TORONTO Water

ASHBRIDGES BAY WASTEWATER TREATMENT PLANT

2020 Annual Report

March 31, 2021

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 and operates under Environmental Compliance Approval No. 1336-B6GM3S, issued on June 26, 2019.

The average daily flow rate in 2020 was 556.26 ML/day. Influent concentrations of Biochemical Oxygen Demand (BOD_5), Total Phosphorus (TP) and Total Suspended Solids (TSS) averaged 179.3 mg/L, 5.6 mg/L, and 252.9 mg/L, respectively.

Ashbridges Bay Treatment Plant achieved the following effluent quality and loading rates in 2020 in comparison to ECA limits:

Parameter	ECA[1]	2020 Final Effluent
Total Suspended Solids (TSS)	25.0 mg/L	11.9 mg/L
Carbonaceous Biological 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/100 mL	17.0 CFU/100 mL
pH	6.0-9.5	6.9
TSS Loading Rate[1]	20,450 kg/day	6,465 kg/day
$CBOD_5$ Loading Rate[1]	20,450 kg/day	2,509 kg/day
TP Loading Rate[1]	818 kg/day	359 kg/day

[1] Referenced from ECA Sewage No. 1336-B6GM3S Schedule C.

[2] Arithmetic mean of monthly geometric mean data.

During 2020, 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 2020 was 148,357 wet tonnes at an average of 26.95 % 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 totalled 1,846 tonnes as Fe. Polymer consumption in 2020 for waste activated sludge (WAS) thickening and sludge dewatering totalled 160.50 and 558 tonnes, respectively. Total sodium hypochlorite (12% w/v) consumption for disinfection totalled 3,684 m^3.

There were six secondary treatment system bypass occurrences in 2020 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 2,517 ML.

The plant continued with numerous capital projects. Notable projects included: construction of a new ultraviolet (UV) disinfection facility; construction of a new influent pumping station; design of a new WAS thickening facility; construction of a new plant outfall; design of D Building Phase 2; design of a dewatering polymer system; 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 459,553 m^3, 135.4 GWh, and 7.0 M scm, respectively. The plant direct operating costs for 2020 totalled $60.9 M. In 2020, the Ashbridges Bay Treatment Plant had a staffing compliment of 151.5 full time equivalent (FTE) employees. As of February 23, 2021, there were 12 health and safety incidents and 280.13 lost time days due to work related injuries in 2020.

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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. In 2020, the plant operated under Environmental Compliance Approval No. 1336-B6GM3S, issued on June 26, 2019.

This report is a summary of plant operations and performance in 2020. 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[1].

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.

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

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

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. 1336-B6GM3S). 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^{o}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 2020, 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	
						Min	Max
Secondary Effluent							
January	4.0	12.0	0.7	0.56	18	6.3	7.9
February	3.2	8.8	0.5	0.55	45	6.2	7.7
March	5.1	11.3	0.7	0.54	18	6.6	7.9
April	3.7	7.2	0.7	0.55	30	6.5	8.0
May	6.2	13.2	0.7	0.54	4	6.7	8.0
June	3.9	9.0	0.6	0.56	12	6.3	7.9
July	5.7	18.8	0.8	0.57	5	6.7	8.0
August	6.4	19.2	0.7	0.54	11	6.2	7.9
September	5.4	11.0	0.4	0.53	7	6.4	7.5
October	3.1	8.0	0.4	0.55	7	6.7	8.0
November	4.4	13.6	0.9	0.58	16	6.5	7.7
December	3.7	9.1	0.7	0.55	27	6.3	8.0
Annual Average Effluent Concentration	**4.6**	**11.8**	**0.7**	**0.55**	**17**	**6.9**	
Loading[2], kg/d	2,509	6,465	359	N/A	N/A	N/A	N/A
Removal Efficiency ,%	97%	95%	88%	N/A	N/A	N/A	N/A

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

[2] 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]						
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: 150 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	MGMD: 200 CFU/100 mL	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

[3] Loading is calculated based on the flow rates as provided in Table 2.
[4] Referenced from ECA Sewage 1336-B6GM3S, issued on June 26, 2019.
[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 average of process parameters over the past three years is shown in *Table 2*.

Table 2: Process Parameters

Parameter	Units	2020	2019	2018
Influent Parameters				
Flow[1]	ML/day	556.3	651.5	563.7
Total Annual Flow[1]	ML	203,657	237,723	205,750
Total Suspended Solids (TSS)	mg/L	252.9	207.8	303.7
Biological Oxygen Demand (BOD5)	mg/L	179.3	153.8	207.9
Total Phosphorus (TP)	mg/L	5.6	4.9	6.3
Transfer from Humber TP: liquid biosolids	Dry tonnes/day	60.1	64.6	72.9
Transfer from Humber TP: WAS	Dry tonnes/day	7.6	2.7	4.9
Transfer from North Toronto TP: sludge (primary sludge, WAS, and scum)	ML/day	0.45	0.49	0.46
Preliminary Treatment				
Grit and Screenings	Tonnes/day	4.7	4.6	5.5
Primary Treatment				
TSS	mg/l	186.0	176.9	142.9
cBOD5	mg/L	117.0	99.8	68.7

Parameter	Units	2020	2019	2018
Secondary Treatment				
Aeration Loading	kg CBOD5/m3.day	0.35	0.35	0.2
Mixed Liquor Suspended Solids	mg/L	3,106	3,008	2,372
Flow through Seawall Gates	ML	1732	3834	3187
Solids Handling				
Primary Sludge Treated	m3/day	4,874	5,429	5,635
Primary Sludge TS	%	2.4	2.3	2.5
Primary Sludge TVS	%	73.7	71.6	73.0
WAS to Primary Treatment and Excess Was to Aeration	m3/day	1,816	1,795	12,64
WAS to Thickening	m3/day	7,787	7,910	7,375
WAS TS	mg/L	0.94	0.91	0.74
TWAS Treated	m3/day	2,257	2,119	1,440
TWAS TS	%	3.4	3.5	3.7
TWAS TVS	%	70.7	73.8	73.2
Volume to Digestion	m3/day	7,131	7,548	7,075
Digesters Hydraulic Retention Time	days	17.4	20.0	20.2
Organic Loading to Digesters	TVS/m3/day	1.1	1.0	0.9
Digester Gas Volume	m3/day	59,945	65,698	61,638
Dewatering Centrifuge Feed TS	%	1.75	1.7	1.7
Dewatered Biosolids TS	%	26.95	27.7	27.9
Centrate Quality	mg/L	635.1	626	298.5
Solids Capture Rate	%	96.4	96.5	98.2
Centrifuge Run-time	hours	47,578	51,226	52,400

In 2020, the secondary treatment daily average flow was 13.8% lower than 2019. This could be attributed to COVID related business slowdowns in the ABTP sewer shed. The plant was also less impacted by wet weather due to 11% less precipitation in 2020 as compared to 2019. There was an increase of TSS, BOD, and TP influent strength of 21.7%, 16.6%, and 13.4% respectively, compared to 2019.

Final Effluent cBOD, TSS, e. Coli, and TP met the design objectives in Schedule B of the ECA over the course of 2020. Secondary effluent pH was within the compliance limits highlighted in Schedule C of the ECA at all times over the course of 2020. Marginal differences were observed in effluent concentrations for each of the compliance parameters listed in the ECA relative to 2019.

In 2020, 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 Condition 6 of the plant's ECA. This was achieved through continuous improvement in operations and maintenance of treatment processes, and infrastructure delivery.

In 2020, there were no deviations from the monitoring schedule. *E. Coli* sampling is conducted weekly, so it has been moved from Wednesdays in 2020 to Thursdays of every week in 2021. All other parameters listed in the Schedule D Monitoring Program in the ECA comply with the sampling frequency requirements described in Condition 9(1)(b).

3.2 Biosolids Management

The flow projections for 2021 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 2020.

Biosolids analysis are included in Appendix F and compared against *Ontario Regulation 267/03* under the *Nutrient Management Act*, which governs 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 2020 totalled 148,357 wet tonnes and was managed as follows.

3.2.1 Agricultural Land Application

A total of 28,205 wet tonnes of biosolids were sent to approved agricultural land application sites in Ontario. During the 2020 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 2020, a total of 36,617 wet tonnes of biosolids were 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 2020, 77,661 wet tonnes of biosolids were processed by the on-site pelletizer. Pellet quality in 2020 met the standards set out by the Canadian Fertilizers Act.

3.2.4 Landfill Management of Biosolids

No biosolids were transported to landfill sites in 2020.

3.2.5 Mine Reclamation

A total of 5,874 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		
	2020	2019	2018
Agricultural Land Application	28,205	28,461	27,835
Alkaline Stabilization	36,617	34,494	37,666
Pelletization	77,661	83,970	82,702
Landfill	0	0	0
Mine Reclamation	5,874	7,731	7,553
TOTAL	**148,357**	**154,656**	**159,288**

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. Costs listed exclude applicable taxes.

Table 4: Chemical Usage Summary

Process	Chemical	Parameters	2020	2019	2018
Phosphorus Removal	Ferrous Chloride as Fe	Dosage (mg/L)	9.20	7.60	8.05
		Consumption (tonnes)	1,846	1,766	1,638
		Cost ($)	$1,509,041	$1,437,272	$1,201,482
Disinfection[1]	Sodium Hypochlorite (12% w/v)	Dosage (mg/L)	2.16	2.38	2.43
		Consumption (m3)	3,684	4,642	4,167
		Cost ($)	$611,818	$804,689	$701,262
WAS Thickening	Polymer	Dosage (kg/DT)	6.03	8.04	7.54
		Consumption (tonnes)	160.50	211.50	160.50
		Cost ($)	$720,613	$612,191	$641,538
Biosolids Dewatering	Polymer	Dosage (kg/DT)	13.45	14.37	12.50
		Consumption (tonnes)	558	639	557
		Cost ($)	$2,290,431	$1,663,838	$1,853,005

3.4 Bypasses, Overflows, Spills, and Abnormal Discharge Events

3.4.1 Bypasses

There were six bypass events in 2020; all were secondary treatment bypasses. The total volume of bypass flow was 2517 ML, or 1.3 % of the annual flow. Table 5 summarizes the bypass events that occurred in 2020.

Bypass flows do not receive secondary treatment (i.e. the Aeration Tanks) but receive preliminary, primary treatment, nutrient removal, as well as disinfection before the final effluent sampling point. All bypass flows are blended with fully treated plant effluent prior to discharge. Secondary bypasses result from high wet weather flows that exceed the plant's secondary treatment capacity. Each instance was reported to the MECP Spills Action Center and recorded in the plant's Monthly report. Total precipitation in the Toronto area[2] was 815.2 mm in 2020, an 11% decrease compared to 2019.

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

Table 5: Bypass Summary

No.	Date	Start of Event	End of Event	Duration (hrs)	Volume (m^3)	Average Chlorine Dose (mg/L)
1	January 11-12, 2020	12:56:00 PM	10:29:00 AM	21.55	1,088,140	9.9
2	January 24-25, 2020	9:53:00 PM	9:14:00 PM	23.35	807,000	10.1
3	March 3, 2020	4:53:00 PM	9:16:00 PM	4.37	158,890	9.9
4	August 2, 2020	1:07:00 PM	3:30:00 PM	2.38	86,500	9.9
5	November 30, 2020	12:59:00 PM	10:10:00 PM	9.22	289,550	9.9
6	December 12, 2020	4:26:00 PM	7:14:00 PM	2.80	86,510	9.9

3.4.2 Overflows

There were no overflow events at the Ashbridges Bay Treatment Plant in 2020. 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 11 spills reported to the MECP in 2020; they are summarized below.

Table 6: Spill Summary

Date	Duration (hr)	Volume (m^3)	Nature of event	Description
04-Mar-20	1.5	30	Primary effluent	Approximate 30 m^3 of primary effluent went onto a grassed area from North Settled Sewage Channel due to a sudden surge flow into the plant within short duration of time during a rain event. The impacted area was cleaned up and disinfected on next day.
27-May-20	Minimal	0.6	Plant water (chlorinated final effluent)	A planned spill of plant water was initiated at one excavation area to identify the leaking sources of plant water reported to SAC in 2019. The spill was stopped by closing the valve shortly after the source was located and the pipe was repaired on June 2nd, 2020.
29-May-20	1	0.01	Sodium Hypochlorite	During an investigation of locating a pin hole, some Sodium Hypochlorite was spilled onto the surrounding gravel area. The damaged portion of the hose was replaced with new one to prevent the reoccurrence.
02-Jul-20	NA	0.26	Silty water	Some silty water drained from a muck pile containment area within the construction site. The contractor has discontinued using this muck pile containment area and now uses metal bins to contain generated muck piles.

