Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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Ministry of the Environment, Conservation and Parks
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March 26, 2021

Re: 2020 Annual Performance Report for the Airport Sewage Treatment System

Attached is the 2020 Annual Performance Report for the Airport Sewage Treatment System located at 38 Greens Rd. in the County of Brant. This report has been completed in accordance with:

- Condition No. 10(6)(a)-(j) cited in Environmental Compliance Approval #8181-8TXHRN dated July 23, 2012 and issued to the Corporation of the County of Brant.

This report was prepared by the Ontario Clean Water Agency on behalf of the County of Brant based on the information we have in our records. The report covers the period from January 1, 2020 to December 31, 2020.

Sincerely,

Sam Sianas
Senior Operations Manager
Ontario Clean Water Agency

Cc.
Matthew D'Hondt – Solid Waste/Wastewater Operations Manager – County of Brant
Allison McGuckin – Process Compliance Technician – Ontario Clean Water Agency
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2020 ANNUAL PERFORMANCE REPORT

AIRPORT SEWAGE TREATMENT SYSTEM

38 GREENS ROAD, BRANT COUNTY

MECP ENVIRONMENTAL COMPLIANCE APPROVAL #8181-8TXHRN

BY THE OPERATING AUTHORITY: ONTARIO CLEAN WATER AGENCY

PREPARED FOR: THE MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS

ON BEHALF OF: THE COUNTY OF BRANT

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INTRODUCTION

The Airport Sewage Treatment System (Airport STS) located in the County of Brant at 38 Greens Road is a large subsurface sewage disposal system. The Airport STS consists of an Integrated Surge Anoxic Mix (ISAM) sequencing batch reactor (SBR) system with a fixed cloth media filter discharging to a tile bed with a design treatment capacity of $60m^3$/day (phase 1) and consists of the following treatment steps:

Influent: Influent enters the influent pump manhole (MH2A) from the gravity collection system. The influent pumps are controlled by a level probe with a start and stop at predetermined levels into the anaerobic chamber where solids settle. The influent then flows to the ISAM reactor by gravity through a weir. Mixed liquor is maintained in the ISAM reactor to suppress odour and initiate and accelerate carbon and nitrogen reduction.

Fill Phase: When the level in the ISAM reactor reaches a predetermined "control level" based off operational discretion, the Jet/Mix liquid pump is started. The SBR basin is filled, mixed and Alum and Carbon chemical injections occur. A percentage of the pumped flow is returned to the anaerobic chamber where biological solids settle. Settled solids in the anaerobic chamber are digested.

Interact Phase: When the level in the SBR basin reaches the high water level, nitrified mixed liquor overflows a weir and flows back into the ISAM reactor to mix and react with the raw influent. Aeration is cycled on and off to provide the required oxygen. Scum is also removed from the SBR basin.

Settle Phase: When the level in the ISAM reactor again reaches "control level" aeration is discontinued and the SBR basin settles under perfect quiescent conditions under operator discretion.

Decant/Disposal Phase: Under normal flow conditions and high flow conditions there are two settle timers that are controlled by operator discretion. Currently the settle timers are set at 60min and 45min respectively. When the settle times are reached, the decant valve opens and treated effluent is withdrawn from the upper portion of the SBR basin and discharged to a post equalization tank which contains effluent pumps, which are controlled by floats which pump the effluent through a fixed cloth media filter to the disposal effluent pump chamber (PS3A). The disposal effluent pump chamber pumps the liquid through a flow meter, housed in the disposal control building, then distributed to 3 subsurface tile beds which are sequentially dosed.

The Ministry of Environment, Conservation and Parks (MECP) was provided notification from MTE Consultants Ltd. on May 31, 2013 of the Airport STS start as per section 10(1) of ECA# 8181-8TXHRN.

Substantial performance was issued on April 10, 2015 and effluent limits became enforceable October 10, 2015 as outlined in Section 4(1) of ECA# 8181-8TXHRN.

PLANT FACTS

Environmental Compliance Approval (ECA):	8181-8TXHRN (Dated July 23, 2012)
Rated Capacity for Phase 1:	$60m^3$/day
Receiving System:	Effluent discharges to onsite tile beds.

The following report is presented such that it corresponds with ECA #8181-8TXHRN Section 10(6) (a) through (j).

SECTION A – MONITORING DATA

As outlined in the ECA #8181-8TXHRN Section 10(6) (a) the following is a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Table 1 of this report, including an overview of the success and adequacy of the Airport STS.

(I) EFFLUENT LIMITS

TABLE 1 – EFFLUENT LIMITS

Effluent Parameter	Annual Concentration Limit (mg/L)
$CBOD_5$	10
Total Suspended Solids	10
Total Phosphorus	5
Total Ammonia Nitrogen +Nitrates Nitrogen	10

(II) SAMPLING PROCEDURES

As per ECA#8181-8TXHRN samples are to be collected from the Airport STS in accordance with the tables 2 and 3 below, utilizing a grab sampling procedure. Analysis for these parameters is conducted at SGS Lakefield Analytical (SGS) in Lakefield, Ontario. SGS is a member of the Canadian Association for Laboratory Accreditation Incorporated, certificate # 1999. The full annual dataset is included in *Appendix B.*

TABLE 2 – INFLUENT MONITORING

Parameters	Sample type	Frequency
BOD_5	Grab	Quarterly
Total Suspended Solids	Grab	Quarterly
Total Phosphorus	Grab	Quarterly
Total Kjeldahl Nitrogen	Grab	Quarterly
Total Petroleum Hydrocarbons	Grab	Quarterly

TABLE 3 - EFFLUENT MONITORING

Parameters	Sample type	Frequency
$CBOD_5$	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Ammonia Nitrogen	Grab	Monthly
Nitrate Nitrogen	Grab	Monthly
Chloride	Grab	Monthly
pH	Grab	Monthly
Total VOCs	Grab	Annually
ICP Scan of Metals	Grab	Annually
Total Petroleum Hydrocarbons	Grab	Annually

(III) PLANT PERFORMANCE

Table 4 and 5 summarizes the raw influent and final effluent parameters which are required by ECA# 8181-8TXHRN to be sampled, at a minimum, on a quarterly and monthly frequency respectively.

TABLE 4 – FINAL EFFLUENT AVERAGE MONTHLY CONCENTRATIONS

	$CBOD_5$ (mg/l)	Total Suspended Solids (mg/l)	Total Phosphorus (mg/l)	Total Ammonia Nitrogen (mg/l)	Nitrate Nitrogen (mg/l)	Total Ammonia Nitrogen +Nitrate Nitrogen (mg/l)	Chloride (mg/l)	pH
ECA Limits	**10**	**10**	**5**			**10**		
January	4.0	7.0	0.09	0.10	6.43	6.53	390	7.12
February	2.5	4.0	0.16	0.10	5.71	5.81	345	6.87
March	2.0	3.5	0.18	0.25	4.84	5.09	520	7.23
April	2.0	3.0	0.36	0.10	7.86	7.96	830	7.17
May	2.0	6.5	1.40	0.15	8.63	8.78	1250	7.01
June	3.0	*33.0	2.86	1.40	3.11	4.51	770	7.03
July	2.0	*15.0	1.32	0.20	2.09	2.29	1100	6.94
August	2.0	*18.0	1.48	0.10	0.41	0.51	680	7.34
September	4.0	*25.0	2.21	0.10	2.50	2.60	1000	7.18
October	30.0	*32.0	1.70	0.10	8.66	8.76	99	6.91
November	3.0	7.3	3.80	0.10	21.90	22.00	670	7.59
December	3.0	5.5	0.78	1.00	0.96	1.76	380	6.82
Annual Average	**4.3**	**8.8**	**1.20**	**0.30**	**6.15**	**6.42**	**677**	**7.09**

