



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Matachewan Drinking Water System

2021 ANNUAL/SUMMARY REPORT

Prepared by the Ontario Clean Water Agency
on behalf of the Township of Matachewan

TABLE OF CONTENTS

INTRODUCTION	1
Section 11 - ANNUAL REPORT	2
1.0 INTRODUCTION.....	2
2.0 MATACHEWAN DRINKING WATER SYSTEM (DWS No. 220003653).....	3
3.0 LIST OF WATER TREATMENT CHEMICALS USED OVER THE REPORTING PERIOD	5
4.0 SIGNIFICANT EXPENSES INCURRED IN THE DRINKING WATER SYSTEM	6
5.0 DETAILS ON NOTICES OF ADVERSE TEST RESULTS AND OTHER PROBLEMS REPORTED TO & SUBMITTED TO THE SPILLS ACTION CENTER.....	6
6.0 MICROBIOLOGICAL TESTING PERFORMED DURING THE REPORTING PERIOD.....	7
7.0 OPERATIONAL TESTING PERFORMED DURING THE REPORTING PERIOD.....	8
Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES	13
1.0 INTRODUCTION.....	13
2.0 REQUIREMENTS THE SYSTEM FAILED TO MEET	13
3.0 SUMMARY OF FLOWS AND COMPARISON TO REGULATORY LIMITS	13
CONCLUSION.....	19

List of Figures

Figure 1 – 2021 – Comparison of Treated Water Flows to the Rated Capacity

Figure 2 – Historical Water Usage Trends (2017 to 2021)

List of Appendices

APPENDIX A – Monthly Summary of Microbiological Test Results

APPENDIX B – Monthly Summary of Operational Data



INTRODUCTION

Municipalities throughout Ontario have been required to comply with Ontario Regulation 170/03 made under the *Safe Drinking Water Act* (SDWA) since June 2003. The Act was enacted following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

Section 11 of Regulation 170/03 requires the owner to produce an Annual Report. This report must include the following:

1. Description of system & chemical(s) used
2. Summary of any adverse water quality reports and corrective actions
3. Summary of all required testing
4. Description of any major expenses incurred to install, repair or replace equipment

This annual report must be completed by February 28th of each year.

Schedule 22 of the regulation also requires a Summary Report which must be presented & accepted by Council by March 31st of each year for the preceding calendar year.

The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any regulatory requirements the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The *Safe Drinking Water Act* (2002) and the drinking water regulations can be viewed at the following website: <http://www.e-laws.gov.on.ca>.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

1. A summary of the quantities and flow rates of water supplied during the reporting period, including the monthly average and the maximum daily flows,
2. A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The reports have been prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Owner and presented to council as the 2021 Annual/Summary Report.



Matachewan Drinking Water System

Section 11

2021 ANNUAL REPORT



Section 11 - ANNUAL REPORT

1.0 INTRODUCTION

Drinking-Water System Name:	Matachewan Drinking Water System
Drinking-Water System No.:	220003653
Drinking-Water System Owner:	The Corporation of the Township of Matachewan
Drinking-Water System Category:	Large Municipal, Residential System
Period being reported:	January 1, 2021 to December 31, 2021

Does your Drinking Water System serve more than 10,000 people? No

Is your annual report available to the public at no charge on a web site on the Internet? Yes
at <http://www.matachewan.com/>

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

Matachewan Township Office
1 Moyneur Avenue,
Matachewan Ontario P0K 1N0

Drinking Water Systems that receive drinking water from the Matachewan Drinking Water System

The Matachewan Drinking Water System provides all drinking water to the community of Matachewan.

The Annual Report was not provided to any other Drinking Water System Owners.

The Ontario Clean Water Agency prepared the 2021 Annual/Summary Report for the Matachewan Drinking Water System and provided a copy to the system owner; the Township of Matachewan. The Matachewan Drinking Water System is a stand-alone system that does not receive water from or send water to another system.

Notification to system users that the Annual Report is available for viewing is accomplished through:

- Notice on the Town's website
- Notice in the Town's News Letter



2.0 MATACHEWAN DRINKING WATER SYSTEM (DWS No. 220003653)

The Matachewan Drinking Water System is a communal ground water well supply that services the Town of Matachewan. It is owned by the Corporation of the Township of Matachewan and is operated by the Ontario Clean Water Agency (OCWA). The system consists of Class 1 water treatment subsystem and a Class 1 water distribution subsystem. OCWA is the accredited operating authority and is designated the Overall Responsible Operator for both the water treatment and water distribution facilities.

Raw Water Supply

The water treatment system obtains its water from two production wells with a combined allowable daily volume of 908 m³/day. The wells are located at 391 Bernard Street, adjacent to the Montreal River. The well head assembly for Well 1 is located within the main building for the water treatment plant while the well head assembly for Well 2 is located outside adjacent to the water treatment plant building. Both wells consist of a 150 mm diameter steel casing; Well 1 is drilled to a depth of 39.6 m and Well 2 is drilled to a depth of 55 m. Well 1 is equipped with a 30 hp vertical turbine pump assembly and a variable frequency drive (VFD) to pump at a maximum rate of 20 L/s. Well 2 is equipped with a 30 hp submersible pump (VFD compatible) rated at 20 L/s. Each well is equipped with a magnetic flow meter installed in a 150 mm diameter line that directs water into the treatment process. Also included are pump-to-waste capabilities from a common pump discharge line.

