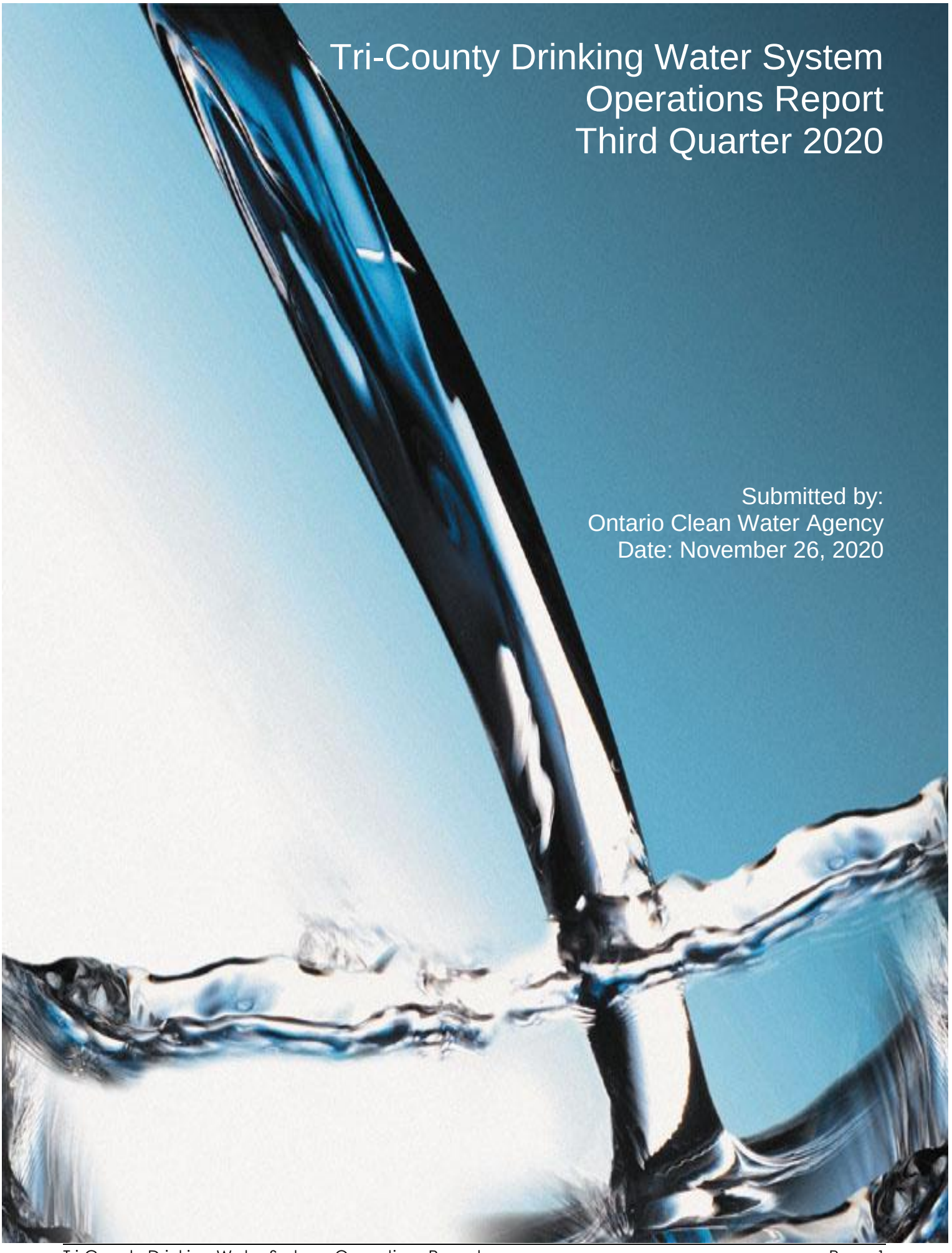


Tri-County Drinking Water System
Operations Report
Third Quarter 2020

Submitted by:
Ontario Clean Water Agency
Date: November 26, 2020

Facility Description

Facility Name:	Tri-County Drinking Water System
Regional Manager:	Dale LeBritton (519) 476-5898
Sr. Operations Manager:	Mike Taylor (226) 545-0414
Business Development Manager:	Susan Budden (519) 318-3271
Facility Type:	Municipal
Classification:	Class 2 Water Distribution, Class 2 Water Treatment
Title Holder:	Municipality