NOTE: The Annual Average values are calculated based on all data collected for the purpose of the ECA for 2020.
Data tables are included in *Appendix B*
*The higher TSS values are discussed further in Table 13

TABLE 5 – RAW INFLUENT AVERAGE CONCENTRATIONS

	BOD_5 (mg/l)	TSS (mg/l)	TP (mg/l)	TKN (mg/l)	CCME F1 (C6-C10) (ug/l)	CCME F2 (C10-C16) (ug/l)	CCME F3 (C16-C34) (ug/l)	CCME F4 (C34-C50) (ug/l)	Oil& Grease (total) (mg/l)
January	160	148	6.75	83.1	--	--	--	--	--
February	107	74	6.19	62.9	<25	261	233	<200	4
March	91	73	6.02	65.7	--	--	--	--	--
April	254	160	13.00	61.3	--	--	--	--	--
May	176	281	10.60	54.6	73	370	890	308	20
June	111	40	3.75	21.5	--	--	--	--	--
July	18	36	3.24	17.1	--	--	--	--	--
August	14.5	26	2.63	9.1	<25	<100	<200	<200	2
September	20	19	2.14	<0.5	--	--	--	--	--
October	43	46	4.64	54.6	--	--	--	--	--
November	111	166	8.24	33.10	<25	161	350	<200	7
December	48	30	3.90	27.20	--	--	--	--	--

Note: Sampling for Oil & Grease and total hydrocarbons are sampled once per quarter as per ECA#8181-8TXHRN

The above table shows the influent results feeding the facility. The BOD5 and Total Suspended Solids data for July, August and September are severely low and will not be sufficient to sustain the biomass in the facility. Additionally, there is an increase in F3 Petroleum Hydrocarbons in May of each year when comparing the 2020 data to previous years. CCME F3 consists of gasoline, diesel and light oils. As these compounds are not a seasonal contribution, the data trends suggest that the source is industry related and could be indicative of failing or missing oil and grit separators. Additional Hydrocarbon and Metal analysis was completed on the influent and collections system – data can be found in ***Section J***.

TABLE 6- MIXED LIQUOR

Month	Alkalinity (mg/l as $CaCO_3$)	Volatile Suspended Solids (mg/l)	Total Suspended Solids (mg/l)
January	312	4,660	5,500
February	295	5,080	5,960
March	348	4,600	5,420
April	403	4,260	5,110
May	414	4,200	4,770
June	483	2,690	3,230
July	437	1,490	1,880
August	491	2,500	3,110
September	577	2,320	3,000
October	355	2,580	3,250
November	330	2,260	2,790
December	760	3,020	3,780

TABLE 7- 2020 FINAL EFFLUENT CHLORIDE SAMPLING

Date	Chloride Result (mg/l)
16-Jan-20	390
05-Feb-20	360
19-Feb-20	330
05-Mar-20	580
12-Mar-20	460
14-Apr-20	830
13-May-20	1200
26-May-20	1300
03-Jun-20	770
15-Jun -20	1100
12-Aug-20	680
09-Sep-20	1000
29-Oct-20	99
16-Nov-20	670
07-Dec-20	380

As per ECA #8181-8TXHRN, the following tables summarize the annual final effluent sampling for Total VOC's, ICP Scan of Metals and Total Petroleum Hydrocarbons.

TABLE 8 – FINAL EFFLUENT ANNUAL GRAB SAMPLE – FEBRUARY 12, 2020

ICP Scan of Metals	Concentration
Aluminum (total) [mg/l]	0.078
Antimony (total) [mg/l]	<0.0009
Arsenic (total) [mg/l]	<0.0002
Barium (total) [mg/l]	0.06902
Beryllium (total) [mg/l]	<0.000007
Bismuth (total) [mg/l]	0.000059
Boron (total) [mg/l]	<0.002
Calcium (total) [mg/l]	81.3
Cadmium (total) [mg/l]	0.0001
Chromium (total) [mg/l]	0.00056

Cobalt (total) [mg/l]	0.000066
Copper (total) [mg/l]	0.005
Iron (total) [mg/l]	0.029
Potassium (total) [mg/l]	30.6
Lithium (total) [mg/l]	0.0038
Magnesium (total) [mg/l]	19.3
Manganese (total) [mg/l]	0.0151
Molybdenum (total) [mg/l]	0.00118
Nickel (total) [mg/l]	0.0013
Phosphorus (total) [mg/l]	0.2
Lead (total) [mg/l]	0.00009
Selenium (total) [mg/l]	0.00012
Silicon (total) [mg/l]	5.3
Silver (total) [mg/l]	<0.00005
Sodium (total) [mg/l]	191
Strontium (total) [mg/l]	0.423
Tellurium (total) [mg/l]	<0.0001
Thallium (total) [mg/l]	<0.0001
Thorium (total) [mg/l]	<0.000005
Tin (total) [mg/l]	0.0003
Titanium (total) [mg/l]	0.00036
Tungstun (total) [mg/l]	0.00016
Uranium (total) [mg/l]	0.000003
Vanadium (total) [mg/l]	0.00029
Zinc (total) [mg/l]	0.019
Zirconium (total) [mg/l]	<0.002
Total Petroleum Hydrocarbons	**Concentration**
Oil & Grease Total [ug/L]	<2
CCME F1 (C6-C10) [ug/L]	<25
CCME F2 (C10-C16) [ug/L]	<25
CCME F1-BTEX (C6-C10) [ug/L]	<25
CCME F3 (C16-C34) [ug/L]	<100
CCME F4 (C34-C50) [ug/L]	<200
VOC's	**Concentration**
Acetone [ug/L]	<30
Benzene [ug/L]	<0.5
Bromodichloromethane [ug/L]	<0.5
Bromoform [ug/L]	<0.5
Bromomethane [ug/L]	<0.5
Carbon tetrachloride [ug/L]	<0.2
Chlorobenzene [ug/L]	<0.5
Chloroethane [ug/L]	<5
Chloroform [ug/L]	<0.5
Chloromethane [ug/L]	<5
Dibromochloromethane [ug/L]	<0.5
1,2-Dichlorobenzene [ug/L]	<0.5
1,3-Dichlorobenzene [ug/L]	<0.5
1,4-Dichlorobenzene [ug/L]	<0.5
1,1-Dichloroethane [ug/L]	<0.5
1,2-Dichloroethane [ug/L]	<0.5
cis-1,2-Dichloroethene [ug/L]	<0.5
1,1-Dichloroethylene [ug/L]	<0.5
1,2-Dichloropropane [ug/L]	<0.5
trans-1,2-Dichloroethene [ug/L]	<0.5

cis-1,3-Dichloropropene [ug/L]	<0.5
trans-1,3-Dichloropropene [ug/L]	<0.5
Ethylbenzene [ug/L]	<0.5
Ethylenedibromide [ug/L]	<0.2
1,2 Dibromoethane	<0.2
Dichloromethane [ug/L]	<0.5
2-Hexanone [ug/L]	<20
Methyl-t-butyl Ether [ug/L]	<2
Methyl ethyl ketone [ug/L]	<20
Methyl Isobutyl ketone [ug/L]	<20
Styrene [ug/L]	<0.5
1,1,1,2-Tetrachloroethane [ug/L]	<0.5
1,1,2,2-Tetrachloroethane [ug/L]	<0.5
Tetrachloroethylene [ug/L]	<0.5
Toluene [ug/L]	<0.5
Trichloroethylene [ug/L]	<0.5
Vinyl Chloride [ug/L]	<0.2
Trichlorofluoromethane [ug/L]	<5
1,1,1-Trichloroethane [ug/L]	<0.5
1,1,2-Trichloroethane [ug/L]	<0.5
Xylene [ug/L]	<0.5
o-xylene [ug/L]	<0.5
m/p-xylene [ug/L]	<0.5