Date	Duration (hr)	Volume (m^3)	Nature of event	Description
09-Jul-20	NA	0.25-0.5	Raw sewage	Some raw sewage went on grass area near east side of M building due to a leak within a containment chamber. The spill was stopped after the valves were closed and the system was isolated. The affected area was disinfected on the same day.
23-Jul-20	NA	0.05	Ferrous chloride	Trace of rusty iron was noticed on the roadway leading to a catch basin along the road outside of Ferrous Building. It was due to the waste ferrous chloride filters container temporally stored outdoor during a rain event. The waste ferrous chloride filters container was moved inside of the building on July 23rd as a preventative measure.
31-Aug-20	NA	0.05	Plant water (chlorinated final effluent)	A spill of plant water was noticed on the ground outside of Digester #5 chamber. The leaking line has been identified but the repair is pending due to required continuous operation by Pelletizer. A complete repair solution will be implemented when Pelletizer is shutdown. As temporary measures, a sump pump has been set up to pump the leaking plant water out of the chamber to primary treatment process.
01-Sep-20	0.42	NA	Foul air	Pelletizer went into an automatic shutdown due to loss of plant instrument air. The instrument air was restored after 25 minutes and Pelletizer was returned to normal operation.
29-Sep-20	NA	0.3	Plant water (chlorinated final effluent)	A spill of plant water occurred during a plant water pipeline tie in for a digester project. The isolated plant water pipeline was drained completely before being cut through, however, there was still some plant water remained unexpectedly and spilled to the surrounding soil when the isolated pipeline was cut through. The spilled plant water was pumped into a sanitary drain within vicinity and the affected area was disinfected on the same day.

Date	Duration (hr)	Volume (m^3)	Nature of event	Description
27-Nov-20	NA	0.2	Secondary effluent	Secondary effluent went onto a gravel area from the south end of secondary clarifier #2 due to an expansion joint failing at the back of the tank. The plant staff put spill socks and sand bags around the affected area and the spill was stopped on Nov. 27th. On Dec. 2nd, the repair crew applied sealing material at the expansion joints for a temporary repair. The permanent repair will be performed from inside of the tank in spring time when the weather is warm to allow the permanent work to be proceeded
30-Nov-20	0.12	0.4	Primary effluent	Primary effluent went onto a catch basin west side of D building where the conduits #3&4 are located. The cause was a sudden surge flow into the plant within a short duration of time during a rain event. The impacted area was cleaned up and disinfected

3.4.4 Abnormal Discharge Events

There were two abnormal discharge events at the Ashbridges Bay Treatment Plant in 2020 related to disinfection interruptions. An abnormal discharge event is defined within the meaning of Part X of the Environmental Protection Act. For additional information, please refer to Section 7.6 – MECP/MOL Correspondence.

3.5 Complaints

The Ashbridges Bay Treatment Plant investigated 16 complaints in 2020; 11 complaints related to odour and 5 complaints related to noise. All complaints were recorded, investigated by Toronto Water staff, reported to MECP, and when possible, followed up with the complainant. Only 2 of the odour complaints and 4 of the noise complaints were found to be related to plant operation. These plant related complaints were temporary due to maintenance shutdowns. The remaining were determined to be related to on-site construction activities unrelated to plant operation. For additional information, please refer to Section 7.6 – MECP/MOL Correspondence.

3.6 MECP Procedures F-5-1 and F-5-5

Condition 11 (4)(m) of the ECA describes requirements to summarize efforts to achieve conformance with MECP Procedure F-5-1 – Determination of Treatment Requirements for Municipal and Private Sewage Works and MECP Procedure F-5-5 – Determination of Treatment Requirements for Municipal and Private Combined and Partially Separated Sewer Systems.

In reference to procedure F-5-1, the plant utilizes the activated sludge treatment process to meet secondary or equivalent treatment and consistently achieves effluent quality at or beyond the objectives outlined in the ECA.

Furthermore, Toronto Water is committed to efforts to control the frequency and volume of CSO discharges and bypass events referenced in Procedure F-5-5. The City is currently implementing a 25 year plan related to its Wet Weather Flow Master Plan (WWFMP), which aims to reduce and eliminate the adverse impacts of storm water runoff and CSO discharges associated with wet weather events. It is expected that the on-going implementation of capital projects related to the City's WWFMP will eliminate CSO discharges and ultimately improve plant effluent.

3.7 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.

3.8 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 2020, including odour and total sulphur reduction activities undertaken with associated reduction levels achieved, can be found in Appendix G.

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 2020.

Table 7: Capital Projects

Project Name	Project Description	Project Stage (Dec 31, 2019)	Estimated Completion
Digester 9-12, II	Complete upgrade of Digester 9-12 cluster, including replacement of the mixing system and sludge recirculation pumps and sludge transfer pumps.	Construction	2022
D Building Phase 2 Upgrade	Upgrades to existing systems including screening handling and ferrous chloride dosing. Includes chemically enhanced primary treatment and upgrades to enhance maintainability of equipment.	Design	2024
D Building Solar Roof	Installation of solar energy cells on the roof of D Building.	Design	2021
Effluent Disinfection	New UV disinfection facility. Also includes new secondary west bypass conduits, plant water station upgrades, seawall substation upgrades, and seawall gate refurbishment.	Construction	2023
IPS Contract 2	Preliminary civil work for the future IPS	Construction	2023
IPS Contract 3	Replacement of M&T pumping station with new Integrated sewage/wet weather flow pumping station located South of Lakeshore.	Design	2032
Outfall	New plant outfall that includes a new effluent drop shaft, new outfall pipe with diffusers.	Construction	2023
P-Building Upgrade	Preliminary treatment upgrades in P Building, including screenings, grit removal, odour control, bypass and gallery. Also includes Chemically Enhanced Primary Treatment and replacement of Gallery 7, 8, and 9 primary sludge pumping equipment.	Completed	2020
Phosphorous Removal Upgrade	Replacement of existing ferrous chemical storage with new ferrous chemical facility that includes storage tanks, chemical transfer pumps and dosing pumps.	Construction	2020
Project Management Office	Renovation of the old administration building to include a new project management office.	Construction	2021
Polymer Upgrades	Replacement of dewatering polymer system, dewatering centrifuges, upgrades to sludge feed system, centrate storage, as well as the WAS polymer system.	Design	2025
WAS Thickening and South Station Upgrades	New WAS thickening facility using centrifuges and overhaul of South Substation.	Design	2025

Project Name	Project Description	Project Stage (Dec 31, 2019)	Estimated Completion
Truck Loading Biofilter Upgrades	Replacement of biofilter for the Truck Loading Facility (TLF). Also include minor upgrades for the TLF, replacement of up blast fans for the pelletizer facility, and conversion of scrubber building into workshop and admin space.	Completed	2020
Waste Gas Burners (WGB)	Replacement of existing three WGB with five new WGB	Construction	2020
Blower Building Upgrades	Upgrades to blower building admin space and stores	Construction	2022
Digester 13 & 16 Cleaning	Cleaning program for Digesters 13 and 16. Additional digester clusters to follow.	Construction	2022
M&T Building Pumping Station Critical Repairs	General upgrades to M&T building to extend the life of the pumping station until the IPS is built.	Completed	2020
Remote Processing Units (RPU) Upgrade	Upgrade of all RPUs at the plant to conform to new standard.	Construction	2021
Pelletizer Upgrade	Upgrades to various system to extend life of facility.	Design	2023
Heating and Air Systems	Replacement of boilers, chillers and digester gas compressors	Design	2024
Cross Collector Pilot	Pilot test of new technology on final tank 2	Design	2022
Digester 13-22 Upgrade Study	Mechanical and electrical upgrade and cleaning of digesters 13-22 (study only)	Design	2021
East Bypass and Wet Weather Flow Study	Investigation of East bypass and wet weather flow management (study only)	Design	2021

5 MAINTENANCE

Staff from the Ashbridges Bay Treatment Plant performed a variety of scheduled, preventative, predictive and reactive maintenance activities 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 was completed in 2020, and found to be within acceptable limits. A summary of effluent monitoring equipment calibration and maintenance performed in 2020 is included in Table 8.

Table 8: Summary of Regulated Monitoring Equipment Calibration and Maintenance

Calibration and/or Maintenance Record	Completion Date
pH Analyzer: TAB-DIS-AIT-3006 Calibration	June 3, 2020
pH Analyzer: TAB-DIS-AIT-3003 Calibration	June 3, 2020
pH Analyzer: TAB-DIS-AIT-3009 Calibration	June 3, 2020
pH Analyzer: TAB-DIS-METR-3018 Calibration	June 3, 2020
Influent Sampler - TAB-PLT-SP-0500 - D Building - Calibration	September 2, 2020
Influent Sampler - TAB-PLT-SP-0500 - D Building - Calibration	July 24, 2020
Influent Sampler - TAB-PLT-SP-0041 - P Building - Calibration	July 30, 2020
Influent Sampler - TAB-PLT-SP-0041 - P Building - Calibration	February 04, 2020
Online Chlorine Analyzer (CL 17) - North - Calibration	July 23, 2020
Online Chlorine Analyzer (CL 17) - South - Calibration	July 23, 2020
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3011 Calibration	July 23, 2020
Autosampler - West Bypass - TAB-STR-SP-4001 - Verification	October 14,2020
Autosampler - West Bypass - TAB-STR-SP-4001 - Verification	August 13, 2020
Autosampler - West Bypass - TAB-STR-SP-4001 - Verification	April 17, 2020
Autosampler - East Bypass - TAB-STR-SP-3001 - Verification	October 14,2020
Autosampler - East Bypass - TAB-STR-SP-3001 - Verification	August 13, 2020
Autosampler - East Bypass - TAB-STR-SP-3001 - Verification	April 17, 2020
Final Effluent - Autosampler - North - TAB-STR-SP-3132 Calibration	March 26, 2020
Final Effluent - Autosampler - North - TAB-STR-SP-3132 Verification	November 05, 2020
Final Effluent - Autosampler - South - TAB-STR-SP-3334 Calibration	March 26, 2020
Final Effluent - Autosampler - South - TAB-STR-SP-3334 Calibration	November 05, 2020
Pocket Colorimeter II Chlorine System - Calibration	July 23, 2020
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3016 Calibration	July 23, 2020
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3012 Calibration	July 23, 2020
pH Analyzer: TAB-DIS-AIT-3009 Calibration	December 7, 2020
pH Analyzer: TAB-DIS-AIT-3006 Calibration	December 7, 2020
pH Analyzer: TAB-DIS-AIT-3003 Calibration	December 7, 2020
pH Analyzer: TAB-DIS-METR-3018 Calibration	December 7, 2020
Influent Flow Meter - D Building - Channel 11 - TAB-PLT-FIT-1103 Verification	December 20, 2019

Calibration and/or Maintenance Record	Completion Date
Influent Flow Meter - D Building - Channel 10 - TAB-PLT-FIT-1003 Verification	January 30, 2020
Influent Flow Meter - D Building - Channel 09 - TAB-PLT-FIT-0903 Verification	January 30, 2020
Influent Flow Meter - D Building - Channel 08 - TAB-PLT-FIT-0803 Verification	February 24, 2020
Influent Flow Meter - P Building - Grit Diversion- TAB-PLT-FIT-0033	December 22, 2020
Influent Flow Meter - P Building – Screening Diversion - TAB-PLT-FIT-0031	December 22, 2020
Effluent Flow Meter - South Conduit - TAB-STR-FIT-8003 - Replacement/Verification	September 21, 2020
Effluent Flow Meter - North Conduit - TAB-STR-FIT-8004 - Verification	May 07, 2020
Bypass Flow Meter - West - TAB-STR-PIT-0004X Calibration	December 22, 2020
Bypass Flow Meter - East - TAB-STR-PIT-0003X Calibration	December 22, 2020
P Building - Grit Tank Flow Meter - Tank 1 - TAB-PLT-FIT-0101 - Verification	June 02, 2020
P Building - Grit Tank Flow Meter - Tank 2 - TAB-PLT-FIT-0201 – Verification	June 02, 2020
P Building - Grit Tank Flow Meter - Tank 3 - TAB-PLT-FIT-0301 - Verification	June 02, 2020
P Building - Grit Tank Flow Meter - Tank 4 - TAB-PLT-FIT-0401 – Repair	November 11, 2020
P Building - Grit Tank Flow Meter - Tank 5 - TAB-PLT-FIT-0501– Repair	November 11, 2020
P Building - Grit Tank Flow Meter - Tank 6 - TAB-PLT-FIT-0601– Repair	November 11, 2020

In 2020, there were a total of 30,630 work orders completed on routine maintenance and emergency repairs; refer to Appendix H for a summary of major maintenance activities as per Condition 11(4) of the ECA.

