

# **West Lorne Wastewater Treatment Plant & Collection System Operations Report Fourth Quarter 2020**

Submitted by:  
Ontario Clean Water Agency  
Date: January 5, 2021

**Facility Information:**

Facility Name: West Lorne Wastewater Treatment Plant & Collection System  
Facility Type: Municipal  
Classification: Class 2 Wastewater Collection, Class 2 Wastewater Treatment

**Operational Description:** The village of West Lorne is served by an extended aeration Wastewater Treatment Plant, comprised of aeration, clarification, filtration, disinfection and sludge disposal. Also included is the collection system with one pumping station and a sanitary sewer system. The operations are in accordance to ECA # 3-0442-90-938, which covers the entire plant including the pumping stations.

The collection system consists of sewers and one submersible pumping station. The treatment facility main elements are an extended aeration process designed for combined carbon removal and nitrification. The discharge of secondary clarifier: effluent is filtered and disinfected with ultraviolet light before being reaerated and discharged to the Zoller Drain and then Brocks Creek. The waste activated sludge is discharged to a lagoon for storage. Dual-point chemical addition alum: is used for phosphorus removal. Sodium hydroxide is added for control of alkalinity.

**Service Information**

Areas Served: Village of West Lorne

**Design Capacity:**

Total Design Capacity: 900 m<sup>3</sup>/day  
Total Annual Flow (2017 Data): 181,074 m<sup>3</sup>/year  
Average Day Flow (2017 Data): 496 m<sup>3</sup>/day  
Maximum Day Flow (2017 Data): 1,512 m<sup>3</sup>/day

**Treatment Process Features:**

Effluent Receiver: Zoller Drain to Brocks Creek to Lake Erie  
Major Process: Extended aeration  
Phosphorus Removal: Continuous, Alum addition  
Additional Treatment: Effluent filtration  
Discharge Mode: Continuous discharge  
Effluent Disinfection Practice: UV Disinfection  
Sludge Stabilization: Lagoon storage

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## **SECTION 1: COMPLIANCE SUMMARY**

### **FIRST QUARTER:**

Monthly average TSS was exceeded in January. Due to high flows, daily sampling was needed as per the ECA. High TSS was experienced during high flows. When flows returned to normal the TSS was also within the ECA limit. The engineers are reviewing filter performance.

### **SECOND QUARTER:**

There were no non-compliances reported for the second quarter.

### **THIRD QUARTER:**

There were no non-compliances reported for the third quarter.

### **FOURTH QUARTER:**

There were no non-compliances reported for the fourth quarter.

## **SECTION 2: INSPECTIONS**

### **FIRST QUARTER:**

There were no MECP or MOL inspections during the first quarter.

### **SECOND QUARTER:**

There were no MECP or MOL inspections during the second quarter.

### **THIRD QUARTER:**

There were no MECP or MOL inspections during the third quarter.

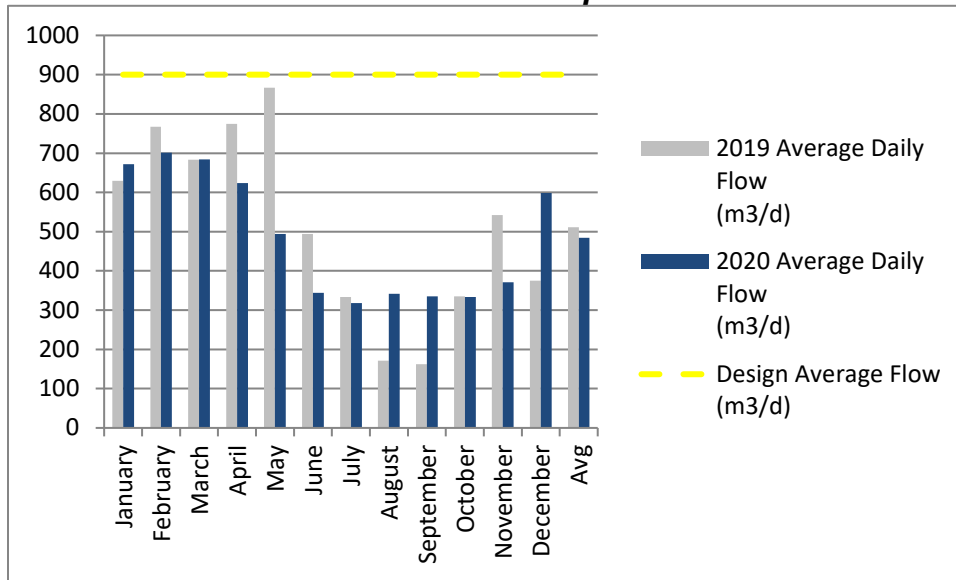
### **FOURTH QUARTER:**

There were no MECP or MOL inspections during the fourth quarter.

## **SECTION 3: PERFORMANCE ASSESSMENT REPORT**

The average daily raw flow for the wastewater treatment plant in 2020 is 484.67 m<sup>3</sup>/d. The average daily flow in 2019 was 511.26 m<sup>3</sup>/d, therefore the flow for 2020 is down 5.2% when compared to 2019. The plant is currently at 54 % of its rated capacity of 900m<sup>3</sup>/d.

**Chart 1. Raw flows in 2020 Compared to 2019 Flows**



Raw samples are taken on a biweekly basis following the ECA requirements. The table below shows the raw sample results for 2020 so far.

