



ASHBRIDGES BAY WASTEWATER TREATMENT PLANT

2021 Annual Report



March 31, 2022

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 m³/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 2021 was 512.80 ML/day. Influent concentrations of Biochemical Oxygen Demand (BOD₅), Total Phosphorus (TP) and Total Suspended Solids (TSS) averaged 218.50 mg/L, 6.3 mg/L, and 329.7 mg/L, respectively.

Ashbridges Bay Treatment Plant achieved the following effluent quality and loading rates in 2021 in comparison to ECA limits:

Parameter	ECA ¹	2021 Final Effluent
Total Suspended Solids (TSS)	25.0 mg/L	13.7 mg/L
Carbonaceous Biological Oxygen Demand (CBOD ₅)	25.0 mg/L	5.6 mg/L
Total Phosphorus (TP)	1.0 mg/L	0.7 mg/L
Escherichia Coli (E. Coli) ²	200 CFU/100 mL	29.0 CFU/100 mL
pH	6.0-9.5	7.0
TSS Loading Rate ¹	20,450 kg/day	6,732 kg/day
CBOD ₅ Loading Rate ¹	20,450 kg/day	2,814 kg/day
TP Loading Rate ¹	818 kg/day	368 kg/day

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

² Arithmetic mean of monthly geometric mean data.

During 2021, 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 2021 was 140,518 wet tonnes at an average of 27.05 % 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 1,932 tonnes as Fe. Polymer consumption in 2021 for waste activated sludge (WAS) thickening and sludge dewatering totalled 196.5 and 593 tonnes, respectively. Total sodium hypochlorite (12% w/v) consumption for disinfection totalled 3,520 m³.

There were eight secondary treatment system bypass occurrences in 2021 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 1,275 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; construction 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 462,143 m³, 133.8 GWh, and 7.0 M scm, respectively. Direct operating costs for 2021 totalled \$62.4 M. In 2021, the Ashbridges Bay Treatment Plant had a staffing compliment of 154.5 full time equivalent (FTE) employees. As of December 31st, 2021, there were 32 health and safety incidents and 149.25 lost time days due to work related injuries in 2021.

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GLOSSARY OF ABBREVIATIONS

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
<i>E. coli</i>	<i>Escherichia coli</i>
ECA	Environmental Compliance Approval
Fe	Iron
HTP	Humber Treatment Plant
HRT	Hydraulic Retention Time
kg	Kilogram
kWh	Kilowatt-hour
MAC	Monthly Average Concentration
MGMD	Monthly Geometric Mean Concentration
MWh	Megawatt-hour
m ³	Cubic metre
m ³ /day	Cubic metre per day
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
% w/v	Percent concentration of components of a solution expressed as weight by volume
% w/w	Percent concentration of components of a solution expressed as weight by weight

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).

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

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

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

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

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 1,733,500; 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 2021, 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 2021. 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 website¹.

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°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 2021, 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	3.4	7.0	0.7	0.54	11	6.3	7.5
February	4.5	10.5	0.8	0.54	43	6.4	7.3
March	6.0	15.0	0.7	0.55	9	6.7	7.3
April	5.3	13.4	0.8	0.55	12	6.6	7.4
May	4.7	10.8	0.7	0.54	12	6.7	7.4
June	8.0	18.0	0.9	0.53	54	6.5	7.5
July	5.0	14.0	0.6	0.54	17	6.8	7.3
August	5.0	10.0	0.4	0.55	23	6.6	7.2
September	7.2	21.0	0.8	0.53	31	6.7	7.4
October	7.0	18.0	0.7	0.54	22	6.9	7.6
November	3.2	7.4	0.6	0.54	75	6.8	7.4
December	6.9	13.5	0.99	0.52	28	6.5	7.6
Annual Average Effluent Concentration	5.5	13.2	0.7	0.54	29	7.0	
Loading ² , kg/d	2,814	6,732	368	N/A	N/A	N/A	N/A
Removal Efficiency, %	97%	96%	88%	N/A	N/A	N/A	N/A

¹ cBOD = 0.8 * BOD assumed for removal efficiency calculations.

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 Limit³	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	2021	2020	2019
Influent Parameters				
Flow ¹	ML/day	512.8	556.3	651.5
Total Annual Flow ¹	ML	187,270	203,657	237,723
Total Suspended Solids (TSS)	mg/L	329.7	252.9	207.8
Biological Oxygen Demand (BOD5)	mg/L	218.5	179.3	153.8
Total Phosphorus (TP)	mg/L	6.3	5.6	4.9
Transfer from Humber TP: liquid biosolids	Dry tonnes/day	53.0	60.1	64.6
Transfer from Humber TP: WAS	Dry tonnes/day	4.3	7.6	2.7
Transfer from North Toronto TP: sludge (primary sludge, WAS, and scum)	ML/day	0.55	0.45	0.49
Preliminary Treatment				
Grit and Screenings	Tonnes/day	5.0	4.7	4.6
Primary Treatment				
TSS	mg/l	246.2	186.0	176.9
cBOD5	mg/L	132.5	117.0	99.8
Secondary Treatment				

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Parameter	Units	2021	2020	2019
Aeration Loading	kg CBOD5/m3/day	0.37	0.35	0.3
Mixed Liquor Suspended Solids	mg/L	3,029	3,106	3,008
Flow through Seawall Gates	ML	1462	1732	3834
Solids Handling				
Primary Sludge Treated	m3/day	3,357	4,874	5,429
Primary Sludge TS	%	1.9	2.4	2.3
Primary Sludge TVS	%	69.1	73.7	71.6
WAS to Primary Treatment and Excess Was to Aeration	m3/day	3430	1816	1795
WAS to Thickening	m3/day	8,266	7,787	7,910
WAS TS	mg/L	1.05	0.94	0.91
TWAS Treated	m3/day	2,527	2,257	2,119
TWAS TS	%	3.3	3.4	3.5
TWAS TVS	%	70.4	70.7	73.8
Volume to Digestion	m3/day	5,885	7,131	7,548
Digesters Hydraulic Retention Time	days	20.9	17.3	20.0
Organic Loading to Digesters	TVS/m3/day	0.8	1.1	1.0
Digester Gas Volume	m3/day	52,682	59,945	65,698
Dewatering Centrifuge Feed TS	%	1.70	1.8	1.7
Dewatered Biosolids TS	%	27.05	26.9	27.7
Centrate Quality	mg/L	985.0	635	626.5
Solids Capture Rate	%	94.3	96.4	96.5
Centrifuge Run-time	hours	48,347	47,578	51,226

Influent flow to the Ashbridges Bay Treatment Plant decreased by 8% in 2021. Influent strength of BOD, TSS, TP, and TKN increased by 21.9%, 30.35%, 12.28%, 12.04%, respectively.

Final effluent annual average concentration for cBOD, TSS, and TP was 5.6 mg/L, 13.7 mg/L, and 0.7 mg/L, respectively, and met the monthly average effluent concentration specified in Schedule C of the ECA throughout 2021. The final effluent annual average for e. Coli monthly geometric mean density in 2021 was 29 CFU/100 mL and also met the Schedule C compliance limit for each month. Furthermore, final effluent pH remained between the range of 6.0 – 9.5 throughout the course of 2021.

The Ashbridges Bay Treatment Plant encountered no chronic operating problems, and continued to produce a high quality effluent through the continued improvement of operations and maintenance of treatment processes. The plant consistently surpassed the design objectives highlighted in Condition 6 as well as Schedule B of the ECA.