None of the maintenance activities undertaken at the plant fell under Limited Operational Flexibility. A summary of the Notice of Modifications is shown in Section 7.6 MECP/MOL Correspondence.

6 UTILITIES

A summary of monthly utility consumption for the previous three years at Ashbridges Bay Treatment Plant is provided in Figure 1. Table 9 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 459,553 m^3, 135 GWh, and 7.0 Mscm , respectively.

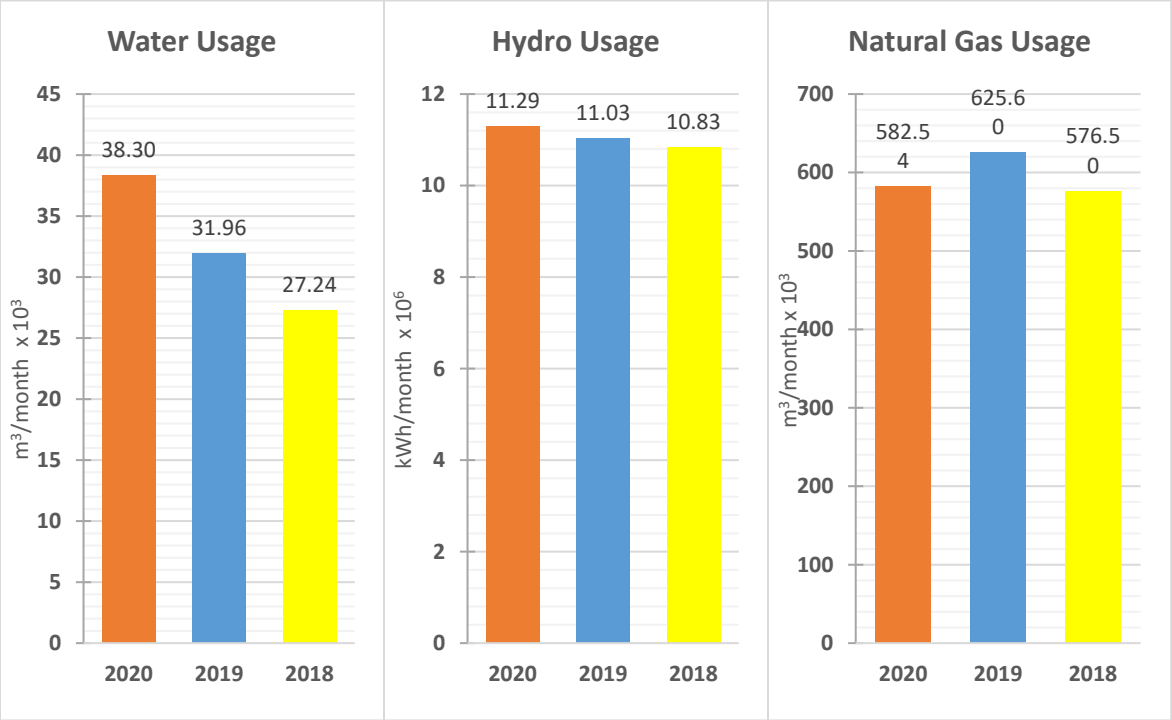


Figure 1: Annual Utility Consumption (Water, Hydro, Gas)

Table 9: Average Unit and Total Utility Cost

Utility	2020	2019	2018
Water Unit Cost ($/$m^3$)	$4.29	$4.11	$4.00
Water Total Cost ($/year)	$1.97M	$1.58M	$1.31M
Hydro Unit Cost ($/kWh)	$0.09	$0.10	$0.10
Hydro Total Cost ($/year)	$12.47M	$12.87M	$12.96M
Natural Gas Unit Cost ($/$m^3$)	$0.23	$0.21	$0.23
Natural Gas Total Cost ($/year)	$1.63M	$1.54M	$1.58M

7 ADMINISTRATION

7.1 Operations and Maintenance Costs

The 2020 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 1.6 % from 2019.

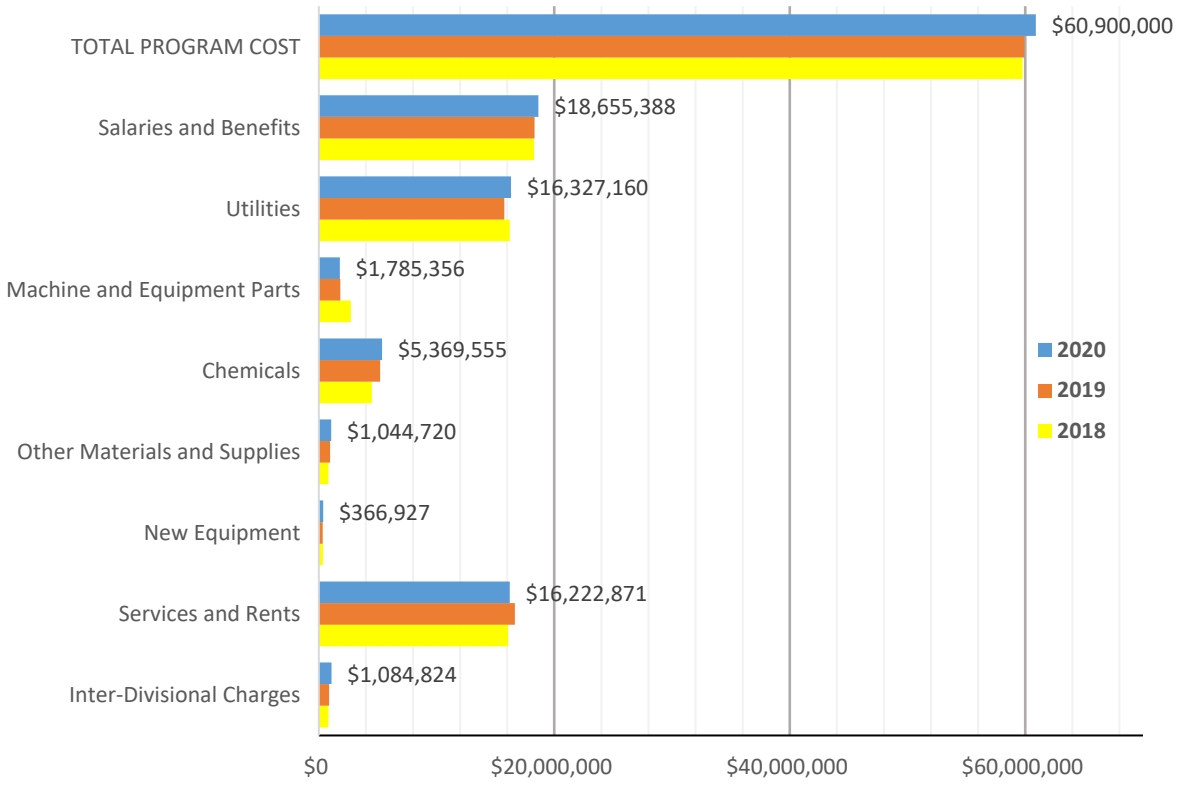


Figure 2: Operations and Maintenance Cost Breakdown

7.2 Human Resources

Plant Staffing at the Ashbridges Bay Treatment Plant in 2020 is shown in Table 10.

Table 10: Plant Staffing

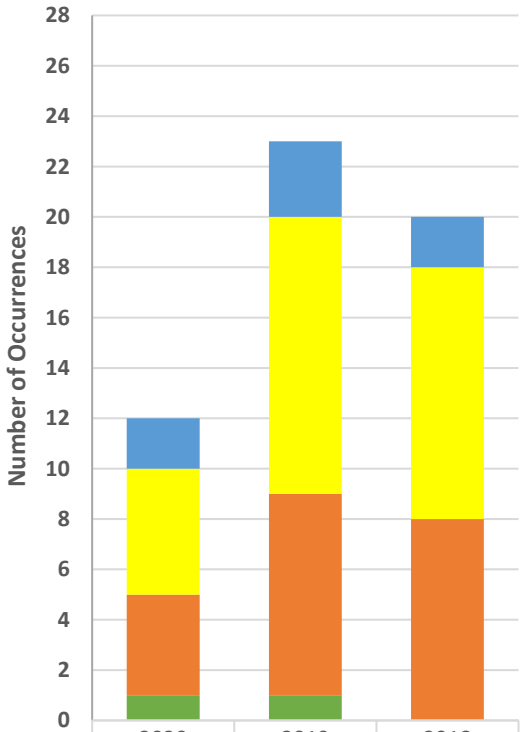
Positon	Number of FTE[1]
Sr. Plant Manager	1
Manager, Engineering Services	2
Superintendent, Plant Process and Operations	2
Senior Engineer	2
Engineer	2
Area Supervisor Plant Operations and Maintenance	10
Supervisor, Operational Support	1
Supervisor, Operating Engineers A/R-C	1
Stationary Engineer Operator	8
Electrical Instrumentation Specialist	2
Engineering Technologist Technician	2
Plant Technician/Wastewater	39
Industrial Millwrights	44
EICT	22
Support Assistant	2
Materials Management Assistant	1
Materials Management Clerk	1
Wastewater Plant Worker	7
Administration Trainee	0
Technical Trainee	0
Labourer 2	2.5
Total FTE Positions	**151.5**

[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[3].

As of January 19, 2021 there were 12 health and safety incidents, and a total of 280.13 lost time days due to work related injuries.



	2020	2019	2018
Lost Time	2	3	2
Medical Aid	5	11	10
Non Reportable Injuries	4	8	8
Recurrence	1	1	0

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

[3] The previously reported values for 2019 and 2018 have been changed to reflect the status of those WSIB claims as of December 31st 2020

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 2020 includes the list of courses shown in Appendix I. Some of these courses were eligible for Continuing Education Units (CEU's) as specified by the Ontario Water and Wastewater Certification Office. 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 11 summarizes the status of operator certification at the Ashbridges Bay Treatment Plant in 2020.

Table 11: Wastewater Treatment Certificates

Class Level	Licensed
Class I	40
Class II	12
Class III	5
Class IV	39
OIT	40
Total	**136**

7.6 MECP/MOL Correspondence

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

Table 12 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.