**Table 1. Raw Water Sample Results for 2020.**

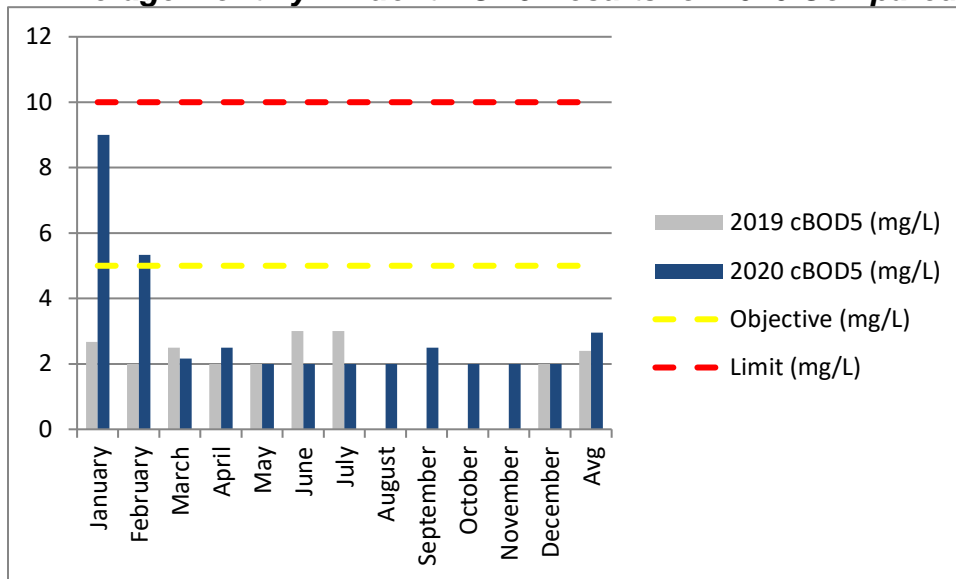
	BOD5 (mg/L)	TKN (mg/L)	TP (mg/L)	TSS (mg/L)	Alkalinity (mg/L)
January Results	82	21.35	2.015	83.5	306.5
February Results	45.5	14.7	1.5	54.5	279.5
March Results	54.5	17.55	1.465	65	205
April Results	70	19.9	1.885	79	280.5
May Results	22.5	7.35	0.65	29.5	152
June Results	130.5	41.25	3.815	143	303
July Results	130.3	44.77	4.653	118.3	328
August Results	132	36	4.485	125	318
September Results	168	63.1	5.225	243	370
October Results	124.5	36.4	3.97	184.5	268
November Results	160.5	58	6.26	167	354
December Results	118	32.73	2.893	127	326.3
<b>Annual Average</b>	<b>104.81</b>	<b>33.219</b>	<b>3.276</b>	<b>118.62</b>	<b>293.7</b>

The effluent is sampled on a bi-weekly basis following the requirements of the ECA.

The average effluent cBOD5 for 2020 is 2.95 mg/L, meeting the limits identified in the ECA. The effluent objective was exceeded in January and February due to high flows and filter performance from the December commissioning. The annual average result for BOD5 in 2019

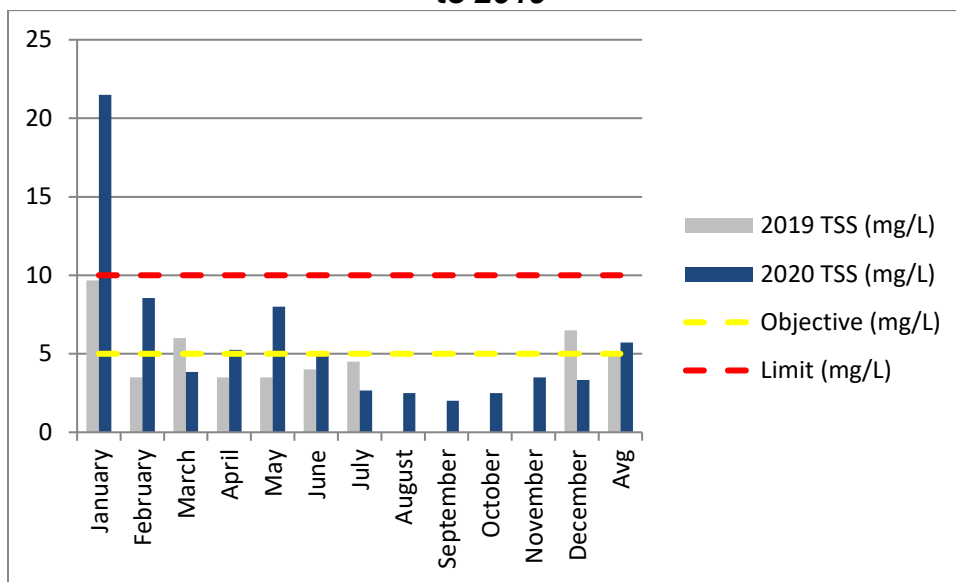
was 2.4mg/L, therefore the results for 2020 are up by 23.5% when compared to 2019 (refer to Chart 2).

