A dynamic, high-speed photograph of water splashing, creating a sense of movement and freshness. The water is captured in mid-air, with droplets and ripples clearly visible against a light blue background.

West Lorne Wastewater Treatment Plant & Collection System Operations Report Second Quarter 2018

Submitted by:
Ontario Clean Water Agency
Date: July 18, 2018



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 m³/day
Total Annual Flow (2017 Data): 181,074 m³/year
Average Day Flow (2017 Data): 496 m³/day
Maximum Day Flow (2017 Data): 1,512 m³/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

Contacts:

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Sr. Operations Manager: Sam Smith 226-377-1540
Business Development Manager: Susan Budden 519: 318-3271

SECTION 1: COMPLIANCE SUMMARY

FIRST QUARTER:

January 25th, 2018 – Lagoon overflowed due to rain and snow melt.

SECOND QUARTER:

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

SECTION 2: INSPECTIONS

FIRST QUARTER:

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

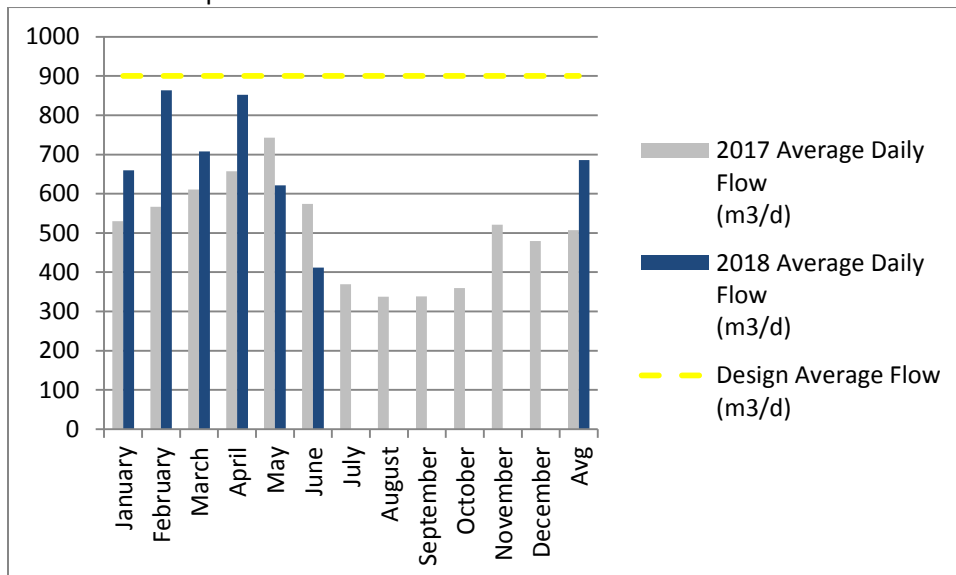
SECOND QUARTER:

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

SECTION 3: PERFORMANCE ASSESSMENT REPORT

The average daily flow for the wastewater treatment plant so far in 2018 is 686.1 m³/d. The average daily flow in 2017 was 507.3 m³/d, therefore the flow for 2018 is so far up 36% when compared to 2017. The plant is currently at 76.2 % of its rated capacity of 900m³/d.

Chart 1. Raw flows in 2018 compared to 2017 flows.



Raw samples are taken on a biweekly basis following the ECA requirements. The table below shows the raw sample results for 2018 so far.