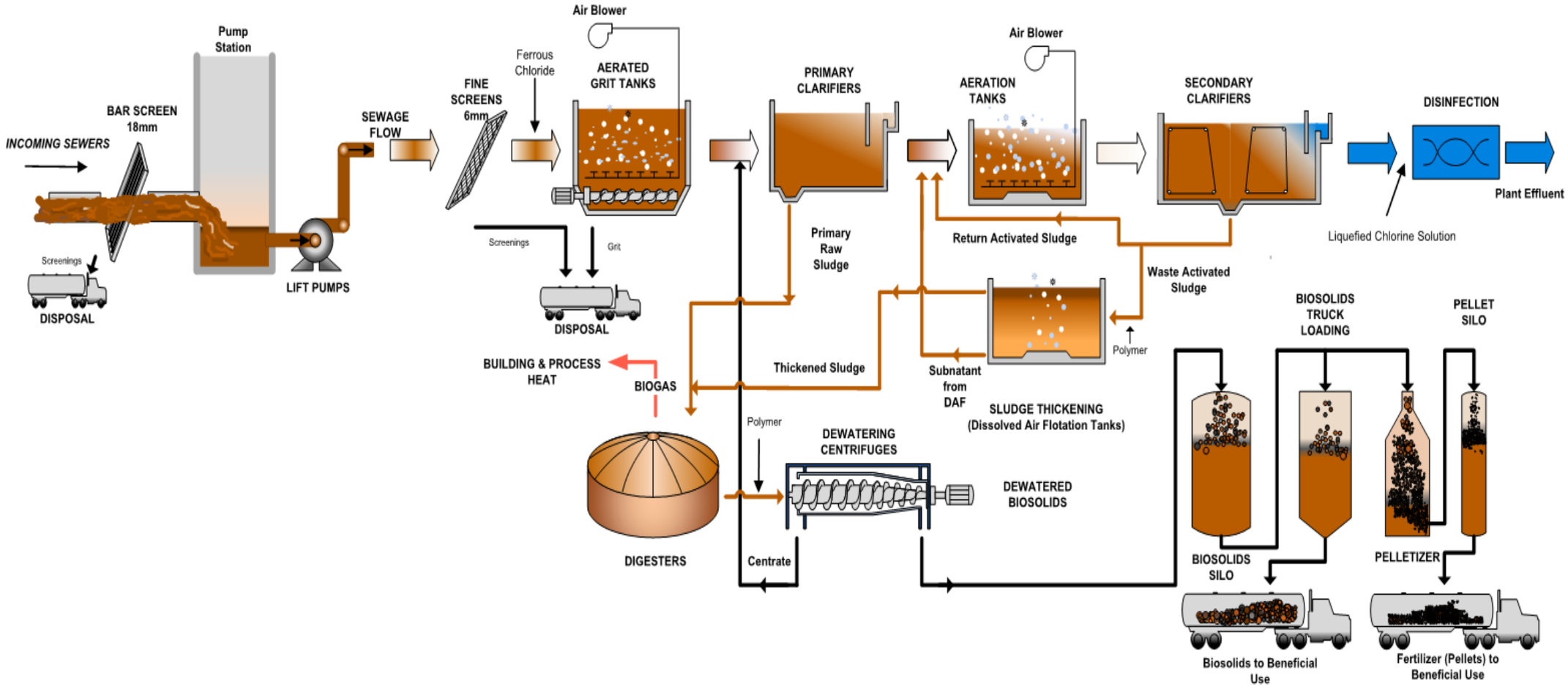
Table 12: Correspondence submitted to the MECP and MOL

Event Date	Type	Description	Resolution	Resolution Date
Complaints				
May 16, 2020	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
May 25, 2020	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
June 30, 2020	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
July 1, 2020	Odour complaint	Odour complaints with investigation revealed that they were not plant operation related.	Not required.	NA
July 18, 2020	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
July 22, 2020	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
July 31, 2020	Odour complaint	An odour complaint with investigation that the possible source was identified as the screen area on west of M building.	To cover the screen area.	August 8, 2020
September 1, 2020	Odour complaint	Odour complaints with investigation revealed that they were due to an emergency Pelletizer shutdown.	Put Pelletizer back to service.	September 1, 2020
September 10, 2020	Noise complaint	A noise complaint with investigation revealed that it was due to a Toronto Water Project currently under construction.	Not required.	NA
September 23, 2020	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
September 28, 2020	Noise complaint	A noise complaint with investigation revealed that it was due to a Toronto Water Project currently under construction.	Not required.	NA

Event Date	Type	Description	Resolution	Resolution Date
October 9, 2020	Noise complaint	A noise complaint with investigation revealed that it was not Toronto Water Project construction related.	Not required.	NA
November 8, 2020	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
November 12, 2020	Noise complaint	A noise complaint with investigation revealed that it was due to a Toronto Water Project currently under construction.	Not required.	NA
November 19, 2020	Noise & Vibration complaint	A noise & vibration complaint with investigation revealed that it was due to a Toronto Water Project currently under construction.	Not required.	NA
December 11, 2020	Odour complaint	An odour complaint with investigation revealed that it was not plant operation related.	Not required.	NA
Consent Letters				
November 2, 2020	Director Consent Letter	Request for Consent – Shutdown of the Aeration Odour Control System for the winter.	Consent was granted.	November 5, 2020
Notice of Modification to Sewage Works				
NA	Notice of Modification to Sewage Works	NA	NA	NA
Notification on Commissioning				
NA	Notice of Start-up	NA	NA	NA
Notification on Construction of Proposed Works				
NA	Notification on Construction Schedule of Proposed Works	NA	NA	NA

Event Date	Type	Description	Resolution	Resolution Date
August 26, 2020	Notification on Commissioning	Commissioning operation of remaining Proposed Works in P building.	NA	NA
November 26, 2020	Statement for completion	Statement for completion of construction of the Proposed Works for P Building.	NA	NA
MECP Inspection				
NA	MECP Communal Sewage Inspection	NA	NA	NA
Correspondence submitted to MECP				
February 20, 2020	Abnormal Discharge Event	Interruption to disinfection due to a strainer blockage.	Notified SAC and District Manager. The blocked strainer was cleaned up and has been put back into service	Follow up letter on February 21 2020 to MECP.
November 25, 2020	Abnormal Discharge Event	Interruption to disinfection due to power to disinfection dosing pumps were mistakenly disconnected by a contractor who was working on a control panel.	Notified SAC and District Manager. The contractor was advised by plant staff regarding the severity of these errors and have told them to ensure proper communication and documentation before flipping any switches/breakers.	Follow up letter on December 1 2020 to MECP.

APPENDIX A – Plant Schematic



Process Flow Diagram for Ashbridges Bay Treatment Plant

APPENDIX B – Influent and Effluent 2020 Performance Charts

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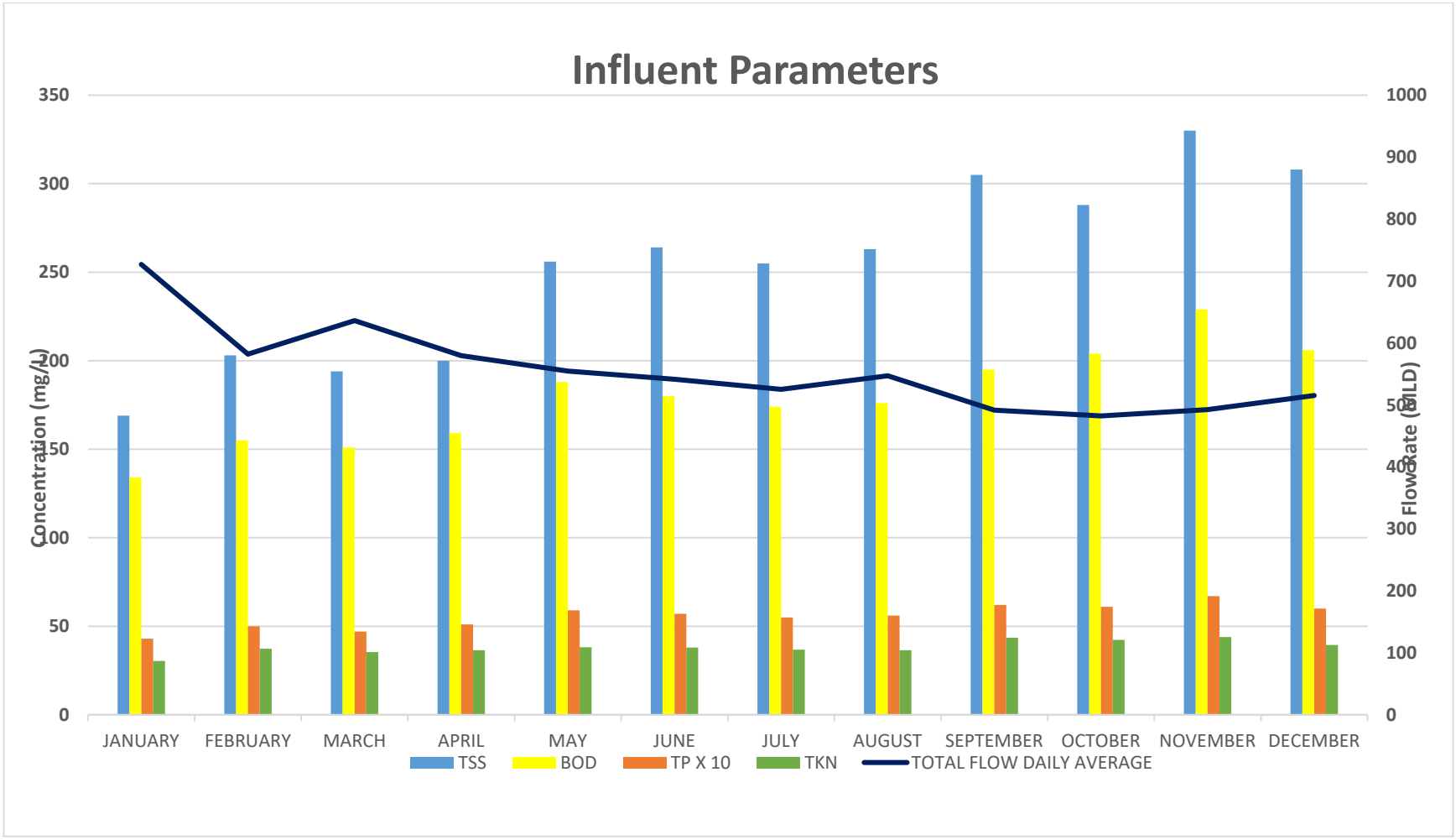

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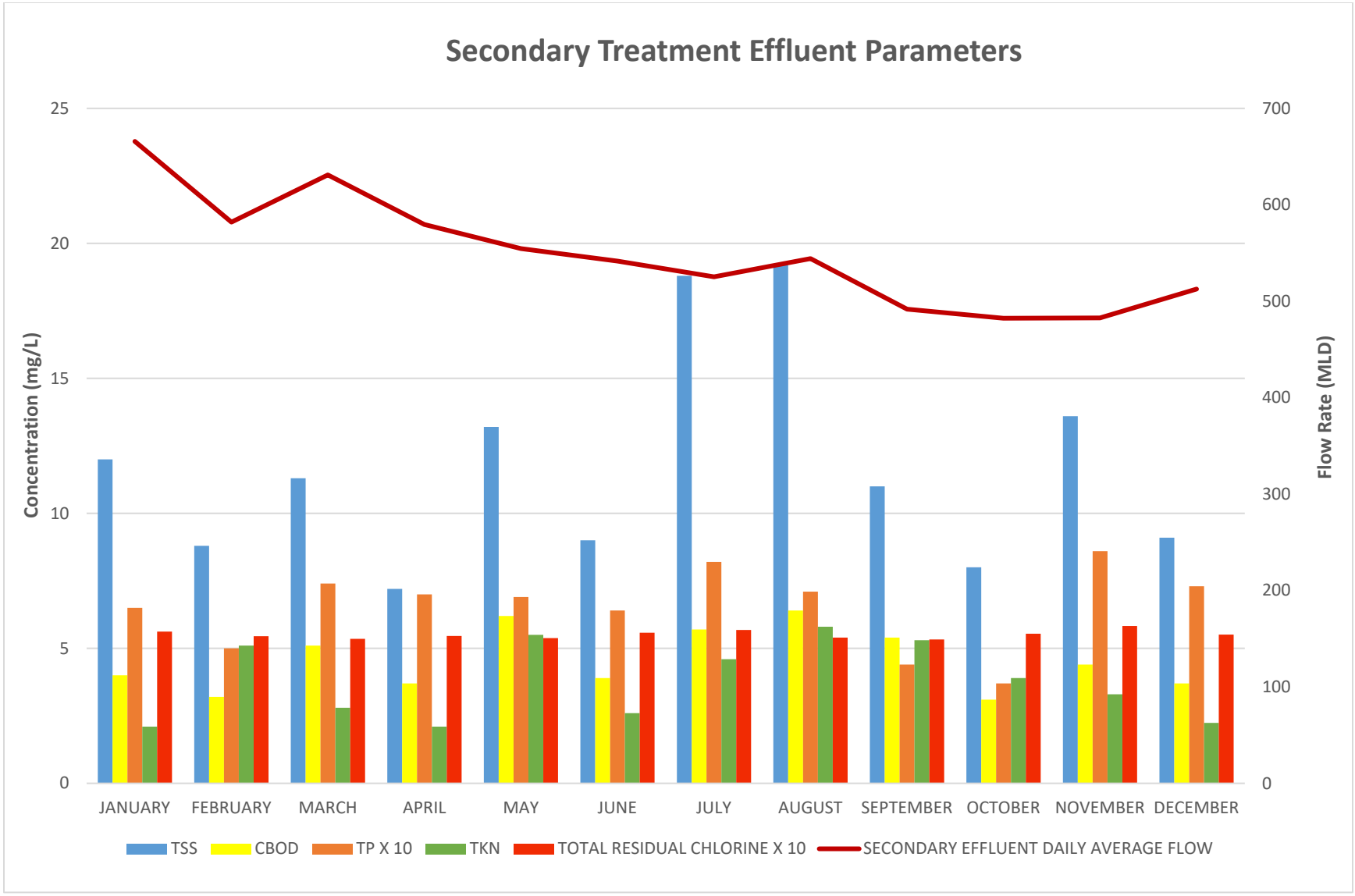