< represents a non detect lab result

(IV) INTERPRETATION OF MONITORED DATA

TABLE 9 – INTERPRETATION AND COMPARISON EFFLUENT LIMITS

Parameter	Limit (mg/l)	2019 Average Concentration (mg/l)	2020 Annual Average Concentration (mg/l)	% Change from 2019 - 2020
$CBOD_5$	10.0	4.07	4.3	+5.65%
Total Suspended Solids (mg/l)	10.0	8.76	8.8	+0.46%
Total Phosphorus (mg/l)	5.0	2.62	1.20	-54.20%
TAN + Nitrate Nitrogen	10.0	4.36	6.42	+47.24%

TABLE 10 – INTERPRETATION AND COMPARISON 2019-2020 ANNUAL SAMPLES

ICP Scan of Metals	*PWQO (mg/l)	2019	2020	% Change from 2019-2020
Aluminum (total) [mg/l]	0.075	0.038	0.078	105.3
Antimony (total) [mg/l]	0.020	<0.0002	<0.0009	--
Arsenic (total) [mg/l]	0.100	<0.0002	<0.0002	--
Barium (total) [mg/l]	--	0.0397	0.06902	73.9
Beryllium (total) [mg/l]	0.011	<0.000007	<0.000007	--
Bismuth (total) [mg/l]	--	0.000085	0.000059	-30.6
Boron (total) [mg/l]	0.200	0.040	<0.002	-95.0
Calcium (total) [mg/l]	--	62.3	81.3	30.5
Cadmium (total) [mg/l]	0.020	0.000225	0.0001	-55.6
Chromium (total) [mg/l]	0.001	0.00143	0.00056	-60.8
Cobalt (total) [mg/l]	0.0009	0.000053	0.000066	24.5
Copper (total) [mg/l]	0.005	0.00730	0.005	-31.5
Iron (total) [mg/l]	0.300	0.040	0.029	-27.5
Potassium [mg/l]	--	25.0	30.6	22.4

Lithium (total) [mg/l]	--	0.0025	0.0038	52.0
Magnesium (total) [mg/l]	--	15.8	19.3	22.2
Manganese (total) [mg/l]	--	0.0288	0.0151	-47.6
Molybdenum (total) [mg/l]	0.007	0.00021	0.00118	461.9
Nickel (total) [mg/l]	0.025	0.0014	0.0013	-7.1
Phosphorus (total) [mg/l]	**0.030**	0.566	0.2	-64.7
Lead (total) [mg/l]	0.005	0.00242	0.00009	-96.3
Selenium (total) [mg/l]	0.100	0.00011	0.00012	9.1
Silicon (total) [mg/l]	--	4.03	5.3	31.5
Silver (total) [mg/l]	0.0001	<0.00005	<0.00005	--
Sodium (total) [mg/l]	--	126	191	51.6
Strontium (total) [mg/l]	--	0.254	0.423	66.5
Tellurium (total) [mg/l]	--	<0.0001	<0.0001	--
Thallium (total) [mg/l]	0.0003	<0.0001	<0.0001	--
Thorium (total) [mg/l]	--	<0.000005	<0.000005	--
Tin (total) [mg/l]	--	0.00007	0.0003	328.6
Titanium (total) [mg/l]	--	0.00027	0.00036	33.3
Tungstun (total) [mg/l]	0.030	0.00014	0.00016	14.3
Uranium (total) [mg/l]	0.005	0.00003	0.000003	-90.0
Vanadium (total) [mg/l]	0.006	0.00007	0.00029	314.3
Zinc (total) [mg/l]	**0.030**	0.036	0.019	-47.2
Zirconium (total) [mg/l]	0.004	<0.002	<0.002	--

Table 9 above shows the percent change in the parameters from 2019 to 2020 in the annual effluent sampling. Changes can be seen in the metal concentrations only.

*To satisfy the requirement to interpret the annual final effluent sample, the metals are compared to the Provincial Water Quality Objectives for Receiving Streams as this is the closest applicable guideline for this site. It should be noted that the annual samples are a grab sample and reflective of what is in the effluent only at the time of sample. All metals identified in the PWQO Guideline were compared to the 2019 and 2020 final effluent samples. All metals were below the PWQO's except phosphorus in both 2019 and 2020 and Zinc in 2019 and are further discussed below.

Total Phosphorus:

The PWQO's state that current scientific evidence is insufficient to develop a firm objective for phosphorus however excessive plant growth in rivers and streams should be eliminated if the phosphorus is kept below 0.030mg/l. Since the Airport effluent is discharged to a tile bed and not directly into a receiving stream, the level of phosphorus detected in the grab sample is not significantly concerning.

Zinc:

The PWQO was exceeded for Zinc in 2019 marginally at 0.036mg/l compared to 0.030mg/l but was not exceeded in 2020. Excess zinc in the soils can decrease the vegetation diversity in the tile bed and decrease the activity of microorganisms and earthworms slowing the breakdown of organic matter. These concerns have not been evident in the tile bed to date.

Based on the above comparison, several parameters have seen a significant increase year over year including; Vanadium, Tin, Strontium, Silicone, Selenium, Molybdenum, Antimony and Aluminum. The impacts of these substances are not well documented, but they are synthetic in origin and are indicative of metal fabrication and electroplating industries. The mere presence of these metals themselves is not cause for concern however, increases year over year need to be noted as they could be resulting from industrial discharges. Another important note is that these are effluent values and therefore we would expect these concentrations to be

elevated in the collection system. As a result, we have completed metal scan analysis to be completed by lab alongside our existing collection system monitoring program. This data can be found in ***Section J***.