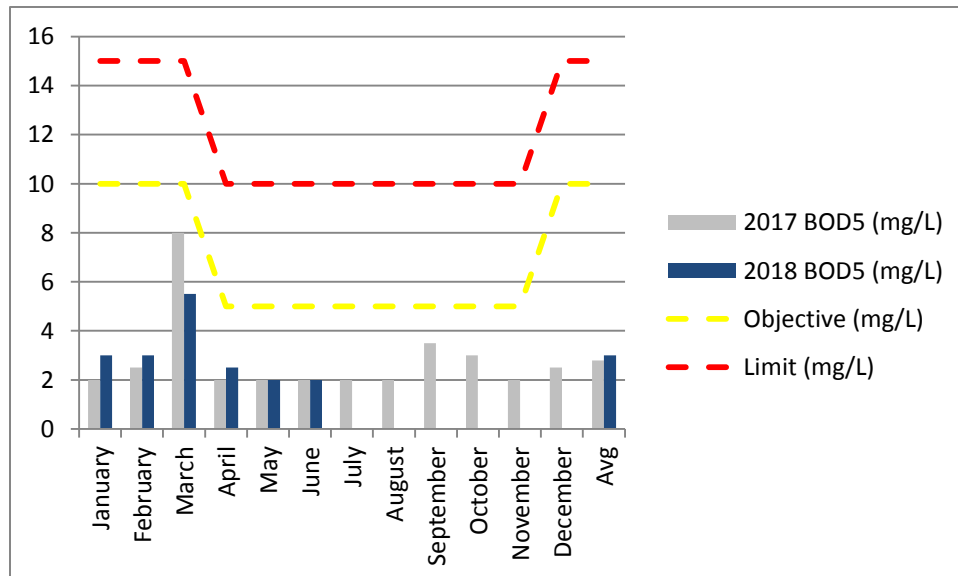
Table 1. Raw water sample results for 2018.

| | BOD5 (mg/L) | TKN (mg/L) | TP (mg/L) | TSS (mg/L) | Alkalinity (mg/L) |
|-----------------------|------------------------|-----------------------|----------------------|-----------------------|------------------------------|
| January Results | 79 | 22.1 | 2.12 | 202.3 | 312 |
| February Results | 112 | 23.25 | 2.595 | 70 | 203.75 |
| March Results | 82.5 | 13.6 | 1.555 | 121 | 287 |
| April Results | 63 | 13.7 | 1.47 | 44.5 | 307.5 |
| May Results | 125.5 | 27.05 | 3.065 | 94.5 | 300 |
| June Results | 154.5 | 30.5 | 3.445 | 156.5 | 205 |
| July Results | - | - | - | - | - |
| August Results | - | - | - | - | - |
| September Results | - | - | - | - | - |
| October Results | - | - | - | - | - |
| November Results | - | - | - | - | - |
| December Results | - | - | - | - | - |
| Annual Average | 136.75 | 19.65 | 2.09 | 70.4 | 267.6 |

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

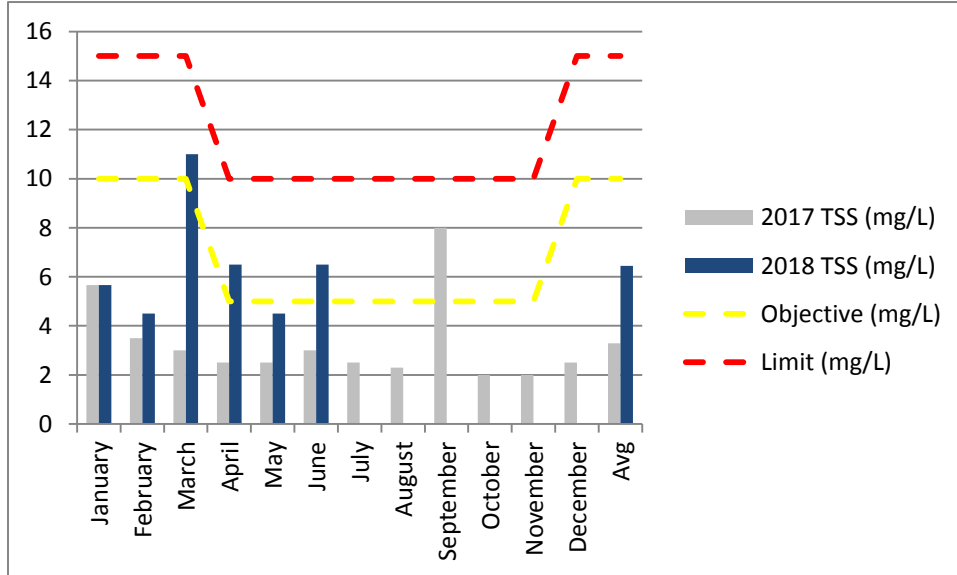
The average effluent BOD5 for 2018 so far is 3.0 mg/L, meeting both effluent objectives and limits identified in the ECA. The annual average result for BOD5 in 2017 was 2.8mg/L, therefore the results for 2018 so far are up by 7.5% when compared to 2017 (refer to Chart 2).