Service Information

Area(s) Serviced:	West Elgin, Dutton/Dunwich, Southwest Middlesex, Newbury and Bothwell
Population Serviced:	9,985
No. of Connections:	
Water Meters:	Commercial / Residential
In Service Date:	2009

Capacity Information

Total Design Capacity:	12.160 (1000 m^3/day)
Total Annual Flow:	1,381 (1000 m^3/year)
Average Day Flow:	3.770 (1000 m^3/day)
Maximum Day Flow:	5.380 (1000 m^3/day)

Operational Description

Water treatment with intake in Lake Erie, 4 low lift pumps, lifting up to the treatment plant. Membrane filtration followed by injection with Sodium Hypochlorite for primary disinfection and into the 2 Storage Tanks. Pumping to tower & distribution system with 4 high lift pumps.

SECTION 1: COMPLIANCE SUMMARY

FIRST QUARTER:

On March 29th, 2020 at 15:41 the historian had a failure likely due to a power surge during a wind storm. The historian alarm failed to call out at 15:41 due to a firewall on the system; however the normal plant alarms functioned. On March 30th the operator conducted the 72hr review of continuous monitoring data with no issues found as identified on round sheets. However, on March 31st, it was noticed that the previous data that was reviewed was no longer stored. The operator contacted the SCADA provider, Eramosa to see if the information could be retrieved from the PLC. Eramosa attempted to retrieve the data from the PLC and the Rockwell historian but was unsuccessful. A non-compliance was reported to the MECP for the loss of continuous monitoring data.

SECOND QUARTER:

There were no compliance or exceedance issues reported this quarter.

THIRD QUARTER:

There were no compliance or exceedance issues reported this quarter.

SECTION 2: INSPECTIONS

FIRST QUARTER:

There was no Ministry of Environment, Conservation and Parks (MECP) or MOL inspections conducted during the first quarter.

SECOND QUARTER:

There was no Ministry of Environment, Conservation and Parks (MECP) or MOL inspections conducted during the second quarter.

THIRD QUARTER:

There was no Ministry of Environment, Conservation and Parks (MECP) or MOL inspections conducted during the third quarter.

SECTION 3: QEMS UPDATE

FIRST QUARTER:

There were no QEMS updates this quarter.

SECOND QUARTER:

There were no QEMS updates this quarter.

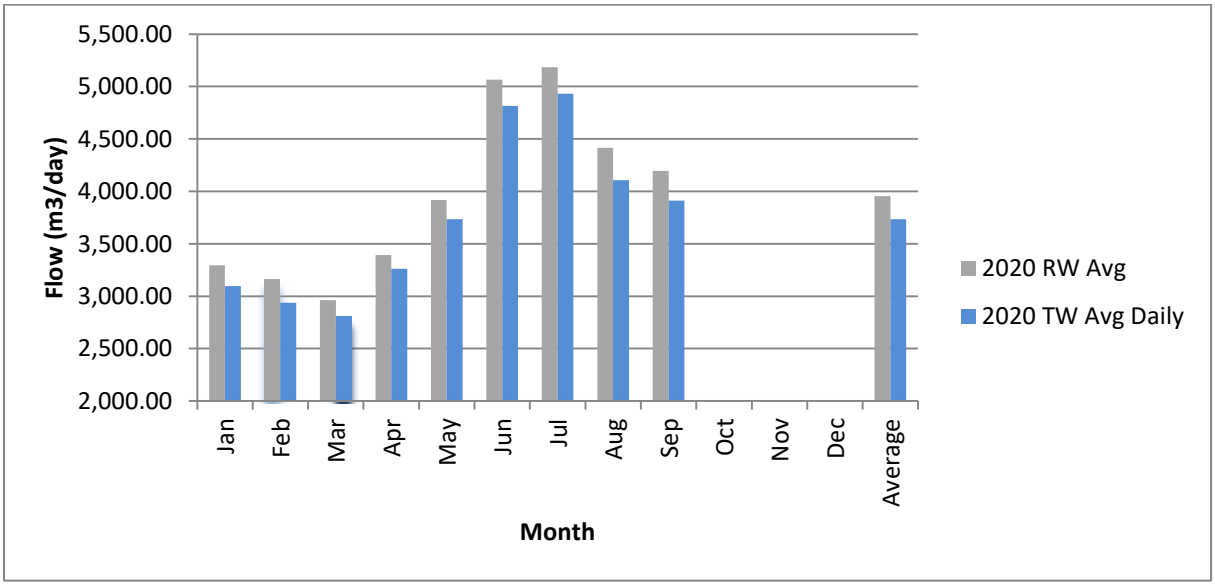
THIRD QUARTER:

There were no QEMS updates this quarter.

SECTION 4: PERFORMANCE ASSESSMENT REPORT

The plant is at 94.4% efficiency with the water taken from Lake Erie that is treated and sent to the distribution systems. Chart 1 below shows the raw water takings compared to the treated water distributed to the distribution system for the first quarter of 2020.

Chart 1: Average daily water takings compared to treated water distributed to the distribution system



Raw water is sampled on a weekly basis and tested for E. coli and Total coliforms as per regulatory requirements. There are no limits identified in the regulations for E. coli and total coliform found in the raw water source. Table 1 below identifies the sample results for the first quarter.

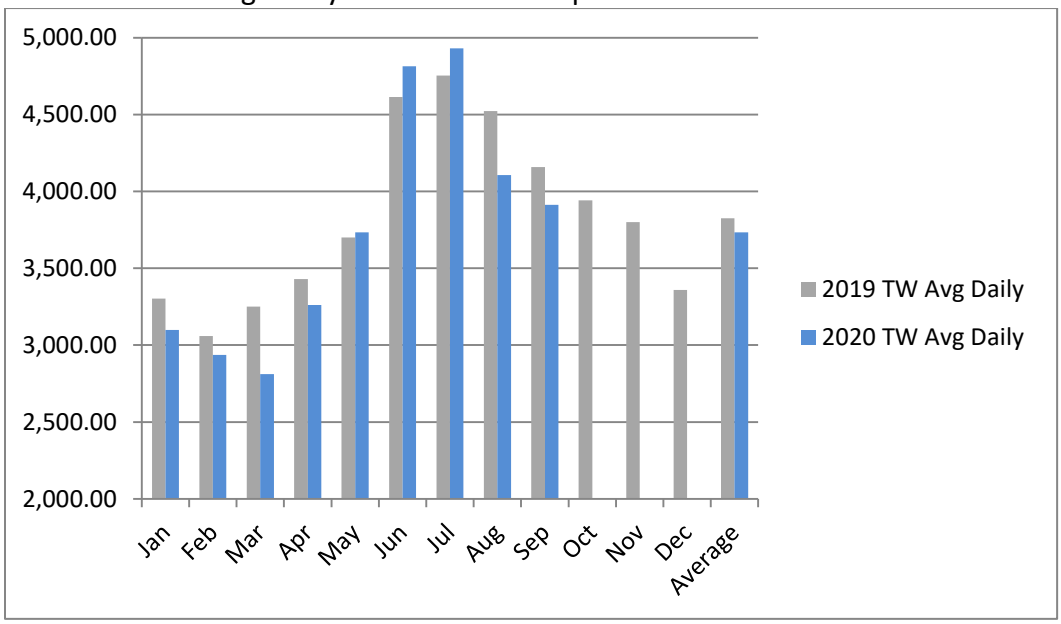
Table 1: Raw water sample results 2020

	# Samples	E. Coli Range (cfu/100mL)	Total Coliform Range (cfu/100mL)
January	4	9-100	210 - 10100
February	4	<10-10	100 - 1600
March	5	<10-100	60-4900
April	4	<10-10	140-370
May	4	<10-100	<10-900
June	5	20-100	<10-200
July	4	<10-<10	<10-80
August	5	<10-<10	<10-600
September	4	<10-100	20-120

*NDOGT- no data, overgrown with target bacteria

The raw water is treated through membrane filtration and chlorine disinfection. The treated water is distributed to the systems it serves though the high lift pumps. The average daily treated water so far for was 2020 was 3,733.8m^3/d. The average treated water flow for 2020 is up 4.9% when compared against the average daily flow for 2019. The Tri-County Drinking Water System is currently at 30.7% of its rated capacity. Chart 2 below depicts the treated water flow for 2020 compared to 2019 average daily flows.

