TORONTO Water

ASHBRIDGES BAY WASTEWATER TREATMENT PLANT

2018 Annual Report

March 28, 2019

EXECUTIVE SUMMARY

The Ashbridges Bay Treatment Plant (ABTP) is one of four wastewater treatment facilities operated by the City of Toronto. This facility, located at 9 Leslie Street, has a rated capacity of 818,000 m^3/day, or 818 ML/day, and serves an equivalent population of approximately 1,603,700 The Ashbridges Bay Treatment Plant discharges into Lake Ontario. Compliance was assessed with Environmental Compliance Approval (ECA) Sewage No. 8047-ABZNY9 conditions, which was in effect at the beginning of 2018.

The average daily flow rate in 2018 was 563.7 ML/day. Influent concentrations of Biochemical Oxygen Demand (BOD_5), Total Phosphorus (TP) and Total Suspended Solids (TSS) averaged 207.9 mg/L, 6.3 mg/L, and 303.7 mg/L, respectively.

Ashbridges Bay Treatment Plant achieved the following effluent quality and loading rates in 2018 in comparison to ECA limits:

	ECA[1]	2018 Final Effluent
Total Suspended Solids (TSS)	25.0 mg/L	8.1 mg/L
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	25.0 mg/L	4.7 mg/L
Total Phosphorus (TP)	1.0 mg/L	0.7 mg/L
Escherichia coli (*E.coli*)[2]	200 CFU/100mL	26 CFU/100 mL
pH	6.5- 8.5	7.0
TP Loading Rate[3]	818 kg/day	376 kg/day
TSS Loading Rate[3]	20,450 kg/day	4,453 kg/day
$CBOD_5$ Loading Rate[3]	20,450 kg/day	2,627 kg/day

[1] Referenced from ECA Sewage 8047-ABZNY9 and Schedule B and C from ECA Sewage 1496-B2UHDE, issued on September 26, 2018.
[2] Arithmetic mean of monthly geometric mean data.
[3] Referenced from ECA Sewage 8047-ABZNY9 and Schedule C from ECA Sewage 1496-B2UHDE, issued on September 26, 2018

During 2018, the biosolids generated at Ashbridges Bay were managed through agricultural land application, soil amendment use, pelletization, and mine reclamation. The total amount of biosolids generated at the plant in 2018 was 155,756 wet tonnes at an average of 27.9% total solids (TS). The biosolids generated met all the metal and *E. coli* concentration requirements set out in O.Reg 267/03.

Ferrous chloride consumption for phosphorus removal was 8.05 tonnes as iron (Fe) per 1000 ML of wastewater treated. Polymer consumption in 2018 for waste activated sludge (WAS) thickening and sludge dewatering totalled 0.780 and 2.71 tonnes per 1000 ML treated, respectively. Sodium hypochlorite (12% w/v) consumption for 2018 was 4166.8 m^3.

There were six secondary treatment system bypass occurrences in 2018 where portions of the flow did not receive secondary treatment, but still received preliminary treatment, primary treatment, and nutrient removal before being disinfected and discharged into Lake Ontario. Total bypassed flows were estimated to be 1,556 ML.

The plant continued with numerous capital projects. Notable projects included: tender of a new ultraviolet (UV) disinfection facility; design of a new influent pumping station; design of a new WAS thickening facility; design of a new plant outfall; construction of a new phosphorous removal facility; design of a dewatering polymer system; construction of P Building headworks upgrades; and construction of Digesters 9-12 upgrade. A variety of scheduled, preventative, predictive and reactive maintenance was performed, including annual calibration of effluent monitoring equipment.

Total annual consumption for potable water, hydro, and natural gas was 326,831 m^3, 130M kWh, and 6.8M scm, respectively. The plant direct operating costs for 2018 totalled $59.0M. In 2018, the Ashbridges Bay Treatment Plant had a staffing compliment of 162.5 employees. As of March 15, 2019, there were seventeen health and safety incidents and 138 lost time days due to work related injuries in 2018[1].

[1] The number of lost days will change due to an incident that occurred in 2018, which was approved and still accumulating lost time.

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GLOSSARY OF ABREVIATIONS

AAC	Annual Average Concentration
BOD5	Five-Day Biochemical Oxygen Demand
CBOD5	Five-Day Carbonaceous Biochemical Oxygen Demand
CEU	Continuing Education Units
CFU	Colony Forming Units
DAF	Dissolved Air Flotation
E. coli	*Escherichia coli*
ECA	Environmental Compliance Approval
Fe	Iron
HTP	Humber Treatment Plant
HP	Horsepower
HRT	Hydraulic Retention Time
kg	Kilogram
kWh	Kilowatt-hour
MAC	Monthly Average Concentration
MGMD	Monthly Geometric Mean Concentration
MWh	Megawatt-hour
m3	Cubic metre
m3 /day	Cubic metre per day
mA	Milliamps
mg/L	Milligrams per litre
mL	Millilitre
ML	Million litres
MECP	Ministry of the Environment, Conservation and Parks
Q	Flow Rate
RAS	Return Activated Sludge
SBS	Sodium Bisulphite
SBS (P)	Sodium Bisulphite Presence
scm	Standard cubic metre
SS	Suspended Solids
TCR	Total Residual Chlorine
TP	Total Phosphorus
TS	Total Solids
TSS	Total Suspended Solids
TVS	Total Volatile Solids
TWAS	Thickened Waste Activated Sludge
µg/L	Micrograms per litre
WAS	Waste Activated Sludge

Definitions

Bypass: Means diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities.

Overflow: An overflow is defined as a discharge to the environment from the plant at a location other than the plant outfall downstream of the final effluent sampling station.

Spill: A spill is defined within the meaning of Part X of the Environmental Protection Act. "Spill", when used in reference to a pollutant, means a discharge,

a) into the natural environment,
b) from or out of a structure, vehicle or other container, and
c) that is abnormal in quality or quantity in light of the discharge.

Abnormal Discharge: A discharge of a pollutant designated by the regulations at a location designated by the regulations shall be deemed to be in a quantity or with a quality abnormal at the location. R.S.O. 1990, c. E.19, s. 91 (2).

$$Loading\ \left(\frac{kg}{day}\right) = Concentration\ \left(\frac{mg}{L}\right) \times Flow\ \left(\frac{ML}{day}\right)$$

$$Percent\ Removal\ (\%) = 1 - \frac{Concentration\ (Final)}{Concentration\ (Initial)}$$

$$Aeration\ Loading = \left(\frac{kg\ cBOD}{m^3\ aeration\ capacity}\right) = \frac{(Q_{Primary\ Effluent} + Q_{RAS}) \times [cBOD_{5_{primary\ effluent}}]}{V_{aeration\ Tanks}}$$

$$Solids\ Capture\ (\%) = \frac{Centrifuge\ Feed\ TS - Centrate\ TSS}{Centrifuge\ Feed\ TS} \times 100$$

1 INTRODUCTION

The Ashbridges Bay Treatment Plant (ABTP) is one of four wastewater treatment facilities operated by the City of Toronto under the responsibility of the Wastewater Treatment section of Toronto Water. The facility is located at 9 Leslie Street, in Toronto's east end and also includes two raw sewage pump stations located north of Lake Shore Boulevard at 1091 Eastern Avenue. The Ashbridges Bay Treatment Plant services a sewershed of approximately 25,000 ha and an estimated connected population of 1,603,700; bounded by Steeles Avenue on the north, the Humber sewershed on the west, the Highland Creek sewershed on the east, and the lakeshore on the south. The plant also provides production of biosolids for beneficial use, including the biosolids that are generated and transferred from the Humber and North Toronto Treatment Plants. The Ashbridges Bay Treatment Plant has a rated capacity of 818,000 m3/day, or 818 ML/day

Major liquid treatment processes include screening and grit removal, primary treatment, secondary treatment, nutrient removal, and effluent disinfection. Treated effluent is discharged to Lake Ontario. Solids handling processes include waste activated sludge thickening, sludge stabilization by anaerobic digestion, dewatering using high speed centrifuges and biosolids management. Numerous auxiliary systems are required for proper operation of plant processes and include: potable water, process water (i.e. "plant water"), heating, ventilation and air conditioning (HVAC), SCADA, odour control, electrical power distribution, natural gas, chemicals, and instrument air.

The Ministry of the Environment, Conservation and Parks (MECP) has classified the Ashbridges Bay Treatment Plant as a Class IV wastewater treatment facility under Regulation 129/04. This facility operated under Environmental Compliance Approvals (ECA) Sewage No. 8047-ABZNY9, issued on July 21, 2016, ECA Sewage No. 8008-AWUPVV, issued on May 15, 2018 and Sewage No. 1496-B2UHDE, issued on September 26, 2018.

The annual report complied with the requirements of the ECA Sewage No. 8047-ABZNY9 conditions, as it was in effect at the beginning of 2018. Requirements have been crossed referenced with the most recent ECA Sewage No. 1496-B2UHDE.

This report is a summary of plant operations and performance in 2018. Highlights of the report include a discussion of effluent quality and summaries of process operations, maintenance, chemical and utility consumption, capital projects, operational costs and human resources.

2 PLANT PROCESS OVERVIEW

A description of the plant process is included below. A Plant process flow diagram is available in Appendix A. Additional information on the plant's process can be found on the City of Toronto website[2].

2.1 Influent

The Ashbridges Bay Treatment Plant treats wastewater flows from the Mid-Toronto, High Level, Low Level, and Lakefront Interceptor Sewers, as well as the Queen Street and Coxwell Avenue Trunk Sewers. The Mid-Toronto Interceptor flows are pumped to the plant via the Pumping Station known as "T Building". The High Level and Low Level Interceptor Sewers, and the Queen Street Trunk Sewer flows are pumped to the plant via the Pumping Station known as '"M Building". The Lakefront Interceptor Sewer flows are pumped to the plant via the M Building or the T Building. The Coxwell Avenue Trunk Sewer flows come to the plant by gravity. Once wastewater enters the plant, it flows by gravity through the plant's processes.

Influent to the Ashbridges Bay Treatment Plant also includes sludge flows received from the Humber Treatment Plant and the North Toronto Treatment Plant via the Mid-Toronto Interceptor and Coxwell Sanitary Trunk Sewer, respectively.

2.2 Preliminary Treatment

Raw wastewater enters the Headworks (known as "P" and "D" Buildings) for grit and screenings removal. The P Building has six aerated grit channels and six mechanical screens. D Building has five mechanical screens and four aerated grit channels. The removed grit and screenings from P and D Buildings are hauled to a sanitary landfill site. Ferrous chloride is applied for nutrient removal (i.e. phosphorous removal) to the distribution conduits upstream of the aerated grit channels.

Throughout 2018, P Building was under renovation as the P Building Preliminary Treatment Upgrades Project was in construction. Six new mechanical screens and three renovated aerated grit channels have been commissioned in December 2018.

[2] https://www.toronto.ca/services-payments/water-environment/managing-sewage-in-toronto/wastewater-treatment-plants-and-reports/

2.3 Primary Treatment

Primary Treatment occurs in the Primary Clarification Tanks, where the flow velocity of the wastewater is reduced to allow heavier solids to settle to the bottom. There are 12 Primary Clarification Tanks. Sludge collectors in the tanks sweep the settled sludge, called primary or raw sludge, into sludge hoppers. Floating solids, called scum, are collected from the top of the water and swept into scum hoppers. The primary sludge and scum are then pumped out for further treatment and the wastewater, called primary effluent, continues onto secondary treatment.

2.4 Secondary Treatment

The primary effluent receives secondary treatment through a conventional, suspended biomass activated sludge process in the Aeration Tanks. The mixed liquor consists of primary effluent mixed with return activated sludge (RAS), which is removed from the Final Clarification Tanks and contains micro-organisms that naturally occur in wastewater and facilitate its degradation. In the presence of oxygen, these micro-organisms break down organic material in the wastewater. Air is supplied to the Aeration Tanks through 10 electrically driven blowers. There are a total of 11 Aeration Tanks that employ a step feed aeration process with four passes per tank. Aeration Tank No.1 and 3 – 9 are equipped with plastic disc coarse air bubble diffusers; Aeration Tank No. 10 and 11 are equipped with stainless steel coarse bubble diffusers; and Aeration Tank No. 2 is equipped with a mix of ceramic and membrane fine bubble diffusers.

The mixed liquor from the Aeration Tanks flows to 11 large Final Clarification Tanks, where the activated sludge is allowed to settle. A controlled quantity of this sludge is returned to the Aeration Tanks as RAS in order to maintain a sufficient biomass concentration. The excess is removed as waste activated sludge (WAS).

The plant has 10 Dissolved Air Flotation (DAF) Tanks to thicken WAS with the use of air and a thickening polymer, which is used as a coagulant. The plant also has the capacity to co-settle WAS from the Final Clarification Tanks in the Primary Clarification Tanks. At the DAF facility, incoming WAS first enters an inlet splitter box, dividing the inlet flow between the DAF tanks in operations. This splitter box also contains an overflow pipe which allows the excess WAS flow to return to the Aeration Tanks.

2.5 Final Effluent

Through operating and maintaining preliminary, primary, and secondary treatment processes, final effluent is treated to meet Schedule B of the ECA (No. 1496-B2UHDE). Sodium Hypochlorite is used to disinfect and kill pathogens in the final effluent.

The final effluent is discharged to Lake Ontario through an outfall pipe equipped with diffusers and extending approximately 1000 m into the lake from the shore. During periods of wet weather flows, the plant also has the capability of discharging final effluent through the seawall gates to prevent flooding.