There was one deviation from the monitoring schedule in 2021. *E. coli* sampling is conducted weekly, so it has been moved from Thursdays in 2021 to Wednesdays of every week in 2022. All other parameters specified in *Schedule D - Monitoring Program* of the ECA exceed the sampling frequency of 3 times/week specified by Condition 9(1)(b), negating the requirement for future sampling forecasts and scheduling.

3.2 Biosolids Management

The flow projections for 2022 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 2021.

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 2021 totalled 140,518 wet tonnes and was managed as follows.

3.2.1 Agricultural Land Application

A total of 30,914 wet tonnes of biosolids were sent to approved agricultural land application sites in Ontario. During the 2021 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 2021, a total of 28,849 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 2021, 73,055 wet tonnes of biosolids were processed by the on-site pelletizer. Pellet quality in 2021 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 2021.

3.2.5 Mine Reclamation

A total of 7,700 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		
	2021	2020	2019
Agricultural Land Application	30,914	28,205	28,461
Alkaline Stabilization	28,849	36,617	34,494
Pelletization	73,055	77,661	83,970
Landfill	0	0	0
Mine Reclamation	7,700	5,874	7,731
TOTAL	140,518	148,357	154,656

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	2021	2020	2019
Phosphorus Removal	Ferrous Chloride as Fe	Dosage (mg/L)	10.56	9.20	7.60
		Consumption (tonnes)	1,962	1,846	1,766
		Cost (\$)	\$2,199,462	\$1,509,041	\$1,437,272
Disinfection ¹	Sodium Hypochlorite (12% w/v)	Dosage (mg/L)	2.24	2.16	2.38
		Consumption (m3)	3,520	3,684	4,642
		Cost (\$)	\$584,629	\$611,818	\$804,689
WAS Thickening	Polymer	Dosage (kg/DT)	6.20	6.03	8.04
		Consumption (tonnes)	196.50	160.50	211.50
		Cost (\$)	\$863,546	\$720,613	\$612,191
Biosolids Dewatering	Polymer	Dosage (kg/DT)	14.72	13.45	14.37
		Consumption (tonnes)	593	558	639
		Cost (\$)	\$2,629,407	\$2,290,431	\$1,663,838

3.4 Bypasses, Overflows, Spills, and Abnormal Discharge Events

3.4.1 Bypasses

There were eight bypass events in 2021; all were secondary treatment bypasses. The total volume of bypass flow was 1,274 ML, or 0.7 % of the annual flow. Table 5 summarizes the bypass events that occurred in 2021.

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 area² was 751.9 mm in 2021, an 8.4% decrease compared to 2020.

Table 5: Bypass Summary

No.	Date	Start of Event	End of Event	Duration (hrs)	Volume (m ³)	Average Chlorine Dose (mg/L)
1	March 26, 2021	7:41:04 AM	2:25:41 PM	6.73	305,870	9.96
2	June 29, 2022	6:43:00 PM	7:19:00 PM	0.60	6,800	13.45
3	July 8, 2021	12:55:11 PM	4:44:00 PM	3.81	216,480	13.45
4	August 24, 2021	10:28:00 AM	12:44:00 PM	2.27	31	15.4
5	September 8, 2021	4:36:55 AM	8:07:24 AM	3.51	153,320	9.50
6	September 22-23, 2021	12:48:16 AM	3:23:00 AM	7.57	245,240	9.51
7	October 30, 2021	3:28:35 AM	9:04:10 AM	5.59	224,600	9.50
8	December 5-6, 2021	10:59:16 PM	2:28:35 AM	3.48	122,220	9.58

3.4.2 Overflows

There were no overflow events at the Ashbridges Bay Treatment Plant in 2021. 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.

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

3.4.3 Spills

There were 8 spills reported to the MECP in 2021; they are summarized below.

Table 6: Spill Summary

Date	Duration (hr)	Volume (m ³)	Nature of event	Description
Feb. 10th, 2021	4.25	150-250	Emergency repair	This venting was due to emergency replacement of two malfunctioned digester gas valve.
Mar. 18th, 2021	Minimal	0.03	Incident due to construction activities	This spill of hydraulic oil occurred from the stand alone HPSI 500 Vibratory Hammer due to Hydraulic Line fatigue.
Mar. 19th, 2021	0.08 (approximately 5 minutes)	0.1	Incident due to construction activities	Both North and South Sodium Hypochlorite underground dosing lines were damaged during excavation in the construction site.
Mar. 26th, 2021	0.4	5	Wet weather event	This spill of primary effluent was due to a sudden surge flow into the plant within short duration of time during a rain event.
July 8th, 2021	0.5	1	Wet weather event	This spill of primary effluent was due to a sudden surge flow into the plant within short duration of time during a rain event.
July 25th, 2021	0.5	0.2	Wet weather event	This spill of primary effluent was due to a sudden surge flow into the plant within short duration of time during a rain event.
Nov. 26th, 2021	Minimal	0.01	Incident due to cleaning activities by contractor	This spill of unchlorinated final effluent was caused by contractor during a tank cleaning process.
Dec. 20th, 2021	0.7	2	Incident due to construction activities	This spill of plant water was caused by contractor due to construction activities.

3.4.4 Abnormal Discharge Events

There was no abnormal discharge events at the Ashbridges Bay Treatment Plant in 2021 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 5 complaints in 2021; 5 complaints related to odour and 0 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 were found to be related to plant operation. The two plant related odour complaints were temporary due to a malfunctioned door which was replaced. The remaining were determined 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

By the end of 2020, all Phases I and II Air Management Strategy Projects, as listed in the ABTP Amended ECA – Air No. 2815-9PWTWV issued on January 15, 2015, had been completed and are operational. The facility currently operates under this ECA (Air), as well as Amendment Notice No. 1, issued November 23, 2020.

Source testing for these projects has been completed. 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

There currently is a new ECA Air application in process for the facility and new modeling efforts related to this application are ongoing

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 2021.

Table 7: Capital Projects

Project Name	Project Description	Project Stage (Dec 31, 2021)	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	2023
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	2025
D Building Solar Roof	Installation of solar energy cells on the roof of D Building.	Design	2022
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	2024
IPS Contract 3	Replacement of M&T pumping station with new Integrated sewage/wet weather flow pumping station located South of Lakeshore.	Design	2033
Outfall	New plant outfall that includes a new effluent drop shaft, new outfall pipe with diffusers.	Construction	2024
Project Management Office	Renovation of the old administration building to include a new project management office.	Construction	2022
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.	Construction	2026
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
Pelletizer Upgrade	Upgrades to various system to extend life of facility.	Design	2024
Heating and Air Systems	Replacement of boilers, chillers and digester gas compressors.	Design	2025
Cross Collector Pilot	Pilot test of new technology on final tank 2.	Construction	2022

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Project Name	Project Description	Project Stage (Dec 31, 2021)	Estimated Completion
Digester 13-22 Upgrade Study	Mechanical and electrical upgrade and cleaning of digesters 13-22 (study only).	Design	2022
East Bypass and Wet Weather Flow Study	Investigation of East bypass and wet weather flow management (study only).	Design	2022
Pelletizer 2.0	Construction of a new Pelletizer based on Pelletizer Design project.	Design	2028
Secondary Treatment Upgrades	Addition of 2 new secondary treatment trains including aeration tanks and final tanks, conversion of tank 11 to fine bubble with complete replacement of associated equipment, new blower building and air header, misc. upgrades to supporting systems.	Design	2035
STS Upgrades – B12	Installation of blower 12.	Design	2024
Grit Study	Study seeks to understand the performance of the grit removal system by computational fluid dynamics (CFD) modeling and field grit sampling.	Design	2023
Elevator Modernization Project	Upgrade of existing elevators.	Design	2023
Pelletizer Upgrades - Fans	Replacement of 3 exhaust fans.	Construction	2022
Digester 1-8 Cleaning	Cleaning and rehabilitation of Digesters 1 to 8. Upgrade associated equipment as needed.	Design	2028