Chart 2: Treated water average daily flow in 2020 compared to 2019



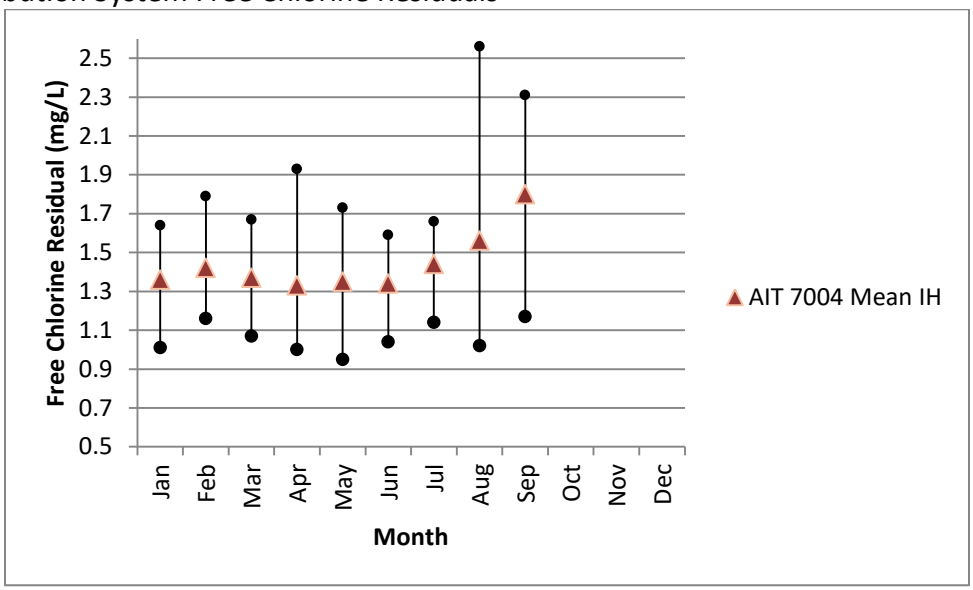
To ensure inactivation of viruses, bacteria and microorganisms the membrane filtration system is required to meet performance criteria for filtered water turbidity of less than or equal to 0.1 NTU in 99% of the measurements each month. The Tri-County Water Treatment Plant met all regulatory requirements for inactivation during the first quarter of 2020. Table 2 below shows the performance of each filter rack and the overall filter rack performance.

Table 2: Filter Rack Performance in 2020

	Rack 1 % Readings <0.1ntu	Rack 2 % Readings <0.1ntu	Rack 3 % Readings <0.1ntu	Rack 4 % Readings <0.1ntu	Overall Filter Performance (% readings <0.1ntu)
January	99.88	99.84	99.99	99.88	99.90
February	99.93	99.80	100.00	99.99	99.92
March	99.92	99.78	99.99	100.00	99.82
April	99.95	99.88	100.00	100.00	99.89
May	99.96	99.83	100.00	99.96	99.94
June	99.95	99.79	100.00	99.87	99.91
July	99.97	99.85	99.99	99.94	99.94
August	99.95	99.86	99.99	99.53	99.88
September	100.00	99.95	99.97	99.71	99.93

Along with turbidity, chlorine residuals are monitored throughout the treatment process by continuous online free chlorine analyzers. Residuals are maintained in order to provide adequate primary disinfection to meet inactivation of viruses, bacteria and microorganisms. The chlorine also provides adequate residuals in the distribution systems the treatment plant serves (secondary disinfection). Chart 3 below provides the online minimum, maximum and average readings of free chlorine provided to the distribution systems. All results have met regulatory requirements.