(V) EFFLUENT QUALITY

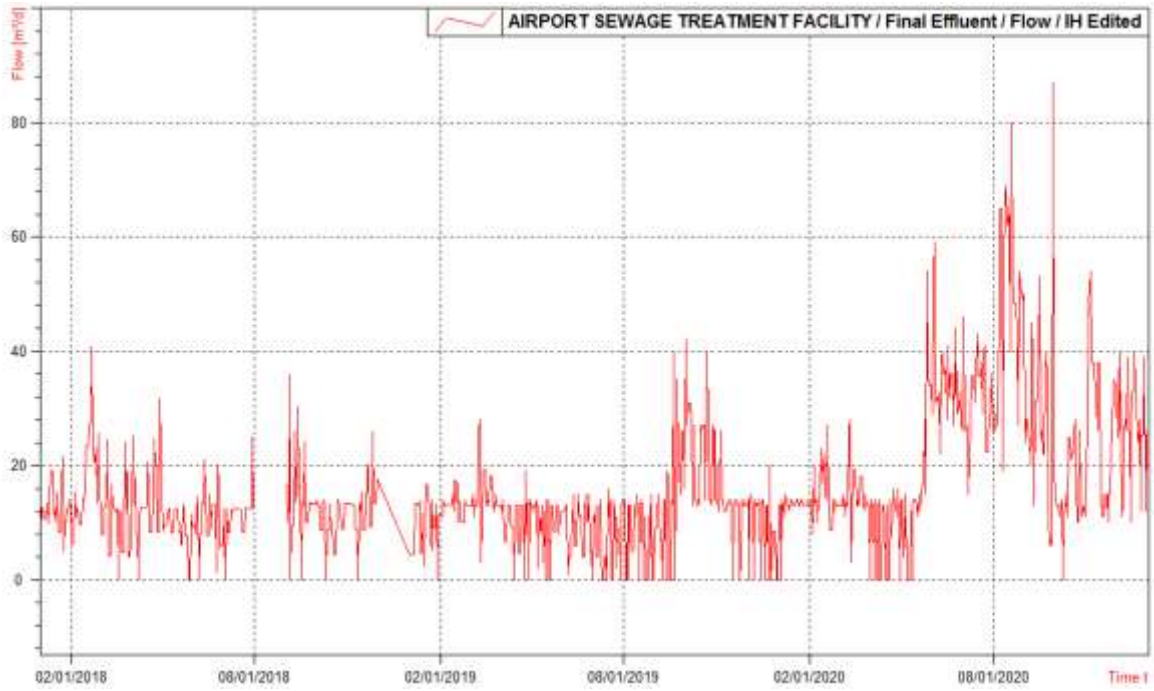
Table 4 above, shows the effluent monthly average concentrations for the parameters outlined in Table 1 of ECA #8181-8TXHRN. The system was successful at meeting all annual compliance limits for 2020. There were some objective exceedances for Total Suspended Solids, Total Phosphorus and Total Ammonia Nitrogen + Nitrate Nitrogen which are further discussed below in **Section F- Effluent Objectives**.

SECTION B - OPERATING PROBLEMS ENCOUNTERED

The flows at the Airport STS were elevated in June 2020 through to the end of 2020 as shown in ***Section E (1) Flow Data***. The following is a list of contributing factors that have resulted in the elevated effluent parameters seen in the final effluent though 2020:

1. Inconsistent, high flows- Flows to plant are significantly elevated and inconsistently sent to the facility. Without a predictable flow pattern, Sequential Batch Rectors struggle to maintain treatment as operators cannot use predictive instincts to make adjustments. Graph 1 below shows the daily flow values for the Airport STS from 2018 to the end of 2020. Additionally, Table 14 in ***Section F – Effluent Objectives***, there were numerous instances where flow exceeded 80% design capacity, and several instances where it exceeded 100% design capacity.
2. Influent flows lack sufficient food for microorganisms- The influent BOD and TSS values indicate a very light strength sewage. Couple this with higher than normal flows and we start to see evidence of biomass wash out and loss of treatment.
3. Significant loss of Volatile biomass observed- we see a significant reduction on volatile solids that aligns with the increased flows. This further supports a washing out of biomass.
4. CCME F3 (C16-C34) hydrocarbon data collected from Raw location shows increased concentrations of Gasoline, Diesel, light oils making their way to the treatment system. These are typically captured by oil grit separators and are not conducive to treatment. When taken into account with higher flows, lack of food, and an increase in metals, we have a toxic build-up of inhibitory substances in the plant and a biomass that is not adapted to treating it.
5. Collection System Chloride levels as presented in ***Section J*** are high and exceed sewer use bylaw at times. We are seeing troubling concentrations of Chlorides in this system. There is a known correlation between biological treatment and Chloride levels such that concentrations above 150mg/l are detrimental and concentrations around 1500mg/l are inhibitory to biological nutrient removal.

GRAPH 1 – JANUARY 2018-DECEMBER 2020 DAILY INFLUENT FLOWS (m^3)



The following are descriptions of what was completed at the facility/collections level to correct the elevated parameters:

- Decrease in chemical used at the facility (alum and carbon) – the theory is that with less biomass in the system, from having been starved of influent biological material, there is less of a need for chemical to be batch dosed. To prevent excess chemical from moving through the system potentially adding to the Total Suspended Solids concentrations. This decrease in chemical showed promising results as the total suspended solids and the Nitrates showed improvement over a few days.
- Collection Sampling continued for the remainder of 2020 and is continuing into 2021 to locate the source of the excess influent flows, and monitor chloride levels from industrial discharges
- Settings were adjusted at the Airport STS including the time intervals between the aerobic and anoxic cycles, adjusting raw pump timers and utilize the EQ tank to address inconsistent flows to the system.
- Operations switched to daily manual backwashes, sometimes multiple times per day combined with replacing with clean filters on a daily basis. This effort has showed only minor improvement in the Total Suspended Solids in the final effluent.
- Airport STS was re-seeded with Return Activated Sludge from the Paris WPCP on November 18, 2020 and again on December 3, 2020 in order to provide the facility with the required biomass to be able to provide treatment. These events showed drastic improvement in the treatment capability of the facility.

SECTION C – MAINTENANCE

(I) UPGRADES

The following upgrades were performed at the Airport STS in 2020:

- May 18, 2020 - Sludge tank was pumped down for valve repair. Valve was not oriented the correct way when originally installed. Re-orienting the valve reduces risk of future blockages

- May 20, 2020 - Generator Battery Replaced

(II) AFTER HOUR ALARMS

The following after hour alarms were responded to at the Airport STS.

TABLE 11– AFTER HOUR ALARMS

Date	Alarm	Issue/Actions Taken
07-Mar-20	Zone 12 Alarm	Alarm was due to "Aerobic SBR Feed Pump Failed to Run" System was operating normally; Operator tested both feed pumps with no issue. Suspected Power dip caused the alarm
25-Apr-20	Zone 12 Alarm	Power dip, power restored upon arrival. operator verified the facility was operating ok
29-Apr-20	Zone 12 Alarm	Aerobic SBR pump failed to run. Rest alarm, checked pump and verified it was operational
28-Jun-20	Zone 12 Alarm	High level ISAM tank alarm. Reset alarms
05-Jul-20	Zone 12 Alarm	Power dip, power restored upon arrival. operator verified the facility was operating ok
12-Aug-20	Zone 12 Alarm	High wet well due to increased flows to the facility. Operator waited for flows to subside, rest alarms and verified all equipment was working
13-Aug-20	Zone 4 Alarm	High ISAM tank level due to increased flows to the facility. Haulage of raw sewage (28m3) was completed the following morning to help with the increased flows to the facility.
06-Nov-20	Zone 12 Alarm	Power dip, power restored upon arrival. operator verified the facility was operating ok

SECTION D – EFFLUENT QUALITY CONTROL MEASURES

Any process changes or adjustments that were out of the ordinary in 2020 are discussed above in ***Section B – Operating Problems Encountered***. MicroC2000 and Alum are often batch dosed manually in additional to the programmed dosing in order to control the denitrification process and assist with total phosphorus control.

The facility experienced and increase in flow to the facility starting at the end of May and continuing through to the end of 2020.