Chart 2. Average Monthly Effluent BOD5 results for 2018 compared to 2017.



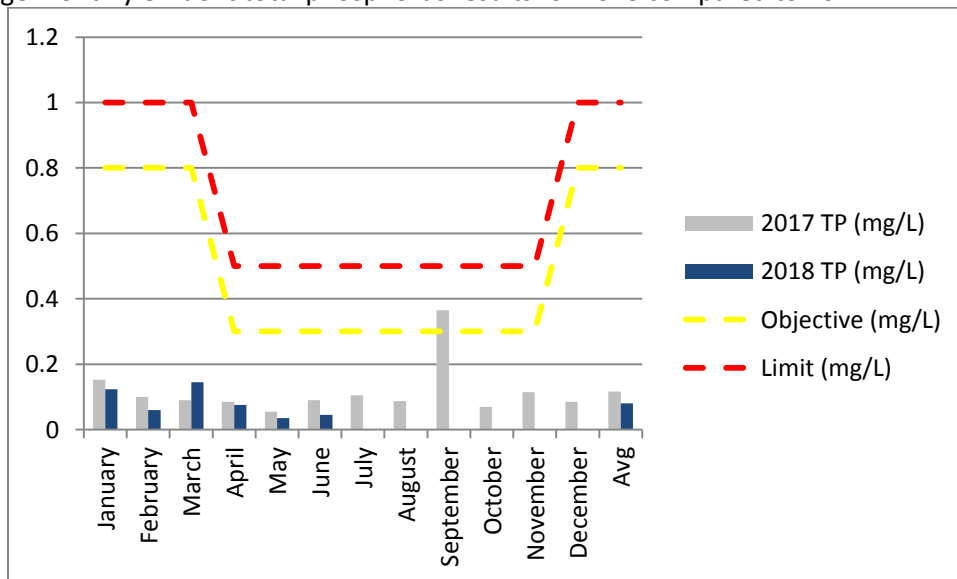
The average effluent TSS for 2018 so far is 6.4mg/L, meeting effluent limits identified in the ECA and exceeding the effluent objective for March, April and June due to wasting and alum dosage adjustments. The annual average result for TSS in 2017 was 3.3mg/L, therefore the results for 2018 are so far up by 96% when compared to 2017 (refer to Chart 3).

Chart 3. Average monthly effluent total suspended solids results for 2018 compared to 2017.



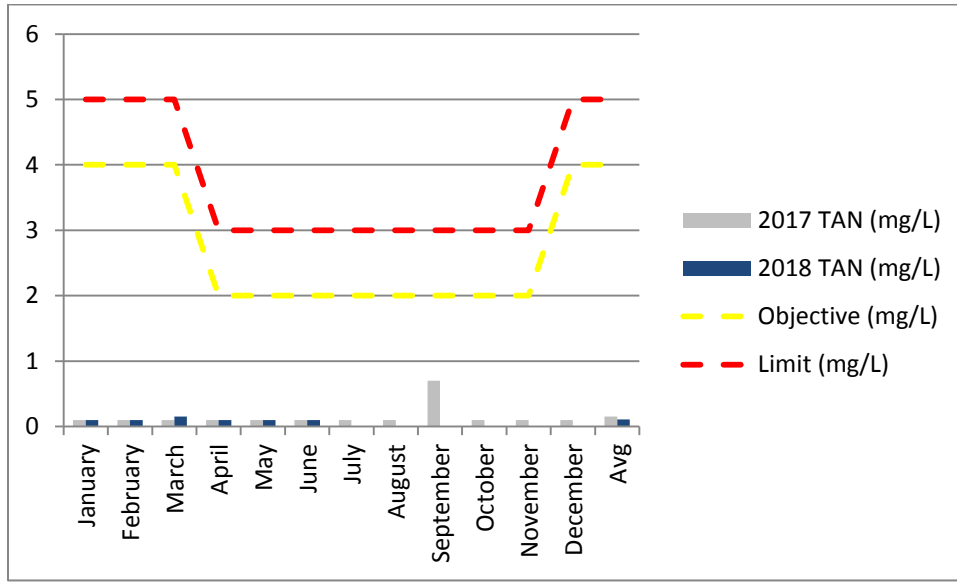
The average effluent TP for 2018 so far is 0.08 mg/L, meeting effluent limits and objectives identified in the ECA. The annual average result for TP in 2017 was 0.12mg/L, therefore the results for 2018 so far are down by 31% when compared to 2017 (refer to Chart 4).

