



Tri-County Drinking Water System Operations Report First Quarter 2020

Submitted by:
Ontario Clean Water Agency
Date: April 23, 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.

SECTION 2: INSPECTIONS

FIRST QUARTER:

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

SECTION 3: QEMS UPDATE

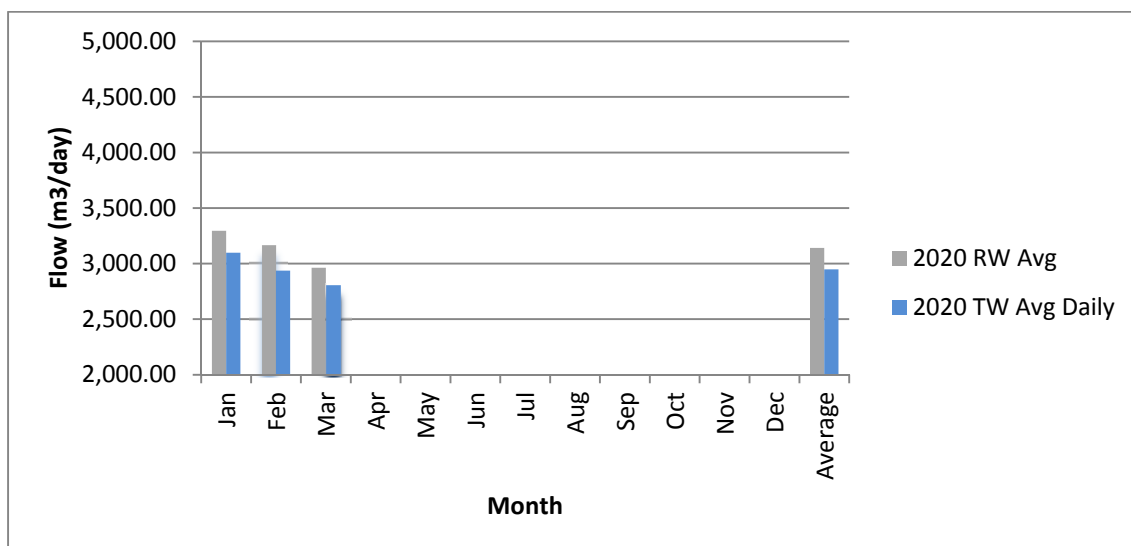
FIRST QUARTER:

There were no QEMS updates this month.

SECTION 4: PERFORMANCE ASSESSMENT REPORT

The plant is at 93.9% 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.