SECTION E - CALIBRATIONS

Calibration of the final effluent flow meter was performed on June 5, 2020. This satisfies the annual requirement in ECA#8181-8TXHRN. Calibration Report is in *Appendix A.*

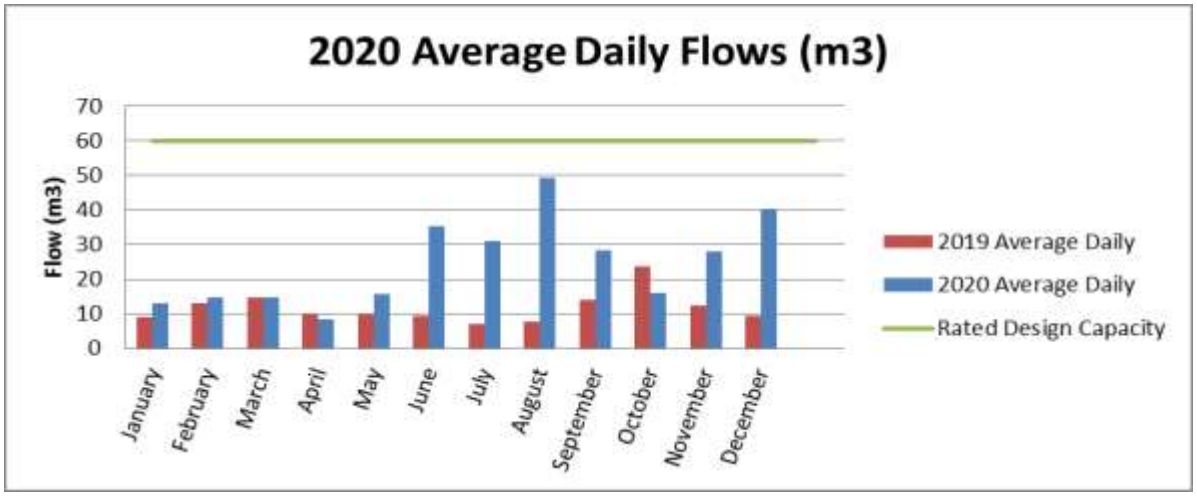
(I) FLOW DATA

The Airport STS provides a rated capacity of 60m^3/day in Phase 1. The average effluent discharge flow for 2020 was 24.5m^3/day, which is 40.9% of capacity. Treated effluent is withdrawn from the upper portion of the SBR basin and discharged to a media filter then to the effluent pump chamber then pumped through a flow meter and distributed to a subsurface tile bed. The following table shows the average effluent discharge flow and the total effluent discharge flow for each month. Lower flows (less batches through the system) were observed in April 2020 and high flows were observed coming into the facility at the end of May and persisted through the remainder of 2020. The cause of the increased flows is suspected to be due to a local industry. Graph 2 shows the average daily flow in comparison to the rated capacity and Graph 3 shows the total monthly flow comparison between 2019 and 2020. The industrial influences are being monitored through collection system sampling as discussed below in ***Section J.***

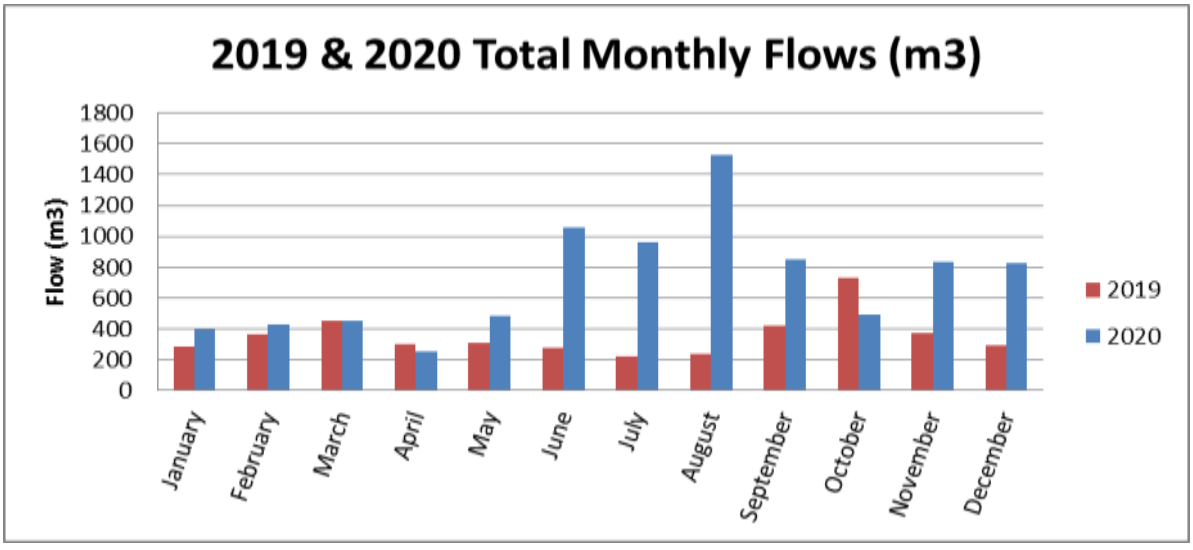
TABLE 12 –INFLUENT FLOW DATA

	Average Daily Flow (m^3)	Total Month Flow (m^3)
January	12.9	399
February	14.7	427
March	14.7	455
April	8.4	251
May	15.7	487
June	35.4	1,061
July	31.1	964
August	49.4	1,529
September	28.4	852
October	15.9	492
November	27.9	836
December	40.0	824
TOTAL		**8,178**
AVERAGE	**24.5**	

GRAPH 2 –2020 AVERAGE DAILY INFLUENT FLOWS (m^3)



GRAPH 3 –2019 AND 2020 TOTAL MONTHLY FLOW (m^3)



SECTION F - EFFLUENT OBJECTIVES

The following is a list of the 2020 objective parameters exceedances and the best efforts used to resolve them.

TABLE 13 –FINAL EFFLUENT OBJECTIVE PARAMETER EXCEEDANCES

Parameter	Date	Result	Best Efforts
Total Suspended Solids (mg/l) **Objective: 7mg/l**	16-Jan-20	7.0	Best efforts included changing the filters regularly, manually backwashing, and decreasing chemical addition. The system saw significantly higher flows starting at the end of May through to the end of 2020 which have contributed to the difficulty in treating the higher solids in the plant as discussed further in ***Section B – Operating Problems Encountered***
	26-May-20	11.0	
	03-Jun-20	33.0	
	15-Jul-20	15.0	
	12-Aug-20	18.0	
	09-Sept-20	25.0	
	29-Oct-20	44.0	
	16-Nov-20	9.0	
	25-Nov-20	7.0	
	01-Dec-20	9.0	
	06-Dec-20	9.0	
	07-Dec-20	7.0	
	08-Dec-20	8.0	
	12-Dec-20	7.0	
Total Phosphorus (mg/l) **Objective: 2mg/l**	13-May-20	2.50	Best efforts included the manual dosing of Alum to the system, monitoring the chloride levels in the collections system and influent.
	03-Jun-20	2.86	
	09-Sept-20	2.21	
	16-Nov-20	3.80	
Total Ammonia Nitrogen + Nitrate Nitrogen **Objective: 5mg/l**	16-Jan-20	6.53	The parameter that is higher on each of these samples is nitrates. Best efforts included the manual dosing of Alum and Carbon to the system, changing the filters regularly and monitoring in house results.
	05-Feb-20	8.69	
	05-Mar-20	5.69	
	14-Apr-20	7.96	
	13-May-20	13.4	
	29-Oct-20	8.76	
	16-Nov-20	22.0	

Table 14 is a list of dates where the daily flow exceeded 80% of the rated design capacity of 60m3/day.