2.6 Solids Handling

All primary sludge, thickened WAS (TWAS), co-settled WAS from the Primary Clarification Tanks, and scum from the Primary and Secondary Clarification Tanks, collectively called "sludge", is treated, handled and disposed of in a similar manner, consisting of anaerobic digestion, dewatering and then hauled or pelletized.

Anaerobic digestion is the biological degradation (stabilization) of organic materials in the absence of oxygen – it reduces volume of solids, destroys pathogens and mitigates sludge odour. The process produces digester gas, made up predominantly of methane. This gas is used as a supplementary fuel for plant needs, including process and space heating, thereby reducing the plant's operating costs and carbon footprint. The digesters are operated in the mesophilic temperature range (34 – 38°C). The Digestion process at Ashbridges Bay Treatment Plant consists of 20 primary digesters.

The resulting anaerobically digested sludge, called "biosolids", is subsequently conditioned with a polymer and dewatered by centrifugation. Twelve solid bowl dewatering centrifuges are used to dewater the biosolids. The resulting biosolids "cake" is pumped either to the plant's Truck Loading Facility, or to the onsite pelletizer facility.

2.7 Solids Management

The dewatered biosolids are managed in a number of ways, including agricultural land application, third party process stabilization, pelletization, landfilling, and mine reclamation.

3 PROCESS SUMMARY

3.1 Process Parameters

In 2018, the Ashbridges Bay Treatment Plant continued to produce a high quality effluent. A summary of key secondary treatment effluent and final effluent parameters against the ECA objectives and limits are shown in Table 1. Influent and effluent performance charts are available in Appendix B. Historical performance data is included in Appendix C.

Table 1: Secondary Treatment and Final Effluent Parameters

Parameter	$cBOD_5$[1] (mg/L)	TSS (mg/L)	TP (mg/L)	Total Residual Chlorine (mg/L)	*E coli* (count/ 100mL)	pH [2]
Secondary Treatment Effluent						
January	4.1	6.4	0.72	0.611	28	7.0
February	5.0	6.8	0.72	0.614	64	6.9
March	3.7	4	0.66	0.615	5	6.8
April	4.3	7	0.51	0.623	21	6.9
May	4.0	5.3	0.67	0.65	8	7
June	4.7	6.4	0.52	0.648	29	7
July	3.3	6.5	0.50	0.626	22	7
August	3.5	10	0.66	0.586	4	7.0
September	6.1	9	0.72	0.515	17	7.1
October	5.3	9.1	0.77	0.534	46	7.1
November	6.3	14	0.87	0.583	15	7.1
December	6.1	11	0.74	0.533	48	7.1
Annual Average	4.7	8.0	0.7	0.595	26	7.0
Loading (kg/d)[3]	2627	4453	376	N/A	N/A	N/A
Removal Efficiency (%)	97%	97%	89.35%	N/A	N/A	N/A

Table 1 continued on next page.

[1] cBOD = 0.8 * BOD assumed for removal efficiency calculatons.

[2] Effluent pH within 2018 was within the required objective and limit at all times.

[3] Loading is calculated based on the flow rates as provided in Table 2.

Table 1: Secondary Treatment and Final Effluent Parameters continued

ECA Requirements [4,5]						
Parameter	**$cBOD_5$[1] (mg/L)**	**TSS (mg/L)**	**TP (mg/L)**	**Total Residual Chlorine (mg/L)**	***E coli* (count/ 100mL)**	**pH[2]**
Final Effluent Objective	AAC: 25.0 mg/L	AAC: 25.0 mg/L	MAC: 1.0 mg/L	N/A	N/A	6.5-8.5
Secondary Treatment Effluent Objective	AAC: 15.0 mg/L	AAC: 15.0 mg/L	MAC: 0.9 mg/L	N/A	MGMD: 200 CFU/100 mL	6.5-8.5
Secondary Treatment Effluent Limit	AAC: 25.0 mg/L	AAC: 25.0 mg/L	MAC: 1.0 mg/L	N/A	N/A	6.0-9.5
Average Waste Loading Limit[3]	AAL: 20,450 kg/d	AAL: 20,450 kg/d	AAL: 818 kg/d	N/A	N/A	N/A

[1] cBOD = 0.8 * BOD assumed for removal efficiency calculations.
[2] Effluent pH within 2018 was within the required objective and limit at all times.
[3] Loading is calculated based on the flow rates as provided in Table 2.
[4] Referenced from ECA Sewage 8047-ABZNY9 and Schedule B and C from ECA Sewage 1496-B2UHDE, issued on September 26, 2018.
[5] AAC refers to Annual Average Concentration, MAC refers to Monthly Average Concentration, MGMD refers to Monthly Geometric Mean Density, and AAL refers to Annual Average Daily Loading.

influent and Final effluent concentrations of eleven select heavy metals have been included in Appendix E. Any discharge into City sewers must meet the sewer use By-law limits. Final effluent concentrations are presented to assess the treatment plant's removal capacity.

A summary of the annual averages of process parameters over the past three years are shown in Table 2.

Table 2: Process Summary

Parameter	Units	2018	2017	2016
Flow[1]	ML/day	563.7	659.8	549.8
Total Annual Flow[1]	ML	205,750	240,817	201,229
Influent Parameters				
Total Suspended Solids (TSS)	mg/L	303.7	279.5	318.6
Biochemical Oxygen Demand (BOD_5)	mg/L	207.9	201.9	244.6
Total Phosphorus (TP)	mg/L	6.3	6.4	7.5
Transfer from Humber TP: liquid biosolids	Dry tonnes/ day	72.9	80.0	59
Transfer from Humber TP: WAS	Dry tonnes/day	4.9	4.9	5.1

Parameter	Units	2018	2017	2016
Transfer from North Toronto TP: sludge (primary sludge, WAS, and scum)	ML/day	0.46	0.40	0.48
Preliminary Treatment				
Grit and Screenings	Tonnes/day	4.9	5.5	5.7
Primary Treatment				
TSS	mg/l	169.4	142.9	123.9
cBOD5	mg/L	89.3	68.7	84.3
Secondary Treatment				
Aeration Loading	kg $CBOD_5$/ m^3/day	0.27	0.25	0.25
Mixed Liquor Suspended Solids	mg/L	2,711	2,372	2,643
Flow through Seawall Gates	ML	3,278	3,187	2,004
Solids Handling				
Primary Sludge Treated	m^3/day	5980	5640	6420
Primary Sludge TS	%	2.3	2.5	2.6
Primary Sludge TVS	%	73.9	73.0	73.8
WAS co-settled in Primary Clarification Tanks or excess WAS to Aeration	m^3/day	911	1260	2130
WAS to Thickening	m^3/day	6944	7380	7360
WAS TS	mg/L	0.84	0.7	0.7
TWAS Treated	m^3/day	1952	1440	1600
TWAS TS	%	3.6	3.7	3.4
TWAS TVS	%	73.9	73.2	71.6
Volume to Digestion	m^3/day	7930	7080	8020
Digesters Hydraulic Retention Time	days	19.3	20.2	18.1
Organic Loading to Digesters	TVS per m3 of digester capacity per day	1.0	0.9	1.1
Digester Gas Volume	m^3/day	61,856	61,640	62,330
Dewatering Centrifuge Feed TS	%	1.6	1.7	1.8
Dewatered Biosolids TS	%	27.79	27.9	28.1
Centrate Quality	mg/L	428	299	319
Solids Capture Rate	%	97.38	98	98
Centrifuge Run Time	hours	52,790	52,400	52,329

[1] Flow monitoring is provided by effluent flow meters.

Even though we experienced higher precipitation in 2018 compared to previous two years (2016 & 2017), the plant flows remained consistent with 2016 levels. We noticed a 2.5% increase in plant flows compared to 2016. (2017 – Was a year with high lake levels which caused higher flow to the facility) With increased precipitation, we noticed the dilution effect in BOD5, TSS & TP, similar to 2017.

In 2018, the Ashbridges Bay Treatment Plant encountered no chronic operating problems, and continued to produce a high quality effluent which surpassed requirements of the effluent objectives as described in Terms and Conditions, Clause 6 of the plant's ECA. This was achieved through continuous improvement in operations and maintenance of treatment processes, and infrastructure delivery. Ashbridges Bay Treatment Plant's effluent was essentially free of floating and settleable solids and did not contain any oil or other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters, as per Condition 6(1)(b) of the ECA.

3.2 Biosolids Management

The flow projections for 2019 do not exceed the plant rated capacity of 818 ML/day and are expected to generate a sludge volume that will be +/- 5% of the volume generated in 2018.

Biosolids analysis are included in Appendix E and compared against the *Ontario Regulation 267/03 under the Nutrient Management Act*, which govern the maximum acceptable metal concentration in biosolids that are applied to land. The average metal and *E. coli* concentrations met all criteria as designated in O.Reg 267/03.

Biosolids management from the Ashbridges Bay Treatment Plant in 2018 totalled 155,756 wet tonnes and was managed as follows.

3.2.1 Agricultural Land Application

A total of 27,835 wet tonnes of biosolids were sent to approved agricultural land application sites in Ontario. During the 2018 land application season, the City contracted an independent field inspector to monitor the practices of the City's land appliers. The independent field inspector observed the application of biosolids on numerous agricultural land sites in Ontario. The inspector was responsible for ensuring the Nutrient Management Act and accompanying Regulations were adhered to, site specific requirements were followed, and monitoring and recording of odour measurements were taken before, during and after application.

3.2.2 Third Party Process Stabilization (Soil Amendment)

In 2018, a total of 37,666 wet tonnes of biosolids was further processed off-site by licensed external service providers and beneficially used as Class A biosolids and soil amendments.

3.2.3 Pelletization

The operation and maintenance of the Ashbridges Bay Treatment Plant Pelletizer facility and marketing of pellets is managed by an outside contractor. In 2018, 82,702 wet tonnes of biosolids were processed by the on-site pelletizer. Pellet quality in 2018 met the standards set out by the Canadian Fertilizers Act.

3.2.4 Landfill Management of Biosolids

A total of 0 wet tonnes was transported to landfill sites.

3.2.5 Mine Reclamation

A total of 7,553 wet tonnes of biosolids was utilized at mine reclamation sites.

Table 3 below summarizes the biosolids management methods utilized and the total amount of biosolids sent to each management option.

Table 3: Biosolids Management Methods

Biosolids Management Method	Wet Tonnes		
	2018	2017	2016
Agricultural Land Application	27,835	32,653	35,414
Third Party Process Stabilization (Soil Amendment)	37,666	35,745	37,968
Pelletization	82,702	82,938	72,886
Landfill	0	0	0
Mine Land Reclamation	7,553	7,952	3,465
Total	**155,756**	**159,288**	**149,733**

3.3 Chemical Usage

Several chemicals are used during the treatment process at the plant. Table 4 outlines the chemical consumption for the current and previous year based on 1000 ML of water treated in the facility for the past three years. Costs listed are plus applicable taxes.

Table 4: Chemical Usage Summary per 1000 ML Treated

Process	Chemical	2018 Usage	2018 Cost	2017 Usage	2017 Cost	2016 Usage	2016 Cost
Phosphorus Removal	Ferrous Chloride as Fe	8.05 tonnes	$720/ tonne Fe	7.04 tonnes	$720/ tonne Fe	10.43 tonnes	$720/ tonne Fe
Disinfection	Sodium Hypochlorite	202.52 m3	$163.20 /m3	47.03 m3	$132/m3	67.53 m3	$129/m3
Biosolids Dewatering	Polymer	2.71 tonnes	$3,090/ tonne	2.23 tonnes	$3,090/ tonne	2.73 tonnes	$3,090/ tonne
WAS Thickening	Polymer	0.780 tonnes	$3,090/ tonne	0.604 tonnes	$3,090/ tonne	0.700 tonnes	$3,390/ tonne

3.4 Bypasses, Overflows, Spills, and Abnormal Discharge Events

3.4.1 Bypasses

There were six bypass events in 2018; all were secondary treatment bypasses. The total volume of bypass flow was 1,556 ML, or 0.76% of the annual flow.

Bypass flow bypasses secondary treatment (i.e. the Aeration Tanks) but receives preliminary, primary treatment, nutrient removal, as well as disinfection and exits the plant through the

plant outfall before of the final effluent sampling point. Secondary bypasses occur due to high wet weather flows that exceed the plant's secondary treatment capacity. Each instance was reported to the MECP Spills Action Center and recorded into the plant's Monthly report. Secondary bypasses occur due to high wet weather flows that exceed the plant's secondary treatment capacity. Total precipitation in the Toronto area[3] was 921.1 mm in 2018, a 17.4% increase from 2017.

Table 5: Bypass Summary

Date	Start of Event	End of Event	Duration (hr)	Volume (m^3)	Average Chlorine Dose (mg/L)
01/12/2018	11:15:00	15:02:00	4.25	90,708	9.7
04/16/2018	08:24:00	01:21:00	16.95	729,819	8.8
06/24/2018	12:00:00	16:06:00	4.10	99,410	10
08/07/2018	23:49:00	03:32:33	3.72	127,350	11.4
11/01/2018	22:39:07	06:12:33	7.55	244,510	12.7
11/26/2018	12:33:00	22:24:00	10	264,440	10.4

3.4.2 Overflows

There were no overflow events at the Ashbridges Bay Treatment Plant in 2018. An overflow is defined as a discharge to the environment from the plant at a location other than the plant outfall downstream of the final effluent sampling station.

3.4.3 Spills

There were thirteen spills reported to the MECP in 2018; they are summarized in below.

