MATACHEWAN DRINKING WATER SYSTEM QUARTERLY OPERATIONS REPORT

Prepared By: The Ontario Clean Water Agency

Prepared for: The Township of Matachewan

SYSTEM OVERVIEW | October 1 to December 31, 2019

SYSTEM HIGHLIGHTS.

- The installation of the iron and manganese removal system was completed in December and put into operation on January 6th.
- The water tower was drained and cleaned the week of December 16th to allow for maintenance and to improve the water quality within the community.
- The annual Management Review meeting was held on December 4th. The management review is conducted at least once per year and evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System. Minutes of the meeting were provided to the Owner on December 12th.
- Two incidents and several water complaints were identified in this quarter. Refer to "*Incidents*" and "*Complaints*" below for details.
- Reminder - The maximum allowable limit of 80 ug/L for Haleoacteic Acids (HAAs) comes into effect on January 1, 2020. A sample is collected quarterly from a location in the distribution system having the highest level of HAAs. The 2019 running annual average for the system is 72.2 ug/L which falls below the limit.

CAPITAL PLAN PROGRESS

CAPITAL ITEM	STATUS
Iron and Manganese removal system	Complete
Annual Fire Extinguisher inspection and certification	Complete
Annual Genset Maintenance at the plant	Complete
Spring and fall flushing and valve cycling	Complete
Membranes and Electrolyte for the Chlorine Analyzer	Complete
Annual Lifting device inspection	Complete
Tower – inspection and cleaning	Complete
Tower – annual genset maintenance	Complete
HAA testing – 4 times per year (new requirement from MECP)	Complete
External QEMS Audit (SAI Global)	Complete

ASSET MANAGEMENT

Preventative maintenance and equipment calibrations are performed as recommended by the manufacturer. Work is scheduled, assigned and tracked using OCWA's Workplace Management System (Maximo). All monthly and quarterly work orders scheduled for this quarter were completed.

CALL-OUT SUMMARY

Number of Call-outs this Quarter:	6
Total Call-outs to Date:	26
Annual Call-in Allowance:	8
Details of the Call-outs:	Refer to Appendix A for a detailed call back summary.

REGULATORY

Sampling, Testing and Monitoring

- All water samples required under O. Regulation 170/03 were collected and tested in the fourth quarter of 2019. Refer to "*Incidents" below for* details on a low chlorine incident.
- The system complied with its water taking permit and municipal license in October and November, but failed to meet the allowable limits of the permit and license in December. Refer to "*Incidents"* for details.
- Refer to Appendix B for a Performance Assessment Report which provides a summary of water usage and regulatory results for the quarter.

Reporting

- No regulatory reporting required this quarter.

Inspections/Audits

- The MECP conducted an inspection of the Matachewan Drinking Water System on October 23, 2019. The system received a rating of 95.86% having one non-compliance identified in the report dated December 10, 2019:

  On three different occasions the operating authority reported that improperly disinfected water was sent out into the distribution system. The operators called Spills Action Centre (SAC) and Ministry of Health (MOH) on the following dates to report improperly disinfected water incidents (April 20, 2019, September 17, 2019 and October 2, 2019).

  The owner is currently installing additional chlorine analyzer as well as many other upgrades in the water treatment plant, to ultimately avoid having these scenarios repeat themselves. The operating authority as also trained all the operators on the contingencies of low and high chlorine residuals at the plant in October 2019.

INCIDENTS

Two (2) regulatory incidents were reported in the fourth quarter:

1. **Dec. 18, 2019 (Flow Exceedances)** - Well No. 1 exceeded its PTTW limit of 454 m^3/day taking a total volume of 916 m^3/day on December 18th. The treated water capacity of the plant (908 m^3/day) was also exceeded on December 18th. The treated water volume recorded was 955 m^3/day.

Details - The water tower was drained on December 16th to allow for cleaning and maintenance. When refilling the tower on December 18th Well No. 1 exceeded its allowable max. volume of 454 m^3/day. The rated capacity of the plant was also exceeded. The water plant was on pressure mode to provide water to consumers while the tower was being filled. This resulted in the exceedances.

Resolution - A new iron and manganese removal filter system has been installed. Well No. 2 will be put back into regular use once the new system is commissioned. Both Well No.1 and Well No. 2 can then be used to fill the tower after maintenance activities to prevent exceedances. Operators will also monitor the treated water flows carefully when filling the tower.

Note: a treatment subsystem may be operated temporarily at a maximum daily volume above the limit for the purposes of fighting a large fire or for the maintenance of the drinking water system.

2. **October 2 - AWQI 148364 (loss of disinfection/BWA)** - Details: Operator responded to a low chlorine alarm at approximately 2100 hours on October 2nd. Upon arrival, the plant was shut down. Operator could not determine with 100% certainty if unchlorinated water entered the distribution system and reported the incident as an AWQI to the local Health Unit (MOH), SAC, and the Owner. The MOH immediately issued a precautionary boil water advisory (BWA).

   The sodium hypochlorite control panel was moved approx. 1 foot earlier that day as part of the upgrades. This caused the status of the switch over panel to default from remote (automatic) to local (manual) so when the well pump turned on, the sodium hypochlorite pump did not resulting in the low chlorine.