**Chart 2. Average Monthly Effluent BOD5 Results for 2020 Compared to 2019**



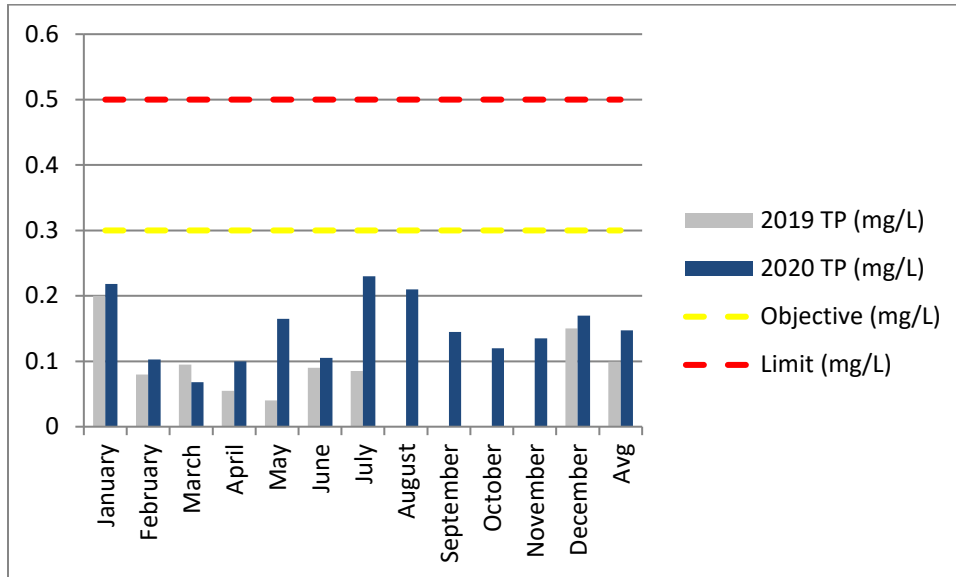
The average effluent TSS for 2020 is 5.7mg/L, exceeding effluent limits identified in the ECA in January as discussed in the compliance section, and exceeding the effluent objective in January and March due to high flows and filter performance. The annual average result for TSS in 2019 was 5.1mg/L; therefore the results for 2020 are up by 11% when compared to 2019 (refer to Chart 3).

**Chart 3. Average Monthly Effluent Total Suspended Solids Results for 2020 Compared to 2019**



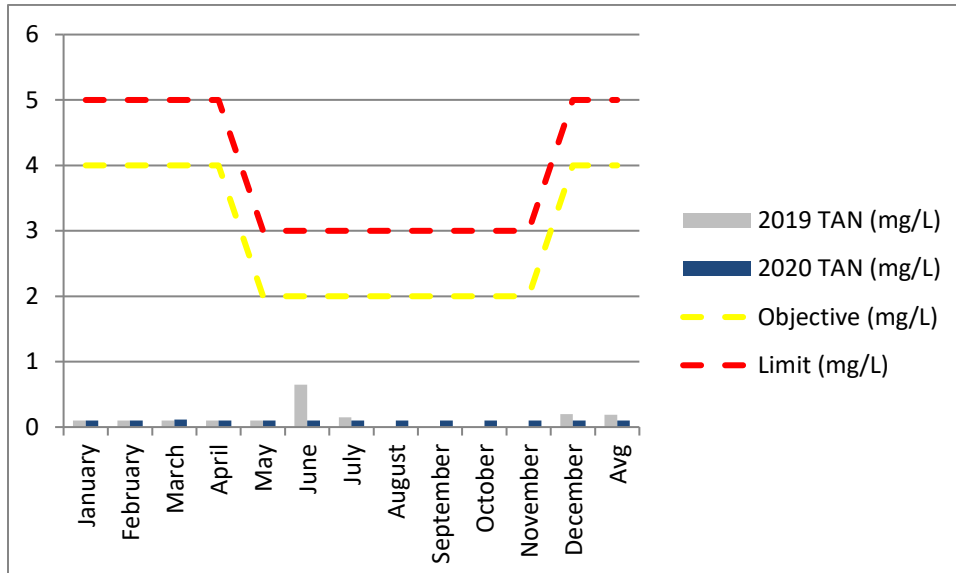
The average effluent TP for 2020 is 0.15 mg/L, meeting effluent limits and objectives identified in the ECA. The annual average result for TP in 2019 was 0.10mg/L, therefore the results for 2020 is up 48% when compared to 2019 (refer to Chart 4).