TABLE 14 –INFLUENT FLOW EXCEEDING 80% OF CAPACITY

Month	Date	*Flow (m3/day)
May	05/27/2020	54
June	06/02/2020	54
	06/03/2020	59
	06/04/2020	48
August	08/07/2020	65
	08/08/2020	65
	08/09/2020	65
	08/11/2020	54
	08/12/2020	67
	08/13/2020	69

	08/14/2020	62
	08/15/2020	63
	08/16/2020	64
	08/18/2020	54
	08/19/2020	80
	08/20/2020	54
	**08/21/2020	48.3
	**08/22/2020	48.3
	**08/23/2020	48.3
	08/26/2020	54
	08/27/2020	52
	08/28/2020	50
	08/29/2020	50
	08/30/2020	49
	08/31/2020	50
September	09/15/2020	53
	09/28/2020	87
November	11/03/2020	49
	11/04/2020	51
	11/05/2020	54

*NOTE: Values highlighted in yellow exceeded the rated design capacity of 60m3/day. The remaining days exceeded 80% of the rated design capacity.
**NOTE: This is a weekend Friday-Sunday. Operations noted a total flow for the weekend of 144.9m3/day and the value was dived equally over the 3 days.

Table 15 below shows the effluent limit and objectives compared against the annual average. Total Suspended Solids and Total Ammonia Nitrogen + Nitrate Nitrogen objectives were exceeded however, the annual average remained below the limits.

TABLE 15 –FINAL EFFLUENT CONCENTRATION AND EFFLUENT LIMITS AND OBJECTIVES

Parameter	Limit (mg/l)	Objectives (mg/l)	2020 Annual Average Concentration (mg/l)
$CBOD_5$	10.0	5.0	4.3
Total Suspended Solids (mg/l)	10.0	7.0	**8.8**
Total Phosphorus (mg/l)	5.0	2.0	1.2
Total Ammonia Nitrogen + Nitrate Nitrogen	10.0	5.0	**6.4**

SECTION G – AIRPORT STS LIQUID BIOSOLIDS

The following table shows the amount of liquid biosolids that were removed from the Airport STS. The biosolids that were removed were sent to the Paris WPCP digester for further treatment.

TABLE 16 –LIQUID BIOSOLIDS REMOVED

Quarter	Quantity Removed (m^3)
January	28.0
February	14.0
March	0.0
April	14.0
May	28.0
June	14.0
July	14.0
August	14.0
September	14.0
October	14.0
November	0.0
December	0.0
Total for 2020	**158.0**

SECTION H - SUMMARY OF COMPLAINTS RECEIVED

The Airport STS did not receive any complaints in 2020.

SECTION I - SUMMARY OF BY-PASS EVENTS

The Airport STS was not involved in any by-pass events in 2020.

SECTION J – OTHER INFORMATION

(I) COLLECTIONS STUDY

Collections sampling was started at the Airport STS in April 2020 to monitor and locate the source of the high Chlorides being detected at the plant. The following is a summary of the data collected to the end of 2020 including a chloride study of a collection of locations in and around the facility and a full metal scan and hydrocarbon analysis. This study will continue into 2021.

MH#1 Aviation Ave (in front of Gilbert's custom aircraft 110 Aviation Ave, Brantford, ON)					
	Field pH	**Field Temp (°C)**	**BOD (mg/l)**	**TSS (mg/l)**	**Chloride (mg/l)**
06-May-20	8.5	11.5	363	792	80
14-May-20	8.39	11.9	158	1110	94
21-May-20	8.08	15.5	600	1470	72
29-May-20	8.18	23.9	386	1060	120
03-Jun-20	8.2	19.8	1620	4300	130
11-Jun-20	8.5	21.7	657	3080	110
19-Jun-20	7.68	24.9	1940	7700	90
25-Jun-20	7.39	20.2	1830	4010	90
03-Jul-20	7.74	26.2	267	573	71
08-Jul-20	7.39	25.9	810	2330	83
15-Jul-20	7.28	24.7	1960	4790	99
24-Jul-20	8.04	28.3	345	613	66

30-Jul-20	8.28	28.7	154	269	68
07-Aug-20	7.71	26.1	212	745	55
12-Aug-20	8.02	26	112	340	42
25-Jun-20	7.39	20.2	1830	4010	90
28-Aug-20	7.35	22.1	1570	3040	98
03-Sep-20	8.04	26	506	1460	100
11-Sep-20	7.93	21.8	1860	1490	93
17-Sep-20	7.93	20.4	1270	2000	140
23-Sep-20	8.54	18.1	371	1850	84
01-Oct-20	8.38	17.3	324	896	99
07-Oct-20	8.55	17.2	444	781	130
16-Oct-20	7.88	14	459	596	89
21-Oct-20	8.66	15.5	731	1240	160
29-Oct-20	8.49	12.9	659	508	170
05-Nov-20	8.05	13.9	21	22	39
13-Nov-20	8.44	12.5	480	1300	160
18-Nov-20	8.00	11.2	1310	1690	140
26-Nov-20	8.57	11.1	470	1070	85
10-Dec-20	8.55	11.1	957	536	130
18-Dec-20	8.36	8.5	209	149	76
23-Dec-20	8.75	9.2	473	236	140
31-Dec-20	8.69	7.6	3990	1530	94

MH#2 York Rd &Aviation Ave OHL01006)					
	Field pH	**Field Temp (°C)**	**BOD (mg/l)**	**TSS (mg/l)**	**Chloride (mg/l)**
06-May-20	7.37	14.5	11	57	44
14-May-20	7.88	13.2	<4	92	6
21-May-20	7.44	16	13	78	4
29-May-20	6.7	24	13	19	5
03-Jun-20	6.87	21.8	22	43	13
11-Jun-20	8	22.7	95	239	640
07-Aug-20	8.17	25.9	136	152	860
12-Aug-20	8.22	26.4	15	120	790
28-Aug-20	8.31	22.4	38	476	760
03-Sep-20	8.17	27.7	389	1000	1200
11-Sep-20	8.17	23.9	77	447	980
17-Sep-20	8.46	20.8	124	520	1400
MH#3 York Rd (OHL01027)					
19-Jun-20	8.21	24.9	264	823	2700
25-Jun-20	8.06	21.5	118	229	1400
03-Jul-20	8.25	25.7	55	115	1300
08-Jul-20	8.1	24.7	99	832	800
15-Jul-20	8.95	24.7	48	68	1400
24-Jul-20	8.28	27.9	108	186	1500

30-Jul-20	8.24	29.1	379	1020	520
23-Sep-20	8.69	19.9	47	56	250
01-Oct-20	8.55	17.9	187	141	160
07-Oct-20	7.59	17.5	1320	2440	390
16-Oct-20	8.18	15.3	58	99	97
21-Oct-20	8.33	16	34	40	140
29-Oct-20	8.6	13.1	143	121	200
05-Nov-20	8.67	14.2	7	9	1200
13-Nov-20	8.23	12.6	576	262	2200
18-Nov-20	8.56	10.8	978	1280	250
26-Nov-20	8.01	12.4	27	178	130
10-Dec-20	8.44	11	314	70	160
18-Dec-20	8.56	7.3	179	106	420
23-Dec-20	8.5	9.8	142	128	110
31-Dec-20	9.5	7.1	120	130	640
Influent (grab)					
06-May-20	--	--	256	80	1300
14-May-20	--	--	87	131	1600
21-May-20	--	--	48	149	440
29-May-20	--	--	78	61	280
03-Jun-20	--	--	58	50	2100
11-Jun-20	--	--	141	35	210
19-Jun-20			37	47	370
25-Jun-20	--	--	53	88	750
03-Jul-20	--	--	35	51	**1700**
08-Jul-20	--	--	46	51	230
15-Jul-20	--	--	49	178	430
24-Jul-20	--	--	130	259	1900
30-Jul-20	--	--	119	150	590
07-Aug-20	--	--	26	24	1300
12-Aug-20	--	--	73	94	210
28-Aug-20	--	--	151	236	120
03-Sep-20	--	--	1140	550	940
11-Sep-20	--	--	69	69	970
17-Sep-20	--	--	128	185	500
23-Sep-20	--	--	70	99	610
01-Oct-20	--	--	602	662	150
07-Oct-20	--	--	131	106	160
16-Oct-20	--	--	226	67	98
21-Oct-20	--	--	57	74	79
29-Oct-20	--	--	520	768	210
05-Nov-20	--	--	25	6	630
13-Nov-20	--	--	28	17	280
18-Nov-20	--	--	228	296	99