   Corrective Actions: The operator restored disinfection, flushed the hydrant in front of the plant and tested free chlorine residual in the distribution system at 2 locations (the curling arena = 1.25 mg/L at 2239 hours and the gym = 1.26 mg/L at 2247 hours).
   Two sets of 3 bacteriological samples were collected 24 hours apart (October 3rd and October 4th) and results were acceptable. The BWA was lifted on Saturday, October 5th at approximately 1520 hours.

   Mechanic/operators performing upgrades at the plant must turn the plant on and let run through a cycle before leaving to ensure all equipment is in proper working condition before leaving the plant. This procedure will be reviewed with the all staff.

The procedure for a Low Chlorine Residual at the Matachewan Water Treatment Plant was reviewed with all operators on Thursday, October 10th.

COMPLAINTS

- Several discoloured water complaints were identified in the fourth quarter. In each case it was explained that high levels of iron and manganese is causing the colour issues and that a new iron and manganese removal system was being installed to resolve the problem.
- Two residents complained that the water was burning their eyes in the shower. An operator visited the complainants, tested for chlorine residual and advised them to let the water run for several minutes before using. Operator explained that upgrade work underway at the plant may have caused the issue.

HEALTH AND SAFETY

- All safety equipment at each plant was checked monthly to ensure that they are in good working order.

✓ Health and Safety Training/Sessions completed this quarter includes:

- ✓ Lock-out/Tag-out
- ✓ Resolving Workplace Health and Safety Issues
- ✓ Winter Driving
- ✓ SCBA Application and Maintenance

APPENDIX A

Call Back Summary

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Workorder Summary Report

Report Start Date:	Oct 1, 2019 12:00 AM
Report End Date:	Dec 31, 2019 11:59 PM
Location:	7203*
Work Order Type:	CALL,
Work Order Class:	

				WorkOrder		PM Schedule		Workorder Details					
WO #	Asset ID	Asset Description	Location Description	Type	Class	FEQ	Units	Work Order Description	Status	Schedule Start	Actual Start	Actual Finsh	WorkLog Detail
1534426			7203, Matachewan WTP, Facility	CALL	Refurbish/ Replace/Repair	0		No pumps available Alarm, 7203	COMP		11/12/19 09:00 PM	11/12/19 11:45 PM	no pumps available alarm - Reset Plant
1463456			7203, Matachewan WTP, Process, Disinfection	CALL	Compliance	0		Matachewan low Cl	CLOSE		9/24/19 05:00 AM	9/24/19 08:30 AM	- • low cl alarm • found analyzer reading 1.50mg/L • changed feed line on Cl pump #1 • shortened feed line to Cl analyzer
1463563		7203, Matachewan WTP		CALL	Compliance	0		AWQI Loss of Disinfection Matachewan WTP	CLOSE		10/2/19 08:00 PM	10/2/19 11:30 PM	-Low chlorine called out, CL read 0mg/L on analyzer, pump control box not in remote found in "local" believed plant started run with pumps off. Flushed hydrant infront and ran plant with chlorine pumps, BWA issued AWQI#148357
1498700		7203, Matachewan WTP		CALL	Compliance	0		Matachewan Chlorine Lockout	COMP		10/31/19 08:00 PM	10/31/19 11:45 PM	Matachewan chlorine lockout -Matachewan chlorine lockout, arrived found plant locked out on high chlorine, tower level below setpoint, cleared alarms+flushed analyzer and started plant, normal operation resumed
1498701		7203, Matachewan WTP		CALL	Compliance	0		Matachewan CL lockout	COMP		11/2/19 03:30 PM	11/2/19 07:00 PM	Matachewan CL lockout -Matachewan chlorine lock out,plant locked out on high chlorine, believed to be from WELL #2 doing a run and chlorine pumps not paced to flow and overdosing the water as the flows not as high as the primary duty well pump. Cleared alarms + flushed line and started plant. Turned off WELL 2 to prevent lockouts until new chlorine pumps installed as part of the rehab.

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Work Order Type:	CALL,
Work Order Class:	

				WorkOrder		PM Schedule		Workorder Details					
WO #	Asset ID	Asset Description	Location Description	Type	Class	FEQ	Units	Work Order Description	Status	Schedule Start	Actual Start	Actual Finsh	WorkLog Detail
1500945			7203, Matachewan WTP, Facility	CALL	Compliance	0		Matachewan Low CL	COMP		11/24/19 08:30 AM	11/24/19 11:30 AM	-Chlorine residual on analyzer dropped and plant lockout during time when no well pumps were running. Analyzer flow was very low causing analyzer to go into alarm and call out, increased flow to analyzer and plant started as normal.