Water Treatment

The wells feed the water treatment plant that has a maximum rated capacity of 908 cubic meters per day (m³/d). The wells operate on an alternating basis but can be adjusted as required.

The plant is controlled by a programmable logic controller (PLC) which communicates with the elevated water storage facility (EWSF) to control the plant start and stop cycles. There is a set point for both wells to prevent them from running more than the permit to take water allows. When the set point is reached, the operational well shuts down and the other well takes over.

The raw water discharges to a combined header in the water treatment plant which is directed to a Filtronics Inc. iron and manganese removal filtration system consisting of two reaction vessels fed with sodium hypochlorite and one pressure filter rated at 10.5 L/second. The filter is filled with Filtronic's Electromedia®, a proprietary media. Sodium hypochlorite solution is injected at the raw water header before the first reaction vessel to oxidize the iron and manganese so it can be removed by the filtration system and provide primary disinfection. The sodium hypochlorite system consists of duplicate chemical pumps (one duty, one back-up) with automatic switchover and a 400 L double walled chemical tank.

The filter is automatically backwashed, prior to shutdown to clean contaminants from the media. Manual backwashes can also be initiated when required. The backwash water is



pumped from a 22,700 L underground backwash water storage tank and the wastewater is discharged to the backwash reclaim water tank. A typical backwash time is four (4) minutes.

The system will also go through a purge cycle prior filtration when there is a call for water or after a backwash cycle if the call for water signal is still on. This step allows the filter to reform. Discharge water from the purge cycle goes to the reclaim tank. Normal purge time is from 1 to 10 minutes.

The backwash and purge discharge water stored in the reclaim tank are blended with raw well water to be reprocessed through the filter during filtration mode. The reclaim pump is rated at 1.04 L/second and when in operation, the reclaim water is continuously monitored for turbidity to ensure it will not cause fouling of the media. Settled sludge from the reclaim tank will be removed via hauling truck when needed.

Filtered water is continuously monitored using free chlorine residual analyzer that is alarmed and is measured by an in-line magnetic flow meter before entering the underground chlorine contact chamber pipe. The 23.87 m³ chlorine contact pipe consists of a 750 mm diameter x 54 m long PVC constructed pressure pipe which provides appropriate contact time to ensure adequate primary disinfection of the water before entering the distribution system.

To ensure water entering the chlorine contact chamber / pipe has sufficient free chlorine there is a post filter sodium hypochlorite system (redundant duty back-up system) to provide trim chlorination as required. If the free chlorine residual drops below an operator specified low set point the post filter sodium hypochlorite chemical system will automatically start to provide a sodium hypochlorite dosage to achieve a specified free chlorine residual set-point. The post filter sodium hypochlorite system is also used to provide primary disinfection when operating in filter bypass or EWSF bypass modes.

A compliance free chlorine residual analyzer is installed after the chlorine contact chamber to ensure water entering the distribution system meets primary disinfection requirements and has a sufficient chlorine to maintain a residual throughout the distribution system. The analyzer is pH compensated and equipped with alarms.

An ammonium sulphate system was installed downstream from the compliance free chlorine analyzer to convert the free chlorine residual to combined chlorine residual before entering the distribution system. The ammonium sulphate chemical addition is fully redundant having a duty backup system consisting of two chemical pumps. After the ammonia injection point there is a total chlorine analyzer to measure and record the total chlorine residual entering the distribution system. The ammonia sulphate solution is stored in a 350 L double walled storage tank. Currently the system is not in use, but may be required if trihalomethane (THM) and/or haloacetic acid (HAA) results increase in the distribution system.

Water Storage

An elevated water storage facility (EWSF) with a tank volume of 650 m³ was constructed and put into operation on December 16, 2015. The EWSF is located at the South East corner of



Anita Street and Amabilis Avenue in the community of Matachewan and has approximately two days of water storage. It is used to provide fire storage, equalization storage and emergency storage capability. The EWSF houses a sodium hypochlorite feed system consisting of two metering pumps (one duty and one spare), two sodium hypochlorite tanks and a chlorine residual analyzer. A flow meter, pressure gauge, process piping, valves, controls and instrumentation are also on-site.

Control System

The Matachewan Water Treatment System is controlled by a dedicated Programmable Logic Controller (PLC) and monitored through a Control System Supervisory Control and Data Acquisition (SCADA) system. All analyzing, monitoring and control module equipment information is routed through the SCADA system for operator monitoring and control. Control of equipment can be accomplished locally using the SCADA computer located at the Matachewan water treatment plant or remotely using operator computers and cell phones. Alarm capability and set point adjustment along with trend monitoring are also available through SCADA system controls.

Emergency Power

A 100 KW diesel powered generator is available at the water treatment building and is capable of supplying power to the entire facility during power failures.

A 15 KW diesel generator is also available outside the water tower to provide standby power during emergencies.