26-Nov-20	--	--	58	27	390
10-Dec-20	--	--	50	26	75
18-Dec-20	--	--	175	81	90
23-Dec-20	--	--	119	110	88
31-Dec-20	--	--	128	75	210

Study Samples:	**03-Jun-20**
Location	**Chloride (mg/l)**
Wet Well	150
SBR Tank	1660
SBR Tank 2	810
SBR Tank 3	740
SBR Effluent Tank	820
Effluent Manhole (Post Filter)	840
MH 2-2 York & Aviation	1300

Additional Metals/Hydrocarbon Scan:

		MH#1 Aviation Ave				MH#3 York Rd				Influent RAW			
		10-Dec-20	18-Dec-20	23-Dec-20	31-Dec-20	10-Dec-20	18-Dec-20	23-Dec-20	31-Dec-20	10-Dec-20	18-Dec-20	23-Dec-20	31-Dec-20
F2 (C10-C16)	**(ug/l)**	378	<100	102	894	128	241	<100	< 100	< 100	130	<100	< 100
F3 (C16-C34)	**(ug/l)**	3810	573	1020	31000	1190	352	228	456	< 200	536	<200	248
F4 (C34-C50)	**(ug/l)**	731	263	312	9210	267	<200	<200	< 200	< 200	<200	<200	< 200
Mercury	**(mg/l)**	< 0.00001	<0.00001	< 0.00001	< 0.00001	< 0.00001	<0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001	< 0.00001
Aluminum	**(mg/l)**	0.221	0.069	0.047	2.080	0.013	0.035	0.064	0.629	0.037	0.032	0.097	0.355
Antimony	**(mg/l)**	< 0.0009	<0.0009	< 0.0009	0.0023	< 0.0009	<0.0009	< 0.0009	< 0.0009	< 0.0009	<0.0009	< 0.0009	< 0.0009
Arsenic	**(mg/l)**	0.0006	0.0003	0.0004	0.0028	0.0004	0.0003	< 0.0002	0.0006	< 0.0002	<0.0002	0.0002	0.0003
Barium	**(mg/l)**	0.144	0.151	0.101	0.263	0.0828	0.0833	0.0348	0.0335	0.111	0.0962	0.0980	0.0936
Beryllium	**(mg/l)**	< 0.000007	<0.000007	< 0.000007	0.00008	< 0.000007	<0.000007	< 0.000007	0.000039	< 0.000007	<0.000007	< 0.000007	0.000015
Bismouth	**(mg/l)**	0.00103	0.000146	0.00445	0.00765	0.000780	0.000105	0.000340	0.000413	0.000233	0.000296	0.000525	0.000191
Boron	**(mg/l)**	0.092	0.03	0.048	0.329	0.079	0.032	0.036	0.018	0.029	0.022	0.028	0.166
Calcium	**(mg/l)**	77.1	85.5	80.8	131.0	63.6	104	38.1	29.8	71.6	67.9	70.0	65.0
Cadmium	**(mg/l)**	0.00839	0.00207	0.00484	0.08240	0.000050	0.000039	0.000028	0.000093	0.000112	0.000218	0.000355	0.000243
Chromium	**(mg/l)**	0.0224	0.00166	0.00370	0.06410	0.00097	0.00103	0.00117	0.00312	0.00102	0.00068	0.00086	0.00112
Cobalt	**(mg/l)**	0.000510	0.000152	0.000237	0.003020	0.000180	0.000168	0.000148	0.000477	0.000113	0.000107	0.000230	0.000323
Copper	**(mg/l)**	0.0765	0.0213	0.0392	0.3310	0.0196	0.0321	0.0211	0.0264	0.0109	0.0175	0.0207	0.0151
Iron	**(mg/l)**	0.650	0.199	0.173	5.360	0.160	0.158	0.224	0.824	0.098	0.097	0.253	0.491
Potassium	**(mg/l)**	62.8	22.2	46.8	32.3	64.6	48	12.4	15.0	10.6	14.7	6.66	6.40
Lithium	**(mg/l)**	0.0047	0.0035	0.0043	0.0086	0.0034	0.0035	0.0023	0.0026	0.0034	0.0022	0.0026	0.0033
Magnesium	**(mg/l)**	26.0	21.8	26.2	30.0	20.0	23.1	10.1	6.52	19.0	16.5	19.7	16.3
Manganese	**(mg/l)**	0.0574	0.028	0.0349	0.2770	0.0262	0.0141	0.0128	0.0654	0.0223	0.0162	0.0255	0.0374
Molybdenum	**(mg/l)**	0.00521	0.00083	0.00118	0.00953	0.00102	0.00123	0.00079	0.00057	0.00034	0.00064	0.00063	0.00073
Nickel	**(mg/l)**	0.0119	0.0017	0.0042	0.0552	0.0036	0.0027	0.0012	0.0020	0.0010	0.0011	0.0011	0.0012
Phosphorus	**(mg/l)**	18.1	4.98	10.6	27.7	10.6	7.18	3.90	2.96	1.83	3.07	3.70	1.87
Lead	**(mg/l)**	0.0208	0.00476	0.0105	0.2090	0.00066	0.00061	0.00071	0.00429	0.00063	0.0009	0.00186	0.00233
Selenium	**(mg/l)**	0.00111	0.00037	0.00069	0.00221	0.00051	0.00076	0.00053	0.00027	0.00025	0.0003	0.00029	0.00018
Silicon	**(mg/l)**	5.51	5.44	5.58	6.81	5.19	6.09	5.89	2.74	5.40	5.03	5.64	5.18
Silver	**(mg/l)**	0.00008	<0.00005	0.00026	0.00050	< 0.00005	<0.00005	0.00006	< 0.00005	< 0.00005	<0.00005	< 0.00005	< 0.00005
Sodium	**(mg/l)**	60.4	6.7	66.3	58.7	76.2	223	155	370	71.6	81.9	76.2	121
Strontium	**(mg/l)**	0.392	0.408	0.415	0.841	0.341	0.515	0.250	0.228	0.361	0.311	0.354	0.319

Tellurium	**(mg/l)**	0.0003	<0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	< 0.0001	< 0.0001
Thorium	**(mg/l)**	0.0005	<0.0001	< 0.0001	0.0005	0.0002	<0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	< 0.0001	< 0.0001
Thallium	**(mg/l)**	< 0.000005	0.000012	0.000006	0.000059	< 0.000005	<0.000005	< 0.000005	0.000005	< 0.000005	<0.00005	< 0.000005	< 0.000005
Tin	**(mg/l)**	0.00268	0.00033	0.00061	0.00540	0.00041	0.00055	0.00030	0.00022	0.00025	0.00028	0.00047	0.00025
Titanium	**(mg/l)**	0.0113	0.00233	0.00368	0.35300	0.0126	0.00619	0.00421	0.0144	0.0300	0.0054	0.0111	0.00864
Tungsten	**(mg/l)**	0.0150	0.00073	0.0148	0.0366	0.00029	0.00006	0.00229	0.00026	0.00008	0.00009	0.00111	0.00022
Uranium	**(mg/l)**	0.000380	0.000233	0.000186	0.000380	0.000080	0.000293	0.000377	0.000119	0.000340	0.000287	0.000271	0.000219
Vanadium	**(mg/l)**	0.00049	0.00021	0.00024	0.00414	0.00018	0.0002	0.00037	0.00196	0.00018	0.00017	0.00036	0.00097
Zinc	**(mg/l)**	0.232	0.076	0.120	0.903	0.073	0.078	0.075	0.076	0.026	0.084	0.066	0.033
Zirconium	**(mg/l)**	< 0.002	<0.002	< 0.002	0.01	< 0.002	<0.002	< 0.002	< 0.002	< 0.002	<0.002	< 0.002	< 0.002