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 2021, and found to be within acceptable limits. A summary of effluent monitoring equipment calibration and maintenance performed in 2021 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 6, 2021
pH Analyzer: TAB-DIS-AIT-3003 - Calibration	June 8, 2021
pH Analyzer: TAB-DIS-AIT-3009 - Calibration	June 8, 2021
pH Analyzer: TAB-DIS-METR-3018 - Calibration	June 8, 2021
Influent Sampler - TAB-PLT-SP-0500 - D Building - Calibration	July 9, 2021
Influent Sampler - TAB-PLT-SP-0500 - D Building - Calibration	September 21, 2021
Influent Sampler - TAB-PLT-SP-0041 - P Building - Calibration	January 7, 2021
Influent Sampler - TAB-PLT-SP-0041 - P Building - Calibration	June 29, 2021
Online Chlorine Analyzer (CL 17) - North - Calibration	June 30, 2021
Online Chlorine Analyzer (CL 17) - South - Calibration	June 30, 2021
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3011 Calibration	June 30, 2021
Autosampler - West Bypass - TAB-STR-SP-4001 - Verification	September 24, 2021
Autosampler - East Bypass - TAB-STR-SP-3001 - Verification	September 29, 2021
Final Effluent - Autosampler - North - TAB-STR-SP-3132 Calibration	July 8, 2021
Final Effluent - Autosampler - North - TAB-STR-SP-3132 Verification	August 5, 2021
Final Effluent - Autosampler - South - TAB-STR-SP-3334 Calibration	November 5, 2021
Pocket Colorimeter II Chlorine System - Calibration	June 30, 2021
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3016 Calibration	June 30, 2021
Pocket Colorimeter II Chlorine System - TAB-DIS-METR-3012 Calibration	June 30, 2021
pH Analyzer: TAB-DIS-AIT-3006 Calibration	December 9, 2021
pH Analyzer: TAB-DIS-AIT-3003 Calibration	December 9, 2021
pH Analyzer: TAB-DIS-METR-3018 Calibration	December 9, 2021
Influent Flow Meter - D Building - Channel 11 - TAB-PLT-FIT-1103 - Verification	December 14, 2021
Influent Flow Meter - D Building - Channel 10 - TAB-PLT-FIT-1003 - Verification	December 14, 2021
Influent Flow Meter - D Building - Channel 09 - TAB-PLT-FIT-0903 - Verification	December 14, 2021
Influent Flow Meter - D Building - Channel 08 - TAB-PLT-FIT-0803 - Verification	December 14, 2021
Influent Flow Meter - P Building - Grit Diversion- TAB-PLT-FIT-0033 - Verification	November 8, 2021
Influent Flow Meter - P Building – Screening Diversion - TAB-PLT-FIT-0031 - - Verification	November 8, 2021

Calibration and/or Maintenance Record	Completion Date
Effluent Flow Meter - South Conduit - TAB-STR-FIT-8003 - Verification	October 13, 2021
Effluent Flow Meter - North Conduit - TAB-STR-FIT-8004 - Verification	October 13, 2021
Bypass Flow Meter - West - TAB-STR-PIT-0004X - Verification	November 8, 2021
Bypass Flow Meter - East - TAB-STR-PIT-0003X - Verification	November 8, 2021
P Building - Grit Tank Flow Meter - Tank 1 - TAB-PLT-FIT-0101 - Verification	December 9, 2021
P Building - Grit Tank Flow Meter - Tank 2 - TAB-PLT-FIT-0201 – Verification	December 9, 2021
P Building - Grit Tank Flow Meter - Tank 3 - TAB-PLT-FIT-0301 - Verification	December 9, 2021
P Building - Grit Tank Flow Meter - Tank 4 - TAB-PLT-FIT-0401 – Verification	November 18, 2021
P Building - Grit Tank Flow Meter - Tank 5 - TAB-PLT-FIT-0501– Verification	November 18, 2021
P Building - Grit Tank Flow Meter - Tank 6 - TAB-PLT-FIT-0601– Verification	November 18, 2021

In 2021, there were a total of 31,907 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 462,143 m³, 133.8 GWh, and 7.0 Mscm , respectively.

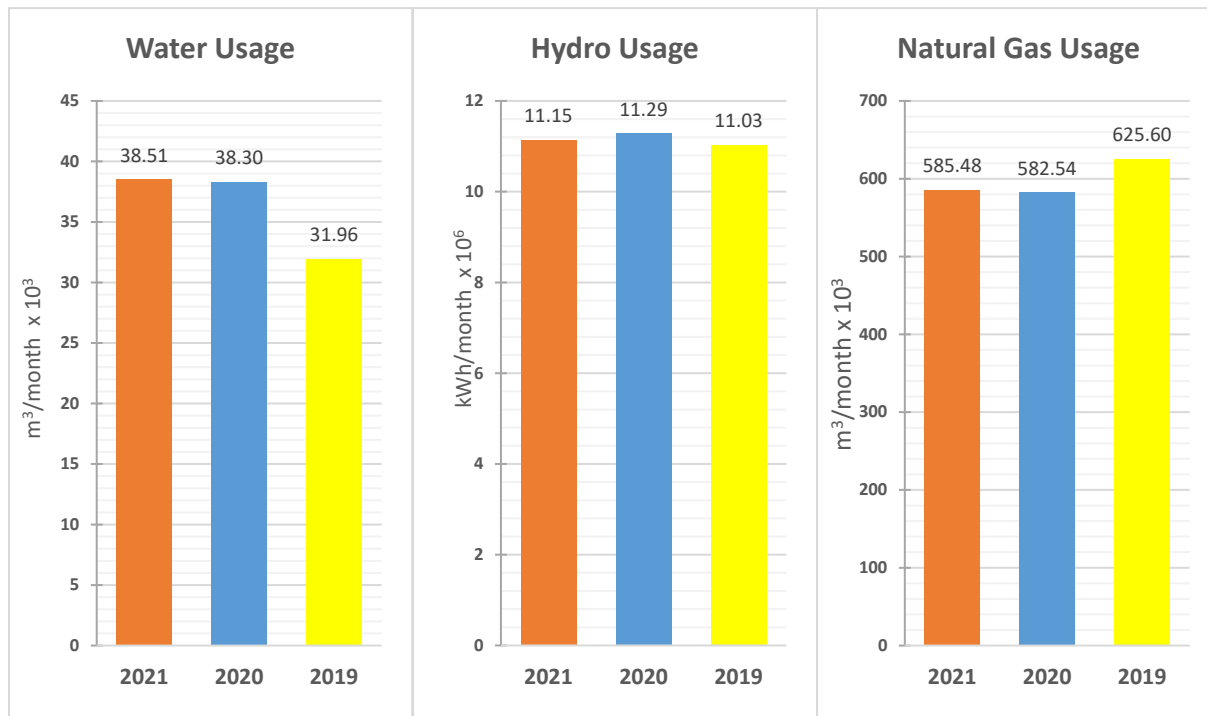


Figure 1: Annual Utility Consumption (Water, Hydro, Gas)

Table 9: Average Unit and Total Utility Cost

Utility	2021	2020	2019
Water Unit Cost (\$/m³)	\$4.35	\$4.29	\$4.11
Water Total Cost (\$/year)	\$2.01	\$1.97	\$1.58
Hydro Unit Cost (\$/kWh)	\$0.09	\$0.09	\$0.10
Hydro Total Cost (\$/year)	\$12.67	\$12.47	\$12.87
Natural Gas Unit Cost (\$/m³)	\$0.24	\$0.23	\$0.21
Natural Gas Total Cost (\$/year)	\$1.71	\$1.63	\$1.54

7 ADMINISTRATION

7.1 Operations and Maintenance Costs

The 2021 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 2.5 % from 2020.