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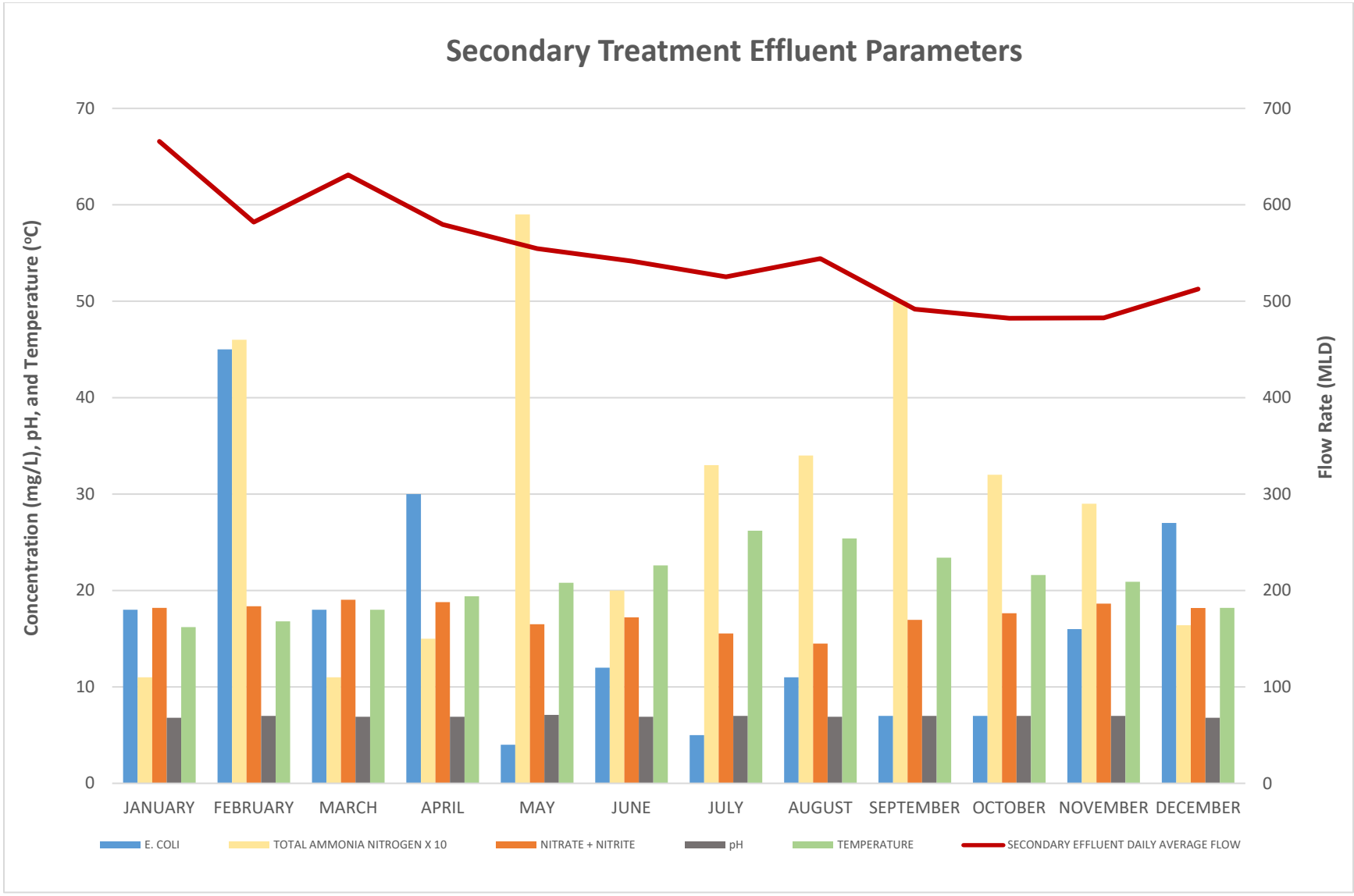

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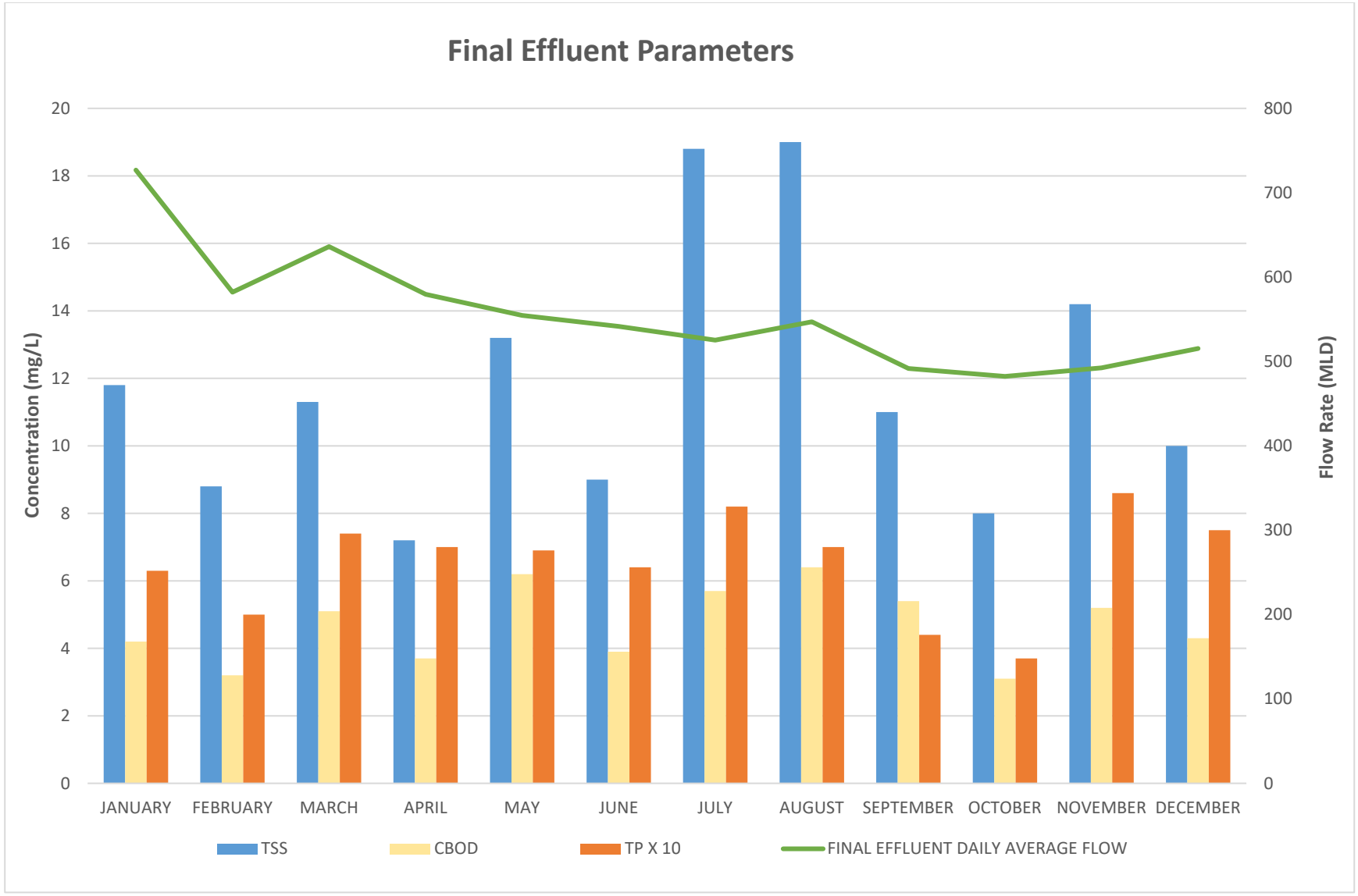

APPENDIX C – Historical Performance Data

APPENDIX C – Historical Performance Data

Parameters	Units	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Influent												
Flow	ML/day	556.3	651.5	563.9	659.8	549.8	585.2	638.4	631.6	576.1	622.4	596.3
Total Annual Flow	ML	203,657	237,723	205,750	240,817	201,229	212,831	232,932	230,456	210,834	227,355	217,641
Total Suspended Solids (TSS)	mg/L	252.9	207.8	303.7	279.5	318.6	334.6	328.5	271.2	275.2	274.0	260
Biochemical Oxygen Demand (BOD_5)	mg/L	179.3	153.8	207.9	201.9	244.6	274.9	258.3	174.9	178.2	142.4	137
Total Phosphorus (TP)	mg/L	5.6	4.9	6.3	6.4	7.5	7.5	6.6	5.9	6.2	6.4	5.9
Total Kjeldahl Nitrogen (TKN)	mg/L	38	37	43	40.26	45.4	43.7	44.7	46.6	47.7	44.1	54.4
Preliminary Treatment												
Grit and Screenings	tonnes/day	4.7	4.6	4.9	5.5	5.7	5.6	11	13	9.2	8.97	11.85
Primary Treatment												
TSS	mg/L	186.0	99.8	89.3	142.9	123.9	233.3	205.9	162.7	216.1	339.9	550.5
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	mg/L	117.0	99.8	89.3	68.7	84.3	98.9	92.9	90.3	113.3	138.2	272.5
Secondary Treatment												
Aeration Loading	kg $CBOD_5$/ m^3.day	0.35	0.35	0.27	0.25	0.25	0.32	0.32	0.32	0.53	0.7	1.46
Mixed Liquor Suspended Solids	mg/L	2933	3,285	3389	2,372	2,643	2,969	2,696	1,830	1,467	2,309	2,002
Flow through Seawall Gates	ML	1732	3,834	3278	3,187	2,004	2,908	4,751	5,227.9	-	-	-
Secondary Treatment Effluent												
Secondary Effluent Daily Average Flow	ML/day	549.5	637.3	559.6	654.9	548.7	576.9	632.4	625.7	571.2	614.7	627.7
TSS	mg/L	11.8	14.7	8.0	5.2	6.4	10.1	8.2	8.0	8.4	11.1	7.8
TSS Loading Rate	kg/day	6465	9,336	4453	3,415	3,489	5,021	5,021	4,981	4,810	7,009	4,614
cBOD5	mg/L	4.6	7.3	4.7	4.1	4.3	5	4.6	8.5	6.9	7.0	5.3
cBOD5 Loading Rate	kg/day	2509	4,668	2627	2,668	2,381	2,838	2,837	5,262	3,926	4,298	3,131
TP	mg/L	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.6	0.6	0.6	0.7
TP Loading Rate	kg/day	359	487	376	458	365	495	495	330	330	389	407