[3] *Adapted from http://climate.weather.gc.ca/historical_data/search_historic_data_e.html, Toronto City Station*

Table 6 - Spills Summary

Date	Duration (hr)	Volume (m^3)	Nature of event	Description
Jan. 11, 2018	0.5	0.68-2	Unchlorinated Final Effluent	Failure of corroded aged pipe. The leaking section was repaired on Jan. 11th, 2018 to prevent reoccurrence.
Jan.12, 2018	5.5	20.7	Unchlorinated Final Effluent	Failure of corroded aged pipe. The pipe was isolated on Jan. 12th 2018 and sealed permanently on Jan. 16th 2018 as preventative measures.
Mar. 12, 2018	60	NA	Digester Gas	Planned spill of digester gas due to new waste gas burner project as approved in Environmental Compliance Approval.
Apr. 11, 2018	NA	1	Unchlorinated Final Effluent	Failure of previous repair work on a knockout panel due to excavating work. The leaking point was repaired with injection on April 12th, 2018.
May 4, 2018	NA	0.05	Digested Sludge	Faulty level sensor reading caused the spill when putting a holding tank back into service. Valve was closed immediately to stop the spill. Visual inspection of level will be implemented when restarting a holding tank.
June 24, 2018	0.03	1-2	Raw Sewage	The spill was caused as a diversion gate was controlled in manual mode during heavy rain. The diversion gate will be set up to automatically open on SCADA to prevent the reoccurrence.
August 10, 2018	NA	0.01	Unchlorinated Final Effluent	A pipe was struck by construction work and the leaking point was sealed with quick drying cement. The pipe was permanently plugged with concrete on Aug. 13th, 2018 to prevent reoccurrence.
August 13, 2018	NA	NA	Unchlorinated Final Effluent	Spill was exposed during construction work and the leaking point was permanently plugged with concrete on Aug. 13th, 2018 to prevent reoccurrence.

Date	Duration (hr)	Volume (m^3)	Nature of event	Description
September 13, 2018	0.25	0.02	Unchlorinated final effluent	Spill was exposed during construction work and the leaking point was permanently plugged with concrete on Oct. 11th, 2018 to prevent reoccurrence.
October 4, 2018	NA	0.005	Sodium Hypochlorite	The backup totes of Sodium Hypochlorite for disinfection was overfilled and approximately 5L of hypo spilled over to the soil. The valve was closed immediately to stop the filling of the tote. The valves accessibilities to the backup totes are now controlled by plant technician locks as a preventative measure to prevent the reoccurrence.
October 16, 2018	NA	0.2	Chlorinated Final Effluent	This spill was due to a crack in the plant water pipe line. Plant staff isolated the plant water pipe line and the spill stopped. The pipe was repaired on Oct. 19th, 2018.
November 7, 2018	NA	0.015	Chlorinated Final Effluent	This spill was due to a cut in a pipe which was being modified as part of a project. The affected soil was taken out on Nov. 8th, 2018 and has been disposed appropriately.
December 18, 2018	NA	0.1	Raw Sludge	Spill of raw sludge on the grassy area in front of Digesters 9-12. The spilled raw sludge was vacuumed and the affected area was cleaned and disinfected.

3.4.4 Abnormal Discharge Events

There were two abnormal discharge events at the Ashbridges Bay Treatment Plant in 2018. An abnormal discharge event is defined within the meaning of Part X of the Environmental Protection Act. These events were related to interruptions to disinfection. Please refer to Table 11.

3.5 Complaints

The Ashbridges Bay Treatment Plant received four complaints related to odour and no complaints related to noise. All complaints were recorded, investigated by Toronto Water staff, reported to MECP, and when possible, followed up with the complainant. After investigation, none of the complaints received were determined to be plant related. For additional information, please refer to Section 7.6 – MECP/MOL Correspondence.

3.6 Effluent Quality Assurance and Control Measures

Analytical tests to monitor required parameters are performed by the Toronto Water Laboratory which is accredited to ISO/IEC 17025 by Canadian Association for Laboratory Accreditation Inc. Plant operation and performance is monitored by licensed operators as well as by the facility management team. Standard Operation Procedures, emergency plans, equipment preventative and predictive maintenance, and a network of support staff, help ensure a rapid and effective response to issues, and maintain the high quality of the effluent and biosolids. A hybrid Quality and Environmental Management System is also in development and will be reported on in future annual reports.

3.7 Odour Reduction Plan

As per Section 22 of the ABTP Amended ECA – Air No. 2815-9PWTWV issued January 15, 2015, a review of the Odour Reduction Plan summarizing the work progress in 2018, including odour and total sulphur reduction activities undertaken with associated reduction levels achieved, can be found in Appendix F.

4 CAPITAL PROJECTS

Under Toronto Water's capital program, the Ashbridges Bay Treatment Plant commenced or continued with the capital works projects and studies listed in Table 7 in 2018.

Table 7: Capital Projects

Project Name	Project Description	Project Stage (Dec 31, 2018)
Digester 9-12, II	Complete upgrade of Digester 9-12 cluster.	Construction
Disinfection	New UV disinfection facility. Also includes new secondary west bypass conduits, plant water station upgrades, seawall substation upgrades, and seawall gate refurbishment.	Construction
IPS Contract 1	Site preparation for future IPS contract.	Construction
IPS Contract 2	Preliminary civil work for the future IPS	Design
IPS Contract 3	Replacement of M&T pumping station with new Integrated sewage/wet weather flow pumping station located South of Lakeshore.	Design
Outfall	New plant outfall.	Design
P-Building	Preliminary treatment upgrades including grit, screenings, odour control, bypass and gallery. Also includes Chemically Enhanced Primary Treatment and replacement of Gallery 7, 8, and 9 primary sludge pumping equipment.	Construction[4]
Phosphorous Removal	Replacement of existing ferrous chemical gallery with new ferrous chemical facility.	Construction
Project Management Office	Renovation of the old administration building to include a new project management office.	Design
Polymer Upgrades	Replacement of dewatering polymer system, dewatering centrifuges, upgrades to sludge feed system, centrate storage, as well as the WAS polymer system.	Design
Rugby Field	Relocation of Rugby Field.	Construction
Thickening	New WAS thickening facility using centrifuges and overhaul of South Substation.	Design
TLF Biofilter	Replacement of TLF biofilter; new pelletizer up blast fans; conversion of scrubber building into workshop and admin space. Includes upgrades to TLF facility.	Construction

[4] Partial commissioning of sewage conduits, screening systems, grit removal systems and channel air systems

Project Name	Project Description	Project Stage (Dec 31, 2018)
WGB	Replacement of Waste Gas Burners.	Construction
Air Header Painting	Recoating of above ground aeration air header.	Construction
Blower Building Upgrades	Upgrades to blower building admin space and stores	Design
Digester 13 & 16 Cleaning	Cleaning program for Digesters 13 and 16. Additional digester clusters to follow.	Construction
M&T Critical Repairs II-ii	General upgrades to M&T building to extend the life of the pumping station until the IPS is built.	Construction
RPU Upgrade	Upgrade of all RPUs to new standard.	Construction
TAB ECAP 03 & 05	Electrical upgrades in blower building and aeration gallery.	Construction
TAB ECAP 04	Electrical upgrades in North Substation.	Construction
Z-Building Heat Conversion	Conversion of all steam loads in Z Building to hot water.	Construction
Facility Condition Assessment	Assess life and condition of facilities onsite.	Study
Process Road Map	Process planning for the future of Ashbridges Bay Treatment Plant.	Study
Digester 9-12, II	Complete upgrade of Digester 9-12 cluster.	Construction

5 MAINTENANCE

Staff from the Ashbridges Bay Treatment Plant performed a variety of scheduled, preventative, predictive and reactive maintenance on a diverse spectrum of equipment. Equipment availability and reliability ensures operational objectives are achieved.

The annual calibration and maintenance records of flow meters and on-line analysers for regulated parameters was completed in 2018, and found to be within acceptable limits.

The Ashbridges Bay work areas include all major and auxiliary processes. In 2018, there were a total of 29,238 work orders completed; refer to Appendix G for a summary of maintenance activities as per Conditions 11(4) of the ECA.

None of the maintenance activities undertaken at the plant fell under Limited Operational Flexibility; as a result, no Notices of Modifications were submitted to the Water Supervisor as per Condition 11.4.i. of the ECA.

6 UTILITIES

A summary of monthly utility consumption for the previous three years at Ashbridges Bay Treatment Plant is provided in Figure 1. Table 8 below summarizes the total cost and average unit cost for water, hydro, and natural gas. Total annual consumption for potable water, hydro, and natural gas was 326,779 m^3, 131.7M kWh, and 6.8M scm, respectively.

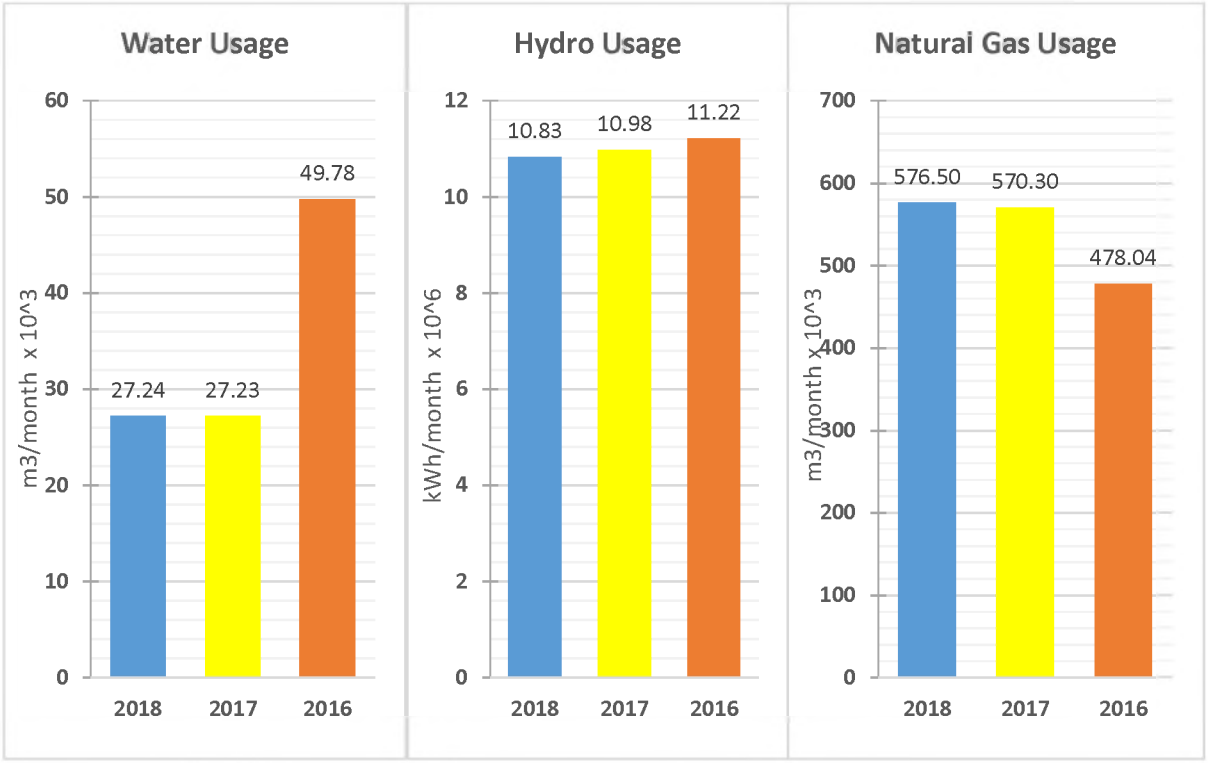


Figure 1: Annual Utility Consumption (Water, Hydro, Gas)

Table 8: Average Unit and Total Utility Cost

Utility	2018	2017	2016
Water Unit Cost ($/m3)	4.00	3.81	3.62
Water Total Cost ($/year)	1.31 M	1.24 M	2.17 M
Hydro Unit Cost ($/kWh)	0.10	0.10	0.10
Hydro Total Cost ($/year)	12.96 M	12.88 M	13.74 M
Natural Gas Unit Cost ($/m3)	0.23	0.24	0.24
Natural Gas Total Cost ($/year)	1.58 M	1.63 M	1.35 M

7 ADMINISTRATION

7.1 Operations and Maintenance Costs

The 2018 plant direct operational costs are broken down into five categories: Salaries and Benefits, Materials and Supplies, New Equipment, Services and Rents, and Inter-Divisional Charges. Materials and Supplies is further segregated into Utilities, Machine & Equipment Parts, Chemicals and Other Materials and Supplies. A breakdown of annual operations and maintenance costs for the past three years is illustrated in Figure 2. Overall, operational costs increased by 3.6% from 2017.