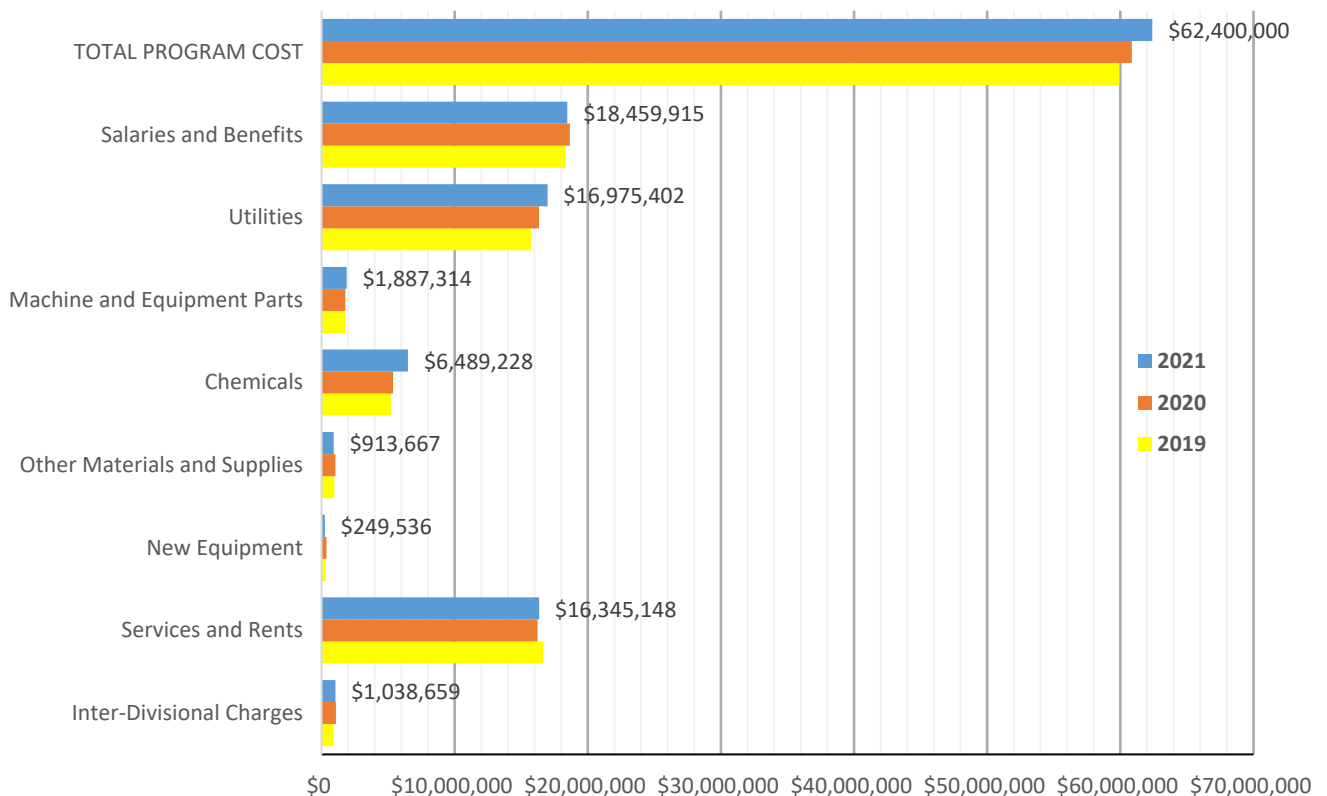


Figure 2: Operations and Maintenance Cost Breakdown

7.2 Human Resources

Plant Staffing at the Ashbridges Bay Treatment Plant in 2021 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	11
Supervisor, Operational Support	1
Supervisor, Operating Engineers A/R-C	1
Stationary Engineer Operator	6
Electrical Instrumentation Specialist	2
Engineering Technologist Technician	3
Plant Technician/Wastewater	38
Industrial Millwrights	45
EICT	23
Support Assistant	2
Materials Management Assistant	1
Materials Management Clerk	1
Wastewater Plant Worker	8
Administration Trainee	0
Technical Trainee	1
Labourer 2	3
Total FTE Positions	154.5

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 3³.

As of December 31st, 2022 there were 32 health and safety incidents, and a total of 149.25 lost time days due to work related injuries.

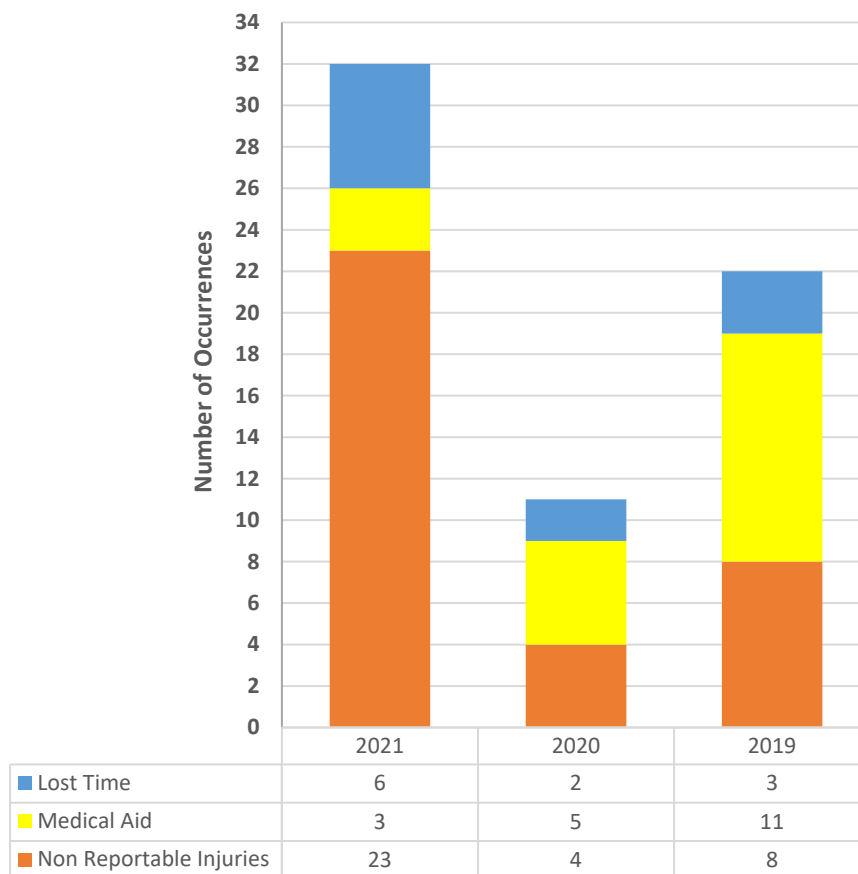


Figure 3: Ashbridges Bay Treatment Plant Health & Safety Injury Summary

³ The previously reported values for 2020 and 2019 have been changed to reflect the status of those WSIB claims as of December 31st 2021

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 2021 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 2021.