**Chart 4. Average Monthly Effluent Total Phosphorus Results for 2020 Compared to 2019**



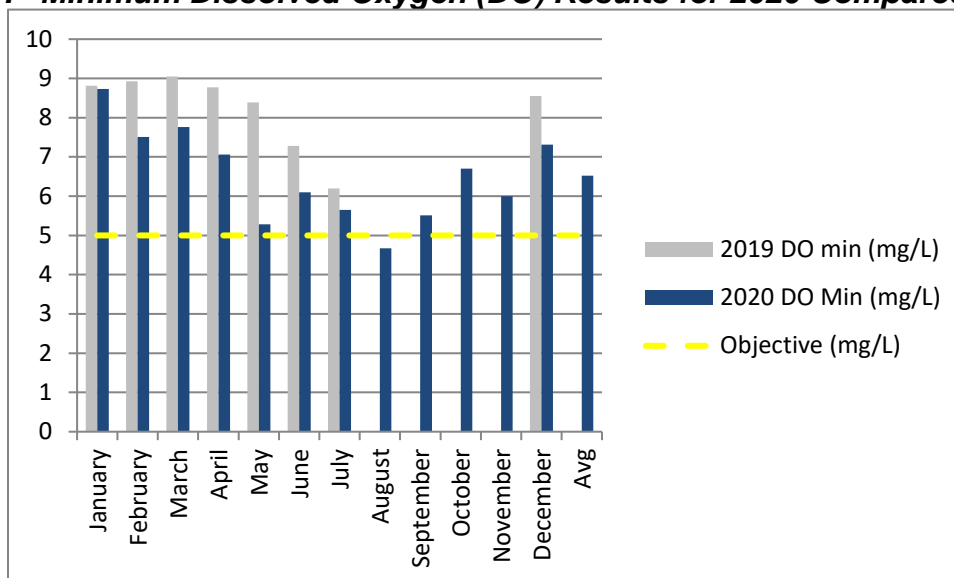
The average effluent TAN for 2020 is 0.10mg/L, meeting both effluent objectives and limits identified in the ECA. The annual average result for TAN in 2019 was 0.19mg/L, therefore the results for 2020 are down 46% compared to 2019 (refer to Chart 5).

**Chart 5. Average Monthly Effluent Total Ammonia Nitrogen Results for 2020 Compared to 2019**



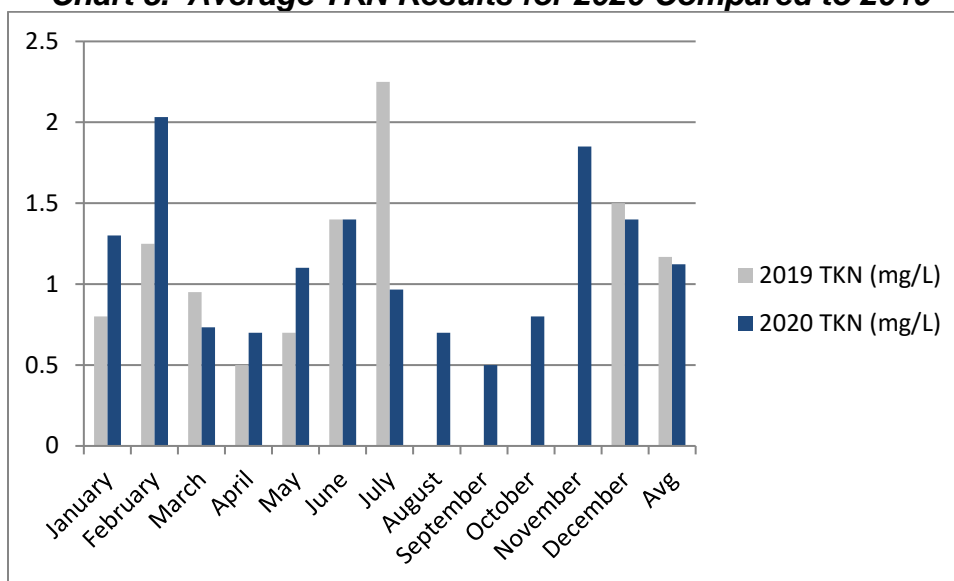
Dissolved oxygen (DO) of the effluent is tested on site at the plant, the ECA identifies a minimum level required as an objective. This objective is 5mg/L. The chart below (chart 7) shows the minimum DO concentrations; there have been no objective exceedances with the exception of August.

**Chart 7. Minimum Dissolved Oxygen (DO) Results for 2020 Compared to 2019**



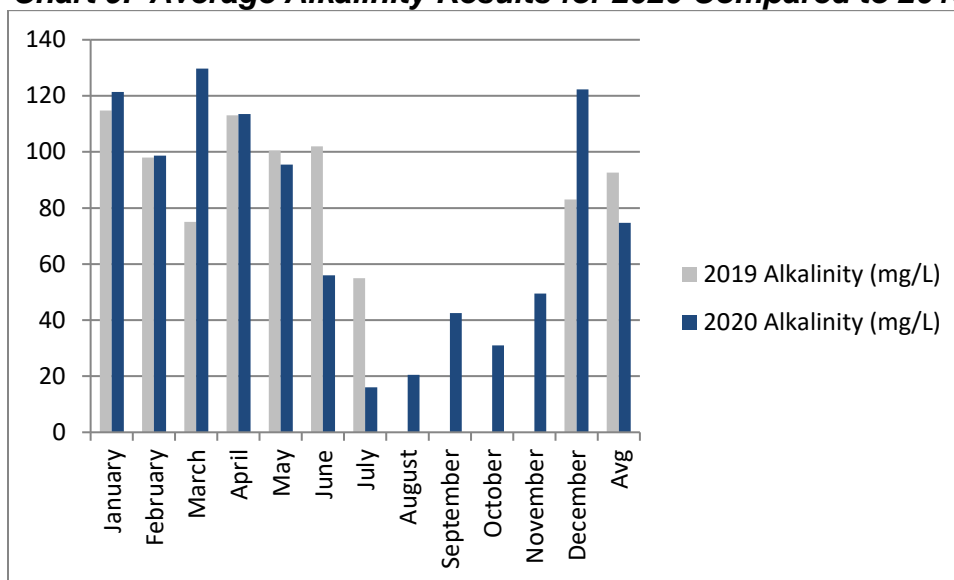
Total Kjeldahl Nitrogen (TKN) is sampled biweekly in accordance with ECA requirements; there are no objective or limits imposed on this parameter. The average effluent TKN for 2020 is 1.12mg/L. The annual average result for TKN in 2019 was 1.17mg/L, therefore the results for 2020 are down by 4% when compared to 2019 (refer to Chart 8).