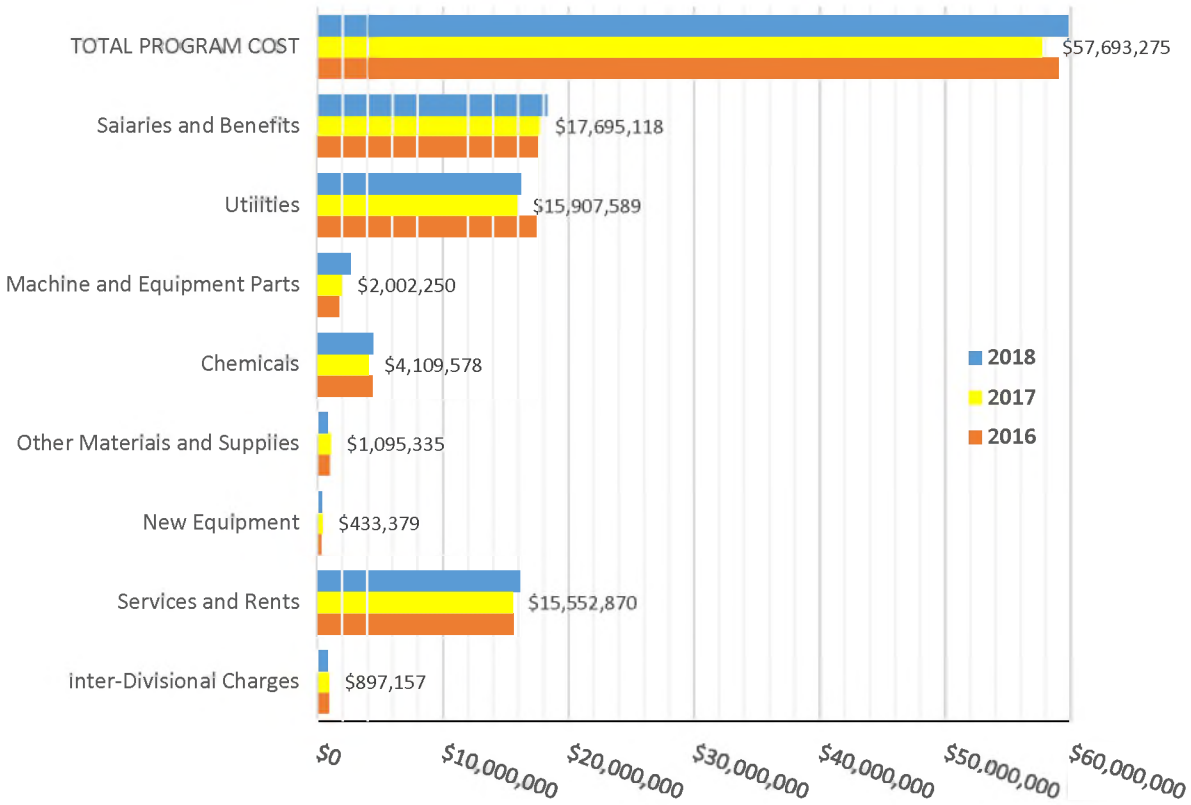


Figure 2: Operations and Maintenance Cost Breakdown

7.2 Human Resources

Plant Staffing at the Ashbridges Bay Treatment Plant in 2018 is shown in Table 9.

Table 9: Plant Staffing

Position	Number of FTE[1]
Senior Plant Manager	1
Manager, Engineering Services	2
Superintendent, Plant Process and Operations	2
Senior Engineer	2
Engineer	2
Area Supervisor Plant Operations and Maintenance	10
Supervisor, Operational Support	1
Supervisor, Operating Engineers A/R-C	1
Stationary Engineer Operator	8
Electronic Instrumentation Specialist	2
Engineering Technologist Technician	2
Plant Technician/Wastewater	41
Plant Maintenance Operator	1
Developmental Plant Technician	2
Industrial Millwrights	49
Electrical Instrumentation Control Tech (EICT)	23
Support Assistant	2
Systems Integrator 1	1
Materials Management Assistant	1
Wastewater Plant Worker	6
Seasonal Temporary	3.5
Total FTE Positions	162.5

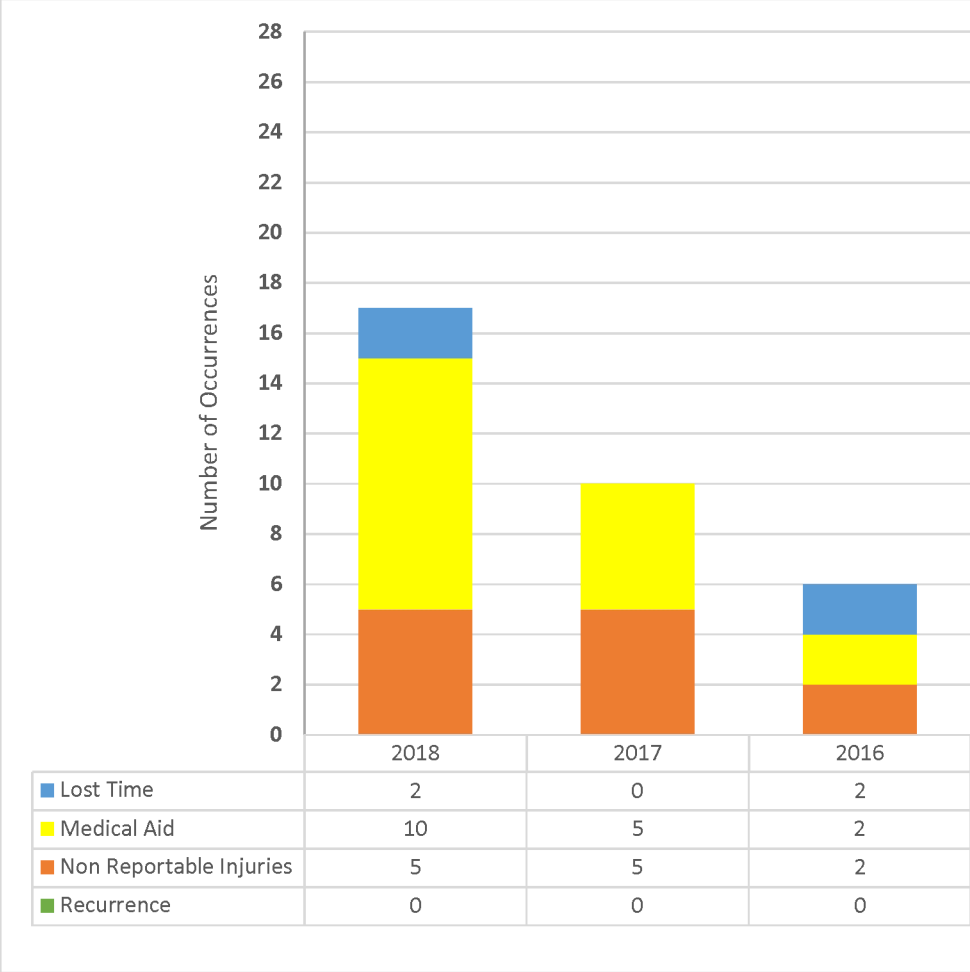
[1] FTE refers to Full Time Equivalent staff. Seasonal staff are considered 0.5 FTE staff.

7.3 Occupational Health & Safety

Continuous efforts are made to ensure a safe working environment at the Ashbridges Bay Treatment Plant. The Joint Health and Safety Committee (JHSC) assists management in resolving issues through regular meetings and monthly workplace inspections. Plant Health and Safety statistics for the Ashbridges Bay Treatment Plant are included in Figure 3[5].

[5] The previously reported values for 2017 and 2016 have been changed to reflect the status of those WSIB claims as of December 31st 2018

As of **March 15, 2018,** there were 17 health and safety incidents, and a total of 138 lost time days due to work related injuries.



	2018	2017	2016
Lost Time	2	0	2
Medical Aid	10	5	2
Non Reportable Injuries	5	5	2
Recurrence	0	0	0

Figure 3: Ashbridges Bay Treatment Plant Health & Safety Injury Summary

7.4 Staff Training and Development

The Strategic Planning and Workforce Development unit of Toronto Water facilitates a comprehensive training program for all staff.

Training attended by Ashbridges Bay Treatment Plant operations and skilled trades staff in 2018 includes the list of courses shown in Appendix H. Some of these courses were eligible for Continuing Education Units (CEU's) from the Ontario Environmental Training Consortium (OETC). Additional training related to the start-up and commissioning of new equipment/systems installed as part of the capital program was provided as required.

7.5 Utility Operator Certification

Toronto Water trains and provides the required resources to ensure all operators achieve and maintain Class IV certifications. In addition, all skilled trade positions are required to achieve and maintain a Class I operator's license. As part of this initiative, general operational/process training was delivered in order to prepare staff for any certification examination that they need to write. Table 10 summarizes the status of operator certification at the Ashbridges Bay Treatment Plant in 2018.

Table 10: Wastewater Treatment Certificates

Class Level	Number of Licenses
Class IV	39
Class III	7
Class II	10
Class I	37
O.I.T.	45
Total	**138**

7.6 MECP/MOL Correspondence

There were no orders issued by the Ministry of the Environment, Conservation and Parks (MECP). There was no orders from the Ministry of Labour (MOL).

Reports were submitted to the MECP for the four odour complaints received at the plant in 2018, 13 spill events, two consent events and as well as one notification of start-up. Table 11Table 11 summarizes the correspondence submitted to the MECP and MOL for the Ashbridges Bay Treatment Plant. Correspondence related to spills and bypasses can be referenced in Section 3.4.

Table 11: Correspondence submitted to the MECP and MOL

Event Date	Type	Description	Resolution	Resolution Date
January 24, 2018	10 Day Report as per Amended ECA	Written report regarding release of unchlorinated final effluent.	10 Day Report as per Amended ECA	January 24, 2018

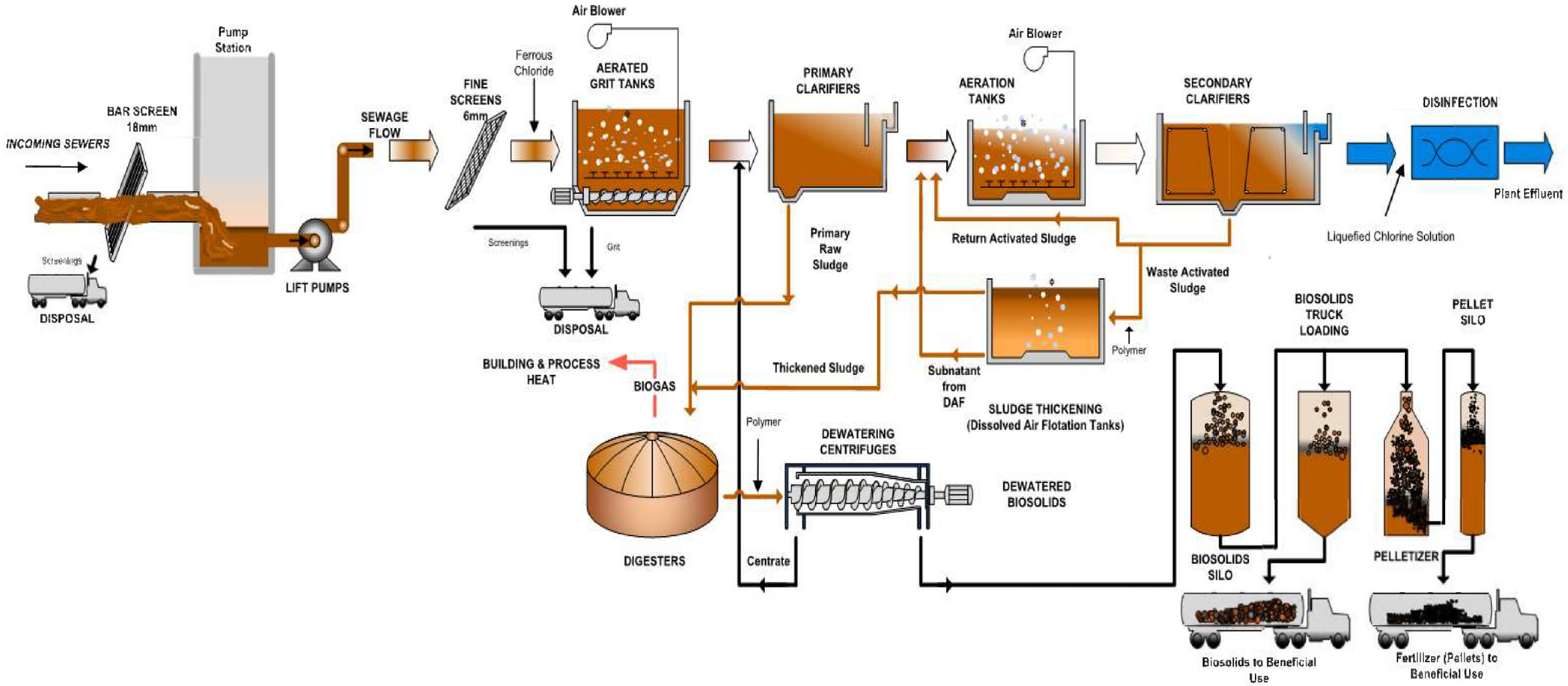
Event Date	Type	Description	Resolution	Resolution Date
February 20, 2018	Communication regarding an odour complaint	Communicated with Shannon Boland, MECP Water Inspector, an odour complaint with investigation revealed that it was not plant operation related.	No action required.	NA
February 28, 2018	Communication regarding an odour complaint	Communicated with Shannon Boland, MECP Water Inspector, an odour complaint with investigation revealed that it was not plant operation related.	No action required.	NA
May 08, 2018	10 Day Report as per Amended ECA	Written report regarding release of digested sludge		
May 17, 2018	Communication regarding an odour complaint	Communicated with Shannon Boland, MECP Water Inspector, an odour complaint with investigation revealed that it was not plant operation related.	No action required.	NA
June 26, 2018	Communication regarding a critical injury	Communication with Steven Briscoe, MOL Inspector, a field investigation was conducted for a critical injury.		
June 28, 2018	Communication regarding an odour complaint	Communicated with Shannon Boland, MECP Water Inspector, an odour complaint with investigation revealed that it was not plant operation related.	No action required.	NA
July 05, 2018	15 Day Report as per Amended ECA	Written report regarding release of raw sewage.		
August 12, 2018	Written report as per Amended ECA	Written report regarding interruption of disinfection due to pump shut off caused by interlock.	Interlock has been removed.	August 13, 2018