Distribution System

The Matachewan Drinking Water System is categorized as a Large Municipal Residential Drinking Water System and serves an estimated population of 266 residents. The distribution system consists of approximately 191 active residential service connections and 177 homes. A review of the distribution system drawings indicated that water mains are primarily six, eight and ten inch in diameter and constructed of ductile iron with PVC constructed pipe used in the upgraded sections of Town. Additionally, service connections to private residences consist primarily of ¾ inch copper pipe. There are an estimated 71 fire hydrants connected to the system for fire protection. An auto-flushing device at the end of Rye Street is programmed to flush at a certain time each day for a specified duration to help maintain the quality of the water.

3.0 LIST OF WATER TREATMENT CHEMICALS USED OVER THE REPORTING PERIOD

The following chemicals were used in the treatment process at the Matachewan Water Treatment Plant.



- Sodium hypochlorite – Oxidation and Disinfection

All treatment chemicals meet AWWA and NSF/ANSI standards.

4.0 SIGNIFICANT EXPENSES INCURRED IN THE DRINKING WATER SYSTEM

OCWA is committed to maintaining the assets of the drinking water system and maintains a program of scheduled inspection and maintenance activities using a computerized Work Management System (WMS).

Significant expenses incurred in the drinking water system include:

- Replaced the reclaim pump with a spare after it failed,
- Replaced the duty post sodium hypochlorite metering pump with a new meter having a higher pressure rating,
- Plexi-glass was installed at the water plant to act as a barrier and prevent water damage to electronic equipment,
- Purchased new back-up air compressor.

5.0 DETAILS ON NOTICES OF ADVERSE TEST RESULTS AND OTHER PROBLEMS REPORTED TO & SUBMITTED TO THE SPILLS ACTION CENTER

Based on information kept on record by OCWA, Three (3) adverse water quality incidents were reported to the Ministry’s Spills Action Centre in 2021.

Date	AWQI No.	Details
May 10, 2021	154030	<p>A treated water sample collected at the Matachewan water treatment plant POE was overgrown with bacteria (NDOGT for Total Coliforms and <i>E. coli</i>). The sample was collected on May 10th at 1536 hours (free chlorine residual = 2.34 mg/L).</p> <p><u>Corrective Actions:</u> The pipes at each sample location were flushed well and the free chlorine residual was maintained well above 0.2 mg/L. Two sets of three bacteriological samples (at the site of the adverse result and two downstream) were collected 24 hours apart and tested for total coliforms (TC) and <i>E.coli</i> (EC). The re-samples were collected on May 12th and 13th and all results were acceptable having zero TC and EC.</p> <p>Notifications and reports completed as required.</p> <p><u>Resolution:</u> Section 2B completed and emailed to MOE SAC , MOH and Owner on May 17, 2021</p>



Date	AWQI No.	Details
August 9, 2021	155008	<p>One (1) total coliform was detected in a drinking water sample collected on August 9th at 1045 hours (FCR = 1.32 mg/L). The sample was collected in the Matachewan distribution system at the Gas Station (418 Moyneur Avenue).</p> <p><u>Corrective Actions:</u> Re-samples were collected as required under O. Regulation 170/03 on August 10th (upstream, downstream and at the site of the adverse result). All sample results were acceptable having zero total coliforms and <i>E. coli</i>.</p> <p>Notifications and reports completed as required.</p> <p><u>Resolution:</u> Section 2B completed and emailed to MOE SAC, MOH and Owner on August 12, 2021</p>
Q4 (October to December of 2021)	HAA RAA	<p>October 29 - calculated the running annual average (RAA) to be 99.25 ug/L (Q1 = 99, Q2 = 84, Q3 = 78, Q4 = 136 ug/L).</p> <p>Notified local Public Health Inspector (PHI) who requested a resample.</p> <p>Resample was collected on Monday, November 1, 2021. Re-sample result = 128 ug/L (RAA = 98.25 ug/L)</p> <p>October 29 - reported exceedance using Section 2C of the form – Notices of Adverse Test Results and Issue Resolution (Schedule 16) to MOH, SAC and the Owner.</p> <p>November 8 - submitted resolution using 2C to MOH, SAC and the Owner.</p>

6.0 MICROBIOLOGICAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Microbiological Data

Sample Type	# of Samples	Range of <i>E. coli</i> Results (min to max)	Range of Total Coliform Results (min to max)	# of HPC Samples	Range of HPC Results (min to max)
Raw (Well No. 1)	52	0 to 0	0 to 0	0	N/A
Raw (Well No. 2)	52	0 to 0	0 to 1	0	N/A
Treated	52	0 to 0/NDOGT*	0 to 0/NDOGT*	52	< 10 to 100
Distribution	104	0 to 0	0 to 1**	52	< 10 to 90

Maximum Allowable Concentration (MAC) for *E. coli* = 0 Counts/100 mL

MAC for Total Coliforms = 0 Counts/100 mL

NDOGT = No Data, Overgrown with Target

"<" denotes less than the laboratory's method detection limit

Notes:

- One microbiological sample is collected and tested each week from the raw (each well) and treated water supply. A total of two microbiological samples are collected and tested each week from the Matachewan distribution system. At least 25% of the distribution samples must be tested for HPC bacteria.



2. * May 10 - Treated water sample gave a results of NDOGT = No Data, Overgrown with Non-Target for total coliforms and *E. coli*. Responded to and reported as an adverse water quality incident (AWQI No. 154030).
3. ** August 9 - One (1) total coliform was detected in a water sample collected in the distribution system at 418 Moyneur Avenue (AWQI No. 155008).