**Chart 8. Average TKN Results for 2020 Compared to 2019**



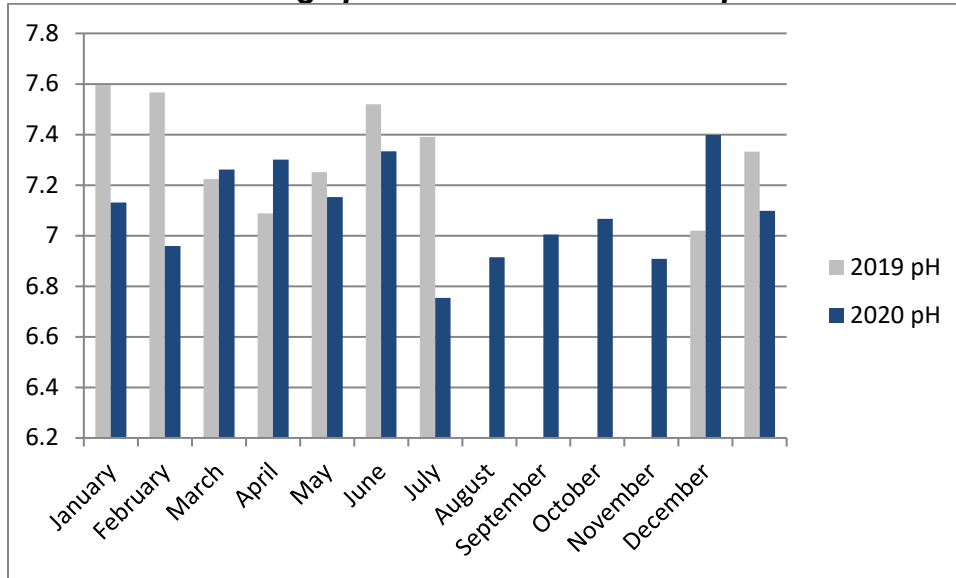
Alkalinity is sampled biweekly in accordance with ECA requirements; there are no objective or limits imposed on this parameter. It is recommended that at least 50mg/L is present in the effluent. The average effluent alkalinity for 2020 is 74.7mg/L. The annual average result for alkalinity in 2019 was 93mg/L, therefore the results for 2020 are down by 19% when compared to 2019(refer to Chart 9).

**Chart 9. Average Alkalinity Results for 2020 Compared to 2019**



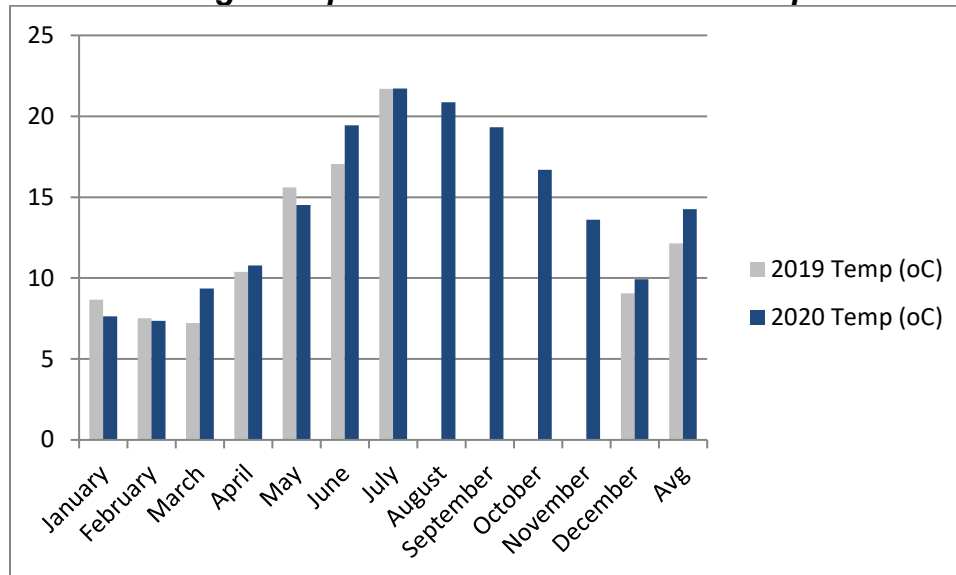
pH is sampled at least biweekly in accordance with ECA requirements; there are no objective or limits imposed on this parameter. It is recommended that the pH is in the range of 6.5-8.5. The average effluent pH for 2020 is 7.09. The annual average result for pH in 2019 was 7.33, therefore the results for 2020 are down by 3% when compared to 2019 (refer to Chart 10).

**Chart 10. Average pH Results for 2020 Compared to 2019**



Temperature is measured at least biweekly in accordance with ECA requirements; there are not any objectives or limits imposed on this parameter. The temperature of the effluent fluctuates based on outdoor temperatures. The average effluent temperature for 2020 is 14.3°C. The annual average temperature in 2019 was 12.2°C, therefore the results for 2020 are up by 17.5% when compared to 2019 (refer to Chart 11).