Event Date	Type	Description	Resolution	Resolution Date
August 23, 2018	15 Day Report as per Amended ECA	Written report regarding release of unchlorinated final effluent (event occurred on August 10, 2018)		
August 23, 2018	15 Day Report as per Amended ECA	Written report regarding release of unchlorinated final effluent (event occurred on August 13, 2018).		
September 10, 2018	Communication regarding a critical injury	Communication with Steven Briscoe, MOL Inspector, released scene by phone.	Scene released by phone	
September 12, 2018	Communication regarding a critical injury	Communication with Steven Briscoe, MOL Inspector, a report was submitted to MOL	Report submitted to MOL	
September 20, 2018	15 Day Report as per Amended ECA	Written report regarding release of unchlorinated final effluent.		
October 12, 2018	Written report as per Amended ECA	Written report regarding interruption of disinfection due to a power loss from Toronto Hydro.	A backup generator has been designated to the disinfection pumps in case of power loss.	Oct. 19, 2018
October 16, 2018	15 Day Report as per Amended ECA	Written report regarding release of Sodium Hypochlorite.		
October 24, 2018	15 Day Report as per Amended ECA	Written report regarding release of plant water.		
November 14, 2018	15 Day Report as per Amended ECA	Written report regarding release of plant water.		
December 21, 2018	15 Day Report as per Amended ECA	Written report regarding release of raw Sewage.		
Consent Letters				
January 05, 2018	Director Consent	Consent Granted – Planned Digester Gas Venting	NA	NA

Event Date	Type	Description	Resolution	Resolution Date
November 16, 2018	Director Consent Letter	Request for Consent – Shutdown of the Aeration Odour Control System for the winter.	Consent was granted.	November 30, 2018
Notification of Commissioning				
December 4, 2018	Notification on Commissioning of Proposed Works	Commissioning Operation of Proposed Works – P Building	N/A	N/A
MECP Inspection				
N/A		MECP Communal Sewage Inspection		

APPENDIX A – Plant Schematic

APPENDIX A: PLANT SCHEMATIC



Process Flow Diagram for Ashbridges Bay Treatment Plant

APPENDIX B – Influent and Effluent 2018 Performance Charts

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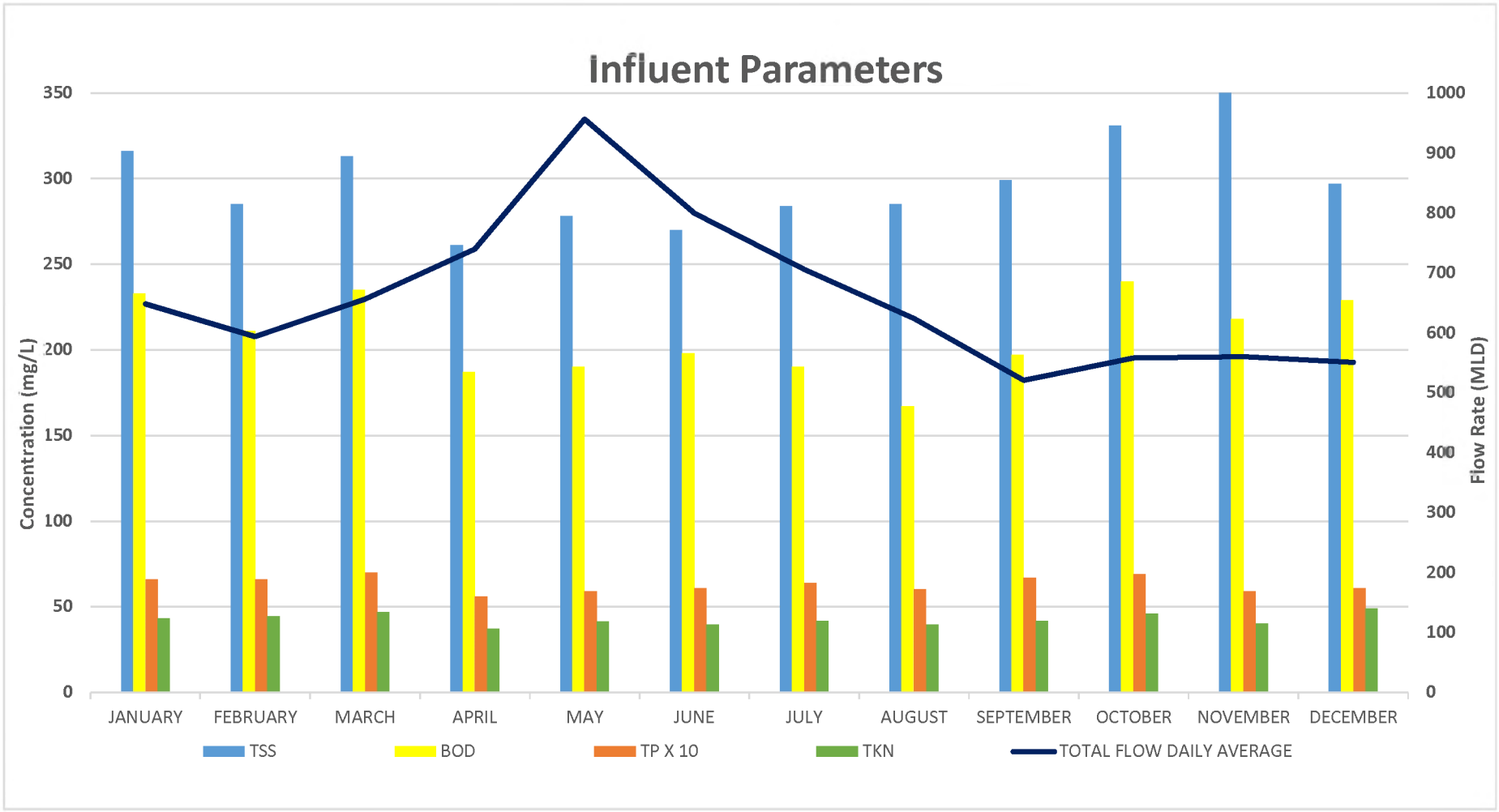

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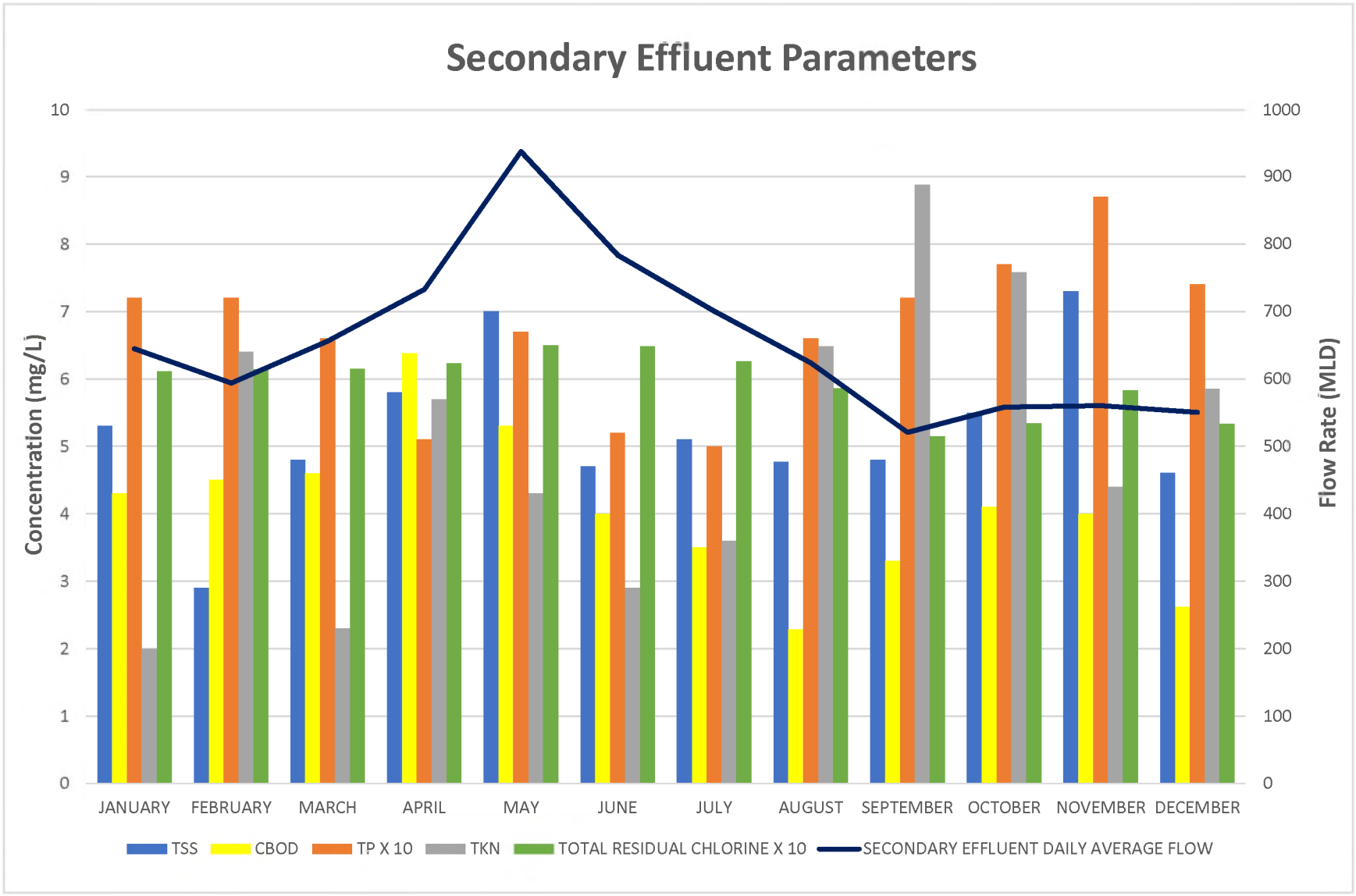

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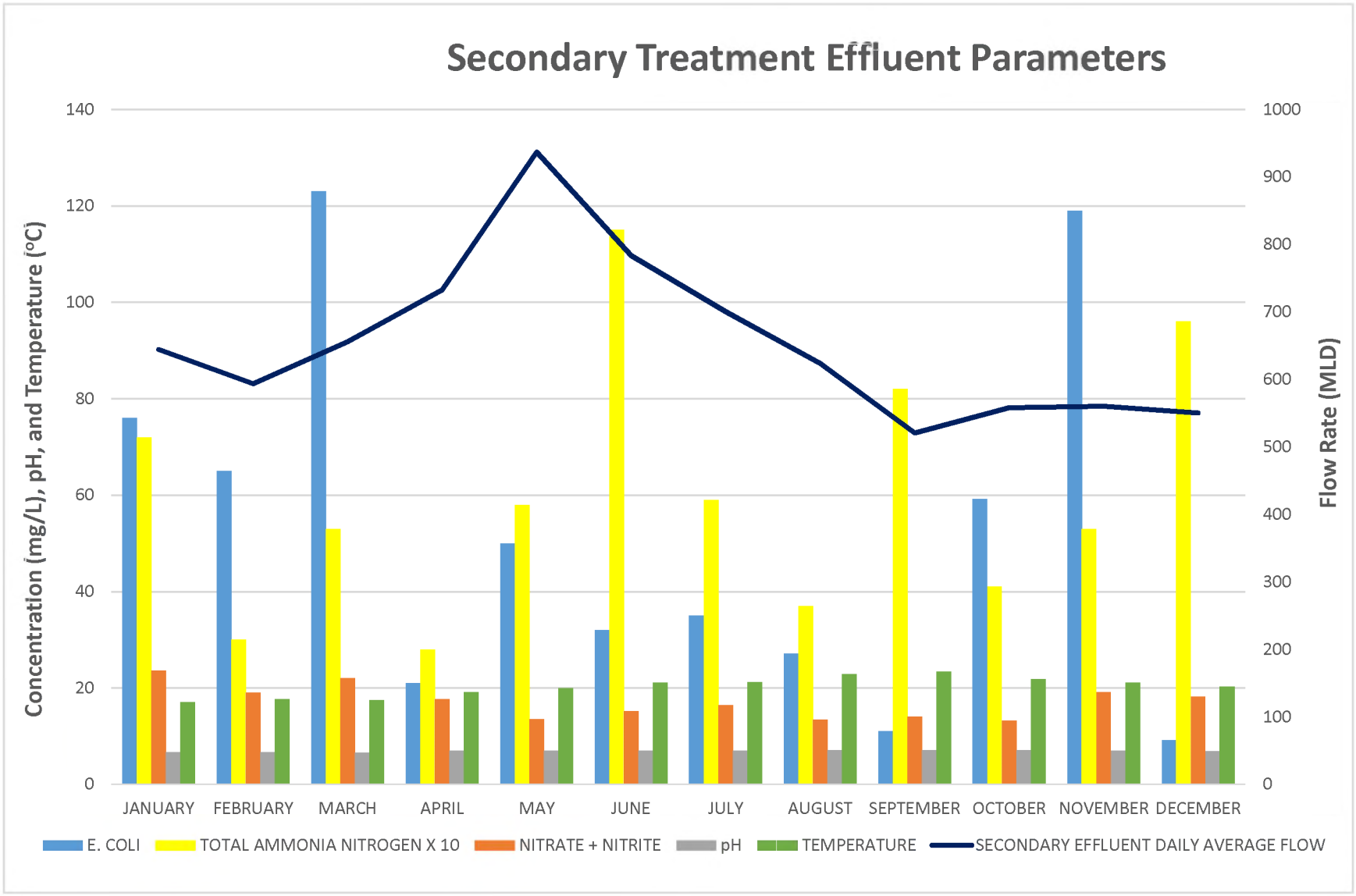