Chart 3: Distribution System Free Chlorine Residuals



On a weekly basis the treated water is tested for E. coli, Total Coliforms and heterotrophic plate count (HPC). The limit for Total Coliform and E. coli is zero; heterotrophic plate count (HPC) doesn't have a limit. This is an operational guide to initiate an action plan if HPC results are continuously high. Table 3 below shows the number of samples taken each month along with the range of results. All samples have met regulatory requirements.

Table 3: Treated water sample results for 2020.

	# Samples	Total Coliform Range (cfu/100mL)	E. coli Range (cfu/100mL)	HPC (cfu/100mL)
January	4	0 - 0	0 - 0	<10 – <10
February	4	0 - 0	0 - 0	<10 – <10
March	5	0 - 0	0 - 0	<10 – <10
April	4	0 - 0	0 - 0	<10 – <10
May	4	0 - 0	0 - 0	<10 – <10
June	5	0 - 0	0 - 0	<10 - 30
July	4	0 - 0	0 - 0	<10 – <10
August	5	0 - 0	0 - 0	<10 – <10
September	4	0 - 0	0 - 0	<10 – <10

The transmission main (distribution system) is sampled on a weekly basis at two locations for E. coli, Total Coliforms and heterotrophic plate count (HPC) to meet regulatory requirements. As with the treated water the limit for Total Coliform and E. coli is zero, heterotrophic plate count (HPC) doesn't have a limit. This is an operational guide to initiate an action plan if HPC results are continuously high. Table 4 below shows the number of samples taken each month along with the range of results.

Table 4: Distribution system sample results for 2020.

	# Samples	Total Coliform Range (cfu/100mL)	E. coli Range (cfu/100mL)	HPC (cfu/100mL)
January	8	0 - 0	0 - 0	<10 – <10
February	8	0 - 0	0 - 0	<10 – <10
March	10	0 - 0	0 - 0	<10 - <10
April	8	0 - 0	0 - 0	<10 - <10
May	8	0 - 0	0 - 0	<10 - <10
June	10	0 - 0	0 - 0	<10 - <10
July	8	0 - 0	0 - 0	<10 - 20
August	10	0 - 0	0 - 0	<10 - 20
September	8	0 - 0	0 - 0	<10 - <10

On a quarterly basis trihalomethanes are tested at two locations in the system. The first location is at the treatment plant prior to the water leaving the facility. The second location is at the end of the system, at the West Lorne Standpipe. Sampling from both locations provides information on how the THMs are forming in the system with retention time. There is an issue with elevated THMs in the distribution systems that the Tri-County Drinking Water System provides water to. Table 5 below provides the running average quarterly results; the running average limit for THMs is 100µg/L. All results are within regulatory requirements. However, THMs increase with increased retention time therefore THMs in the distribution system the WTP serves can be much higher, even reaching the regulatory limit.

Table 5: Trihalomethane sampling results.

	Limit (µg/L)	Treated Water THM Result (µg/L)	West Lorne Standpipe THM Result (µg/L)
October 2019		49	63
January 2020	100	18	31
April 2020	100	21	33
July 2020	100	27	8.2
Running Average	100	**28.8**	**33.8**

On a quarterly basis Haloacetic Acids (HAAs) are now required to be tested as per regulatory requirements. They are sampled at two locations in the system. The first location is at the treatment plant prior to the water leaving the facility. The second location is at the end of the system, at the West Lorne Standpipe. Sampling from both locations provides information on how the HAAs are forming in the system with retention time. Table 6 below provides the current running average quarterly results; the running average limit for HAAs is 80µg/L. All results are within regulatory requirements however, the limits are now enforced for 2020.

Table 6: Haloacetic Acid sampling results.