Table 11: Wastewater Treatment Certificates

Class Level	Licensed
Class I	44
Class II	9
Class III	4
Class IV	37
OIT	29
Total	123

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

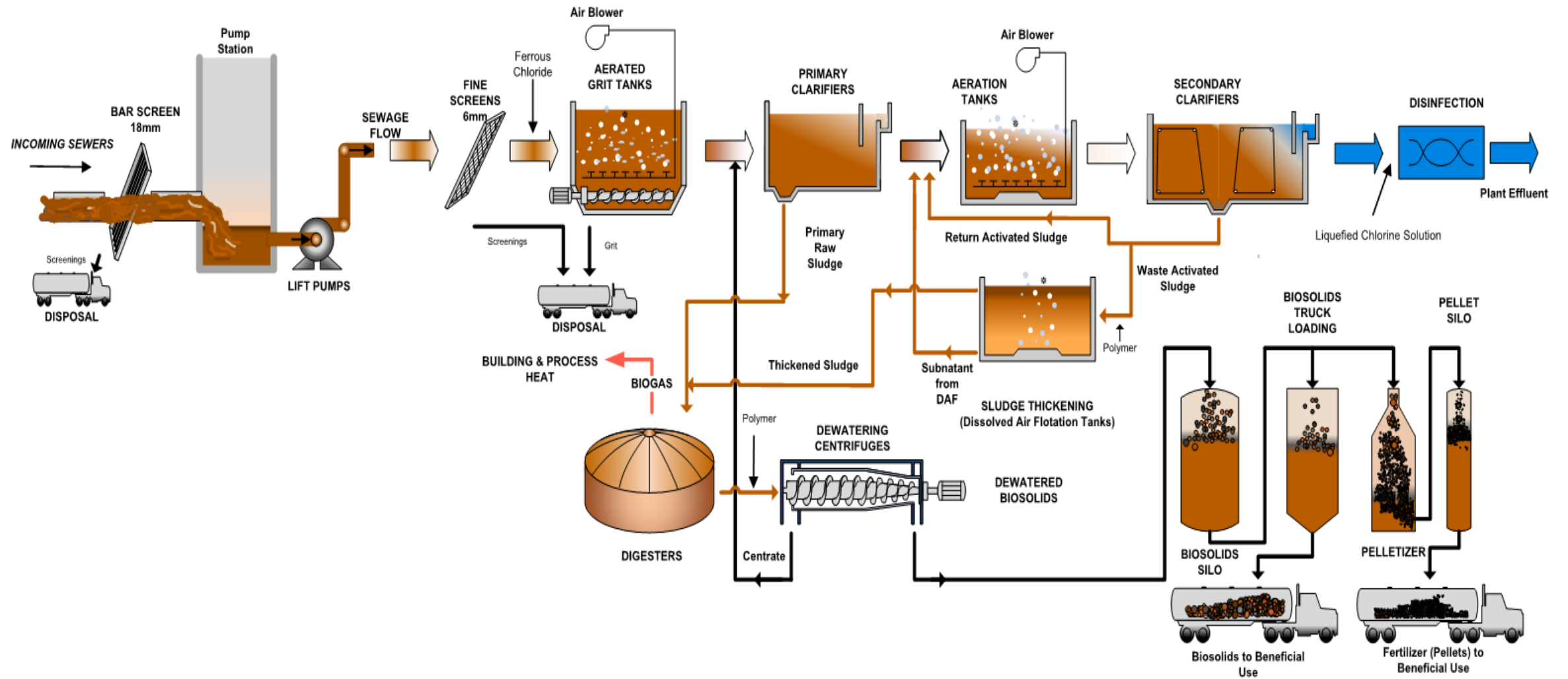
Event Date	Type	Description	Resolution	Resolution Date
Complaints				
April 26th, 2021	Odor Complaint	An odour complaint was received on April 26th, 2021. An investigation was completed and no possible source of odour was identified at the plant. The plant contacted the complainant and the complainant advised it was a local odour problem.	N/A	N/A
April 29th, 2021	Odor Complaint	An odour complaint was received on April 29th, 2021 via 311. However, it was a general inquiry for odours encountered and there was no specific location, date or time provided for odour encountered, the plant was not able to conduct an investigation.	N/A	N/A
May 6th, 2021	Odor Complaint	An odour complaint was received on May 6th, 2021. An investigation was completed and a possible source of odour was identified at the plant due to Pelletizer Loading Bay door malfunction.	The new doors were installed.	May 31st, 2021.
May 9th, 2021	Odor Complaint	An odour complaint was received on May 9th, 2021. An investigation was completed and a possible source of odour was identified at the plant due to Pelletizer Loading Bay door malfunction.	The new doors were installed.	May 31st, 2021.
Oct. 2nd, 2021	Odor Complaint	An odour complaint was received on Oct. 2nd, 2021. An investigation was completed and no possible source of odour was identified at the plant. The plant contacted the complainant and left a voicemail with updates.	N/A	N/A
Consent Letters				
August 6th, 2021	Request for Consent	Planned releases of primary effluent due to bypass gates annual maintenance.	Consent was granted.	August 17th, 2021
Notice of Modification to Sewage Works				
April 22nd, 2021	Notice of Modification to Sewage Works	The modifications to Aeration Tank #2 and Secondary Clarifier #2 as part of the Limited Operational Flexibility.	N/A	N/A
Notification on Commissioning				

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Event Date	Type	Description	Resolution	Resolution Date
N/A	N/A	N/A	N/A	N/A
Notification on Construction of Proposed Works				
June 10th, 2021	Notification of Construction Schedule of the Proposed Works	Notification of Construction Schedule for Digesters 9-12 Refurbish at Ashbridges Bay Treatment Plant	N/A	N/A
August 22nd, 2021	Notification of Construction Schedule/Notification of Construction Commencement of the Proposed Works	Notification of Construction Schedule for Ashbridges Bay Treatment Plant Outfall Project and the construction commenced in January 2019.	N/A	N/A
May 21st, 2021	Notification of Completion of Construction of Proposed Works	Notification of Completion of Construction of Phosphorus Removal System on July 31st, 2020.	N/A	N/A
MECP Inspection				
N/A	N/A	N/A	N/A	N/A
Correspondence submitted to MECP				
N/A	N/A	N/A	N/A	N/A