Refer to [Appendix A](#) for a monthly summary of microbiological test results.

7.0 OPERATIONAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Raw Water Turbidity Data

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure
Turbidity (Well No. 1)	24	0.18 to 3.39	NTU
Turbidity (Well No. 2)	24	0.18 to 0.78	NTU

Note: Turbidity samples are required once every month.

Continuous Monitoring in the Treatment Process

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine Residual	8760	0.18 to 5.02	mg/L	CT

Notes:

1. For continuous monitors 8760 is used as the number of samples.
2. CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the Matachewan water plant if the free chlorine residual level drops below 0.15 mg/L to ensure primary disinfection is achieved.

Summary of Chlorine Residual Data in the Distribution System

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine Residual	364	0.39 to 5.21*	mg/L	≥ 0.05

Note:

1. A total of seven operational checks for chlorine residual in the distribution system are collected each week. Four (4) samples are tested one day and three (3) on a second day. The sample sets are collected at least 48-hours apart and samples collected on the same day are from different locations.
2. * High free chlorine residuals (>4 and 5 mg/L) were measured in the distribution system. Most of these high residuals occurred in at the beginning of January 2021 during mechanical issues with the filters. High free chlorine residuals were also recorded on August 23rd and 25th when the sodium hypochlorite system was having issues. The pump was relocated below the injector to prevent air issues.

Refer to [Appendix B](#) for a monthly summary of the above operational data.



Summary of Nitrate & Nitrite Data (sampled at the plant’s point of entry into the distribution every quarter)

Date of Sample	Nitrate Result Value	Nitrite Result Value	Unit of Measure	Exceedance
January 21	< 0.05	< 0.05	mg/L	No
April 12	0.37	< 0.05	mg/L	No
July 12	0.32	< 0.05	mg/L	No
October 18	0.31	< 0.05	mg/L	No

Maximum Allowable Concentration (MAC) for Nitrate = 10 mg/L

MAC for Nitrite = 1 mg/L

Summary of Total Trihalomethane Data (sampled in the distribution system every quarter)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 21	89.7	ug/L		
April 12	70.3	ug/L		
July 12	53	ug/L	69.0	No
October 18	63	ug/L		

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Four Quarter Running Average)

Summary of Total Haloacetic Acid Data (sampled in the distribution system)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 21	99	ug/L		
April 12	84	ug/L		
July 12	78	ug/L	98.3	YES
October 18	136	ug/L		
November 1, 2021	128	ug/L		

Maximum Allowable Concentration (MAC) for Total Haloacetic Acids = 80 ug/L (Four Quarter Running Average)

Note:

* HAA samples are collected and tested quarterly as required under section 13-6 of Schedule 13, under O. Reg. 170/03. A re-sample was collected on November 1, 2021 after the running annual average (RAA) calculated on October 19th failed to meet the MAC of 80 ug/L.

Summary of Most Recent Lead Data under Schedule 15.1

(applicable to the following drinking water systems; large municipal residential systems, small, municipal residential systems, and non-municipal year-round residential systems)

The Matachewan Drinking Water System was eligible to follow the “Exemption from Plumbing Sampling” as described in section 15.1-5(9) and 15.1-5(10) of Schedule 15.1 of Ontario Regulation 170/03. The exemption applies to a drinking water system if, in two consecutive periods at reduced sampling, not more than 10% of all samples from plumbing exceed the maximum allowable concentration (MAC) of 10 ug/L for lead. As such, the system was



required to test for total alkalinity and pH in one distribution sample collected during the periods of December 15 to April 15 (winter period) and June 15 to October 15 (summer period). This testing is required in every 12-month period with lead testing in every third 12-month period.

Lead samples were last collected in 2020 and results were well below the MAC. Two rounds of alkalinity and pH testing were carried out on March 8th and September 15th of 2021. Results are summarized in the table below.

Summary of Lead Data (sampled in the distribution system)

Date of Sample	# of Samples	Field pH	Field Temperature (°C)	Alkalinity (mg/L)	Lead (ug/L)
March 8	1	7.46	4.9	154	N/A
September 15	1	7.94	14.3	106	N/A

Note: Next lead sampling scheduled for 2023

Most Recent Schedule 23 Inorganic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Antimony	< 0.5	ug/L	6	No	No
Arsenic	< 1.0	ug/L	10	No	No
Barium	24.0	ug/L	1000	No	No
Boron	6.0	ug/L	5000	No	No
Cadmium	< 0.1	ug/L	5	No	No
Chromium	< 1.0	ug/L	50	No	No
Mercury	< 0.1	ug/L	1	No	No
Selenium	0.3	ug/L	50	No	No
Uranium	< 1.0	ug/L	20	No	No

Note: Sample required every 36 months (sample date = October 5, 2020). Next sampling scheduled for October 2023

Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Alachlor	< 0.233	ug/L	5	No	No
Atrazine + N-dealkylated metabolites	< 0.5	ug/L	5	No	No
Azinphos-methyl	< 0.175	ug/L	20	No	No
Benzene	< 0.1	ug/L	1	No	No
Benzo(a)pyrene	< 0.01	ug/L	0.01	No	No
Bromoxynil	< 0.118	ug/L	5	No	No
Carbaryl	< 1.0	ug/L	90	No	No
Carbofuran	< 2.0	ug/L	90	No	No
Carbon Tetrachloride	< 0.2	ug/L	2	No	No
Chlorpyrifos	< 0.175	ug/L	90	No	No



Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Diazinon	< 0.175	ug/L	20	No	No
Dicamba	< 0.104	ug/L	120	No	No
1,2-Dichlorobenzene	< 0.3	ug/L	200	No	No
1,4-Dichlorobenzene	< 0.3	ug/L	5	No	No
1,2-Dichloroethane	< 0.3	ug/L	5	No	No
1,1-Dichloroethylene (vinylidene chloride)	< 0.3	ug/L	14	No	No
Dichloromethane	< 1.0	ug/L	50	No	No
2-4 Dichlorophenol	< 0.2	ug/L	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	< 0.444	ug/L	100	No	No
Diclofop-methyl	< 0.148	ug/L	9	No	No
Dimethoate	< 0.175	ug/L	20	No	No
Diquat	< 0.2	ug/L	70	No	No
Diuron	< 6.0	ug/L	150	No	No
Glyphosate	< 20.0	ug/L	280	No	No
Malathion	< 0.175	ug/L	190	No	No
Metolachlor	< 0.116	ug/L	50	No	No
Metribuzin	< 0.116	ug/L	80	No	No
Monochlorobenzene	< 0.5	ug/L	80	No	No
Paraquat	< 0.2	ug/L	10	No	No
Polychlorinated Biphenyls (PCBs)	< 0.06	ug/L	3.0	No	No
Pentachlorophenol	< 0.3	ug/L	60	No	No
Phorate	< 0.116	ug/L	2	No	No
Picloram	< 0.104	ug/L	190	No	No
Prometryne	< 0.058	ug/L	1	No	No
Simazine	< 0.175	ug/L	10	No	No
Terbufos	< 0.116	ug/L	1	No	No
Tetrachloroethylene	< 0.3	ug/L	30	No	No
2,3,4,6-Tetrachlorophenol	< 0.2	ug/L	100	No	No
Triallate	< 0.116	ug/L	230	No	No
Trichloroethylene	< 0.2	ug/L	10	No	No
2,4,6-Trichlorophenol	< 0.2	ug/L	5	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA)	< 7.4	ug/L	100	No	No
Trifluralin	< 0.116	ug/L	45	No	No
Vinyl Chloride	< 0.1	ug/L	1	No	No

Note: Sample required every 36 months (sample date = October 5, 2020). Next sampling scheduled for October 2023



Inorganic or Organic Test Results that Exceeded Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg. 169/03) during the reporting period.

Most Recent Sodium Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 5, 2020	1	9.9	mg/L	20	No

Note: Sample required every 60 months. Next sampling scheduled for October 2025

Most Recent Fluoride Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 5, 2020	1	<0.05	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for October 2025

Additional Testing Performed in Accordance with an Approval, Order or Legal Instrument

No additional regulatory sampling and testing was required for the Matachewan Drinking Water System during the 2021 reporting period.



Matachewan Drinking Water System

Schedule 22

2021 SUMMARY REPORT

FOR MUNICIPALITIES



Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

1.0 INTRODUCTION

Drinking-Water System Name:	Matachewan Drinking Water System
Municipal Drinking Water Licence (MDWL) No.:	279-101-4 (issued September 24, 2020)
Drinking Water Work Permit (DWWP) No.:	279-201-4 (issued September 24, 2020)
Permit to Take Water (PTTW) No.:	3106-9E5LKA (issued January 6, 2014)
Period being reported:	January 1, 2021 to December 31, 2021

2.0 REQUIREMENTS THE SYSTEM FAILED TO MEET

According to information kept on record by OCWA, the Matachewan Drinking Water System has complied with all the requirements set out in the system's MDWL, its DWWP, the Act and its Regulations.

According to information kept on record by OCWA, the Matachewan Drinking Water System failed to meet the following requirements during the 2021 reporting period:

It should be mentioned that three (3) adverse water quality incidents were reported to the Ministry's Spills Action Center during the reporting period. Refer to Section 5.0 – *Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Actions Center* on page 6 of this report for details.

3.0 SUMMARY OF FLOWS AND COMPARISON TO REGULATORY LIMITS

Flow Monitoring

MDWL No. 279-101 requires the owner to install a sufficient number of flow measuring devices to permit the continuous measurement and recording of:

- the flow rate and daily volume of treated water that flows from the treatment subsystem the distribution system, and
- the flow rate and daily volume of water that flows into the treatment subsystem.

The flow monitoring equipment identified in the MDWL is present and operating as required. These flow meters are calibrated on an annual basis as specified in the manufacturers' instructions.



Water Usage

The following water usage tables summarize the quantities and flow rates of water taken and produced during the 2021 reporting period, including total monthly volumes, average monthly volumes, maximum monthly volumes, and maximum flow rates.