	Limit (µg/L)	Treated Water HAA Result (µg/L)	West Lorne Standpipe HAA Result (µg/L)
October 2019		26.2	36.8
January 2020	80	<5.3	14.3
April 2020	80	<5.3	8.5
July 2020	80	12	21.3
Running Average	**80**	**12.2**	**20.2**

SECTION 5: OCCUPATIONAL HEALTH & SAFETY

FIRST QUARTER:

Due to the COVID-19 pandemic, which has been brought to the attention of all OCWA staff; precautionary protection measures have been implemented at all facilities. In addition to the mandatory PPE worn by all operational staff, the following additional steps were taken to assure safety:

- Additional PPE and supplies were sourced as applicable.
- The frequency of facility and vehicle cleaning and surface disinfection was increased and documented
- Staff re-organization was implemented to meet social distancing requirements where applicable.
- Facility access to essential contractors and/or delivery personal are closely monitored.

There were no additional Health & Safety issues identified during the first quarter.

SECOND QUARTER:

There were no Health & Safety issues identified during this quarter.

THIRD QUARTER:

There were no Health & Safety issues identified during the third quarter.

SECTION 6: GENERAL MAINTENANCE

FIRST QUARTER:

JANUARY:

04: Air Liquide on site to deliver CO2.
04: Completed repair of valve v3306 on rack #3.
08: FloChem on site for chemical delivery.
14: Changed pH and chlorine probes at analyzer AIT5006.
23: Venture Automation was on site to check air manifold cards on racks.
29: Eramosa on site to test High Lift pump #4 and do programming.

FEBRUARY:

03: Changed actuator on rack #3 valve V3*06.
06: Changed the belt on air makeup unit, and installed new coolant heat pump on low lift generator.
10: Air Liquide on site to deliver CO2.

13: Kone Crane on site for inspection of mono rail lifting device.
18: Gerber Electric on site to install new motor on heat pump.
19: Franklin Empire on site to calibrate milltronics.
24: Air Liquide on site to deliver CO2.
25: Installed new pH and ORP probe on neutralization tank.

MARCH:
02: Installed and calibrated new chlorine probe at chlorine analyzer AIT -2003.
04: Gardner Denver on site to do maintenance on compressors.
11: Lakeside on site to calibrate thermometer TIT 1403 at the low lift.
16: Air Liquide on site for CO2 delivery.
18: Flowmetrix on site to calibrate flow meters.
19: Installed and calibrated new pH probe on Chlorine analyzer 7001.
24: Anchem on site for chlorine (NaOCl) delivery.

SECOND QUARTER:
APRIL:
01: Captor chemical delivery.
02: Brown's enterprise onsite at Silver Clay chamber to fix drain pipe for sump pump.
02: Completed monthly meter readings.
07: ASL Roteq onsite to remove and rebuild low lift pump #3.
07: Install new pH probe on AIT-7004.
08: ASL Roteq onsite to remove and rebuild low lift pump #3.
08: Air Liquide onsite for CO2 delivery.
08: Calibrated Cl analyzer AIT7001
09: Flowmetrix onsite to check meter at Eagle East chamber.
20: Chlorine residual adjusted and set higher for hydrant flushing.
27: Flowmetrix onsite to fix water meters at Silver Clay and Pioneer.
28: Eramosa onsite to work on SCADA remote sites.
30: Air Liquide onsite to deliver CO2.

MAY:
01: Lowered chlorine residual set point as spring flushing is complete.
05: Installed new sump pump in Pioneer chamber.
12: Pre-chlorination system started at low lift. Residual set to 0.40mg/L.
13: pH and chlorine analyzer at low lift, AIT1401 calibrated and electrolyte added.
13: Chlorine residual at plant lowered due to pre-chlorination at low lift.
15: Gerber Electric onsite for maintenance on cooling system.
21: Air Liquide onsite for CO2 delivery.
28: Gerber Electric onsite to install VFD on low lift pump #3.

JUNE:
01: VFD solutions onsite for troubleshooting for highlift pump 4.
09: Started chamber inspections.
10: Completed chamber inspections.
11: Gerber Electric onsite to check wire connections.
15: Air Liquide onsite to deliver CO2.