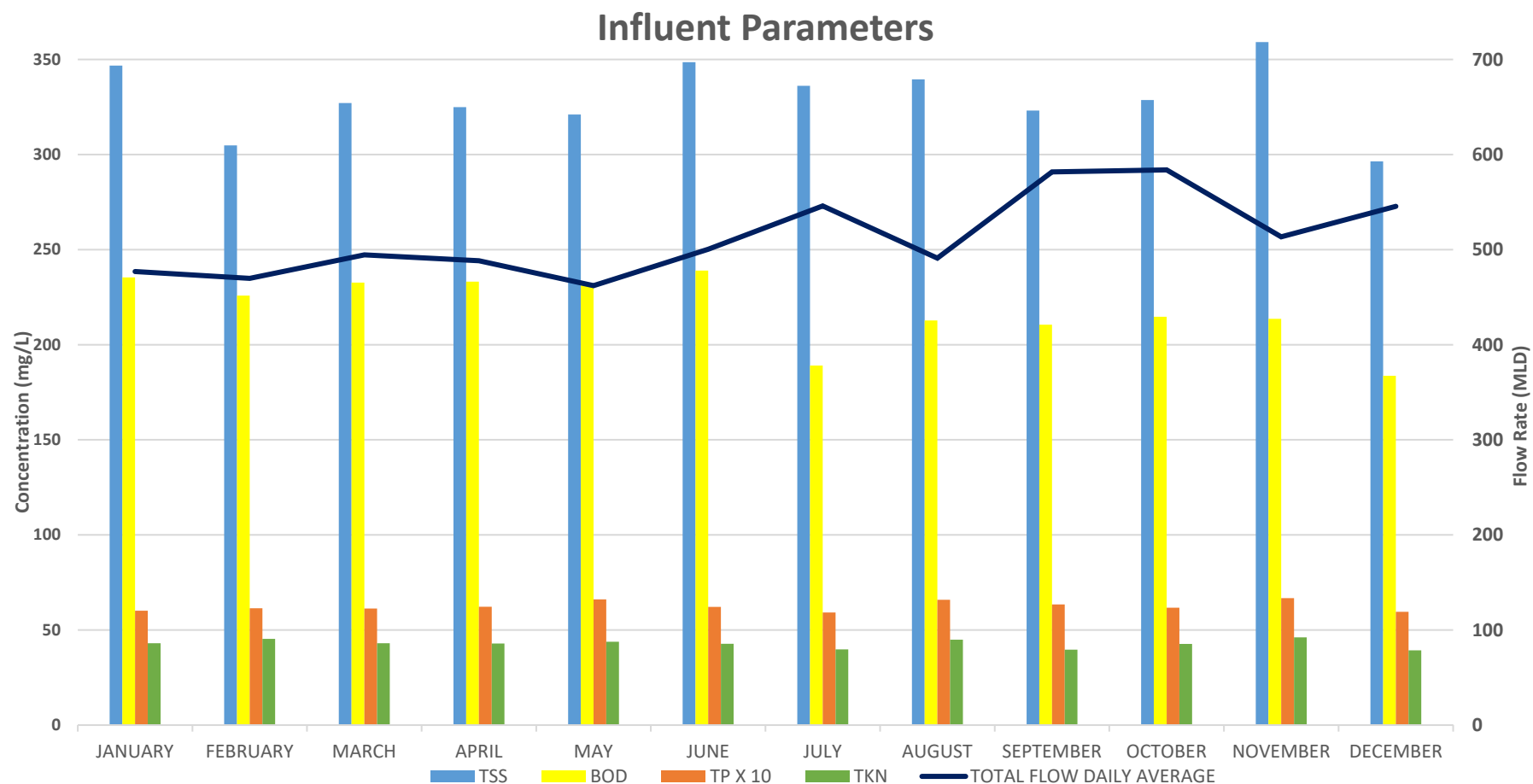
APPENDIX A – Plant Schematic



Process Flow Diagram for Ashbridges Bay Treatment Plant

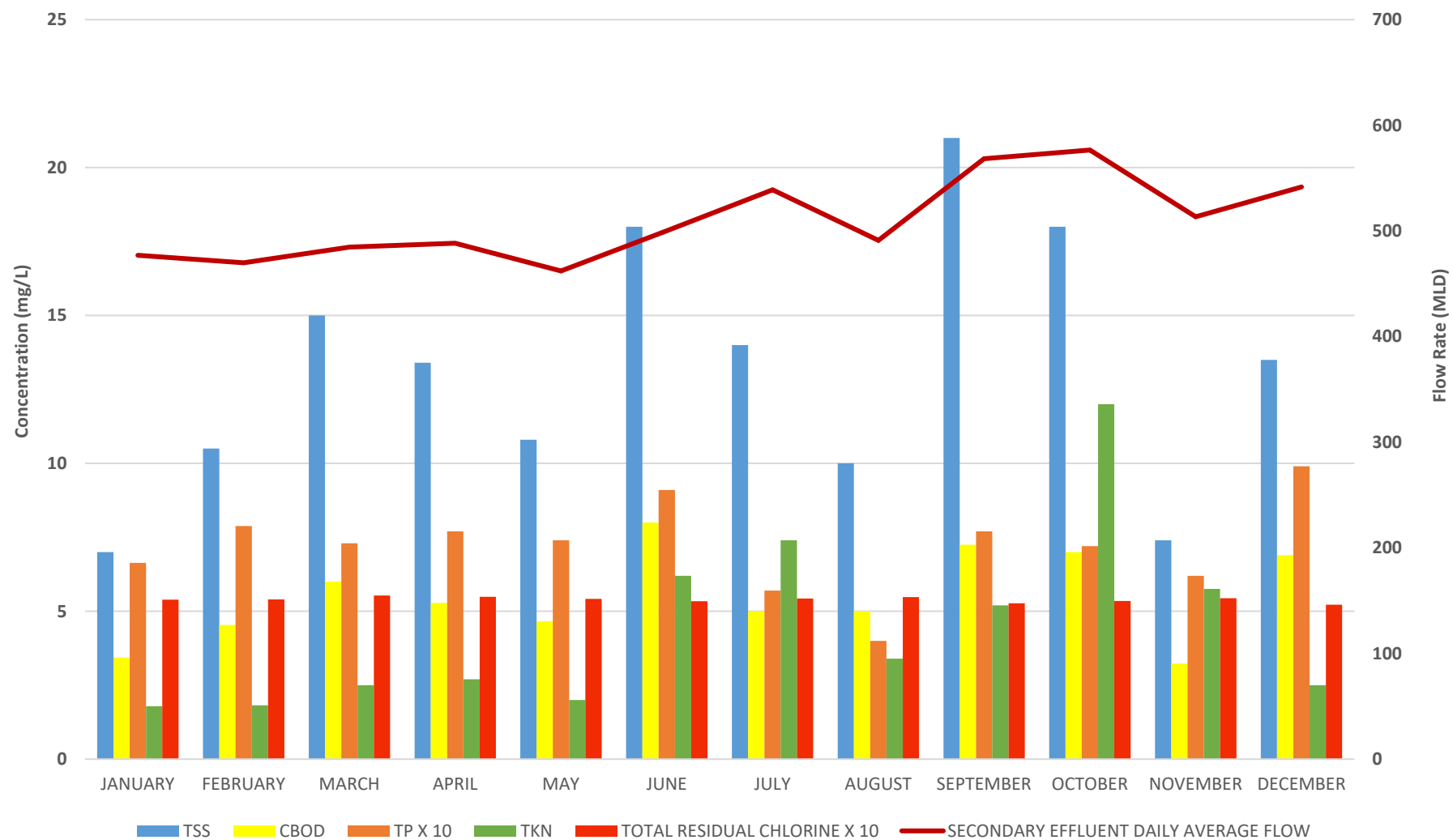
APPENDIX B – Influent and Effluent 2021 Performance Charts

