, at least nine distribution samples were taken every month; however, typically, only one of the distribution samples was analyzed for HPC most months. At least two of the distribution samples needed to be tested for HPC on a monthly basis.</p>			
5	<p><b>All microbiological water quality monitoring requirements for treated samples were not being met.</b> Schedule 10, Section 10-3 of O. Reg. 170/03 requires that the owner of a drinking water system ensure that a water sample is taken at least once every week and tested for,</p> <p>(a) Escherichia coli (EC);  (b) total coliforms (TC); and  (c) general bacteria population expressed as colony counts on a heterotrophic plate count (HPC).  This criteria was met throughout the inspection review period except for the sample taken on February 8, 2021. On this date it was not requested that this sample be analyzed for HPC.</p>	Immediately	Review O.Reg 170.03 Scheduling 10-3 with operations as well as Sampling SOP. A training record will be signed after.	Completed
6	<p><b>All inorganic water quality monitoring requirements prescribed by legislation were not conducted within the required frequency.</b> O. Reg. 170/03, Schedule 13, section 13-2 requires that treated water samples be tested at least once every 12 months (+/- 30 days, i.e. between 335 and 395) for inorganic parameters. During the review period these parameters were tested on February 26, 2020 and January 11, 2021. Previously these samples were taken on January 8, 2019. The length of time between the 2020 and 2021 samples was 320 days. This did not allow enough time between samples.</p>	April 16 2021	Review O.Reg 170.03 Scheduling 13-2 with operations as well as Sampling SOP. A training record will be signed by operators after.	Completed
7	<p><b>All organic water quality monitoring requirements prescribed by legislation were not conducted within the required frequency.</b> O. Reg. 170/03, Schedule 13, section 13-4 requires that treated water samples be tested at least once every 12 months (+/- 30 days, i.e. between 335 and 395) for organic parameters. During the review period these parameters were tested on February 26, 2020 and January 11, 2021. Previously these samples were taken on January 8, 2019. The length of time between the 2020 and 2021 samples was 320 days. This did not allow enough time between samples.</p>	April 16 2021	Review O.Reg 170.03 Scheduling 13-4 with operations as well as Sampling SOP. A training record will be signed by operators after.	Completed
8	<p><b>Where required continuous monitoring equipment, used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person did not respond in a timely manner</b></p>	April 16 2021	Review turbidity technical bulletin with operators as well as Schedule 6 section 6-5 and provide a training record for operators to sign.	Completed

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
	<p><b>and/or did not take appropriate actions.</b></p> <p>Schedule 6, section 6-5, of O. Reg. 170/03, requires that a person who is qualified to examine test results takes appropriate action at the location where a regulatory alarm required by this Schedule sounds, before water is again directed to users of water sampled by the equipment. During the review period, actions taken in response to regulatory alarms were documented in the log book; however, on August 18, 2020, an operator responded to an alarm, but did not document their observations/actions taken. On this date, filter effluent turbidity increased above 1 NTU. Two of the facility's computer programs (SCADA and Wonderware) show that both filters shut down as turbidity reached 1 NTU; however, the continuous data captured in Excel shows the filters continued to produce water for 20 minutes when filter effluent turbidity was &gt;1 NTU, then shut down. Based on the data provided, it appears as though the error is in the Excel data; however, if the operator had documented their observations and action taken in response to the alarm (i.e. noted when the filter shut down in relation to filter effluent turbidity), this assumption may have been clarified and would not be questioned if this is a reportable adverse water quality incident.</p>			

On July 21 2019 the gas chlorination system failed and leaked chlorine. The municipal fire department attended the water plant to contain the gas leak. The gas chlorination system was shut down and an alternate chlorination system established to maintain disinfection using sodium hypochlorite. The use of the gas chlorination system was re-implemented for disinfection in March of 2021 following necessary work to repair.



## Section 5: Conclusion

In the reporting year of 2021, there were three 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
October 2 2021	Water main break, affecting 18 homes. BWA issued			Water main repaired. Disinfection restored. 2 sets of bacti samples collected	October 8 2021
October 12 2021	Water Main valve leak, affecting 5 services. BWA issued			Water main repaired. Disinfection restored. 2 sets of bacti samples collected	October 22 2021
November 15 2021	Water main break Tompkins road			Water main repaired and flushed. Two sets of bacti samples collected	November 20 2021

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

**Water Taking Data submitted successfully.**

**Confirmation:**

Thank you for submitting your water taking data online.