Raw Water

2021 - Monthly Summary of Water Takings from the Source (Well No. 1 and Well No. 2)

Regulated by Permit to Take Water (PTTW) #3106-9E5LKA, issued January 6, 2014

Well No. 1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	9497	9477	10509	9797	10660	9254	10371	10071	4722	4413	4203	8406	101380
Average Volume (m ³ /d)	306	338	339	327	344	308	335	325	157	142	140	271	278
Maximum Volume (m ³ /d)	454	454	454	454	454	454	454	454	278	290	349	454	454
PTTW - Maximum Allowable Volume (m ³ /day)	454	454	454	454	454	454	454	454	454	454	454	454	454
Maximum Flow Rate (L/min)	1361	1378	1364	1219	1273	1358	1482	1391	1385	1281	1386	1237	1482
PTTW - Maximum Allowable Flow Rate (L/min)	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

July 20 - High peak flow of 1482 L/minute on pump start up.

Note: The system's PTTW allows the flow rate of 1500 L/min upon well pump start-up.

Well No. 2

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	3322	1732	2382	1987	1379	2874	1056	2608	4912	4083	3818	3021	33174
Average Volume (m ³ /d)	107	62	76.8	66.2	44.5	95.8	34.1	84.1	163.7	131.5	127.3	97.4	90.9
Maximum Volume (m ³ /d)	454	296	294	288	289.3	289	288	286	279	278	234	454	454
PTTW - Maximum Allowable Volume (m ³ /day)	454	454	454	454	454	454	454	454	454	454	454	454	454
Maximum Flow Rate (L/min)	1144	1108	1092	1102	1091	1302	1238	1074	1154	1160	1167	1095	1302
PTTW - Maximum Allowable Flow Rate (L/min)	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

Combined Water Taking (Well No. 1 and Well No. 2)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	12819	11209	12891	11784	12039	12128	11427	12679	9634	8496	8021	11427	134554
Average Volume (m ³ /d)	414	400	416	393	388	404	369	409	321	274	267	369	369
Maximum Volume (m ³ /d)	547	516	555	502	532	615	554	630	491	556	511	556	630
PTTW - Maximum Allowable Volume (m ³ /day)	908	908	908	908	908	908	908	908	908	908	908	908	908

The system's Permit to Take Water #3106-9E5LKA, allows the Township to withdraw water at the following rates:



Well No. 1: 454 m³/day 1400 L/minute (1500 L/min during pump start-ups and shut downs)

Well No. 2: 454 m³/day 1400 L/minute (1500 L/min during pump start-ups and shut downs)

Total Combined Daily Volume: 908 m³/day

A review of the raw water flow data indicates that the system did not exceed the maximum allowable volumes during the reporting period.

Treated Water

2021 - Monthly Summary of Treated Water Supplied to the Distribution System

Regulated by Municipal Drinking Water Licence (MDWL) #279-101 (issue 4), issued September 24, 2020

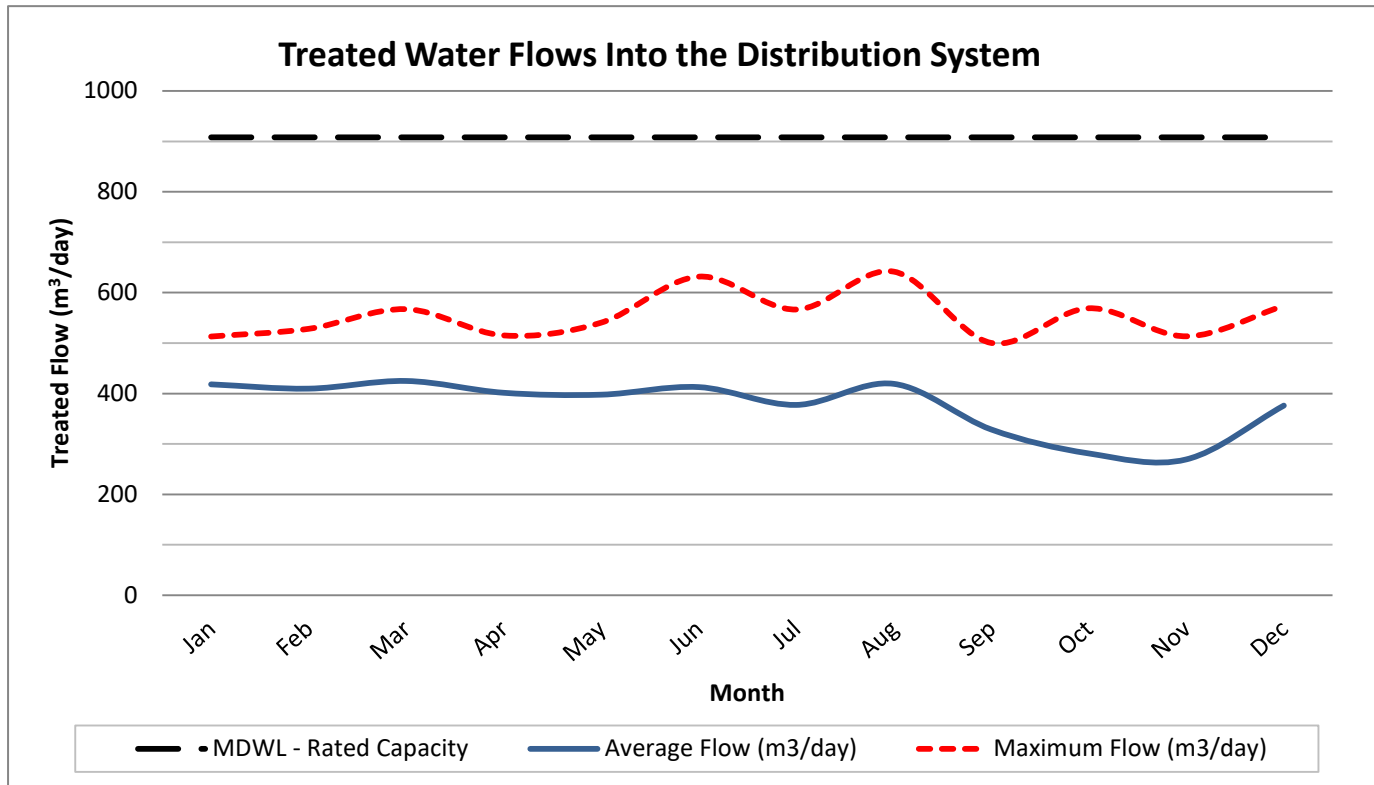
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	12963	11470	13170	12043	12328	12380	11698	12993	9858	8715	8079	11657	137353
Average Volume (m ³ /d)	418	410	425	401	398	413	377	419	329	281	269	376	376
Maximum Volume (m ³ /d)	513	528	567	515	541	632	567	642	500	569	513	574	642
MDWL - Rated Capacity (m ³ /day)	908	908	908	908	908	908	908	908	908	908	908	908	908