16: Schneider Electric onsite to fix power corrector.
17: Pall onsite to perform health check analysis on Pall system.
18: Pall onsite to perform health check analysis on Pall system.
19: Albert's Generator onsite to perform annual generator maintenance.
22: Gerber Electric onsite to install new air conditioning unit.
23: Gerber Electric onsite to install new air conditioning unit.
24: Gerber Electric onsite to finish installation of new air conditioning unit.
25: Flochem onsite for chemical delivery.
25: Gerber Electric onsite to perform work on low lift pump #3.
29: Closed valve at Silver Clay chamber and Marsh Line chamber to push more water down Marsh Line East.
30: Hach onsite for membrane maintenance for turbidimeters.

THIRD QUARTER:

JULY:

02: Anchem on site for chlorine delivery.
07: Gerber Electric on site to install new turbidity meter at low lift.
14: H2Flow on site to do maintenance on UV system.
23: Eramosa on site to program new VFD LL#3.
30: H2Flow on site for UV maintenance.

AUGUST:

04: Gerber was on site to install line reactor on HL pump# 4.
18: Hurricane was on site for low lift wet well cleaning.
19: Hurricane was on site for low lift wet well cleaning.
20: Hurricane was on site to clean settling tank.
21: Hurricane was on site to clean settling tank.
25: Elgin Fire was on site to inspect fire extinguishers.

SEPTEMBER:

02: Farmington onsite to replace backflow preventers at low lift. Eramosa onsite to preform work in PLC panel in MCC room.
03: ASL Roteq onsite to observe low lift pump 3.
14: Manitoulin transport was on site to deliver chlorine gas.
22: Anchem is on site to deliver NaOCl.
23: ASL was on site to take HL pump # 3 for repair.
29: PowerCore Engineering onsite for main power meter replacement. Hurricane onsite for settling pond cleaning at the low lift.

SECTION 7: ALARM SUMMARY

FIRST QUARTER:

JANUARY:

05: Operator received alarm for AIT-7004 analyzer low chlorine residual. Operator attended the site, chlorine was 0.99 mg/l, tested analyzer and got a grab sample of 1.02 mg/l, calibrated meter to 1.02 mg/l and tested AIT-7001 chlorine analyzer it was 1.16 mg/l and grab sample was 1.31 mg/l calibrated this meter. Started high lifts to allow flow to distribution system and the analyzer is now reading 1.27 mg/l. Notified ORO.

31: Operator received page for PALL critical failure. Operator came on site and found that rack # 1,2,3 disabled due to high pressure. Able to get rack 1 & 2 running but rack 3 air scrub valve V3306 faulting unable get the valve working, notified ORO and asked to put rack 3 in idle and rack 4 into forward flow. Monitor system.

FEBRUARY:
11: Operator received alarm, PALL system critical. Logged in on SCADA laptop and found Rack # 2 was idle and rack #3 was disabled due to high pressure. Reset the system, put rack # 2 and 3 on forward flow and started to produce water.

MARCH:
15: Operator got alarm for High Lift and Low Lift pump faulted. Operator attended the water plant and reset pumps and plant started to produce water. Completed rounds, checked all systems for normal operation. Suspected power flicker was the cause.
29: Operator received alarm for water storage low level. Arrived on site because could not remotely access the SCADA. After investigation still could not able access the SCADA, notified ORO, advised to reset SCADA and PLC. After resetting PLC the situation did not resolve. Notified ORO and was advised to call Eramosa. Eramosa was not able to remotely access system. After investigation found a UPS battery that's responsible for remote access was not functioning; replaced UPS with a power bar. System returned to normal. SCADA up and running and plant started to produce water again. Storage tanks level was below 6.4m. Tested remote access; works well now. Monitored system until out of alarm and reset dialer.

SECOND QUARTER:
APRIL:
11: Operator received call from spectrum for low storage tanks at 16:15. Logged onto SCADA and observed storage tank at 6.46M and high lifts were pumping water to Wallacetown. Pall system was not making water; reset low lifts and Pall system started. Turned off high lift pumps to Wallacetown (currently at 10.01M) and changed low lift set-points in order to have only one low lift pump on. System currently now making water, will continue to monitor system remotely.