Chart 4. Average monthly effluent total phosphorus results for 2018 compared to 2017.



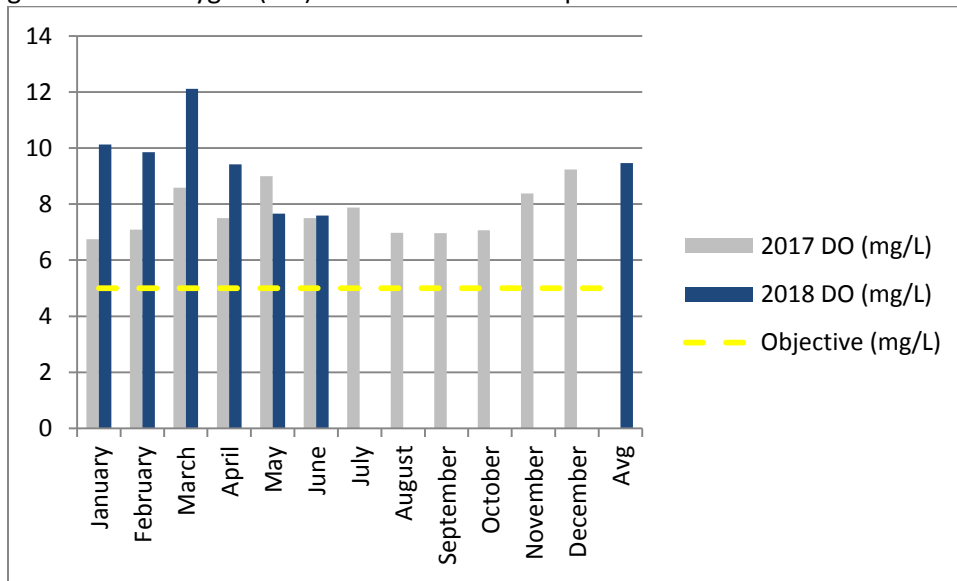
The average effluent TAN for 2018 so far is 0.11mg/L, meeting both effluent objectives and limits identified in the ECA. The annual average result for TAN in 2017 was 0.15mg/L, therefore the results for 2018 so far are down 28% compared to 2017 (refer to Chart 5).

Chart 5. Average monthly effluent total ammonia nitrogen results for 2018 compared to 2017.



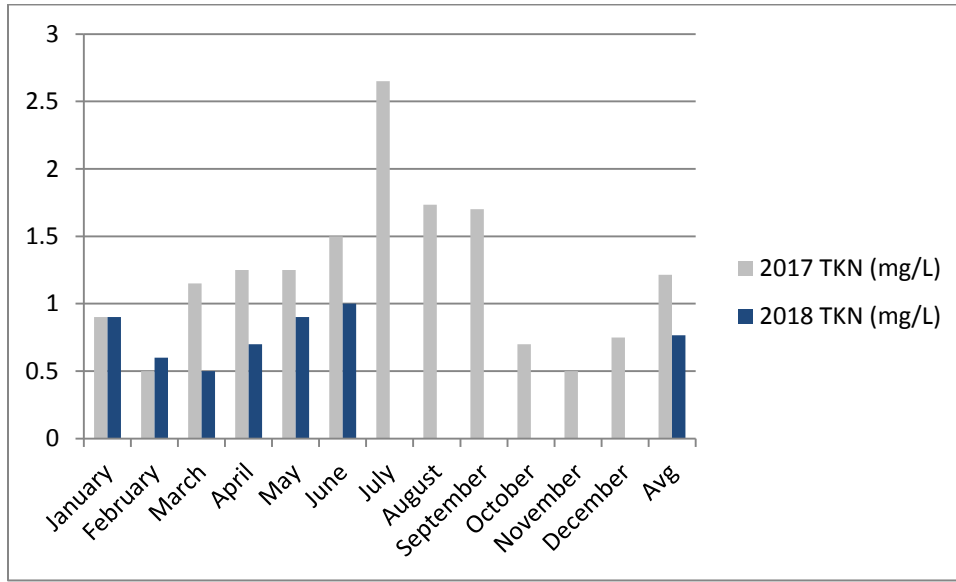
Dissolved oxygen (DO) of the effluent is tested on site at the plant, the ECA identifies a minimum level required as an objective. This objective is 5mg/L. The chart below (chart 7) shows the average DO concentrations; there have been no objective exceedances.