APPENDIX C – Historical Performance Data

Parameters	Units	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Escherichia Coli (E. Coli)	CFU/100 mL	17.0	32.0	25.6	53	36.8	66.5	7.4	90.0	31.3	35.9	3.0
pH	-	6.9	7.1	7.0	6.8	6.8	7.0	7.0	7.2	7.2	7.3	7.0
Total Residual Chlorine	mg/L	0.6	0.5	0.6	0.6	0.6	0.5	0.8	1	0.6	0.64	0.9
Total Kjeldahl Nitrogen (TKN)	mg/L	3.8	10.4	6.2	5.0	3.8	6.7	7.3	14.5	14.4	15.8	18.4
Total Ammonia Nitrogen	mg/L	3.0	10.9	6.0	4.6	3.3	5.3	5.9	11.2	13.8	13.7	16.9
Nitrate + Nitrite	mg/L	17.5	14.4	17.4	17.1	18.5	17.0	16.3	13.1	17.1	15.6	13.2
Temperature	degrees Celsius	20.8	19.7	21.0	20.2	20.9	20.1	19.5	20.2	19.7	19.3	20.6
Final Effluent												
TSS	mg/L	11.9	15.0	8.1	5.4	6.5	10.4	9.2	-	-	-	-
cBOD5	mg/L	4.7	7.9	4.7	4.1	4.4	5.2	5.0	-	-	-	-
TP	mg/L	0.7	0.8	0.7	0.7	0.7	0.8	0.8	-	-	-	-
Solids Handling												
Primary Sludge Treated	m^3/day	4874	5,429	5978	5,640	6,420	4,440	4,292	5,067	5,546	6,900	6,590
Primary Sludge Total Solids (TS)	%	2.4	2.3	2.3	2.5	2.6	3	3.05	2.9	2.72	2.60	3.18
Primary Sludge Total Volatile Solids (TVS)	%	73.7	71.6	73.9	73	73.8	73.5	72.9	62.9	74.9	73.4	92.4
Waste Activated Sludge (WAS) co-settled in Primary Clarification Tanks or excess WAS to Aeration	m^3/day	1816	1,795	911	1,260	2,130	1,240	2,405	8,800	14,523	35,288	20,809
WAS to Thickening	m^3/day	7787	7,910	6944	7,380	7,360	8,470	8,163	10,469	9,665	8,992	11,279
WAS TS	mg/L	0.9	0.9	0.8	0.7	0.7	0.8	0.82	0.54	0.49	0.69	1.03
Thickened WAS (TWAS) Treated	m^3/day	2257	2,119	1952	1,440	1,600	2,090	2,366	876	677	980	1,064
TWAS TS	%	3.4	3.5	3.6	3.7	3.4	3.3	3.4	4.8	4.6	4.8	4.3
TWAS TVS	%	70.7	73.8	73.9	73.2	71.6	71	72.9	69.1	72.0	71.9	71.7
Volume to Digestion	m^3/day	7131	7,548	7930	7,080	8,020	6,530	6,658	5,933	6,222	5,900	7,634
Digesters Hydraulic Retention Time	days	17.4	20.0	19.3	20.2	18.1	23.3	23.1	21.8	21.1	19.1	16.6
Organic Loading to Digesters	TVS per m3 of digester capacity per day	1.1	1.0	1.0	0.9	1.1	1.0	1.0	2.1	1.3	-	-

APPENDIX C – Historical Performance Data

Parameters	Units	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Digester Gas Volume	m^3/day	59945	65,698	61856	61,640	62,330	64,560	65,921	77,781	115,174	60,782	63,100
Dewatering Centrifuge Feed TS	%	1.8	1.7	1.6	1.7	1.8	1.8	1.8	1.8	1.7	2.0	1.8
Dewatered Biosolids TS	%	26.9	27.7	27.9	27.9	28.1	27.7	26.5	27.8	28.3	28.3	28.0
Centrate Quality	mg/L	635	626	428	299	319	665.32	2091	1959	1196	5921	5066
Solids Capture Rate	%	96	96	97	98	98	96.44	88	77	96	70	70
Centrifuge Run Time	hours	47578	51,226	52790	52,400	52,329	48,049	43,507	51,451	102,922	77,844	57,995
Biosolids Management	wet tonnes/year	148357	154,656	155756	159,288	149,733	145,321	143,190	142,908	139,562	129,213	134,185

APPENDIX D – Secondary Treatment Effluent Parameters (Leachate Related)

APPENDIX D – Secondary Treatment Effluent Parameters (Leachate Related)

Quarterly Average	Boron	Cobalt	Magnesium	Manganese	Potassium	Strontium	Bis(2-ethlhexyl) Phthalate
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
Q1	0.097	*0.002*	14.7	0.0364	0.259	12.4	*0.25*
Q2	0.105	*0.002*	14.6	0.0385	0.267	13.2	*0.25*
Q3	0.130	*0.002*	11.8	0.0627	0.262	12.7	*0.25*
Q4	0.135	*0.002*	12.7	0.0682	0.239	14.4	*0.25*

Values in red italics is half the MDL

APPENDIX E - Influent and Effluent Metal Concentrations

APPENDIX E - Influent and Effluent Metal Concentrations

Influent (Daily Composite tested once/month for metals)

Parameters	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	0.00405	0.002	0.0799	2.2	0.0025	0.0519	0.00005	0.0025	0.0895
February	0.005	0.002	0.0043	0.002	0.0914	2.37	0.0025	0.0611	0.00005	0.0025	0.108
March	0.005	0.002	<0.004	0.002	0.0829	1.91	0.0025	0.052	0.00005	0.0025	0.101
April	0.005	0.002	<0.004	0.002	0.0893	2.01	0.0025	0.0534	0.00005	0.0025	0.11
May	0.005	0.002	0.00488	0.002	0.118	4.12	0.00512	0.0709	0.00005	0.0025	0.153
June	0.005	0.002	0.00569	0.002	0.127	4.85	0.00671	0.0742	0.00005	0.00532	0.171
July	0.005	0.002	0.00656	0.002	0.121	2.47	0.00594	0.0588	0.000106	0.0025	0.148
August	0.005	0.002	0.00473	0.002	0.123	2.8	0.00652	0.0618	0.00005	0.0025	0.155
September	0.005	0.002	0.00477	0.002	0.138	2.76	0.00596	0.0615	0.00015	0.00693	0.162
October	0.005	0.002	0.00534	0.002	0.14	2.58	0.00729	0.0587	0.000128	0.00595	0.159
November	0.005	0.002	0.00543	0.002	0.138	3.05	0.00571	0.0635	0.00005	0.00569	0.166
December	0.005	0.002	0.00469	0.002	0.125	2.64	<0.005	0.0606	0.00005	0.0025	0.169
Annual Average	**0.005**	**0.002**	**0.005**	**0.002**	**0.114**	**2.81**	**0.0048**	**0.0607**	**0.0000695**	**0.0037**	**0.141**

Data in red italics is half the MDL

APPENDIX E - Influent and Effluent Metal Concentrations

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

Parameters	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Strontium	Zinc
Units	mg/L	mg/L	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	0.0972	0.002	0.002	0.002	0.00968	0.522	0.0025	0.0364	0.00005	0.0025	0.259	0.0256
February	0.005	0.142	0.002	0.002	0.002	0.00887	0.594	0.0025	0.0546	0.00005	0.0025	0.286	0.0299
March	0.005	0.113	0.002	0.002	0.002	0.00749	0.405	0.0025	0.0418	0.00005	0.0025	0.291	0.0243
April	0.005	0.105	0.002	0.002	0.002	0.00913	0.472	0.0025	0.0385	0.00005	0.0025	0.267	<0.02
May	0.005	0.115	0.002	0.002	0.002	0.00877	0.938	0.0025	0.0538	0.00005	0.0025	0.273	0.024
June	0.005	0.13	0.002	0.002	0.002	0.00901	0.677	0.0025	0.0528	0.00005	0.0025	0.274	<0.02
July	0.005	0.13	0.002	0.002	0.002	0.0134	1.26	0.0025	0.0627	0.00005	0.0025	0.262	0.0267
August	0.005	0.143	0.002	0.002	0.002	0.0135	1.52	0.0025	0.0755	0.00005	0.0025	0.268	0.0255
September	0.005	0.414	0.002	0.002	0.002	0.00734	0.596	0.0025	0.0833	0.00005	0.0025	0.25	0.0206
October	0.005	0.135	0.002	0.002	0.002	0.0104	0.671	0.0025	0.0682	0.00005	0.0025	0.239	0.0259
November	0.005	0.134	0.002	0.002	0.002	0.012	0.805	0.0025	0.0605	0.00005	0.0025	0.239	0.0261
December	0.005	0.12	0.002	0.002	0.002	0.00943	0.557	0.0025	0.0556	0.00005	0.0025	0.254	0.0244
Annual Average	**0.005**	**0.1482**	**0.002**	**0.002**	**0.002**	**0.0099**	**0.7514**	**0.0025**	**0.057**	**0.0001**	**0.0025**	**0.2635**	**0.0253**

Data in red italics is half the MDL

APPENDIX F – Biosolids Analysis

Appendix F – Biosolids Analysis

Ashbridges Bay Treatment Plant - Summary of Dewatered Biosolids Analysis for 2020

Dewatered Cake	January	February	March	April	May	June	July	August	September	October	November	December	Max Allowable Dry Wt Conc mg/Kg [1]	Annual Average
TKN	68,200	49,200	57,500	45,800	45,200	49,800	45900	39,700	40,100	44,200	45,650	33,300		47,046
Ammonia(N)	5,470	6,155	7,395	7,590	6,745	6,380	5,695	6,555	5,140	7,390	6,925	6,630		6,944
Nitrate as N	0.79	0.98	0.15	1.09	0.56	2.17	0.40	0.37	0.15	0.25	0.25	0.25		6.94
Nitrite as N	0.88	0.47	0.18	1.21	0.31	0.16	0.18	0.57	1.11	0.95	0.35	1.31		5.43
As	2.89	3.195	2.945	0.8955	2.555	3.295	3.255	4.31	4.15	3.67	3.805	2.735	**170**	2.20
B**	21.25	18.45	16.3	13.9	17.9	17.6	22.05	21.65	22.25	22.25	21.7	23.85		15.0
Cd	0.78	0.86	0.81	0.77	0.68	0.62	1.22	0.57	0.50	0.50	0.50	0.50	**34**	0.83
Cr	87.7	80.1	69.8	58.7	65.1	58.0	63.8	69.5	75.1	70.4	62.7	64.55	**2,800**	74.0
Co	3.38	3.57	3.48	3.57	3.77	3.02	3.85	3.44	3.22	3.78	3.46	3.725	**340**	3.97
Cu	653	663	656	668	657	653	746	747	693	718	689	687	**1,700**	666
Pb	39.9	34.8	34.0	33.1	30.4	32.1	43.2	44.9	40.0	40.2	34.5	37.0	**1,100**	37.0
Mn	306	298	283	265	283	260	236	231	262	231	237	253		273
Hg	0.51	0.42	0.39	0.46	0.54	0.43	0.43	0.48	0.55	0.52	0.43	0.50	**11**	0.427
Mo	8.53	8.04	8.37	8.13	8.63	9.28	10.30	9.23	9.68	9.72	10.30	9.6	**94**	8.72
Ni	28.0	27.8	25.8	22.9	26.8	24.0	25.9	29.6	30.8	28.6	25.0	26.7	**420**	29.1
Total P	33,800	29,750	30,600	29,300	32,850	32,300	32,250	27,300	32,450	31,150	36,650	30,850		30,113
K	1053	1170	1190	1150	1120	1160	1165	1235	1195	1250	1170	1195		1130
Se	3.96	4.29	3.26	3.44	3.77	3.64	3.08	2.61	1.84	3.09	1.80	0.70	**34**	3.23
Zn	587	574	618	613	596	613	751	720	665	686	641	640	**4,200**	606
TS%	27.5	27.1	27.1	26.5	26.7	27.3	26.6	27.1	28.1	27.0	26.3	26.6		27.7
VS%	61.9	64.2	64.6	63.0	63.3	63.7	64.6	60.4	61.2	62.8	65.2	62.9		64.0
E. Coli	337,005	246,735	714,612	557,723	763,549	396,644	928,876	428,145	998,181	680,967	379,784	302,395	**2,000,000**	666,257

APPENDIX G – Odour Reduction Plan

ODOUR REDUCTION PLAN – Status as of December 31, 2020

1. Program Summary

The Odour Reduction Plan consisted of construction projects in the T Building, M Building, Aeration Tanks, D Building, Truck Loading Facility Biofilter and the P Building. As of 2020, all projects have been completed and are operational. These projects and their estimated emissions reductions of odour are summarized in the following sections.

The plan provided details for Phases I and II, as required under Environmental Compliance Approval (ECA) (Air) number 2815-9PWTWV, dated January 15, 2015. The facility currently operates under this ECA (Air), as well as Amendment Notice No. 1, issued November 23, 2020.

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

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.