MAY:
05: Alarm for Wallacetown high level, high lift pumps were sending water to West Lorne in order to fill Rodney. Changed set-points to turn off high lift pumps.
09: Alarm for high lift and low lift pump fault. Logged onto SCADA and reset pumps. Arrived at the plant to ensure all systems were working as designed. Pump fault due to power flicker.
13: Alarm for discharge turbidity high high now normal. Logged onto SCADA and found the discharge turbidity spiked after the start-up of high lift pumps. The turbidity now normal.

JUNE:
06: Alarm for storage tank fault. Logged onto SCADA and observed storage tank at 6.38m, reset communication fault from CP1000 to CP2000. System started up and is now producing water. Operator to monitor remotely.
10: Alarm for power outage. Logged onto SCADA remotely and reset low lift pumps. On route to plant received a call for loss of communication with Wallacetown. Dutton-Dunwich operator was contacted and communication was restored. Plant was operating on normal power upon arrival and operating as designed. Currently sending water to both Wallacetown and West Lorne and producing water.

11: Alarm for power outage. Logged onto SCADA and reset low lift pumps, also observed plant was running on generator power. On route to plant observed a tree had fallen onto the power line down the road from plant. Contacted Hydro One and left site as power was expected to be restored at a later time. Received call from Hydro One stating power was back on, upon arrival to site power had cycled twice and therefore placed power input to only generator. Returned facility back to normal power, currently making water and sending to Wallacetown.
12: Alarm for generator running. Arrived onsite, power had returned to normal. Observed a communication error with low lift. Went to low lift and reset a tripped breaker in PLC cabinet and communication had been restored. Returned to plant and reset low lift pumps, plant now producing water and sending water to West Lorne.
21: Alarm for channel 32, less than 3 high lift pumps available. Found high lift pump #1 and #4 to be in fault. Reset both pumps and placed high lift pump #1 in manual due to pump not opening and closing properly.

THIRD QUARTER:

JULY:

13: Alarm for chlorine analyzer AIT 5006 fault. Operator came on site. Reset low lift pumps. Put chlorine pump on 100%. Start the system. After chlorine on AIT 5006 start to go up, put pump on auto and working as normal.
26: Operator received call from spectrum for west Lorne standpipe general alarm. Logged onto SCADA and observed high lift pumps to be in fault. Reset high lift pumps, high lift pump 1 and high lift pump 2 then started to fill west Lorne and Wallacetown. West Lorne currently at 28.62m and Wallacetown at 8.3 and both filling. West Lorne now out of low level at 30.34m. Will continue to monitor remotely. Most likely due to high temperatures and weather causing brown out.
28: Received page for Wallacetown communication fail, notified ORO, and called Dutton on-call operator. Operator from Dutton went onsite to reset the router, and communication was restored. Channel 67 back to normal and alarm dialer reset.

AUGUST:

16: Operator received call from spectrum for no communication. Arrived at plant and observed no communication to low lift, and high lifts had faulted out. West Lorne standpipe at 30.9m and Wallacetown at 9.18m, storage tanks at 8.9m. Reset high lift pumps, placed MV-7021 in manual to close valve, then placed back into auto. High lift pumps started back up and sending water to West Lorne. Went to low lift. No communication in CP1000 cabinet. Turned breakers in cabinet off, reset CP1000 breaker from main panel and turned all breakers in cabinet back on. Low lift communication was restored. Went back to plant and reset remaining three low lift pumps from SCADA. Plant got back to normal operation. Everything happened because of power flicker.
22: Operator received alarm channel 24 alarm, UV reactor 1 fault. Arrived on site. Find the wipers were faulted. Could not reset it. Called ORO to notify him. Checked UV reactor # 2 to verify it is working properly. Reset Dialer and left site.

SEPTEMBER:

29: UV chlorine analyzer fault. Logged in on SCADA. Chlorine was 5.00 mg/l. Reset low lift pump, started to produce water. In 3 min after LL pump started chlorine got back to normal. Monitored the system for 15 min to make sure everything is working properly.

SECTION 8: COMMUNITY COMPLAINTS & CONCERNS

FIRST QUARTER:

There were no complaints or concerns this quarter.

SECOND QUARTER:

There were no complaints or concerns this quarter.

THIRD QUARTER:

There were no complaints or concerns this quarter.