Schedule C, Section 1.0 (1.1) of MDWL No. 279-101 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 908 m³/day. The Matachewan DWS complied with this limit having a recorded maximum volume of 642 m³/day on August 22nd. This represents 70.7% of the rated capacity.

Figure 1 compares the average and maximum flow rates into the distribution system to the rated capacity of the system identified in the MDWL.

Figure 1: 2021 - Comparison of Treated Water Flows to the Rated Capacity

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Flow (m ³ /day)	418	410	425	401	398	413	377	419	329	281	269	376
Maximum Flow (m ³ /day)	513	528	567	515	541	632	567	642	500	569	513	574
MDWL - Rated Capacity	908	908	908	908	908	908	908	908	908	908	908	908
% Rated Capacity	56	58	62	57	60	70	62	71	55	63	57	63





Summary of System Performance

The following information is provided to enable the Owner to assess the capability of the system to meet existing and future water usage needs.

Rated Capacity of the Plant (MDWL)	908 m ³ /day	
Average Daily Flow for 2021	376m ³ /day	41.4 % of the rated capacity
Maximum Daily Flow for 2021	642 m ³ /day	70.7 % of the rated capacity
Total Treated Water Produced in 2021	137,353 m ³	

Historical Flows

Matachewan Water Treatment Plant – Historical Flow Comparison

Year	Maximum Treated Flow (m ³ /d)	Average Daily Treated Flow (m ³ /d)	Average Day % of Rated Capacity (908 m ³ /d)
2021	642	376	41.4%
2020	827	363	39.9%
2019	995	308	33.9%
2018	850	243	26.8%
2017	955	201	22.1%

Figure 2 compares the average treated water flows from 2017 to 2021.



CONCLUSION

The water quality data collected in 2021 demonstrates that the Matachewan drinking water system provided high quality drinking water to its users. Three adverse water quality incidents occurred during the reporting period and were immediately reported, responded to and resolved.

The Matachewan Drinking Water System was able to operate in accordance with the terms and conditions of the Permit to Take Water and in accordance with the rated capacity of the licence while meeting the community's demand for water use.



APPENDIX A

Monthly Summary of Microbiological
Test Results

Facility Works Number: 220003653
 Facility Owner: Municipality: Township of Matachewan
 Facility Classification: Class 1 Water Treatment

RAW WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Well 1 / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Well 1 / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Well 2 / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	1	0	0	0	0	0	0	0	0			1	
Mean Lab	0	0	0	0.5	0	0	0	0	0	0	0	0		0.038		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Well 2 / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
TREATED WATER																
Treated Water (POE) / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	5	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water (POE) / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	5	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water (POE) / HPC - cfu/mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	< 10	< 80	< 10	< 20	< 100	< 10	< 10	< 20	< 10	< 30	< 10	< 50			100	
Mean Lab	< 10	< 32.5	< 10	< 12.5	< 28	< 10	< 10	< 12	< 10	< 15	< 10	< 20		< 15		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10
DISTRIBUTION WATER																
MW-3 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
MW-3 (Bacti) / E. Coli: cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
MW-3 (Bacti) / HPC - cfu/mL																
Count Lab	2	2	2	2	3	2	3	2	2	1	3	2	26			
Max Lab	< 10	< 10	< 10	< 20	< 10	< 10	< 10	< 10	< 10	< 20	< 10	< 10			20	
Mean Lab	< 10	< 10	< 10	< 15	< 10	< 10	< 10	< 10	< 10	< 15	< 10	< 10		< 10.769		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10
MW-4 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	1	0	0	0	0			1	
Mean Lab	0	0	0	0	0	0	0	0.2	0	0	0	0		0.019		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
MW-4 (Bacti) / E. Coli: cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
MW-4 (Bacti) / HPC - cfu/mL																
Count Lab	2	2	3	2	2	2	1	3	2	3	2	2	26			
Max Lab	< 10	< 20	< 10	< 10	< 10	< 20	< 10	< 40	< 90	< 10	< 10	< 10			90	
Mean Lab	< 10	< 15	< 10	< 10	< 10	< 15	< 10	< 23.333	< 50	< 10	< 10	< 10		< 15.385		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10

NOTES:
 1. May 10 - Treated water sample gave a results of NDOGT = No Data, Overgrown with Non-Target for total coliforms and E. coli. Responded to and reported as an adverse water quality incident (AWQI No. 154030).
 2. August 9 - One (1) total coliform was detected in a water sample collected in the distribution system at 418 Moyneur Avenue (AWQI No. 155008).