APPENDIX B – Influent and Effluent 2021 Performance Charts



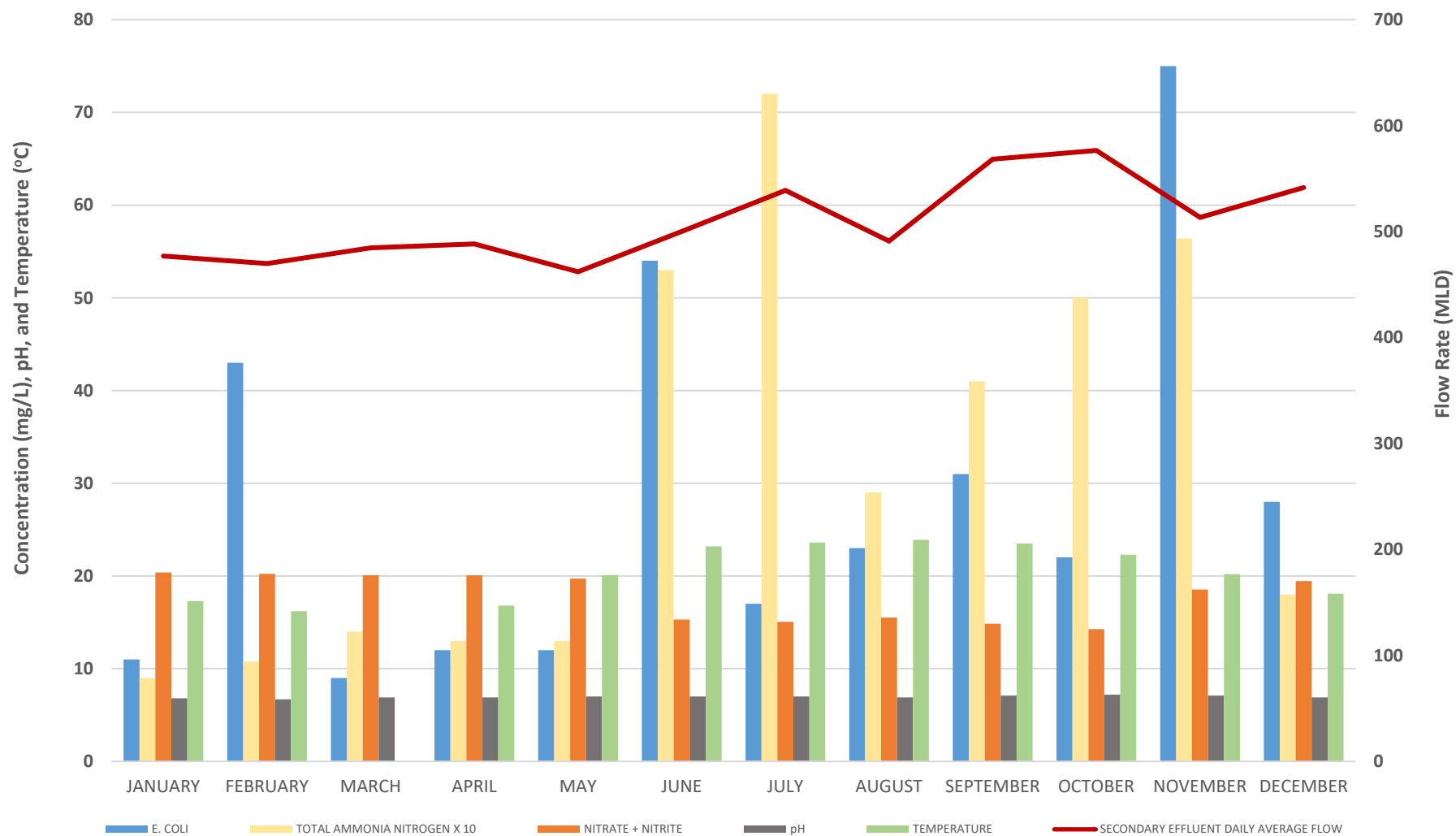
APPENDIX B – Influent and Effluent 2021 Performance Charts

Secondary Effluent Parameters



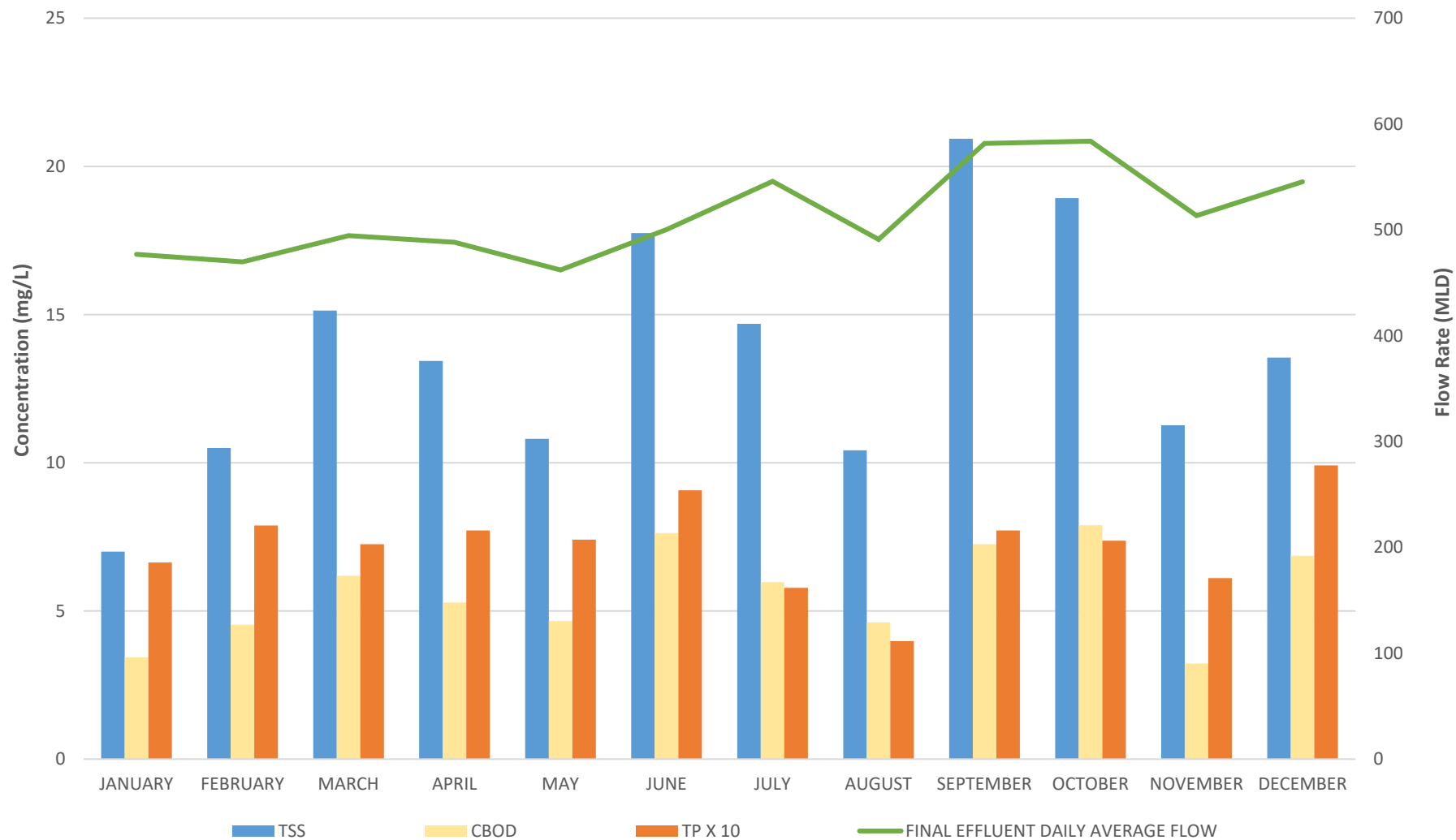
APPENDIX B – Influent and Effluent 2021 Performance Charts