2.1 T Building

The scope for the T Building included:

- 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	

APPENDIX G – Odour Reduction Plan

2.2 M Building

The scope for the M Building included:

- 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 included:

- 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 included:

- 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 included:

- 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	In Operation	
Completion Date	Completed 2018	

3.2 P Building

The proposed upgrade of P Building was 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 comprised 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	In Operation	
Estimated Completion Date	Completed 2020	

[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.

4. Odour Facility Reassessment

Source Testing was performed in September of 2020 to determine the rates of emissions of odour and total reduced sulphur (TRS) from the Phase II Targeted Sources. Previously in October 2018, source testing had also been performed for the Phase I Targeted Sources.

It should be noted that during the 2020 Source Testing, three sampling locations deviated from the submitted Pre-Test plan due to health and safety concerns.

Based on the above source testing, air dispersion modeling was able to show that the facility is able to demonstrate compliance with the applicable MECP limits for the Odour and TRS.

In 2021 or 2022, additional odour samples may be taken in the sampling locations that had deviated, with air dispersion modelling completed for this additional data.

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 2020 for Work Area 1.

- Overhaul and repair of broken chains and panels for D Building Bar Screen #2
- Replaced burnt out brushes on D Building Bar Screen #2 & 5
- Overhaul and repair of D Building Bar Screen #3
- Overhaul and repair of D Building Bar Screen #4
- Clean conveyor screw and replace brushes of P Building screenings washer compactors
- Replace Primary Tank #12 Scum Collector chain
- Overhaul of D Building Grit Tank #14 conveyor
- Replace Broken Bronze Nuts on Grit Bypass Channel outside D Building
- Modify P Building Grit classifier sensor rack
- Replace broken D Building Grit Tank #13 screw conveyor
- Replace conveyor screw and overhaul D Building screenings washer compactors
- Replace conveyor screw, gearbox and motor in D Building screenings washer compactor
- Rebuild of D Building Screening Transfer Pumps P-1800 & P-1900
- Replacement and overhaul of screw in D Building Screenings Washer Compactor in
- Installation of Primary sludge density meter and modification of sludge line in Old Primary Section Tanks #3/4 & 5/6
- Manufacture and install new panels for P Building Bar Screen #3
- Repair Primary Tank #12 bridge collector mechanism drive chain
- Repair chain and flight for Primary Tank #7 Bridge collector mechanism
- Repair Primary Tank #8 bridge/ collector mechanism
- Overhaul D Building scum pump for Primary Tanks #11 & 12
- Repair discharge line and motor for humidification unit for D Building Biofilter

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 2020 for Work Area 2.

- Complete overhaul of Final Tank# 10
- Overhaul of air blower #7 motor
- Repair and reinstallation of WAS Pump for Final Tank #11
- Replace & install Final Tank #11 & 12 Scum Pump
- Replace scum pump for Final Tank #1, 2, 3 and add in 2” flushing water line
- Repair WAS Pump for Final Tank #11
- Replace faulty Scum Pump discharge gate valve and repaired actuator
- Rebuild 2” flushing water line for Scum Hopper for Final Tank #10 & 11

APPENDIX H – Maintenance Activities

- Overhaul WAS Pump for Final Tank #10
- Overhaul motor for Aeration Tank #5 Odour Control Fan
- Replace scum pump for Final Tank #7, 8, 9 and add in 2" flushing water line
- Install & Calibrate New mid-range Turbidity Analyzer for North Channel
- Install & Calibrate New mid-range Turbidity Analyzer for South Channel
- Overhaul of WAS Pump for Final Tank #7

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 2020 for Work Area 3.

- Replace broken feed line, trouble shoot and repair of Centrifuge #12
- Overhaul and major rebuild of Centrifuge # 4
- Repair broken water box, replaced poppet suction shaft on Dewatered Cake Pump #.4
- Replace broken feed line on Centrifuge #11
- Upgrade Centrifuge #7 back drive controller
- Upgrade Centrifuge #8 back drive controller
- Install TSS Transmitter for Centrate Line
- Repair back drive DC Motor on Centrifuge # 8
- Replaced Sludge Transfer Pump Discharge #2
- Replaced main motor at Centrifuge #6
- Repair leaking Dewatered Cake Pump #1
- Troubleshoot and repair leaking issues in Centrifuge #4
- Repair bushing and weld elbow for Dewatered Cake Silo #2 sliding frame
- Replace Centrifuge #7 sludge feed valve
- Replace Centrifuge #5 sludge feed valve
- Upgrade Centrifuge #1 back drive control
- Upgrade Centrifuge #3 back drive control
- Replace sludge transfer pump #2
- Installation of level transmitter on Sludge Holding Tank #1
- Upgrade of all lighting in all building in Work Area 3
- Take down Equalization Tank #1 for cleaning

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 2020 for Work Area 4.

APPENDIX H – Maintenance Activities

- Repair pump poppet housing, screw feeder conveyor bearings and RAM change on Biosolids Transfer Pump #2
- Replacement of DC Valves on Biosolids Cake Transfer Pump #2
- Repair poppet valves, differential cylinder oil leaks on Biosolids Transfer Pump #1
- Replacement hydraulic hoses on power pack Biosolids Transfer Pump #1
- Installation of new entrance and exit loop sensor in truck loading bay
- Completion of sodium hypochlorite tanks liner inspection
- Troubleshoot Power Pack A hydraulic pressure, Repair portable filtration pump, replaced oil cooler Biosolids Cake Transfer Pump #2
- Relocate and replacement of hydraulic oil tank to Silo Building basement for Biosolids Cake Transfer Pump #2
- Screw Feeder Gearbox Replacement on Biosolids Cake Transfer Pump 3
- Rebuild and assemble of Differential Cylinder on Biosolids Cake Transfer Pump 3
- Fabrication of adapter for pump ram and hydraulic cylinder piston rod on Biosolids Cake Transfer Pump 3
- Repair and replacement of hydraulic hoses, oil cooler on Power Pack 203A
- Replacement of gearbox, motor and worned liners for conveyors drive motor for hopper #2
- Replacement of temporary hypo disinfection of south secondary final effluent channel from North NaOCl dosing line
- Replacement of seized gate valve on conveyor 304 in Truck Loading facility, rebuild of the two valves for spares
- Hydraulic pump repair and Replacement of Oil Cooler for power pack #1
- Replacement of actuator and gearbox for valve in Silo #1
- Modification of Hopper #1 Feed screw conveyor header box
- Overhaul of header box, replacement of header box liner for silo extraction conveyor for hopper #3
- Overhaul of west header box for silo extraction conveyor for silo #3
- Replacement and adjustment of two isolation knife gate valve under hopper #3
- Replacement and repair of seized isolation knife gate valve for hopper #1 discharge
- Installation of temporary South - Final Effluent Conduit sampler
- Repair of seized isolation knife gate valve for hopper #3
- Replacement of seized isolation knife gate valve for hopper #4

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 2020 for Work Area 5.

- Retrofit cooling water inlet pipeline for mixing compressor for Digester 13-16
- Rebuild check valve and fabricate bushing for mixing compressor for Digester 13-16
- Complete rebuild of digester gas compressor #3 for Digester 19-22
- Alignment of pump gearbox and motor, install 1” drain valve, realignment of pump and gear box on TWAS Transfer Pump No. 4

APPENDIX H – Maintenance Activities

- Removed existing, installation of spare and rebuild old pump of Flotation Tank #7 TWAS Transfer Pump
- Removed existing, installed spare and rebuild old pump of Flotation Tank #5 TWAS Transfer Pump
- Removed existing, installed spare and rebuild old pump TWAS Transfer Pump #3
- Replace defective VFD Controller for Sludge Transfer Pump #2
- Removed existing, installed spare and rebuild old pump of Digester Mixing Pump #2A
- Removed existing, installed spare and rebuild old pump of Digester Mixing Pump #3A
- Removed existing, installed spare and rebuild old pump of sludge recirculation pump of Digester Tank 19
- Removed damaged and installed sump in Digester 5-8 basement
- Re-weld and fabricate cracked skimmer shackles on flotation tanks 1-8
- Overhaul sludge recirculation pump of Digester Tank 1-4
- Removed existing, installed spare and rebuild old pump of sludge recirculation pump of Digester Tank 16
- Removed existing, installed spare and rebuild old pump for Digester 5-8 sludge transfer pump
- Removed and replaced broken chains, skimmer and flights on Flotation Tank #7

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 2020 for Work Area 6.

- Overhauled digester gas compressor #1, installed three gas valves on compressor, two valves on both dryers and attached vent line
- Troubleshoot TCV 2244 temperature to hot coolant in gas compressor #2, installed thermostatic mixing valve
- Replace pressure switches on hot water boiler #6
- Z Building Sub-Basement Sump Pump replacement
- Overhaul glycol pump for Dewatering Building space heating
- Primary Loop Distribution Pump #1 overhaul
- CO Alarm Investigation, strip M Building hot water boiler down and troubleshoot system CO leak points
- Overhaul exhaust fan in Auxiliary Building 3rd Floor
- Investigated glycol leakage, removed existing and installed new heater in Dewatering Building
- Replace actuated flow control valve plant/city water to heat exchanger in Digester Gas Control Building
- Replace leaky floor drains in Z Building

APPENDIX H – Maintenance Activities

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 2020 for Work Area 7.

Machine Shop

- Fabricated pump casing rings and sleeves, collector mechanism parts for flotation, pump shafts and gate nuts;
- Fabricated parts in welding shop for various work areas.
- Fabricated bronze nuts for various gate valves
- Fabricate guide pins for gate valves in the Biosolids Truck Loading Facility

Fire Protection and Safety

- Put P Building fire system in operation
- Prepare and procured fire pump replacement for Blower Building

City Water System & Backflow Preventers (BFP)

- Attending all service calls and repairing done on priority basis.
- Installed parallel back flow preventers at Pelletizer facility
- Installation of oil filled pressure gauges at all main water feed lines
- Replace chamber valves at Lakeshore line entry at west of D Building by North security gate water chamber
- Procured materials for replacement of back flow preventers at M Building
- Troubleshoot boiler feed water pressure at back flow preventers in Z Building

Grounds keeping

- Snow plowing and salting throughout the plant.
- Spills clean up, retaining and disinfecting throughout the plant.
- Ensured that waste oil is removed from work areas pump into holding tank in a safe manner and scheduled pickup
- Scheduled annual maintenance inspection and repairs for all RTVs, Pick-up truck, boom truck, case tractor forklifts.
- Scheduled annual maintenance inspection and repairs for all lifting devices in the plant.

Electrical Department (Work Area 8)

WA8 Electrical and Instrumentation department provides support to process and non- process activities across the facility at the ABTP and NTTP. Below is a number of maintenance activities that was completed in ABTP for the year 2020.

- Fabricated plate with support and installed solar light -SLX-177-24HR plant wide.
- Installed new flow meter display in D Building for city water revenue flow meter

APPENDIX H – Maintenance Activities

- Investigated diagnose and repaired sump pump control system wiring. Set working parameters for primary and bypass pump, changed control timer in the basement of digester # 5-8.
- Rebuilt two Manning auto sampler due to bearing broken, rpm sensor position offset, wrong wire connection, replaced pump unit, RPM sensor, flow sensor.
- Replaced pump unit, set up pipe guide in order to insert PVC hose easily into primary tunnel, changed flow sensor, reset and set-up program and calibrated in primary North sampler.
- Built up BX cable circuit, installed lighting fixture in the electrical shop meeting room of North Toronto plant.
- Replaced safety switch breaker (100 Amp, 600V) in elevator in the basement of Administration Z Building north side and in the Auxiliary building.
- Replace all lighting fixtures in the offices and hallways of the mezzanine floor of the Z Building machine shop with LEDs.
- Maintains and upgrades street lighting – plant wide.
- Replace and updated Flotation basement lighting with LEDs.
- Repairs and maintains the PA system across the entire facility.
- Monitors, maintains and inspects North and South substations.
- Condition base monitoring to include plant wide oil testing, infrared scanning of transformers and ultrasonic inspection.
- Mo-gen maintenance repairs and inspection.
- T-building feeder repairs.
- Replace of heaters at Stand-By auto sampler station East and West.
- Installation of new electrical feeder to a pit of elevator 2.
- Installation of new portable gas monitors ALTAIR 4XR in the electrical meeting room.