Chart 7. Average Dissolved Oxygen (DO) results for 2018 compared to 2017.



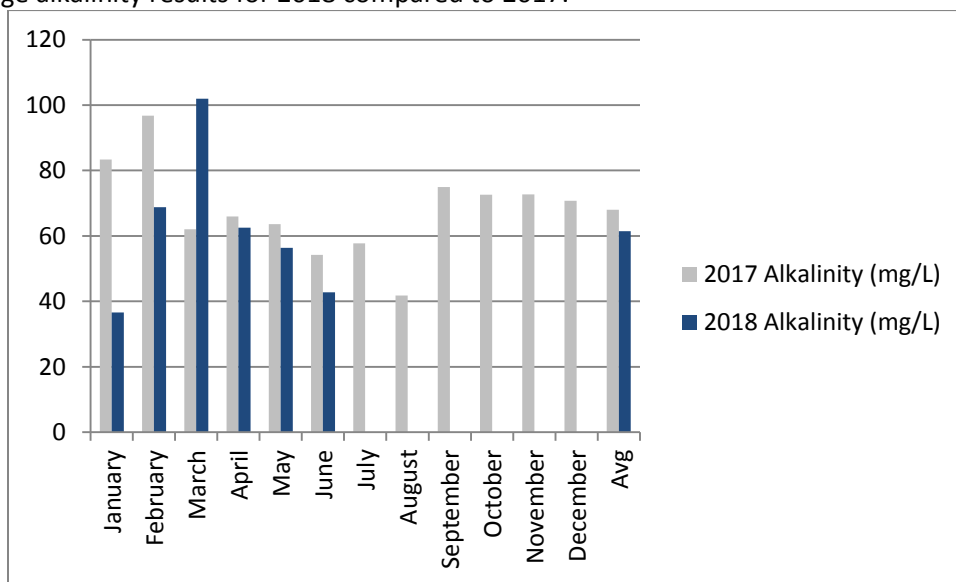
Total Kjeldahl Nitrogen (TKN) is sampled biweekly in accordance with ECA requirements; there are no objective or limits imposed on this parameter. The average effluent TKN for 2018 so far is 0.78mg/L. The annual average result for TKN in 2017 was 1.2mg/L, therefore the results for 2018 so far are down by 37% when compared to 2017 (refer to Chart 8).

Chart 8. Average TKN results for 2018 compared to 2017.