**Chart 11. Average Temperature Results for 2020 Compared to 2019**



## **SECTION 4: 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 accesses to essential contractors and/or delivery personal are closely monitored.

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

### **SECOND QUARTER:**

The Covid-19 precaution's still continue to ensure the protection of all staff and the public.

### **THIRD QUARTER:**

The Covid-19 precaution's still continue to ensure the protection of all staff and the public.

### **FOURTH QUARTER:**

The Covid-19 precaution's still continue to ensure the protection of all staff and the public.

## **SECTION 5: GENERAL MAINTENANCE**

### **FIRST QUARTER:**

#### **JANUARY:**

\* Facility upgrades still in progress.

08: Operators received training on new VFD drives from Rockwell.

08: Flow diverted to lagoon due to leak at plant. Operator initially thought it was raw sewage. MECP contacted for spill, but later discovered water pipe leak.

08: Gerber Electric on site at pump station testing amperage on P100; loose wiring tightened.

09: Pulled P100 at pump station; found it was clogged with rags. Pulled P102 at pump station; plugged with nylon rope.

10: Water leak at plant repaired; flow diverted from lagoon back to plant.

21: New sump pump installed in filter building.

27 to 31: High flow; additional sampling performed as per ECA.

#### **FEBRUARY:**

\*Facility upgrades still in progress.

03: High flow. Additional sampling performed as per ECA.

06: Pre and post filter samples shipped to contract lab for TSS analysis.

07: Pre and post filter samples shipped to contract lab for TSS analysis.

10: Pre and post filter samples shipped to contract lab for TSS analysis.

13: Kone Cranes on site to inspect lifting devices for annual inspection

- 14: Service tech from NCA Air Compressors on site to inspect filter building air compressor.
- 19: New backwash pumps installed in the filter building.
- 21: New backwash pumps commissioned.
- 21: Grit chamber valve troubleshooting performed by contractor (Glover Hill).

#### MARCH:

- 03: Completed generator run test
- 04: High flow samples taken for ECA
- 05: High flow samples taken for ECA
- 17: Flowmetrix on site for calibration
- 31: Replaced fuse on pump 3 that was burnt out, causing the issue from call out.

#### **SECOND QUARTER:**

##### APRIL

- 03: T&T power on site to rewire UV lights as the circuit was used temporarily for sump pump. UV system was started for the season
- 09: Filters and back wash pumps rotated.
- 20: Gerber Electric on site to replace GFCI plug for UV system.

##### MAY

- 07: Hetek on site to calibrate gas monitors in grit room.
- 12: T&T Power on site for warranty work related to call out on May 9<sup>th</sup>.
- 13: T&T power on site; SCADA programmer able to make blower operational again.
- 15: New battery replaced in verbatim alarm dialer.
- 27: K&L on site to complete deficiency list. T&T power back on site to complete warranty work on blowers.
- 28: Bell Canada on site to fix phone line issue causing delayed alarm dialing. Phone lines were submerged in water. Bell to have third party contractor raise the PED box outside of the gates, as it is more than two feet two low to the ground.

##### JUNE

- 01: High temperature in lime room caused by sand filter air compressor.
- 05: Blower 100 and fan was shut down due to issues with the fan faulting.
- 08: Decant turned off until effluent flow meter is commissioned.
- 08: T&T Power assessed blower 100 issue. It was concluded that the overload was tripping. Repair requires electrician to further investigate.
- 10: T&T power on site to further investigate Blower 100 fan issue. Ambient temperature in the room was high. Exhaust fan was rewired to allow cooling of the room.
- 12: Gerber Electric on site to assess filter building's air compressor. They concluded that the contactor melted and therefore, swapped it out with spare compressors contactor.
- 15: Gerber Electric on site to assess back wash filter pump; ordered new contactor as it was burnt out.
- 18: Gerber Electric installed new contactor and test pump. It was found that the pump was water logged from a basement flood. Gerber to provide a quote for replacement.
- 19: Albert's Generator on site for annual service.
- 25: CSI and T&T Power on site to commission effluent flow meter.

### **THIRD QUARTER:**

#### **JULY**

- 02: Gerber Electric was on site to remove both filter reject pumps. Pumps to be sent away for rebuild. Flow still diverting to lagoon.
- 06: Gerber Electric on site to reinstall the filter reject pumps, but require some plumbing to be changed and an alignment.
- 07: Gerber Electric's plumber on site to align pump and fix plumbing unions. Operator returned proper flows to plant and stopped diverting to lagoon. UV was turned on.
- 08: T&T Power on site to assess why the SCADA keeps freezing. No reason for the freezing was found.
- 22: Operators arrived to site in morning to find no blowers running. After troubleshooting and unable to run blowers in auto, started a blower in hand and called T&T Power to come for warranty work. T&T arrived and found a program fault. They added an alarm for no blowers running after 5 minutes.
- 23: T&T Power on site to assess issue with gas detector alarms at head works.
- 24: SPD sales was on site to fix the head works gas detectors. He updated the system to reset the buzzer after the alarm has cleared.
- 30: Alum delivery of 5000L from Chemtrade.