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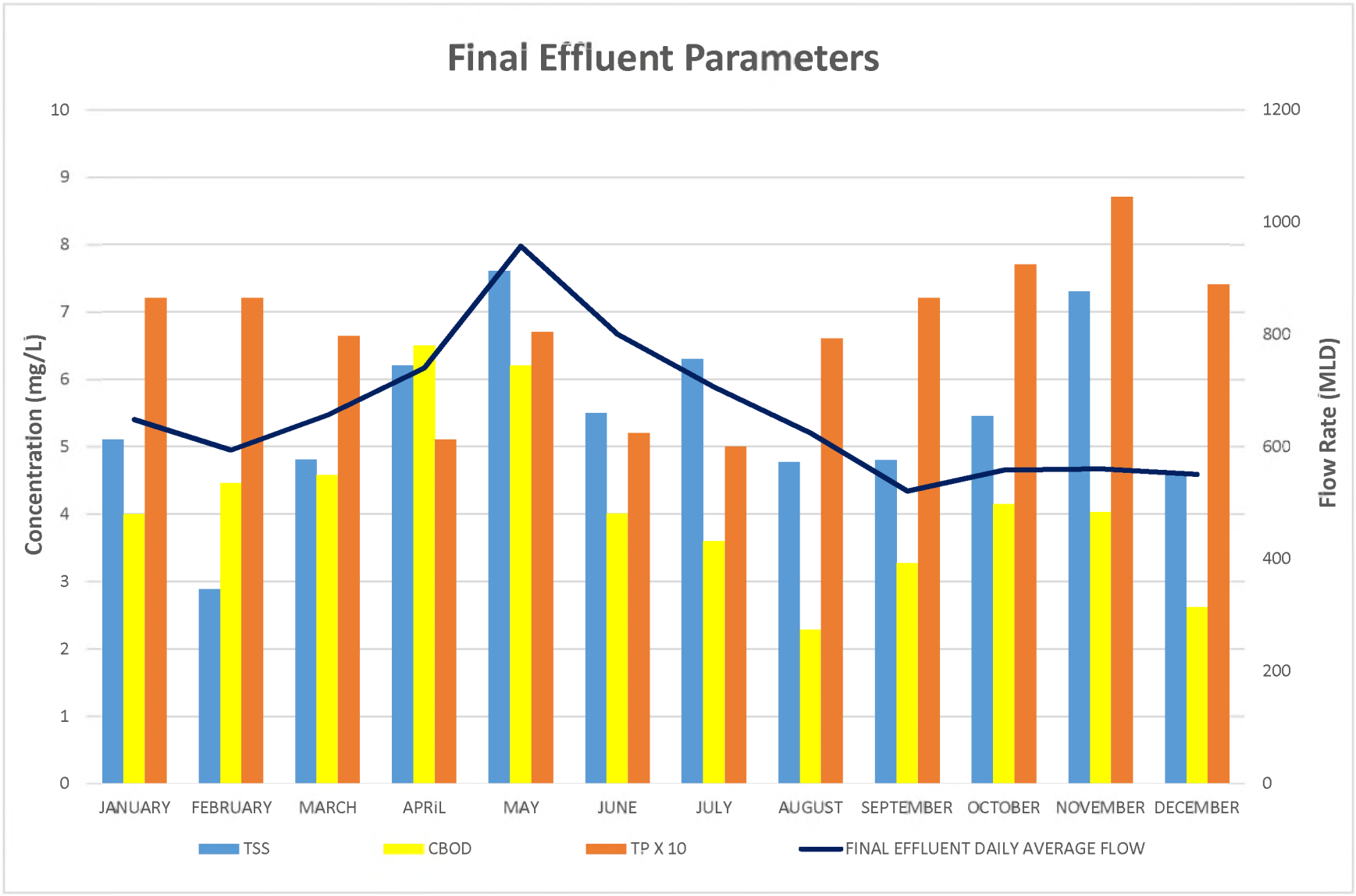

APPENDIX C – Historical Performance Data

APPENDIX C – Historical Performance Data

	Units	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Influent Parameters												
Flow	ML/day	563.9	659.8	549.8	585.2	638.4	631.6	576.1	622.4	596.3	697.6	653.2
Total Annual Flow	ML	205,750	240,817	201,229	212,831	232,932	230,456	210,834	227,355	217,641	254,609	239,045
Total Suspended Solids (TSS)	mg/L	303.7	279.5	318.6	334.6	328.5	271.2	275.2	274.0	260	255.5	274.3
Biochemical Oxygen Demand (BOD_5)	mg/L	207.9	201.9	244.6	274.9	258.3	174.9	178.2	142.4	137	121.1	101.0
Total Phosphorus (TP)	mg/L	6.3	6.4	7.5	7.5	6.6	5.9	6.2	6.4	5.9	6.2	6.0
Total Kjeldahl Nitrogen (TKN)	mg/L	43	40.26	45.4	43.7	44.7	46.6	47.7	44.1	54.4	37.9	36.9
Preliminary Treatment												
Grit and Screenings	tonnes/day	4.9	5.5	5.7	5.6	11	13	9.2	8.97	11.85	9.67	8.6
Primary Treatment												
TSS	mg/L	89.3	142.9	123.9	233.3	205.9	162.7	216.1	339.9	550.5	319.1	257.7
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	mg/L	89.3	68.7	84.3	98.9	92.9	90.3	113.3	138.2	272.5	113.5	96.9
Secondary Treatment												
Aeration Loading	kg $CBOD_5$/ m^3.day	0.27	0.25	0.25	0.32	0.32	0.32	0.53	0.7	1.46	0.65	0.53
Mixed Liquor Suspended Solids	mg/L	3389	2,372	2,643	2,969	2,696	1,830	1,467	2,309	2,002	2,215	2,014
Flow through Seawall Gates	ML	3278	3,187	2,004	2,908	4,751	5,227.9	-	-	-	-	-
Secondary Treatment Effluent												
Secondary Effluent Daily Average Flow	ML/day	559.6	654.9	548.7	576.9	632.4	625.7	571.2	614.7	627.7	692.0	651.8
TSS	mg/L	8.0	5.2	6.4	10.1	8.2	8.0	8.4	11.1	7.8	8.7	9.4
TSS Loading Rate	kg/day	4453	3,415	3,489	5,021	5,021	4,981	4,810	7,009	4,614	6,041	6,128
cBOD5	mg/L	4.7	4.1	4.3	5	4.6	8.5	6.9	7.0	5.3	4.7	3.6
cBOD5 Loading Rate	kg/day	2627	2,668	2,381	2,838	2,837	5,262	3,926	4,298	3,131	3,239	2,347
TP	mg/L	0.7	0.7	0.7	0.8	0.8	0.6	0.6	0.6	0.7	0.7	0.7
TP Loading Rate	kg/day	376	458	365	495	495	330	330	389	407	482	464

APPENDIX C – Historical Performance Data

	Units	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Escherichia coli (*E. coli*)	CFU/100 mL	25.6	53	36.8	66.5	7.4	90.0	31.3	35.9	3.0	1.9	2
pH	-	7.0	6.8	6.8	7.0	7.0	7.2	7.2	7.3	7.0	7.0	-
Total Residual Chlorine	mg/L	0.6	0.6	0.6	0.5	0.8	1	0.6	0.64	0.9	0.9	0.9
Total Kjeldahl Nitrogen (TKN)	mg/L	6.2	5.0	3.8	6.7	7.3	14.5	14.4	15.8	18.4	19.1	11.4
Total Ammonia Nitrogen	mg/L	6.0	4.6	3.3	5.3	5.9	11.2	13.8	13.7	16.9	17.2	11.8
Nitrate + Nitrite	mg/L	17.4	17.1	18.5	17.0	16.3	13.1	17.1	15.6	13.2	9.9	13.8
Temperature	degrees Celsius	21.0	20.2	20.9	20.1	19.5	20.2	19.7	19.3	20.6	20.5	19.6
Final Effluent												
TSS	mg/L	8.1	5.4	6.5	10.4	9.2	-	-	-	-	-	-
cBOD5	mg/L	4.7	4.1	4.4	5.2	5.0	-	-	-	-	-	-
TP	mg/L	0.7	0.7	0.7	0.8	0.8	-	-	-	-	-	-
Solids Handling												
Primary Sludge Treated	m^3/day	5978	5,640	6,420	4,440	4,292	5,067	5,546	6,900	6,590	5,767	5,575
Primary Sludge Total Solids (TS)	%	2.3	2.5	2.6	3	3.05	2.9	2.72	2.60	3.18	2.68	2.65
Primary Sludge Total Volatile Solids (TVS)	%	73.9	73	73.8	73.5	72.9	62.9	74.9	73.4	92.4	70.4	69.5
Waste Activated Sludge (WAS) co-settled in Primary Clarification Tanks or excess WAS to Aeration	m^3/day	1	1,260	2,130	1,240	2,405	8,800	14,523	35,288	20,809	18,092	13,537
WAS to Thickening	m^3/day	6944	7,380	7,360	8,470	8,163	10,469	9,665	8,992	11,279	12,308	13,850
WAS TS	mg/L	0.8	0.7	0.7	0.8	0.82	0.54	0.49	0.69	1.03	0.72	0.65
Thickened WAS (TWAS) Treated	m^3/day	1952	1,440	1,600	2,090	2,366	876	677	980	1,064	1,851	1,800
TWAS TS	%	3.6	3.7	3.4	3.3	3.4	4.8	4.6	4.8	4.3	4.5	4.4
TWAS TVS	%	73.9	73.2	71.6	71	72.9	69.1	72.0	71.9	71.7	71.2	71.1
Volume to Digestion	m^3/day	7930	7,080	8,020	6,530	6,658	5,933	6,222	5,900	7,634	7,617	7,390
Digesters Hydraulic Retention Time	days	19.3	20.2	18.1	23.3	23.1	21.8	21.1	19.1	16.6	16.2	16.8
Organic Loading to Digesters	TVS per m3 of digester capacity per day	1.0	0.9	1.1	1.0	1.0	2.1	1.3	-	-	-	-

APPENDIX C – Historical Performance Data

	Units	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Digester Gas Volume	m^3/day	61856	61,640	62,330	64,560	65,921	71,781	115,174	60,782	63,100	71,483	86,400
Dewatering Centrifuge Feed TS	%	1.6	1.7	1.8	1.8	1.8	1.8	1.7	2.0	1.8	2.2	2.2
Dewatered Biosolids TS	%	27.9	27.9	28.1	27.7	26.5	27.8	28.3	28.3	28.0	28.0	28.6
Centrate Quality	mg/L	428	299	319	665.32	2091	1959	1196	5921	5066	5614	6167
Solids Capture Rate	%	97	98	98	96.44	88	77	96	70	70	75	74
Centrifuge Run Time	hours	52790	52,400	52,329	48,049	43,507	51,451	102,922	77,844	57,995	56,760	56,906
Biosolids Management	wet tonnes/year	155756	159,288	149,733	145,321	143,190	142,908	139,562	129,213	134,185	136,629	149,166

APPENDIX D – Secondary Treatment Effluent Parameters (Leachate Related)

APPENDIX D: Secondary Treatment Effluent Parameters (Leachate Related)

Quarterly Averages Units	Boron mg/L	Cobalt mg/L	Magnesium mg/L	Manganese mg/L	Potassium mg/L	Strontium mg/L	Bis (2 ethylhexyl) Phthalate µg/L
Q1[1]	-	*0.002*	14.40	0.05447	13.95	-	-
Q2	0.103	*0.002*	13.57	0.03870	13.00	0.280	*0.25*
Q3	0.114	*0.002*	13.13	0.05130	13.00	0.230	*1.00*
Q4	0.122	*0.002*	14.84	0.04967	13.64	0.237	*0.25*

Data in red italics is half the MDL.

[1] Boron, Strontium and Bis (2-ethylhexyl) Phthalate analysis commenced in Q2 per the newly issued ECAs.