APPENDIX I – Staff Training Courses

APPENDIX I – Staff Training Courses

Training attended by Ashbridges Bay Treatment Plant operations and skilled trades staff in 2020 includes the list of courses below.

Capital Projects Training

- ABTP - TEMPERATURE MODULATING VALVE FOR DIGESTER 16
- ABTP - TIALGATE WHMIS 2015 NEW CHEMICAL SAFETY INFO SYSTEM
- ABTP - TLF BIOFILTERS UPGRADES AHU-301 401 403 404
- ABTP - TRANSFER PUMPS FOR DIGESTER 16
- ABTP - TSS & PH INSTRUMENT COMMISSIONING AND CALIBRATION TRAINING

Health and Safety Training

- AIR PURIFYING RESPIRATORS (2020)
- ARC FLASH FOR NON-QUALIFIED PERSONS (2020)
- ASBESTOS AWARENESS
- CHAINSAW SAFETY AWARENESS (2019-2022)
- CONFINED SPACE AWARENESS 1/2 DAY (2019-2021)
- CONFINED SPACE RESCUE - 2 DAY
- DESIGNATED SUBSTANCES AWARENESS (2019-2022)
- ELECTRICAL AWARENESS
- ELECTRICAL SAFETY AWARENESS
- EMERGENCY FIRST AID LEVEL 'A' CPR (2019-2021)
- FALL PROTECTION AWARENESS
- FALL PROTECTION IN AN INDUSTRIAL WORK SETTING
- FIRE SAFETY AND EXTINGUISHER USE
- FIRE WARDEN ESSENTIALS TRAINING
- FUNDAMENTALS OF LADDER SAFETY AWARENESS
- HEALTH AND SAFETY ORIENTATION TRAINING PROGRAM - PART B
- HOT WORK PERMIT SYSTEM AWARENESS (2019-2021)
- INCIDENT REPORTING (2020)
- IN-SERVICE HEALTH & SAFETY ORIENTATION
- JOINT HEALTH AND SAFETY COMMITTEE (JHSC) CERTIFICATION TRAINING – CERTIFICATION REFRESHER
- LOCK OUT, TAG OUT & TEST AWARENESS (2019-2021)
- MANAGING LABOUR RELATIONS: AN INTRODUCTION - PART 1
- MANAGING LABOUR RELATIONS: PART TWO
- MMR – SELF-CONTAINED BREATHING APPARATUS (2018-2020)
- MOULD AWARENESS (2019-2022)
- OEM EMERGENCY MANAGEMENT 100
- OVERHEAD CRANE SAFETY
- QUICK CUT SAW SAFETY AWARENESS
- RESPONDING TO WORKPLACE HARASSMENT: WHAT YOU NEED TO KNOW
- SCAFFOLD SAFETY AWARENESS (2019-2021)
- SLIPS, TRIPS AND FALL PREVENTION
- STANDARD FIRST AID - LEVEL "C" CPR & AED - 2 DAY (2019-2021)
- TRAFFIC CONTROL AWARENESS
- TRAFFIC CONTROL ROADWAY WORK (2019-2021)
- TRENCHING AND EXCAVATION AWARENESS (2019-2021)
- WORKER HEALTH AND SAFETY AWARENESS IN 4 STEPS
- WORKING AT HEIGHTS (2019-2021)
- WORKING AT HEIGHTS REFRESHER

APPENDIX I – Staff Training Courses

- WORKPLACE VIOLENCE LEGISLATION & POLICY REVIEW

Site Specific Training

- ABTP - MSA ALTAIR 4XR - GAS MONITORS
- ABTP - TAILGAGE USING DISPOSABLE GLOVES
- ABTP - TAILGAGE USING SURGICAL MASKS
- ABTP - TAILGATE FIRE EVACUATION
- ABTP - TAILGATE JHSC - RIGHT TO PARTICIPATE
- ABTP - TAILGATE ACCEPTABLE USE OF CITY'S IT ASSETS
- ABTP - TAILGATE AIR QUALITY AND YOUR HEALTH
- ABTP - TAILGATE AWARENESS RE: JHSC
- ABTP - TAILGATE COVID PROTOCOLS - PREVENTING THE SPREAD COVID-19 AT WORKPLACE
- ABTP - TAILGATE DISTRACTED DRIVING
- ABTP - TAILGATE ERGONOMICS INJURIES SIMPLE PRECAUTIONS
- ABTP - TAILGATE EYEWASH STATION AND EMERGENCY SHOWER
- ABTP - TAILGATE INFECTION CONTROL
- ABTP - TAILGATE LOCKOUT, TAG & TEST
- ABTP - TAILGATE MSD HAZARDS CONTROL MEASURES
- ABTP - TAILGATE PHYSICAL DISTANCING
- ABTP - TAILGATE PREVENTING BACK INJURIES
- ABTP - TAILGATE PSYCHOSOCIAL PROGRAM AND RISK ASSESSMENTS
- ABTP - TAILGATE SHARP TOOLS (NEEDLES AND SYRINGES)
- ABTP - TAILGATE WINTER DRIVING
- ABTP - TAILGATE WORKING WITH WASTEWATER
- ABTP - TAILGATE WORKPLACE VIOLENCE

Mandatory Tailgate

- LADDER SAFETY- MANDATORY TAILGATE FEBRUARY 2020
- SLIPS, TRIPS AND FALLS HAZARD- TORONTO WATER MANDATORY TAILGATE NOVEMBER 2020
- TORONTO WATER EMERGENCY PLAN AWARENESS-MAY 2020 MANDATORY TAILGATE

Technical Training

- ASSET MANAGEMENT - 1. DECOMMISSIONING ASSETS
- BACKFLOW PREVENTION AWARENESS (2019-2021)
- BASIC PUMPS AND PUMPING HYDRAULICS
- BASIC VIBRATION ANALYSIS
- CENTRIFUGAL AND POSITIVE DISPLACEMENT PUMP OPERATION (2020-2022)
- CLASSROOM REVIEW OF COMMON WEAR ITEMS FOR PLANT MACHINERY (2019-2021)
- DRINKING WATER OPERATOR TRAINING AND CERTIFICATION REQUIREMENTS OVERVIEW
- DRINKING WATER QUALITY MANAGEMENT STANDARD (2020)
- ENVIRONMENTAL COMPLIANCE APPROVALS
- ONTARIO ELECTRICAL SAFETY CODE (27TH EDITION/2018) GENERAL LEVEL 1
- ONTARIO ELECTRICAL SAFETY CODE (27TH EDITION/2018) GENERAL LEVEL 2
- PART 1: GETTING STARTED WITH ERIS
- PART 2: E-LOGBOOKS
- PROJECT MANAGEMENT: AN INTRODUCTION
- SAP ARIBA - CLIENT DIVISION: SOURCING REQUEST
- SCADA TRAINING (POTABLE WATER AUTO-SWITCHOVER, HVAC MONITORING - NON BAS, HOT WATER FLOW MONITORING)

APPENDIX I – Staff Training Courses

- SEWAGE WORKS AND SURFACE WATER SPILL RESPONSE
- SOURCE WATER PROTECTION (2019-2021)
- SUCCESSFACTORS - KNOWLEDGE EXCHANGE FOR MANAGERS WITH DIRECT REPORTS
- SUCCESSFACTORS WEBEX SERIES: REPORTS SPECIFIC INFORMATION SESSION
- THE TORONTO PUBLIC SERVICE BY-LAW ELEARNING
- TORONTO WATER ORIENTATION
- VALVE ACTUATOR (2019-2021)
- WATER SAFETY SEMINAR
- WHMIS 2015 ELEARNING MODULE
- WMS AVANTIS WORKSHOP (2020)

Other Training

- ACCEPTABLE USE OF INFORMATION TECHNOLOGY ASSETS POLICY
- ACCESSIBILITY 101
- ACTIVE LISTENING SKILLS FOR PROFESSIONALS
- AODA - OHRC
- BEATING PROCRASTINATION BY BOOSTING YOUR CREATIVITY AND DRIVE
- BECOME A GREAT LISTENER
- BUILDING RESILIENCE
- CHECKMARKET SURVEYS
- CISCO JABBER VOICE & INSTANT MESSAGING
- CIVILITY IN THE WORKPLACE (AUGUST 2020 MANDATORY TAILGATE)
- COLLABORATION AND CUSTOMIZATION WITH THE CALENDAR, CONTACTS AND TASKS IN OUTLOOK 2013
- CREATING WORKBOOKS, WORKSHEETS, AND DATA IN EXCEL 2013 V2.0
- DELIVERING FEEDBACK
- DEVELOPING A PERSONAL ACCOUNTABILITY FRAMEWORK
- DEVELOPING HEALTHY HABITS FOR YOUR EMOTIONAL WELL-BEING
- DIFFICULT PEOPLE: WHY THEY ACT THAT WAY AND HOW TO DEAL WITH THEM
- DOMESTIC/INTIMATE PARTNER VIOLENCE FOR SUPERVISORS
- ELI PRIVACY ACKNOWLEDGMENT
- ELIMINATING SEXUAL HARASSMENT_IT'S EVERYONE'S BUSINESS
- EXTERNAL TRAINING FOR END-USERS
- FACING CHALLENGES AS A FIRST-TIME MANAGER
- FACING CONFRONTATION IN CUSTOMER SERVICE
- FORMATTING CELLS AND WORKSHEETS IN EXCEL 2013 V2.0
- FORMATTING DATA IN EXCEL 2013 V2.0
- GRADUATE DIPLOMA IN PUBLIC ADMINISTRATION PROGRAM – INFORMATION SESSION
- HOW CULTURE IMPACTS COMMUNICATION
- HUMAN RIGHTS 101
- INTRODUCTION TO CYBER SECURITY AWARENESS
- LEADERSHIP ESSENTIALS: MOTIVATING EMPLOYEES
- LET'S TALK ABOUT PRIVILEGE
- LET'S TALK ABOUT SYSTEMIC INJUSTICE
- MAKING FEEDBACK A REGULAR OCCURRENCE
- MALWARE
- MANAGING MULTIGENERATIONAL EMPLOYEES
- MANAGING PRESSURE AND STRESS TO OPTIMIZE YOUR PERFORMANCE
- MASTERING ACTIVE LISTENING IN THE WORKPLACE
- ORIENTATION TO THE CITY OF TORONTO EMPLOYEE ASSISTANCE PROGRAM (EAP)
- OUTLOOK 2013 - INCREASE YOUR PRODUCTIVITY WITH OUTLOOK
- PASSWORD SECURITY

APPENDIX I – Staff Training Courses

- PHISHING
- PHYSICAL SECURITY
- PLANNING AN EFFECTIVE PRESENTATION
- PROCRASTINATION: ADMITTING IT IS THE FIRST STEP
- PROTECTING PRIVACY ON THE JOB
- REACHING GOALS USING PERSEVERANCE AND RESILIENCE
- REMOVABLE MEDIA (I.E. CDS, DVDS AND USBS)
- RIGGING SAFETY AWARENESS (2019-2021)
- SOCIAL ENGINEERING
- SUPERVISOR HEALTH AND SAFETY AWARENESS IN 5 STEPS
- SUPPORTING BLACK COLLEAGUES & THE ANTI-BLACK RACISM MOVEMENT
- UNCONSCIOUS BIAS
- UNPACKING ANTI-BLACK RACISM THROUGH DIALOGUE (FOR MANAGEMENT)
- UNPACKING ANTI-BLACK RACISM THROUGH DIALOGUE (FOR STAFF)
- VEHICLE OPERATOR ORIENTATION
- VIRTUAL TPS NEW EMPLOYEE ORIENTATION (NEO)
- WEBEX EVENTS: CONDUCTING LARGE-SCALE ASSEMBLIES - VIRTUAL INSTRUCTOR-LED TRAINING (VILT)
- WEBEX MEETINGS: HOSTING POWERFUL MEETINGS - VIRTUAL INSTRUCTOR-LED TRAINING (VILT)
- WEBEX TRAINING: CREATING ENGAGING CLASSROOMS - VIRTUAL INSTRUCTOR-LED TRAINING (VILT)
- WORKING OUT AND THROUGH CONFLICTACCESS TO INFORMATION AND PROTECTION OF PRIVACY