#### **AUGUST**

- 05: West Lorne Pump Station pump 3 was found to have a 'fail to stop alarm'. Pump 1 remains out of service. Troubleshooting was performed on the pumps. The pump 3 fault was cleared and the pump worked as designed. Pump 1 would not operate likely due to a blockage.
- 06: West Lorne Pump Station pump 1 was pulled from the wet well. The pump was jammed with wire and rags which were removed. The pump was reinstalled and ran in hand mode. The pump flow was acceptable, and pump 1 was returned to service.
- 11: Rinsed down effluent channel and clarifier with effluent water.
- 12: Ran a test of the RAS/WAS cycle to investigate the alarm callout the previous night. The pinch valve decreased to the correct flow rate and the RAS/WAS valve transitioned from RAS to WAS and back without fault. The system operated correctly, no errors were found.
- 14: An unusual intermittent thud was coming from the bar screen auger. Troubleshooting was performed on the equipment and the auger was run alternating between forward and reverse until the objects cleared. The auger then ran normally.
- 17: Troubleshooting performed on the West clarifier scraper. The unit was reset and monitored, no faults were found. The bar screen auger had an unusual loud noise coming from it. Troubleshooting was performed and several nuts, bolts and plastic parts were removed from the auger.
- 21: The SCADA computer froze during the day shift and called out an alarm. The computer was reset then operated normally.
- 25: Reviewed and made corrections for new assets to be entered into Maximo software. Rinsed down the clarifiers and effluent channel.
- 26: Removed 4 large old bolts from the influent channel.
- 27: Pho Tech Environmental was on site to remove chemical waste and spent UV bulbs.

## SEPTEMBER

- 02: Farmington mechanical on site to secure floor grating in bar screen area after near miss reported by an operator.
- 08: Operator assessed pump 3 at pump station as it has been faulting. Operator found that the pump will not operate at all. Operator scheduled Gerber's Electric to come and test wiring.
- 10: Operator completed a monthly check of the blowers and drained the water build up from the lines using the blow off ports at the aeration cells.
- 11: Operators receive UV light order from H2Flow
- 17: Hurricane Hydrovac on site at pump station to clean out rags and grease.
- 18: Gerber Electric on site at pump station. Tested pump 3 and found the pump to be shot; possibly faulty  
Windings in the motor.
- 22: K&L construction on site to grind out concrete and measure for new grating to be installed in bar screen area.

## **FOURTH QUARTER:**

### OCTOBER

- 29: Aecon on site to repair bell box; work order was submitted back in late spring. Lifting bell box so it doesn't get swamped with water.
- 30: Bell on site to splice cables into new bell box.

### NOVEMBER

- 02: DO set point changed so a low DO won't happen in aeration basins.
- 25: Operator adjusted SCADA at pump station to prevent loss of echo calls.

### DECEMBER

- 04 to 12: Operator investigates cause of pump faults which are sporadic at pump station and finds that during high flow the first pump faults before the second pump is called to operate.
- 24: Operator adjusted DO set points from previous night call out as the DO readings were very high in aeration after the set points were changed by the on call operator.

## **SECTION 6: ALARM SUMMARY**

### **FIRST QUARTER:**

#### JANUARY:

- 08: Pump fault at pump station; reset pump and monitored.
- 10: Alarm for Bar Screen high level. Operator cleaned temporary bar screen and ensured everything was operating normal.
- 11: Pump 2 fail; turned pump off until PLC upgrade.
- 13: Filter building high level, blower fault and bar screen fault; issues were resolved and monitored
- 18: Operator on site to check temporary operations at plant.
- 19: Operator on site to check temporary operations at plant.

## FEBRUARY:

There were no alarms this month.

## MARCH:

28: Pump station pump 3 failed to start. Operator switched pump off and left pump station running on 2 pumps.

## **SECOND QUARTER:**

### APRIL

There were no alarms this month.

### MAY

- 09: Blower 101 fan fault; operator unable to reset. Blower fan turned off as other blowers were able to work. Issue believed to be caused by a power flicker.
- 24: Odour complaint received; community complaint form was filled out and filed. Operator on site to investigate, but no odours were found.
- 26: Blower issues; operator unable to fix problem and put blower 102 into hand to allow it to work all night till next day.
- 28: Operator called out for an alarm that was delayed by several hours. Operator got plant back up and running, but was unable to get alarms working.

### JUNE

- 04: Channel 1 Alarm; operator reset SCADA computer and plant resumed normal operation.
- 10: Power outage; operator ran generator until power was restored. Operator reset all alarms.
- 11: Power outage; operator ran generator, but outage had caused filter basement to flood. Operator diverted flow to the lagoon; could not start filter building air compressor.
- 12: Operator back on site to turn off generator.
- 13: Back wash pump fault; operator unable to start pump so flow was partially diverted to the lagoon.
- 19: Channel 1 alarm; SCADA computer frozen. Operator restarted the system and all operations returned to normal.
- 27: Channel 1 alarm; operator reset SCADA computer and found second filter back wash pump had faulted. Operator diverted all flow to lagoon and turned off UV system.

## **THIRD QUARTER:**

### JULY

- 04: Operator received alarm for pump station loss of echo. Operator arrived on site and found system working as normal.
- 05: Operator received alarm for channel 3. Upon arrival, found SCADA frozen. Operator reset the computer and the system returned to normal operation.
- 10: Operator received call for power failure during a storm situation. Operator ran generator and stayed on site until power was restored.
- 15: Operator received call for channel 3. Upon arrival, found SCADA frozen. Operator reset the computer and the system returned to normal operation.