APPENDIX A

CALIBRATION RECORDS

Industrial Technical Services

951 Matheson Blvd. East
Mississauga, ON L4W 2R7
Ph: 905-275-2717 Fax: 905-275-2724
www.itsinstruments.com

Certificate No: 30959-001

Certificate Of Calibration

Customer:
Ontario Clean Water Agency
120 Race Street, Paris ON N3L 3X2
Phone: (519) 442-3255
Fax: (519) 442-2616

Cal. Date: June 5, 2020
Due Date: June 5, 2021

Instrument Identification:

Description:	Flow Indicator / Transmitter
Manufacturer:	Krohne
Model No:	IFC100W
Serial No:	C12504886
Range:	0 to 300 LPM / 4 to 20 mA Output
Tolerance:	± 2% FS
Tag No:	0000077034, OCWA#0000248354
Location:	Brantford Airport, 38 Greens Road Brantford

Test Report:

AS FOUND				AS LEFT			
Reference	Instrument		Error	Reference	Instrument		Error
Switch Position	LPM	mA	%FS	Switch Position	LPM	mA	%FS
Y=0	0.00	3.99	-0.06	Y=0	0.00	3.99	-0.06
Y=A	63.77	7.41	0.06	Y=A	63.77	7.41	0.06
Y=B	127.70	10.81	0.06	Y=B	127.70	10.81	0.06
Y=C	255.31	17.62	0.00	Y=C	255.31	17.62	0.00

Standards Used:

Asset No	Manufacturer	Calibration Date	Due Date
SIM004	Krohne	August 26, 2019	August 26, 2020

	Yes	No		Yes	No
Passed:	✓		As found in tolerance:	✓	
Failed:			As left in tolerance:	✓	
Calibration Sticker applied?	✓		Repair performed:		✓
Restricted Use:			Adjustment performed:		✓

Comments: None.

Performed By: A. Shah, Technician
Issue Date: June 5, 2020

Reviewed By ITS: C. Ramnarine, Service Manager
Date: June 5, 2020

Reviewed By Customer: _____

APPENDIX B

2020 DATA SET

AIRPORT STS Final Effluent 2020

Date	field pH	field Temp (°C)	CBOD (mg/L)	BOD (mg/L)	TSS (mg/L)	TP (mg/L)	TKN (mg/L)	TAN (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Nitrate (mg/L)	Nitrite + Nitrate (mg/L)	TAN+ Nitrate (mg/L)
ECA Objectives			**5**		**7**	**2**							**5**
ECA Limits			**10**		**10**	**5**							**10**
16-Jan-20	7.12	16.5	4	8	7	0.09	1.8	0.1	390	0.03	6.43	6.46	6.53
05-Feb-20	6.73	16.3	<2	<2	5	0.1	0.6	0.1	360	0.07	8.59	8.66	8.69
19-Feb-20	7.01	15.7	2	3	3	0.22	1.1	<0.1	330	0.03	2.83	2.83	2.93
05-Mar-20	7.26	17.1	2	4	4	0.15	1.1	<0.1	580	0.06	5.59	5.65	5.69
12-Mar-20	7.19	18	<2	3	3	0.21	2	0.4	460	0.04	4.08	4.12	4.48
14-Apr-20	7.17	15.3	<2	<2	3	0.36	0.7	0.1	830	<0.3	7.86	7.86	7.96
13-May-20	7.04	19	<2	<2	2	2.5	0.8	0.1	1200	<0.3	13.3	13.3	13.4
26-May-20	6.98	18.2	<2	4	11	0.21	0.9	0.2	1300	<0.3	3.95	3.95	4.15
03-Jun-20	7.03	16.9	3	6	33	2.86	3	1.4	770	0.27	3.11	3.38	4.51
15-Jul-20	6.94	21.7	2	<2	15	1.32	0.7	0.2	1100	<0.3	2.09	2.09	2.29
12-Aug-20	7.34	21.3	<2	3	18	1.48	<0.5	<0.1	680	<0.3	0.41	0.41	0.51
09-Sep-20	7.18	20	4	5	25	2.21	<0.5	<0.1	1000	<0.3	2.5	2.5	2.6
29-Oct-20	6.91	16	30	32	44	1.7	1.1	<0.1	99	0.35	8.66	9.01	8.76
16-Nov-20	7.59	15.3	3	2	9	3.8	1.4	<0.1	670	<0.03	21.9	21.9	22
23-Nov-20					6								
25-Nov-30					7								
30-Nov-20					6								
01-Dec-20					9								
04-Dec-20					5								
05-Dec-20					5								
06-Dec-20					9								
07-Dec-20	6.82	14.6	3	11	7	0.78	1.5	0.8	380	4.9	0.96	5.86	1.76
08-Dec-20					8								
09-Dec-20					6								
12-Dec-20					7								
13-Dec-20					5								
14-Dec-20					3								
15-Dec-20					4								
16-Dec-20					4								
18-Dec-20					3								
19-Dec-20					4								
20-Dec-20					5								
21-Dec-20					4								

RAW Influent

Date	BOD (mg/l)	TSS (mg/l)	TP (mg/l)	TKN (mg/l)	chloride (mg/l)	CCME F1 (ug/l)	CCME F2 (ug/l)	CCME F3 (ug/l)	CCME F4 (ug/l)	O&G (ug/l)
16-Jan-20	160	148	6.75	83.1						
05-Feb-20	138	96	8.08	79.3						
12-Feb-20	76	52	4.23	46.4		<25	261	233	<200	4
05-Mar-20	91	73	6.02	65.7						
14-Apr-20	254	160	13	61.3						
13-May-20	157	61	10.1	59.7	1800					
13-May-20	176	266	11	72		73	370	890	308	20
26-May-20	194	516	10.8	32.2	1300					
03-Jun-20	111	40	3.75	21.5	480					
15-Jul-20	18	36	3.24	17.1	820					
12-Aug-20	17	28	2.42	7.8	630					
19-Aug-20	12	24	2.83	10.3		<25	<100	<200	<200	2
09-Sep-20	20	19	2.14	<0.5	1100					
29-Oct-20	43	46	4.64	54.6	110					
16-Nov-20	148	270	7.44	17.2	560					
18-Nov-20	73	62	9.04	49		<25	161	350	<200	7
07-Dec-20	48	30	3.9	27.2						

Mixed Liquor SBR

MLSS (mg/l)	MLVSS (mg/l)	Alkalinity (mg/l)
5500	4660	312
5960	5080	295
5420	4600	348
5110	4260	403
5460	4570	277
4770	4200	414
3230	2690	483
1880	1490	437
3110	2500	491
3000	2320	577
3250	2580	355
2790	2260	330
3780	3020	405