Permit Number: 0756-AVYL2X

Permit Holder: THE CORPORATION OF THE TOWNSHIP OF EMO.

Received on: Feb 24, 2022 9:32 AM

This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.

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# The Corporation of the Township of Emo

2021 Section 11 Annual Report and  
Schedule 22 Annual Summary Report  
Emo Drinking Water System

## Definitions and Acronyms

<b>Acronym</b>	<b>Definition</b>	<b>Acronym</b>	<b>Definition</b>
MAC	Maximum Acceptable Concentrate	PTTW	Permit To Take Water
AWQI	Adverse Water Quality Incident	MDWL	Municipal Drinking Water Licence
O. Reg.	Ontario Regulation	BWA	Boil Water Advisory
CT	Concentration of Chlorine x Time of Contact	m <sup>3</sup>	Cubic Meter
NTU	nephelometric turbidity units		



## Municipal Drinking Water System - Annual Reports

- In Ontario, O. Reg. 170/03 of the Safe Drinking Water Act (SDWA), requires an Annual Report be prepared for each drinking water system.
- This Report is intended to inform both the public and Municipal Council about the operation of the drinking water system over the previous calendar year





## **Municipal Drinking Water System - Annual Reports**

**Section 11** of O. Reg. 170/03 requires the development and distribution to the public of an annual report summarizing water quality monitoring results, adverse water quality incidents, system expenses and chemicals used in the water treatment process.

**Section 11** summarizes the “quality” of the treated water

## Section 11 – Annual Reports

### Chemicals Used in the Water Treatment Process

- Chlorine gas
- Sodium carbonate
- Alum
- Polymer
- Sodium hypochlorite




## Section 11 – Annual Reports

### Major System Expenses

Description	Expense
Soda Ash upgrades – 2 Soda Ash feed systems, pH probe, and PLC/SCADA tie in.	\$ 86,974
Polymer day tank replacement – new 450L double walled tank to diminish the chance of a spill.	\$ 819
Chlorine Gas exhaust system study to determine the needed exhaust requirements for the health and safety of the operators	\$ 17,849
Alum Storage and day tank replacement – new 6800L double walled storage tank and 450L double walled day tank to diminish the chance of a spill.	\$ 9,935
Spare chemical feed pump purchased to provide backup duties should the primary pump fail.	\$ 3,319

## Section 11 – Annual Reports

### Adverse Water Quality Incidents

1. October 2 – Water main break, affecting 18 homes BWA Issued.  
October 8 - Water main repaired, disinfection restored and 2 sets of bacti samples collected.
  2. October 12 - Water Main valve leak, affecting 5 services BWA issued  
October 22 - Water main repaired. Disinfection restored. 2 sets of bacti samples collected
  3. November 15 - Water main break Tompkins road  
November 20 -Water main repaired and flushed. 2 sets of bacti samples collected
- 



## **Municipal Drinking Water System - Annual Reports**

**Schedule 22** of O. Reg. 170/03 requires the development and distribution to Council of an annual report summarizing incidents of regulatory non-compliance and associated corrective actions, in addition to providing flow monitoring results for the purpose of enabling the Owner to assess the capability of the system to meet existing and planned demand.