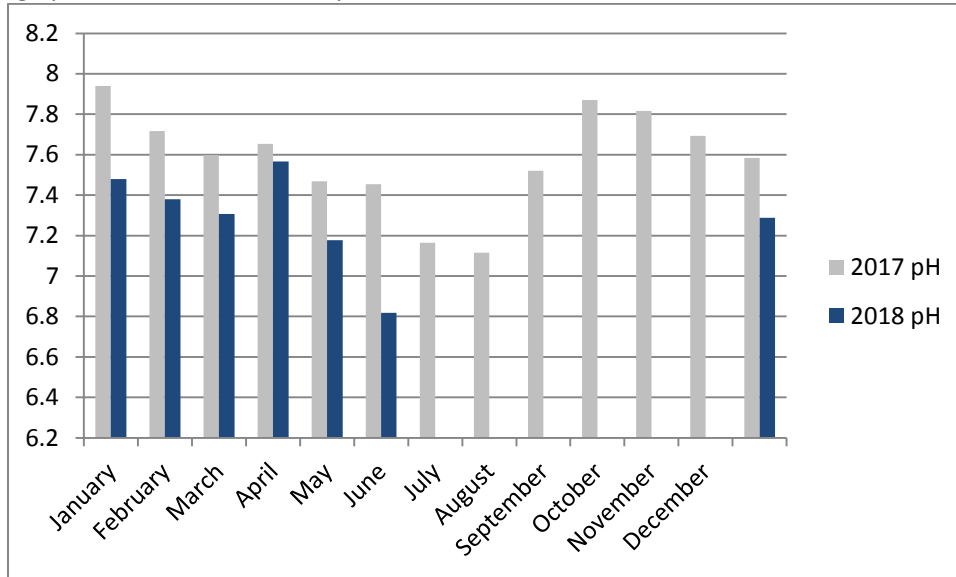
Alkalinity is sampled at least biweekly in accordance with ECA requirements; there are no objective or limits imposed on this parameter. It is recommended that at least 50mg/L is present in the effluent. The average effluent alkalinity for 2018 so far is 61.5mg/L. The annual average result for alkalinity in 2017 was 68mg/L, therefore the results for 2018 so far are down by 9.6% when compared to 2017 (refer to Chart 9).

Chart 9. Average alkalinity results for 2018 compared to 2017.



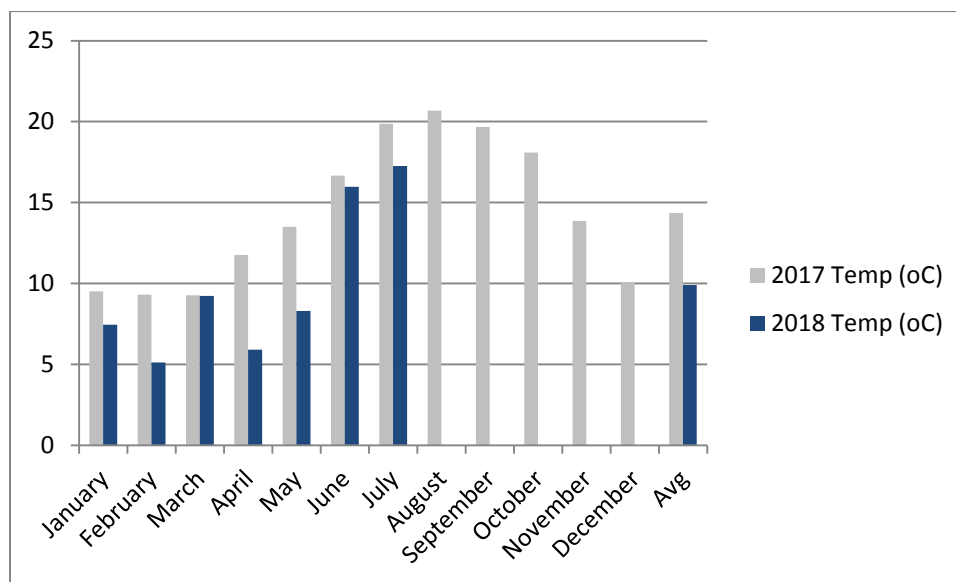
pH is sampled at least biweekly in accordance with ECA requirements; there are no objective or limits imposed on this parameter. It is recommended that the pH is in the range of 6.5-8.5. The average effluent pH for 2018 so far is 7.29. The annual average result for pH in 2017 was 7.58, therefore the results for 2018 so far are down by 3.9% when compared to 2017 (refer to Chart 10).

Chart 10. Average pH results for 2018 compared to 2017.



Temperature is measured at least biweekly in accordance with ECA requirements; there are no objective or limits imposed on this parameter. The temperature of the effluent fluctuates based on outdoor temperatures. The average effluent temperature for 2018 so far is 9.89°C. The annual average temperature in 2017 was 14.4 °C, therefore the results for 2018 so far are down by 31% when compared to 2017 (refer to Chart 11).