APPENDIX E - Influent and Effluent Metal Concentrations

APPENDIX E – Influent and Effluent Metal Concentrations

Influent (Daily Composite tested once/month for metals)

Parameter	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
January	*0.005*	*0.002*	0.00674	*0.002*	0.129	3.79	0.00681	0.0616	0.000195	0.00674	0 .161
February	*0.005*	*0.002*	0.00621	*0.002*	0.132	3.06	0.00635	0.0591	*0.00005*	0.00556	0.165
March	*0.005*	*0.002*	0.00757	*0.002*	0.154	3.32	0.00508	0.0611	0.000196	0.00577	0.165
April	*0.005*	*0.002*	0.00729	*0.002*	0.151	2.91	*0.0025*	0.0545	*0.00005*	0.00504	0.149
May	*0.005*	*0.002*	0.00697	*0.002*	0.139	2.88	0.00591	0.0638	*0.00005*	0.00538	0.177
June	*0.005*	*0.002*	0.00622	*0.002*	0.106	3.45	*0.0025*	0.0599	*0.00005*	*0.0025*	0.135
July	*0.005*	*0.002*	0.00549	*0.002*	0.117	4.21	0.00559	0.0664	*0.00005*	*0.0025*	0.151
August	*0.005*	*0.002*	0.00845	*0.002*	0.133	5.19	0.00825	0.0767	0.000159	0.00598	0.16
September	*0.005*	*0.002*	0.00732	*0.002*	0.126	4.84	0.00739	0.0668	*0.00005*	0.00536	0.151
October	*0.005*	*0.002*	0.00712	*0.002*	0.164	4.96	0.00595	0.0695	*0.00005*	0.00576	0.143
November	*0.005*	*0.002*	0.00608	*0.002*	0.122	5.06	0.00585	0.0708	*0.00005*	0.00521	0.129
December	*0.005*	*0.002*	0.00568	*0.002*	0.113	4.32	0.00506	0.0708	*0.00005*	*0.0025*	0.127
Annual Average	0.005	0.002	0.006762	0.002	0.1322	3.999	0.00560	0.06508	0.0000803	0.004858	0.1511

Final Effluent (Daily Composite tested once/month for metals)

Parameter	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Zinc
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
January	*0.005*	*0.002*	*0.002*	*0.002*	0.0134	0.387	*0.0025*	0.0597	*0.00005*	*0.0025*	0.0298
February	*0.005*	*0.002*	*0.002*	*0.002*	0.0117	0.362	*0.0025*	0.0524	*0.00005*	*0.0025*	0.0255
March	*0.005*	*0.002*	*0.002*	*0.002*	0.0159	0.289	*0.0025*	0.0513	*0.00005*	*0.0025*	0.0242
April	*0.005*	*0.002*	*0.002*	*0.002*	0.0213	0.241	*0.0025*	0.0308	*0.00005*	*0.0025*	0.0293
May	*0.005*	*0.002*	*0.002*	*0.002*	0.00964	0.29	*0.0025*	0.0442	*0.00005*	*0.0025*	0.0256
June	*0.005*	*0.002*	*0.002*	*0.002*	0.012	0.349	*0.0025*	0.0411	*0.00005*	*0.0025*	0.0238
July	*0.005*	*0.002*	*0.002*	*0.002*	0.00646	0.548	*0.0025*	0.0416	*0.00005*	*0.0025*	0.0223
August	*0.005*	*0.002*	*0.002*	*0.002*	0.0147	0.409	*0.0025*	0.0482	*0.00005*	*0.0025*	0.0249
September	*0.005*	*0.002*	*0.002*	*0.002*	0.0152	1.05	*0.0025*	0.0641	*0.00005*	*0.0025*	0.0297
October	*0.005*	*0.002*	*0.002*	*0.002*	0.0165	0.425	*0.0025*	0.053	*0.00005*	*0.0025*	0.0225
November	*0.005*	*0.002*	*0.002*	*0.002*	0.0153	0.81	*0.0025*	0.0459	0.0001460	*0.0025*	0.0265
December	*0.005*	*0.002*	*0.002*	*0.002*	0.0104	0.618	*0.0025*	0.0501	*0.00005*	*0.0025*	0.0311
Annual Average	0.0050	0.0020	0.0020	0.0020	0.013542	0.4815	0.00250	0.04853	0.000050	0.00250	0.02627

Data in red and italic is half the Method Detection Limit

APPENDIX F – Biosolids Analysis

APPENDIX F – Biosolids Analysis

Ashbridges Bay Treatment Plant - Summary of Dewatered Biosolids Analysis for 2018

Dewatered Cake	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Max Allowable Dry Wt Conc mg/Kg[1]	Annual Average
TKN	51,850	48,700	48,200	47,900	48,100	51,200	50100	44,650	46,700	50,300	53,200	48,800		49,142
Ammonia(N)	6,745	7,010	9,035	6,475	7,155	5,815	5,755	5,295	5,630	6,955	7,085	7,020		6,665
Nitrate as N	0.92	1.02	1.27	0.54	0.58	0.67	1.61	0.81	1.32	0.67	0.90	0.75		0.92
Nitrite as N	1.05	1.23	1.04	0.63	1.79	1.22	1.90	0.64	1.31	0.95	1.24	13.46		2.20
As	1.04	2.6	3.23	2.49	2.2705	1.435	1.345	1.465	2.195	0.716	1.231	3.24	**170**	1.94
B	12.8	13.8	15.8	15.35	12.1	11.05	14.2	20.8	25.7	18.35	18.3	18.75		16.4
Cd	0.82	0.74	0.92	0.91	0.93	0.89	0.76	0.90	0.87	0.68	0.84	1.03	**34**	0.86
Cr	89.0	74.0	90.6	108.9	87.7	73.6	72.7	76.3	119.1	56.8	62.2	58.3	**2,800**	80.7
Co	4.06	3.59	3.60	3.89	3.96	3.47	3.52	4.04	5.05	3.22	3.92	3.71	**340**	3.83
Cu	720	690	684	658	677	706	690	683	721	646	690	676	**1,700**	686
Pb	32.5	31.4	37.5	41.3	38.0	34.5	36.0	37.1	45.6	38.0	39.0	35.7	**1,100**	37.2
Mn	250	246	243	287	309	279	296	262	269	208	243	237		261
Hg	0.46	0.40	0.46	0.63	0.42	0.56	0.34	0.39	0.42	0.46	0.41	0.36	**11**	0.441
Mo	9.47	8.71	8.39	7.78	7.86	9.26	8.45	8.89	10.70	9.85	10.65	9.4	**94**	9.12
Ni	27.7	22.0	20.8	22.3	22.2	19.9	19.7	22.8	46.3	22.8	25.9	24.4	**420**	24.7
Total P	31,550	30,750	31,800	30,950	32,800	31,500	33,050	31,500	31,500	28,400	34,400	31,700		31,658
K	993	1,065	1,080	1,017	1,040	1,012	970	1,034	1,225	1,125	1,270	1,048		1,073
Se	3.73	3.85	3.61	3.70	3.77	3.61	4.04	4.33	4.89	3.68	3.80	3.36	**34**	3.86
Zn	685	695	675	652	679	699	694	684	704	631	635	611	**4,200**	670
TS%	27.5	29.6	28.4	28.7	27.5	26.6	28.0	28.7	29.2	27.5	26.4	28.5		28.0
VS%	65.6	66.1	65.8	60.5	62.8	65.6	63.8	64.3	62.0	67.2	64.8	64.0		64.4
***E. coli*[2]**	908,227	190,210	365,563	219,197	247,681	328,268	1,506,334	950,940	1,378,758	562,230	1,826,736	1,632,554	**2,000,000[3]**	843,058

[1] As per MECP Regulations for Biosolids Utilization on Agricultural lands.
[2] CFU/g, dry weight.
[3] *E. coli* compliance is based on the geo mean of the last four samples (two samples per month).

APPENDIX G – Odour Reduction Plan

ODOUR REDUCTION PLAN – Status as of December 31, 2018

1. Program Summary

The details of the Odour Reduction Plan status including odour reduction activities, scheduled completion, and estimated emissions reductions of odour are summarized in the following Sections. The plan provides details for Phases I and II, as approved under the Environmental Compliance Approval (Air) ECA number 3771-92NP7X dated January 23, 2013. The facility currently operates under an updated ECA (Air) number 2815-9PWTWV, dated January 15, 2015.

The goal of the Odour Reduction Program is to reduce the plant-wide odour and Total Reduced Sulphur (TRS) impact beyond the plant property. The program achieves this with a combination of air capture and ventilation, improved dispersion, process changes, and treatment. Of these, only process changes and treatment have the potential to reduce odour emissions. For all new odour sources, odour and TRS emissions were estimated on a conservative basis and are not necessarily reduced at each implementation step. However, the overall odour and TRS impact is always reduced, thus meeting the objectives of the odour reduction program.

Following each project, phase emission sampling will be performed and impact assessment will be calculated as required by the ECA (Air).

2. Phase I Scope by Building

The building-by-building details of the odour reduction activities for Phase I are presented in this section for the Ministry's information. The current status of the activities and estimated completion dates have been updated to reflect the current project status.

2.1 T Building

The scope for the T Building includes:

- New air collection and ventilation system
- Re-use of existing activated carbon scrubber
- 3 new roof stacks, all 4m above roof (wet well, dry Well, and scrubber)
- Monument Building – new activated carbon scrubber

	Odour (impact)	TRS (emission)
Previous	0.34 OU	3.43E-03 g/s
Current	0.34 OU	3.43E-03 g/s
Project Status	In Operation	
Completion Date	Completed 2012	

2.2 M Building

The scope for the M Building includes:

- New ventilation system
- Installation of new activated carbon scrubber

- One new exhaust stack

	Odour (impact)	TRS (emission)
Previous	0.32 OU	5.49E-03 g/s
Current	0.32 OU	5.49E-03 g/s
Project Status	In Operation	
Completion Date	Completed 2012	

2.3 Aeration Tanks

The scope for the Aeration Tanks includes:

- Process aeration air capture and exhausted to incinerator stack

	Odour (impact)	TRS (emission)
Previous	306 OU	2.23E-01 g/s
Current	1.8 OU	2.23E-01 g/s
Project Status	In Operation	
Completion Date	All construction completed in 2014. Process air capture and exhaust completed in 2013.	

2.4 D Building

The scope for the D Building includes:

- New enclosed loading bay
- New ventilation systems
- Odour segregation and treatment including collection of air from channels, weirs, grit tanks and screens for biological odour treatment
- New biofilter with 35 m stack
- New 40 m stack for dispersion of air from primary clarifiers building

	Odour (impact)	TRS (emission)
Previous	12.5 OU	2.55E-02 g/s
Current	3.5 OU	2.55E-04 g/s
Project Status	In Operation	
Completion Date	Completed 2014	

3. Phase II Scope by Building

3.1 Truck Loading Facility Biofilter

The scope for the Truck Loading Biofilter includes:

- Replacement of the existing biofilters
- Future conveyance of odourous air from WAS thickening to biofilter
- A new dedicated 20m stack for dispersion of treated air

	Odour (impact)	TRS (emission)
Current	9.6 OU	2.67E-02 g/s
Future	0.62 OU	2.67E-02 g/s
Project Status	Under Construction	
Completion Date	Odour related elements of this project were commissioned in November 2018. (One odour related component of this project, connection of the equalization tanks to this biofilter instead of the current carbon scrubbers, has been de-scoped and moved to a future project.)	

3.2 P Building

The proposed upgrade of P Building is part of the City's overall strategy to rehabilitate and modernize aging infrastructure, enhance treatment processes, as well as to reduce odours emitted from the facility. In general, this upgrade comprises of the following:

- Selective odour collection of the primary clarifiers 7 to 9
- Odour segregation / treatment and a new odour collection system for the head works
- A new biofilter and stack

	Odour (impact)	TRS (emission)
Current	243 OU	1.32E-01 g/s
Future	106 OU [1]	1.22E-02 g/s
Project Status	Under Construction	
Estimated Completion Date	December 2019	

[1]The odour impact assessment of the P building has increased from 17.3 OU to 106 OU due to the primary clarifier 7 to 9 design scope change. After the completion of this project and the other Phase I and Phase II Odour projects, the City will reassess the odours at the facility to determine next steps.

4. Operational Initiatives

Plant staff implemented a number of operational changes to reduce odour. Below is a list of what's been done so far and what is on-going:

Odour initiative	Timing	Benefit
Regular replacement of activated carbon scrubber media for various locations.	On-going	Ensures existing odour control equipment operate at maximum efficiency.
Biosolids inventory management	On-going	Keeping in-plant biosolids inventory as low as possible reduces likelihood of septic conditions in certain open tanks.
Good housekeeping	On-going	Includes ensuring tanks taken out of service for maintenance are quickly washed down.
Odour Facility Re-Assessment	2020	The Facility's odour performance will be reassessed after all Phase I and Phase II Odour Projects are complete

APPENDIX H – Maintenance Activities

APPENDIX H – Maintenance Activities

Preliminary and Primary Treatment (Work Area 1)

Work Area 1 includes two raw sewage pumping stations (M and T Buildings), preliminary treatment areas (P and D Buildings), and three primary treatment areas (Primary Clarification Tanks No. 1 to 6, Tanks No. 7 to 9, and Tanks No. 10 to 12). The following maintenance was completed in 2018 for Work Area 1.

D Building, P Building, OPS:

- 80% overhaul of primary tank #7 clarifier bridge
- Scum collector refurbishment of primary tank #10
- Overhaul and maintenance of grit screw conveyor #13 and grit slurry pump
- Repair of inlet gate of perforated plate screen #4
- Repair of sprocket in bar Screen #1 in P Building
- Installed top roller shaft for bar screen #3 in P Building
- D Building screening grinder replacement
- Overhaul and repair of D Building's spare screening grinder
- Inspection of 5KV cables through underground tunnel
- Overhaul of D Building grit pump for grit tank #14
- Rerouting of ferrous chloride lines for second day tank in D Building
- Replacement of media for odour control systems in OPS
- Calibration of influent flow meters
- Trial run of new influent flow meters for D Building
- Complete refurbish of bar screen #4 & #5 in D Building (perforated plates, chains, etc.)
- Installed derailment sensors on primary tank #10-12 bridges
- Design and implement screw conveyor reverse controls in D Building
- Replaced 4 screws on the screening washer compactors
- Changed body and liner on grit classifier in D Building
- Overhaul two screen sluicing pumps in D Building
- Overhaul two screening transfer pumps in D Building
- Rebuild spare sludge pump in D Building
- OPS Tanks #3 & 4 sprocket on scum collector

M & T Building/Monument:

- Replacement of media for odour control systems
- Repairs on monument odour control system.
- Refurbishment of T Building raw sewage pump #1 & 2
- Emergency repair and testing of T Building pump #3 EM drive and motor
- Emergency repair of Feeder A cable underground
- Major repair on cable on one of the M Building Bosker unit
- Overhaul of other M Building Bosker unit
- M Building Pump #4 repair on the accumulator

APPENDIX H – Maintenance Activities

Secondary Treatment (Work Area 2)

Work Area 2 includes eleven Aeration Tanks, eleven Final Clarification Tanks, and the Plant Water System. The following maintenance was completed in 2018 for Work Area 2.