- 17: Operator received alarm at pump station for pump 1 fault. Operator arrived on site and set pump to off and left pump 2 and 3 in auto. Later that night operator received call from operations manager that there was a strange noise at plant. Operator arrived at plant to find head works gas detectors in alarm. Operator reset alarms.
- 25: Operator received call for high methane gas at head works. By the time operator arrived on site alarm had cleared and was back to normal.
- 26: Operator received call for high methane gas at head works. By the time operator arrived on site alarm had cleared and was back to normal.
- 29: Operator received alarm for channel 3, arrived on site and found SCADA frozen. Operator reset the computer and the system returned to normal operation.

## AUGUST

- 01: Received an alarm call for a channel 2 alarm. Went to site and found blower fan 101 in fault. Reset the blower fan fault and returned the blower to service. A facility walkthrough was performed, the facility was operating normally.
- 12: Received a call from Spectrum for a channel 1 alarm 'now normal'. Arrived on site and found a cleared alarm for WAS valve stuck open. Observed RAS/WAS pumps cycling the duty (in-service) pump correctly. SCADA was reviewed, the facility was operating normally.
- 13: Received an alarm call from Spectrum at 19:40. Arrived on site and found the SCADA computer frozen. Reset the SCADA computer and performed a plant walk through, all systems were operating as designed.
- 15: Received an alarm call from Spectrum at 03:24. Arrived at the facility and found the filter backwash tank level hi-hi alarm had been active but was already cleared. Received another alarm call from Spectrum a few hours later. Arrived at the facility to find the filter backwash tank level hi-hi alarm had been active but was cleared. Investigated the filter backwash tank issue and performed a facility walkthrough. The filter air compressor was found off. Turned on the air compressor and monitored a couple of cycles of the filter backwash tank filling and emptying. The facility was the operating normally.
- 16: Received an alarm call from Spectrum. Arrived on site and found several alarms had been active but majority were now clear. The likely cause was a power flicker due to a thunderstorm in the area. The blower fans, RAS/WAS pumps, sludge scrapers and filter air compressor were reset. The scraper for clarifier 2 would not reset but could be left out of service until Monday morning. The facility was then operating normally.

## SEPTEMBER

- 06: On-call operator received a page; channel 1 alarm. Upon arrival found the power was off due to a storm. Operator started generator and remained on site until power was restored. Operator completed plant walk through and ensured all operations were normal.
- 08: On-call operator received loss of echo alarm for pump station. Operator arrived on site and everything was normal. Operator reset dialer.
- 09: On-call operator received page for channel 2 alarm; loss of communication. Operator arrived on site and SCADA computer was frozen. Operator restarted computer and all systems returned to normal.

24: On-call operator received page for channel 2 loss of communication. Operator arrived on site and reset SCADA computer; all other systems operating normal.

#### **FOURTH QUARTER:**

##### **OCTOBER**

- 09: Operator received page for communication fail. Operator attended site and reset SCADA.
- 15: Operator received channel 1 alarm. Arrived on site to reset all pumps and compressor due to power flicker.
- 18: Operator received page from pump station; loss of echo. Operator arrived on site everything was normal and pumps operating as they should.
- 22: Operator received page for communication fail. Operator attended site and reset SCADA computer; all systems returned to normal.
- 23: Operator received page for power fail. Operator attended site and reset all pumps and compressors.
- 31: Operator received page and attended plant. DO was low in aeration but had recovered prior to operator's arrival. Operator used hand held to verify readings were correct.

##### **NOVEMBER**

- 02: Operator received a loss of echo at pump station. Alarm was cleared by the time operator was on site.
- 06: Operator received communication loss; SCADA reset and plant checked for proper operations.
- 14: Operator received communication loss; SCADA reset and plant checked for proper operations.
- 21: Operator received communication loss; SCADA reset and plant checked for proper operations.
- 24: Operator received a loss of echo at pump station. Alarm was cleared by the time operator was on site.
- 29: Operator received communication loss; SCADA reset and plant checked for proper operations.

##### **DECEMBER**

- 04: Operator received alarm to West Lorne pump station for pump fail. Operator switched to pump 2 and turned off pump 1.
- 07: Operator received communication loss; SCADA reset and plant checked for proper operations.
- 12: Operator received page for pump fault and again switched to only allow pump 2 to operate.
- 12: Operator received communication loss; SCADA reset and plant checked for proper operations.
- 18: Operator received Low DO call out. Operator monitored system till DO was normal.
- 19: Operator received communication loss; SCADA reset and plant checked for proper operations.
- 23: Operator received Low DO call out. Operator increased blower speeds and set points to fix issue.

27: Operator received communication loss; SCADA reset and plant checked for proper operations.

## **SECTION 7: COMMUNITY COMPLAINTS & CONCERNS**

### **FIRST QUARTER:**

There were no complaints or concerns this quarter.

### **SECOND QUARTER:**

#### **MAY:**

24: Odour complaint received; community complaint form was filled out and filed. Operator on site to investigate, but no odours found. SAME AS ALARM ABOVE

### **THIRD QUARTER:**

There were no complaints or concerns this quarter.

### **FOURTH QUARTER:**

There were no complaints or concerns this quarter.