**Schedule 22** summarizes the “quantity” of the raw and treated water

# Schedule 22 Summary Report

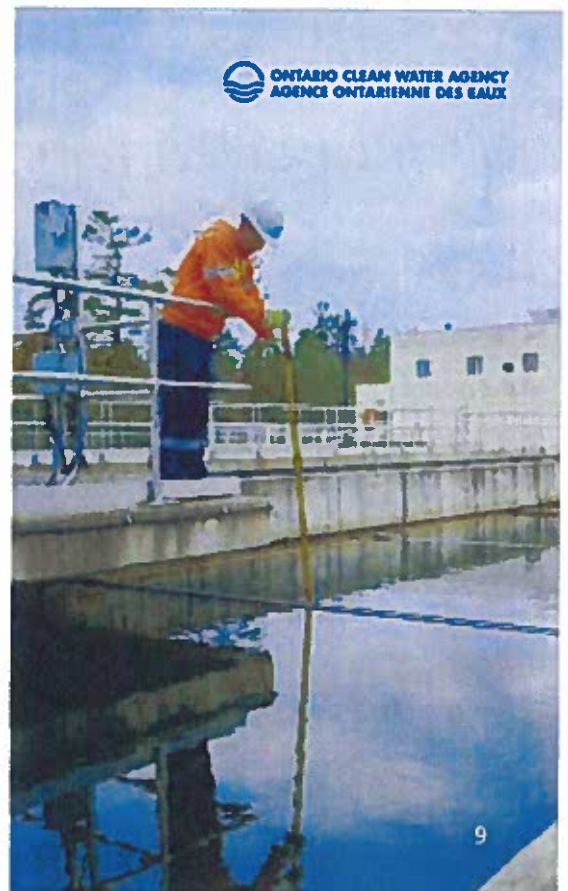
## Daily Flow Rates

### Raw Water

- Average Daily Volume vs. Permit to Take Water
- Maximum Daily Volume vs. PTTW

### Treated Water

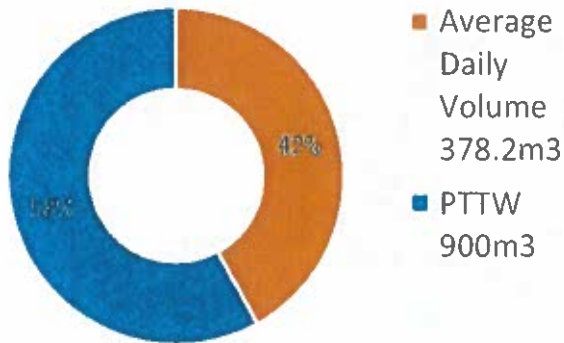
- Average Daily Volume vs. Municipal Drinking Water Licence
- Maximum Daily Volume vs. MDWL



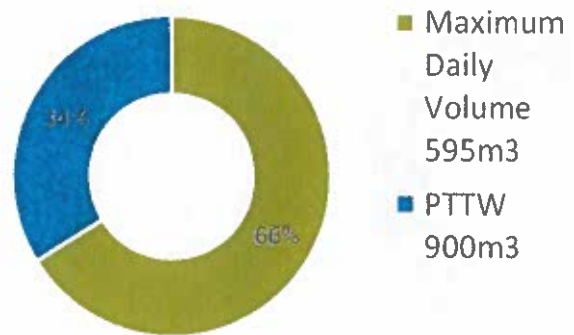


## Raw Water Flow Rates

### Average Daily Volume

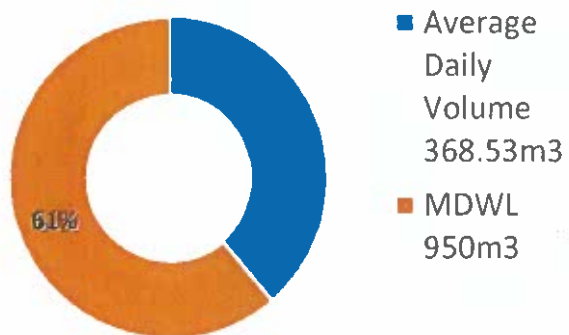


### Maximum Daily Volume

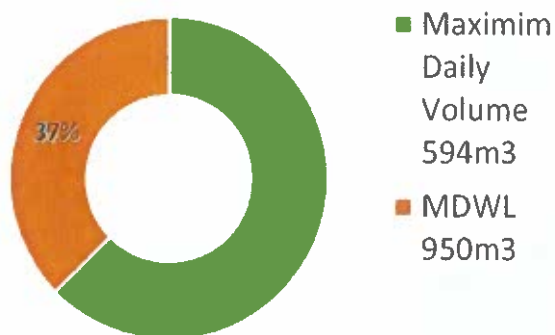


## Treated Water Flow Rates

### Average Daily Volume



### Maximum Daily Volume



## Schedule 22 Summary Report

### Regulatory Non-Compliance and Corrective Actions

Item	Non Compliance	Status
1	The operations and maintenance manuals did not contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system	In Progress
2	The operations and maintenance manuals did not meet the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA	In progress
3	Operators-in-charge had not been designated for all subsystems which comprised the drinking water system	Complete
4	All microbiological water quality monitoring requirements for distribution samples were not being met	Complete

# Schedule 22 Summary Report

## Regulatory Non-Compliance and Corrective Actions

Item	Non Compliance	Status
5	All microbiological water quality monitoring requirements for treated samples were not being met	Complete
6	All inorganic water quality monitoring requirements prescribed by legislation were not conducted within the required frequency	Complete
7	All organic water quality monitoring requirements prescribed by legislation were not conducted within the required frequency	Complete
8	Where required continuous monitoring equipment, used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person did not respond in a timely manner and/or did not take appropriate actions	Complete

## Thank you

If you have any questions or concerns please reach out to us anytime.

OCWA Contact

Ty Maurice

Senior Operations Manager

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