Chart 11. Average Temperature results for 2018 compared to 2017.



SECTION 4: OCCUPATIONAL HEALTH & SAFETY

FIRST QUARTER:

There were no Health and Safety concerns this quarter.

SECOND QUARTER:

Electrical conduit in bar screen area corroded.

SECTION 5: GENERAL MAINTENANCE

FIRST QUARTER:

JANUARY:

05: Frozen gear box causing flight chains to jump off sprockets, thawed out with jugs of hot water. Flights back to normal operation.

07: Frozen gear box causing flight chains to jump off sprockets, thawed out with jugs of hot water. Flights back to normal operation

22: Cleaned UV channel

24: Inspected Alum Pumps

25: Received notification that West lagoon was over flowing, arrived onsite @ 10:50 found a slow trickle pooling in south west corner low point. Collected samples and tested for ammonia and total phosphorous, Total Phos 0.00 MG/L, Ammonia 0.37 MG/L, PH 7.4. Contacted municipality and developed a plan to construct a berm and contain the leak, leak estimated to be 1m³ per 5 hrs and started at approximately 5:00 am. Notified SAC of overflow, sample Taken @ 11:45. SAC Report #901827. Estimated 5m³ in 24 hrs.

FEBRUARY:

01: Lagoon decant in progress

05: Turned up alum pump to get higher dosage for lagoon decant.

12: WAS valve stuck open, unable to control WAS valve using SCADA. Operated WAS valve manually and was able to redirect sludge to aeration tank; exercised WAS valve on SCADA without concern. All systems operating normally.

13: Switched blower #1 from duty 2 to duty 1 as per OIC.

27: Complete calibration with buffers on pH meter. Adjusted alum pumps due to high dose.

MARCH:

01: Cleaning of clarifiers, bar screen and UV channel. Pumped out RAS chamber.

05: Cleaning out of Grit bin and grit room.

07: Received Alum delivery from Chemtrade, 9000L of alum. Operator flushed Alum line beforehand.

16: Completed facility generator check and tested dialer alarms.

20: Completed cleanse of both clarifiers.

27: Completed cleaning of clarifiers, UV channel and bar screen.

28: Operator repaired alum line on discharge side of the pump. Replaced a section with new line.

SECOND QUARTER:

APRIL:

- 03: Start east lagoon transfer to west lagoon.
- 04: Install UV lights for season.
- 05: Gerber onsite to work on bar screen.
- 11: Clean clarifiers and v-notches.
- 13: Fuel generators.
- 17: Flowmetrix onsite for calibration.
- 24: Clean clarifier.
- 26: Alum delivery from Chemtrade.

MAY:

- 10: Completed full cleaning of clarifiers.
- 15: Clean clarifiers and UV channel.
- 17: Clarifier cleaning, generator runs, alarm tests completed.
- 29: Decant completed for season; alum dose adjusted down to regular flows.

JUNE:

- 07: Chemtrade onsite for alum delivery.
- 26: Supervisor onsite to review process & logbook.

SECTION 6: ALARM SUMMARY

FIRST QUARTER:

JANUARY:

No alarms this month.

FEBRUARY:

No alarms this month.

MARCH:

20: Operator onsite for channel 20 alarm, low RAS. East clarifier was nearly empty due to cleaning process the previous day. This caused the RAS flow to be low when the pumps tried to pump from that clarifier. Operator returned full flow to east clarifier and monitored flows as process returned to normal.

SECOND QUARTER:

APRIL:

There were no alarms this month.

MAY:

- 02: Channel 18 alarm for power failure. Operator started generator and restarted plant and monitored till power restored.
- 14: RAS chamber flood alarm. Operator arrived onsite and pumped down till out of alarm.

JUNE:

There were no alarms this month.

SECTION 7: COMMUNITY COMPLAINTS & CONCERNS

FIRST QUARTER:

There were no complaints or concerns this quarter.

SECOND QUARTER:

There were no complaints or concerns this quarter.