APPENDIX B

Performance Assessment Report

Facility: [7203] MATACHEWAN DRINKING WATER SYSTEM

Works: [220003653]

From: 01/10/2019 to 31/12/2019

WATER USAGE		10/2019		11/2019		12/2019		<--Total-->		<--Avg.-->		<--Max.-->		<--Min.-->		<--Criteria-->
Flows:																
Raw Flow: Monthly Total - Well 1 (m^3)		7070		8336		9826.02		25232.02								
Raw Flow: Monthly Avg - Well 1 (m^3/d)		228.06		277.87		316.97				274.3						
Raw Flow: Monthly Max - Well 1 (m^3/d)		379		316		916*						912				454
Raw Flow: Monthly Avg - Well 2 (m^3/d)		0		0		14.38				4.79						
Raw Flow: Monthly Max - Well 2 (m^3/d)		0		0		365.4						365.4				454
Treated Flow: Monthly Total - Treated Water (POE) (m^3)		7157		8343		10225.43		25725.43								
Treated Flow: Monthly Avg - Treated Water (POE) (m^3/d)		230.87		278.1		329.85				279.61						
Treated Flow: Monthly Max - Treated Water (POE) (m^3/d)		380		316		955*						913				908
Raw Flow: Monthly Total - Raw Water Total (m^3)		7070		8336		10271.94		25677.94								
Raw Flow: Monthly Avg - Raw Water Total (m^3/d)		228.06		277.87		331.35				279.09						
Raw Flow: Monthly Max - Raw Water Total (m^3/d)		379		316		912						912				908

RAW WATER		10/2019		11/2019		12/2019		<--Total-->		<--Avg.-->		<--Max.-->		<--Min.-->		<--Criteria-->
Turbidity:																
Raw: Max Turbidity - Well 1 (NTU)		0.67		0.291		0.43						0.67				
Raw: Max Turbidity - Well 2 (NTU)				0.693		0.27						0.693				

TREATED WATER		10/2019		11/2019		12/2019		<--Total-->		<--Avg.-->		<--Max.-->		<--Min.-->		<--Criteria-->
Chlorine Residuals:																
Treated: Min Free Cl2 Resid - Treated Water (POE) (mg/L)		0**		0.5		0.31								0		CT**
Treated: Max Free Cl2 Resid - Treated Water (POE) (mg/L)		4.79		4.786		4.794						4.794				
Bacti Samples:																
Treated Bacti: # of samples - Treated Water (POE)		4		4		5		13								13
Treated Bacti: # of TC exceedances - Treated Water (POE)		0		0		0		0								0
Treated Bacti: # of EC exceedances - Treated Water (POE)		0		0		0		0								0
Chemical Parameters:																
Treated: Max Nitrite - Treated Water (POE) (mg/L)	<	0.05									<	0.05				1
Treated: Max Nitrate - Treated Water (POE) (mg/L)		0.23										0.23				10

DISTRIBUTION WATER		10/2019		11/2019		12/2019		<--Total-->		<--Avg.-->		<--Max.-->		<--Min.-->		<--Criteria-->
Chlorine Residuals:																
Dist: Min Free Cl2 Resid - Residual No. 1 (mg/L)		0.47		0.97		0.93								0.47		0.05
Dist: Min Free Cl2 Resid - Residual No. 2 (mg/L)		0.63		0.67		0.78								0.63		0.05
Dist: Min Free Cl2 Resid - Residual No. 3 (mg/L)		0.48		0.62		0.8								0.48		0.05
Dist: Min Free Cl2 Resid - Residual No. 4 (mg/L)		0.48		0.8		0.89								0.48		0.05
Dist: Max Free Cl2 Resid - Residual No. 1 (mg/L)		2.15		1.44		2.2						2.2				
Dist: Max Free Cl2 Resid - Residual No. 2 (mg/L)		1.23		2.2		1.68						2.2				
Dist: Max Free Cl2 Resid - Residual No. 3 (mg/L)		1.13		2.2		1.54						2.2				
Dist: Max Free Cl2 Resid - Residual No. 4 (mg/L)		0.67		1.14		2.2						2.2				
Bacti Samples:																
Dist Bacti: # of samples - MW-3 (Bacti)		4		4		5		13								13
Dist Bacti: # of TC exceedances - MW-3 (Bacti)		0		0		0		0								0
Dist Bacti: # of EC exceedances - MW-3 (Bacti)		0		0		0		0								0
Dist Bacti: # of samples - MW-4 (Bacti)		4		4		5		13								13
Dist Bacti: # of TC exceedances - MW-4 (Bacti)		0		0		0		0								0
Dist Bacti: # of EC exceedances - MW-4 (Bacti)		0		0		0		0								0
Chemical Parameters:																
Distribution: Max THM - Distribution Water (µg/l)		99		89.5		89.5						99				100***
Distribution: Max HAA - Distribution Water (µg/l)		136		38		14						136				N/A

NOTES:

* December 18 - Well No. 1 exceeded its PTTW limit of 454 m3/day taking a total volume of 916 m3/day. The treated water capacity of the plant (908 m3/day) was also exceeded on December 18th. The treated water volume recorded was 955 m3/day. These exceedances occurred when re-filling the water tower after cleaning and maintenance.

** 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 0.28 mg/L to ensure primary disinfection is achieved.
System failed CT on October 2nd when the sodium hypochlorite pump failed to start causing a low chlorine incident (AWQI 148364)

*** Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Four Quarter Running Average). The running average to the end of the quarter = 80.04 ug/L