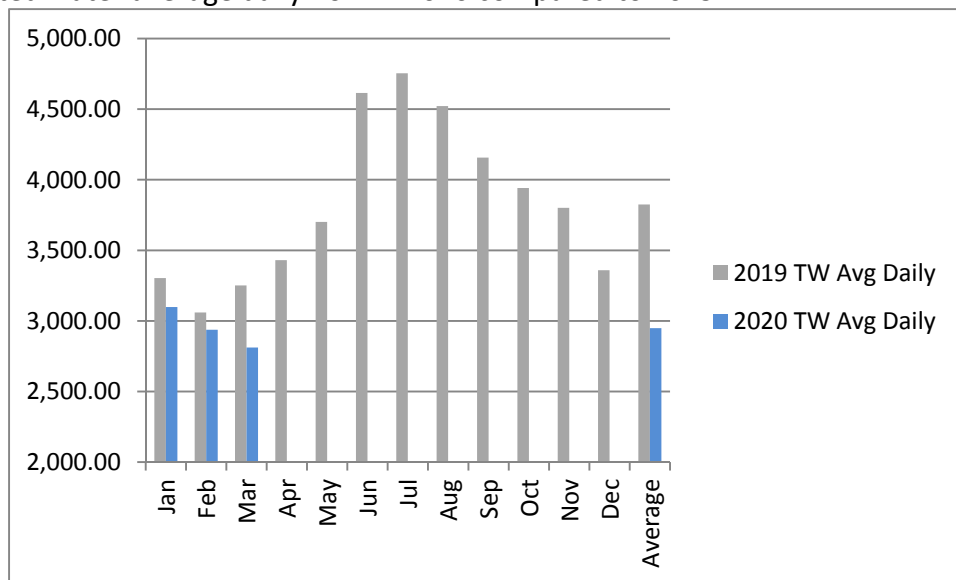
Table 1: Raw water sample results 2020

	# 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

*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 through the high lift pumps. The average daily treated water in the first quarter of 2020 was 2, 948.8m³/d. The average treated water flow in the first quarter of 2020 is down 8% when compared against the average daily flow in the first quarter of 2019. The Tri-County Drinking Water System is currently at 25.8% 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



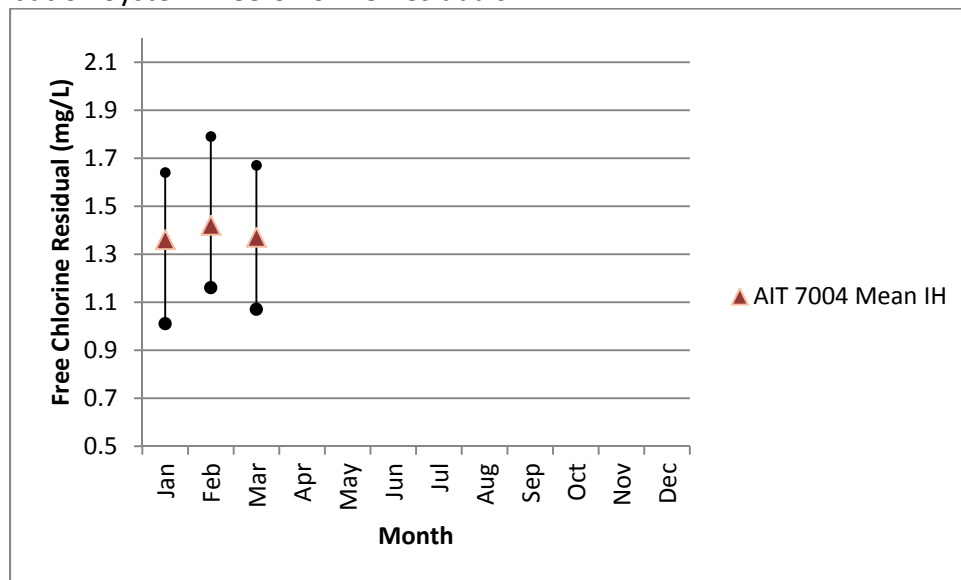
To ensure inactivation of viruses, bacteria and microorganisms the membrane filtration system is required to meet performance criteria for filtered water turbidity of less than or equal to 0.1 NTU in 99% of the measurements each month. The Tri-County Water Treatment Plant met all regulatory requirements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

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

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

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)
April 2019		22	29
July 2019		22	32
October 2019		49	63
January 2020	100	18	31
Running Average	100	27.8	38.8

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)
April 2019		5.3	15.3
July 2019		6.5	16
October 2019		26.2	36.8
January 2020	80	<5.3	14.3
Running Average	80	10.8	20.6

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.

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: Cone 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.

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:

08: Operator received alarm for third release valve stuck open, logged onto SCADA and checked alarms but alarm had cleared. Observed 2 low lift pumps running, storage tank was at 7.3m, shut down flow to Wallacetown in order for the storage tanks to fill quicker, Wallacetown was at 10.1m upon shutdown. Placed rack 4 into forward flow until second low lift pump was off. Observed flow to Wallacetown was double than the previous day, notified ORO. Storage tanks currently at 7.8m and one low lift pump currently pumping water to plant. Placed rack 4 back into RFR.

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.

SECTION 8: COMMUNITY COMPLAINTS & CONCERNS

FIRST QUARTER:

There were no complaints or concerns this quarter.