APPENDIX B

Monthly Summary of Operational Data

**MATACHEWAN DRINKING WATER SYSTEM
2021 SUMMARY OF OPERATIONAL TEST RESULTS**

Facility Works Number: 220003653
 Facility Owner: Municipality: Township of Matachewan
 Facility Classification: Class 1 Water Treatment

RAW WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Well 1 / Turbidity - NTU																
Count IH	1	2	3	2	2	2	3	2	1	2	2	2	24			
Max IH	2.16	0.425	0.271	0.316	0.32	0.36	0.28	0.251	0.42	0.45	1.08	3.39			3.39	
Mean IH	2.16	0.34	0.264	0.309	0.3	0.285	0.237	0.247	0.42	0.4	0.905	2.315		0.595		
Min IH	2.16	0.255	0.26	0.301	0.28	0.21	0.18	0.243	0.42	0.35	0.73	1.24				0.18
Well 2 / Turbidity - NTU																
Count IH	1	2	3	2	2	2	3	2	1	2	2	2	24			
Max IH	0.654	0.544	0.68	0.612	0.331	0.47	0.65	0.372	0.66	0.58	0.29	0.78			0.78	
Mean IH	0.654	0.415	0.546	0.6	0.326	0.445	0.527	0.367	0.66	0.525	0.235	0.7		0.49		
Min IH	0.654	0.286	0.38	0.588	0.32	0.42	0.42	0.361	0.66	0.47	0.18	0.62				0.18
TREATED WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Treated Water (POE) / Cl Residual: Free (0.15 mg/L) - mg/L																
Max OL	5.02	3.511	3.745	4.819	5.015	5.015	4.851	5.016	5.016	5.016	3.375	5.015			5.02	
Mean OL	3.272	2.088	2.368	2.247	2.31	2.482	1.674	2.084	1.935	2.158	2.109	1.896		2.219		
Min OL	0.676	0.654	0.852	0.661	0.182	0.893	0.602	0.372	0.641	0.524	0.608	0.322				0.182
TREATED WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Residual No. 1 / Cl Residual: Free - mg/L																
Count IH	8	8	10	8	9	8	9	9	8	9	9	9	104			
Max IH	4.30**	2.01	3.00	1.60	2.19	1.64	1.05	4.8	2.38	0.86	1.03	1.71			4.80	
Mean IH	2.821	1.476	1.546	1.228	1.651	1.155	0.848	1.908	0.932	0.746	0.838	1.082		1.346		
Min IH	1.63	1.07	1.13	0.93	1.19	0.68	0.66	0.60	0.62	0.59	0.63	0.69				0.59
Residual No. 2 / Cl Residual: Free - mg/L																
Count IH	8	8	10	8	9	8	9	9	8	9	9	9	104			
Max IH	4.20**	1.52	2.10	2.05	1.91	2.73	1.40	2.03	1.45	1.05	1.49	1.86			4.20	
Mean IH	2.596	1.211	1.676	1.275	1.51	1.401	0.952	1.269	1.045	0.837	0.878	1.319		1.326		
Min IH	1.61	1.07	1.24	0.91	1.32	0.52	0.58	0.55	0.76	0.62	0.60	0.79				0.52
Residual No. 3 / Cl Residual: Free - mg/L																
Count IH	8	8	10	8	9	8	9	9	8	9	9	9	104			
Max IH	4.60**	1.90	2.40	1.44	2.05	1.88	1.32	1.45	1.75	2.76	2.74	1.86			4.60	
Mean IH	2.73	1.37	1.676	1.251	1.502	1.213	0.883	1.141	1.245	1.467	1.572	1.559		1.465		
Min IH	2.00	1.06	1.12	0.92	1.01	0.66	0.43	0.61	0.99	0.79	1.01	1.27				0.43
Residual No. 4 / Cl Residual: Free - mg/L																
Count IH	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max IH	3.80**	2.04	2.14	1.55	2.09	2.25	0.69	5.21**	1.62	2.86	2.08	1.82			5.21	
Mean IH	3.075	1.69	2.002	1.328	1.398	1.5	0.61	2.348	1.36	2.018	1.334	1.318		1.673		
Min IH	2.30	1.21	1.70	0.98	0.92	0.39	0.56	0.68	1.12	1.44	0.74	0.58				0.39

NOTES:
 * CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are calculations are performed for the Matachewan water plant if the free chlorine residual level drops below 0.15 mg/L to ensure primary disinfection is achieved.
 ** High free chlorine residuals (>4 and 5 mg/L) were measured in the distribution system. Most of these high residuals occurred in at the beginning of January 2021 during mechanical issues with the filters. High free chlorine residuals were also recorded on August 23rd and 25th when the sodium hypochlorite system was having issues. The pump was relocated below the injector to prevent air issues.