- Repair skimmers on Final Tank #3, #4 & #5
- Repair of multiple couplings in below ground air header
- Replace leaking check valve for glycol system
- Repair of check valve on RAS pump for final tank #4
- Repair expansion joints in aeration gallery
- Final clarifiers concrete repairs
- Assessment of blower #9 for upcoming refurbishment
- installed floor drains in blower building basement
- installed bearings for the odour control fan in stack
- installed plant water straining system
- Replaced ground water sump pump in secondary gallery
- Repaired 20" isolation valve in RAS header
- Refurbishment of RAS pump
- initial start on refurbishment of the existing gallery seal water line

Dewatering (Work Area 3)

Work Area 3 includes the Centrifuges, Schwing Silo Pumps, Polymer/Sludge Feed Pumps and all electrical control equipment for dewatering operations. The following maintenance was completed in 2018 for Work Area 3.

- Centrifuge #1 lube system complete overhaul which included a new oil pump and heat exchanger being installed
- Centrifuge #3 complete overhaul which included refurbishing the bowl/auger assembly, complete overhaul gear drive, overhaul 100 HP DC motor
- Rebuild and re-install centrifuge #5 DC motor.
- Overhaul of Centrifuge #6 after loss of power.
- Centrifuge #7, back Drive motor overhaul and realigned.
- Centrifuge #8, back Drive motor overhaul and realigned.
- Centrifuge #11, gear box overhauled.
- Partial overhaul of centrifuge #5 after detection of vibration.
- Replaced VFD on sludge feed pump #9
- Replacement of filter media in odour control systems in Equalization Tanks
- Sliding frame silo #1 overhaul and alignment.
- Sliding frame silo #3 overhaul and alignment.
- install rams and poppets on Schwing pumps
- install and align sliding frame guides on Schwing pumps #1 and #3
- Schwing pumps #2 & #4 poppet heads overhauled.

APPENDIX H – Maintenance Activities

Solids Handling (Work Area 4):

Work Area 4 includes Disinfection, the Biosolids Storage Silos, Sludge Cake Transfer Pumps, Truck Loading Facility and Biofilters, Odour Control Building, and maintenance for the Lab Building. The following maintenance was completed in 2018 for Work Area 4.

- Modified discharge piping manifolds for NaOCL back-up disinfection diaphragm pumps.
- installed a back-up generator for new NaOCL disinfection peristaltic pumps.
- installed new support base for 6 diaphragm pumps and 2 flushing water boxes
- Hydrostatic testing of #5 Chlorine evaporator pressure cylinder
- Replaced silo Schwing pump #1 power-pack A & B
- Replaced silo Schwing pump #2 power-pack A & B
- Replaced silo Schwing pump #3 power-pack B
- Hopper #1 shaft-less conveyor drive shaft and spiral replacement
- Hopper #2 shaft-less conveyor drive shaft and mounting bracket replacement
- Hopper #3 shaft-less conveyor liners replacement
- Hopper #4 shaft-less conveyor spirals and liners replacement.
- Bearing replacement on Silo Building roof exhaust fan
- Arc flash study for silo building completed
- Reroute pelletizer sump pump discharge to aux sub-basement sump

Digestion, Air Flotation, and Bio-Gas (Work Area 5)

Work Area 5 includes twenty Anaerobic Digesters, ten DAF tanks and three Waste Gas Burners. The following maintenance where completed in 2018 for Work Area 5.

- Replacement and installation of TWAS mag flowmeter to Digesters #1-12
- Replacement and installation of Digesters #5-8, digester gas flowmeter
- Replace rain header in Z Building basement
- DAF subnatant line cleaning
- Replacement of cooling water lines to water jackets to gas mixing compressors in digester complexes
- Refurbishment of TWAS transfer pump #1
- Rebuild inlet plug valve to Digester Gas Compressor Building scrubber #3
- Overhaul valve to Digester Gas Compressor Building scrubber #1
- install and align digester mixing pump #1A in Digesters #1-4
- installation of mechanical seals on Digester 13-16 recirculation pumps
- Overhaul of digester gas compressor in Digester Tanks #19-22
- Overhaul of sludge transfer pump for Digester Tanks #5-8
- Rebuild mixed polymer feed pump #1 and #6
- Rebuild recirculation pump for Flotation Tank #3
- Overhaul of recirculation sludge pump for Digester #15

- Replaced motor on recirculation pump on Digester #16
- Repairs of flotation tanks and various components tanks #2, 3, 6, 7
- Preparation for digester gas system purging for the replacement of old isolation valves

Boilers, Air Compressors, and HVAC (Work Area 6)

Work Area 6 includes the plant-wide hot water system, heating, ventilation, and air conditioning (HVAC), and instrument air compressors (Auxiliary Building). The following maintenance was completed in 2018 for Work Area 6.

- Repair of hot water boilers #1-3 panel repair
- Hot water boiler #4 tube cleaning
- installation of Z Building Boiler Room roof dampers
- Overhauled glycol recirculating pump in Dewatering Building Basement
- Overhauled motor for return air fan in the Flotation Building
- Balanced air handling unit in the Digester Gas Control Building
- Overhaul of hydronic heating pump in Z Building
- insulate 15 digesters lids/covers
- install four unit heaters in T Building

Consumables, Mechanical and Welding, Grounds Keeping and Licensed Vehicles (Work Area 7)

Work Area 7 includes consumables, mechanical and welding, grounds keeping, licensed vehicles, and maintenance for the Training Centre. The following maintenance was completed in 2018 for Work Area 7.

- Upgrade of Z Building change-room bathroom upgrades
- isolate city water leaks from buried city water line by D Building west wall area
- isolation and repair of emergency fire line breakout
- Replace catch basin frame
- Repair of back flow preventer in work area 1 – T Building
- Repair spare drive shaft for WA 4, hopper #3 conveyor
- Fabricate adaptor for Digester #16 moisture trap plug valve
- Repair oil and coolant leak on lathe
- Z Building Main Lunchroom raccoon control
- Supply and install structural steel for the refurbishment of precast panels on the ramp to the Z Building
- installation of internet/phone for Z Building Main Lunchroom and Admin Board Room
- Consultant Trailer miscellaneous repairs

APPENDIX H – Maintenance Activities

Electrical Department (Work Area 8)

Work Area 8 includes all non-process related electrical activities, such as Main Substations, Mobile Generators, Standby Generators, office and grounds lighting, and electrical aspects of grounds maintenance. The following maintenance was completed in 2018 for Work Area 8.

- North Substation HVAC Upgrades
- North Substation Switchgear Maintenance
- Seawall Substation emergency repair, assessment and re-energization of Switchgear
- installation of floodlight in area of east and west bypass samplers
- installation of LED lights in Z Building offices
- New circuit breaker and feeder cable for Power Distribution Panel in Aeration Gallery
- Calibration of the autosamplers at ABTP

APPENDIX I – Staff Training Courses

APPENDIX I –Staff Training Courses

Training attended by Ashbridges Bay Treatment Plant operations and skilled trades staff in 2018 includes the list of courses below.

Technical and Health and Safety Training:

- ABTP - 2018 De-Chlorination Chlorine Residual eOPS
- ABTP - 2018 Hydroflow Struvite Control
- ABTP - 2018 Lockout Tag-out Program
- ABTP - 2018 North Toronto TP CSO Tank Project
- ABTP - 2018 T-Building E-House
- ABTP - 2018 Temporary Disinfection Sodium Hypo System
- ABTP - Tailgate 2018 Cell Phone Use
- ABTP - Tailgate 2018 Cold Stress
- ABTP - Tailgate 2018 Hand Tools
- ABTP - Tailgate 2018 Housekeeping
- ABTP - Tailgate 2018 Lifting Safely
- ABTP - Tailgate 2018 Machine Guarding
- ABTP - Tailgate 2018 MSA Gas Monitors
- ABTP - Tailgate 2018 Noise Hazards
- ABTP - Tailgate 2018 Right To Refuse Unsafe Work
- ABTP - Tailgate 2018 Significant Incidents Or Events
- ABTP - Tailgate 2018 Slips Trips Falls
- ABTP - Tailgate 2018 Winter Driving
- ABTP - Tailgate 2018 Workplace Violence
- Activated Sludge
- Air Purifying Respirators (2017)
- Air Quality And Your Health (May 2018 Tailgate)
- Arc Flash For Non-Qualified Persons (2017)
- Asbestos Awareness
- Backflow Prevention Awareness (2016-2018)
- Basic Spill Response
- Basic Vibration Analysis
- Behaviour And Effects Of Air In Water Distribution Systems
- Centrifugal And Positive Displacement Pump Operation
- Chloramination, Nitrification And Cyanotoxins In Water Treatment And Distribution System
- Chlorine Safety / "B" Kit (2016-2018)
- Classroom Review Of Common Wear Items For Plant Machinery (2016-2018)

APPENDIX I –Staff Training Courses

- Conductors (2016-2018)
- Confined Space Awareness
- Confined Space Rescue - 2 Day
- Content Server - EDOCS
- Critical Pump Maintenance, Packing & Mechanical Seals
- Cross Connection Specialist Backflow Tester - Certification
- Disinfection Of Potable Water Piping (2016)
- Drinking Water Quality Management Standard
- Electrical Awareness
- Electrical Safety For District Operations & Maintenance Operators (2016-2018)
- Electrical Safety For Maintenance Staff (2016-2018)
- Emergency First Aid Level 'A' CPR (2016-2018)
- Fall Protection Awareness
- Fire Hydrant & Valve - Operation, Inspection, Maintenance & Installation
- Flushing Techniques
- Fundamentals Of Ladder Safety Awareness
- GIS Basics
- GIS In The City
- Health And Safety Aspects Of Contracts For Services
- Health And Safety Competency For Front-Line Supervisors
- Health And Safety Competency For Senior Management
- Hot Work Permit System Awareness (2016-2018)
- How To Conduct Workplace Investigations
- Incident Management Team Training (EHSC)
- Incident Reporting (2017)
- Industrial Maintenance Technician (IMT) Certification
- In-Service Health & Safety Orientation
- JHSC Recognition Event
- Joint Health And Safety Committees - (JHSC) Certification Training Part I - Basic
- Joint Health And Safety Committees - (JHSC) Certification Training Part II - Workplace Specific Hazard Training
- Lock Out, Tag Out & Test Awareness (2016-2018)
- Logbook Entry (2017-2019)
- Mathematics For Operators: Module 3 (2017-2019)
- MMR – Self-Contained Breathing Apparatus (2018-2020)
- Mould Awareness
- Outlook 2013 - Increase Your Productivity With Outlook

APPENDIX I –Staff Training Courses

- Outlook 2013: All About Outlook 2013
- Preventing Back Injuries (August 2018 Tailgate)
- Project Management: Concepts
- Psychological And Mental Health In Our Workplace (Tailgate February 2018)
- Rigging Safety Awareness (2016-2018)
- Safe Drinking Water Operator Essentials
- Safety Data Sheet Interpretation For WHMIS 2015
- Safety In A High Voltage Environment (2016-2018)
- Safety On The Road (November 2018 Tailgate)
- Scaffolding Awareness Course (2016-2018)
- Standard First Aid - Level "C" CPR & AED - 2 Day (2016-2018)
- SW St Backing-Up Vehicles
- SW St Overhead Hazards
- SW St School Out
- Toronto Water Orientation
- TPS New Employee Orientation Day (Neo)
- Traffic Control Awareness
- Traffic Control Roadway Work (2016-2018)
- Transportation Of Dangerous Goods (2016-2018)
- Trenching And Excavating Awareness
- Understanding Windows 10
- Water Leak Detection Listening Course
- Water System Repairs: Introduction To Oxy-Acetylene Cutting And Stick Welding (SMAW)
- Water Valve Training, Selection, Operation, Maintenance
- Watermain Design
- WHMIS 2015: New Chemical Safety Info System
- Winterwise: The Cold Hard Facts About Distribution Systems
- WMS Avantis Workshop
- Working At Heights Training (2016-2018)
- WWT-MECP Exam Prep For Wastewater Treatment Level 3 And 4

Other Training:

- 2019 Performance Management Refresher Sessions
- Activity And Process Cost Management
- Anti-Oppression In The Workplace
- Building A Strategic, Value-Based BPI Framework
- Business Process Improvement: An Introduction

APPENDIX I –Staff Training Courses

- Coaching For Effectiveness, Improvement And Growth
- Conflict Resolution & Negotiation Skills
- Effectively Using Social Media
- Essential Financial Planning For Retirement
- Fundamentals Of Purchasing
- Human Rights In The Workplace
- Inclusive Workplace Practices
- Intercultural Communication
- Leadership Skills For Non-Managers
- Make Better Decisions By Understanding: Use Effective Thinking Strategies
- Managing Difficult Conversations
- Performance Management In A Unionized Environment
- Preparing To Move Into Supervision
- Respect In Our Workplace
- Sharing Knowledge For Success
- Violence In The Workplace
- Wellness And Resiliency
- Workplace Violence Awareness