Secondary Treatment Effluent Parameters



APPENDIX B – Influent and Effluent 2021 Performance Charts

Final Effluent Parameters



APPENDIX C – Historical Performance Data

APPENDIX C – Historical Performance Data

Parameters	Units	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Influent												
Flow	ML/day	512.8	556.3	651.5	563.9	659.8	549.8	585.2	638.4	631.6	576.1	622.4
Total Annual Flow	ML	187,270	203,657	237,723	205,750	240,817	201,229	212,831	232,932	230,456	210,834	227,355
Total Suspended Solids (TSS)	mg/L	329.7	252.9	207.8	303.7	279.5	318.6	334.6	328.5	271.2	275.2	274.0
Biochemical Oxygen Demand (BOD ₅)	mg/L	218.5	179.3	153.8	207.9	201.9	244.6	274.9	258.3	174.9	178.2	142.4
Total Phosphorus (TP)	mg/L	6.3	5.6	4.9	6.3	6.4	7.5	7.5	6.6	5.9	6.2	6.4
Total Kjeldahl Nitrogen (TKN)	mg/L	42.8	38.2	37.2	42.6	40.3	45.4	43.7	44.7	46.6	47.7	44.1
Preliminary Treatment												
Grit and Screenings	tonnes/day	5.0	4.7	4.6	4.9	5.5	5.7	5.6	11.0	13.0	9.2	9.0
Primary Treatment												
TSS	mg/L	246.2	186.0	99.8	89.3	142.9	123.9	233.3	205.9	162.7	216.1	339.9
Carbonaceous Biochemical Oxygen Demand (cBOD ₅)	mg/L	132.5	117.0	99.8	89.3	68.7	84.3	98.9	92.9	90.3	113.3	138.2
Secondary Treatment												
Aeration Loading	kg CBOD ₅ /m ³ .day	0.37	0.35	0.35	0.27	0.25	0.25	0.32	0.32	0.32	0.53	0.7
Mixed Liquor Suspended Solids	mg/L	2899	2933	3,285	3389	2,372	2,643	2,969	2,696	1,830	1,467	2,309
Flow through Seawall Gates	ML	1462	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	509.3	549.5	637.3	559.6	654.9	548.7	576.9	632.4	625.7	571.2	614.7
TSS	mg/L	13.2	11.8	14.7	8.0	5.2	6.4	10.1	8.2	8.0	8.4	11.1
TSS Loading Rate	kg/day	6732	6465	9,336	4453	3,415	3,489	5,021	5,021	4,981	4,810	7,009
cBOD5	mg/L	5.5	4.6	7.3	4.7	4.1	4.3	5	4.6	8.5	6.9	7.0
cBOD5 Loading Rate	kg/day	2814	2509	4,668	2627	2,668	2,381	2,838	2,837	5,262	3,926	4,298
TP	mg/L	0.7	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.6	0.6	0.6
TP Loading Rate	kg/day	368	359	487	376	458	365	495	495	330	330	389
Escherichia Coli (E. Coli)	CFU/100 mL	29.0	17.0	32.0	25.6	53	36.8	66.5	7.4	90.0	31.3	35.9
pH	-	7.0	6.9	7.1	7.0	6.8	6.8	7.0	7.0	7.2	7.2	7.3

APPENDIX C – Historical Performance Data

Parameters	Units	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Total Residual Chlorine	mg/L	0.5	0.55	0.54	0.59	0.60	0.60	0.50	0.80	1.00	0.60	0.64
Total Kjeldahl Nitrogen (TKN)	mg/L	4.4	3.8	10.4	6.2	5.0	3.8	6.7	7.3	14.5	14.4	15.8
Total Ammonia Nitrogen	mg/L	3.2	3.0	10.9	6.0	4.6	3.3	5.3	5.9	11.2	13.8	13.7
Nitrate + Nitrite	mg/L	17.8	17.5	14.4	17.4	17.1	18.5	17.0	16.3	13.1	17.1	15.6
Temperature	degrees Celsius	18.8	20.8	19.7	21.0	20.2	20.9	20.1	19.5	20.2	19.7	19.3
Final Effluent												
TSS	mg/L	13.7	11.9	15.0	8.1	5.4	6.5	10.4	9.2	-	-	-
cBOD5	mg/L	5.6	4.7	7.9	4.7	4.1	4.4	5.2	5.0	-	-	-
TP	mg/L	0.7	0.7	0.8	0.7	0.7	0.7	0.8	0.8	-	-	-
Solids Handling												
Primary Sludge Treated	m³/day	3,357	4,874	5,429	5,978	5,640	6,420	4,440	4,292	5,067	5,546	6,900
Primary Sludge Total Solids (TS)	%	1.9	2.4	2.3	2.3	2.5	2.6	3	3.05	2.9	2.72	2.60
Primary Sludge Total Volatile Solids (TVS)	%	69.1	73.7	71.6	73.9	73	73.8	73.5	72.9	62.9	74.9	73.4
Waste Activated Sludge (WAS) co-settled in Primary Clarification Tanks or excess WAS to Aeration	m³/day	3,430	1,816	1,795	911	1,260	2,130	1,240	2,405	8,800	14,523	35,288
WAS to Thickening	m³/day	8,266	7,787	7,910	6,944	7,380	7,360	8,470	8,163	10,469	9,665	8,992
WAS TS	mg/L	1.1	0.9	0.9	0.8	0.7	0.7	0.8	0.82	0.54	0.49	0.69
Thickened WAS (TWAS) Treated	m³/day	2,527	2,257	2,119	1,952	1,440	1,600	2,090	2,366	876	677	980
TWAS TS	%	3.3	3.4	3.5	3.6	3.7	3.4	3.3	3.4	4.8	4.6	4.8
TWAS TVS	%	70.4	70.7	73.8	73.9	73.2	71.6	71	72.9	69.1	72.0	71.9
Volume to Digestion	m³/day	5,885	7,131	7,548	7930	7,080	8,020	6,530	6,658	5,933	6,222	5,900
Digesters Hydraulic Retention Time	days	20.9	17.3	20.0	19.3	20.2	18.1	23.3	23.1	21.8	21.1	19.1
Organic Loading to Digesters	TVS per m3 of digester capacity per day	0.8	1.1	1.0	1.0	0.9	1.1	1.0	1.0	2.1	1.3	-
Digester Gas Volume	m³/day	52,682	59,945	65,698	61,856	61,640	62,330	64,560	65,921	77,781	115,174	60,782
Dewatering Centrifuge Feed TS	%	1.7	1.8	1.7	1.6	1.7	1.8	1.8	1.8	1.8	1.7	2.0

APPENDIX C – Historical Performance Data

Parameters	Units	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Dewatered Biosolids TS	%	27.0	26.9	27.7	27.9	27.9	28.1	27.7	26.5	27.8	28.3	28.3
Centrate Quality	mg/L	985	635	626	428	299	319	665.32	2091	1959	1196	5921
Solids Capture Rate	%	94	96	96	97	98	98	96.44	88	77	96	70
Centrifuge Run Time	hours	48,347	47,578	51,226	52,790	52,400	52,329	48,049	43,507	51,451	102,922	77,844
Biosolids Management	wet tonnes/year	140,518	148,357	154,656	155,756	159,288	149,733	145,321	143,190	142,908	139,562	129,213

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-ethylhexyl) Phthalate
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
Q1	0.417	0.002	12.9	0.051	13.9	0.237	0.25
Q2	0.393	0.002	9.79	0.039	11.2	0.230	0.5
Q3	0.392	0.002	12	0.04	13.4	0.220	0.25
Q4	0.431	0.002	8.18	0.039	9.77	0.229	0.25

Values in red are 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	0.011	0.002	0.092	12.9	0.0025	0.130	0.00005	0.0092	0.117
February	0.005	0.002	0.007	0.002	0.099	2.07	0.0025	0.058	0.00016	0.0127	0.138
March	0.005	0.002	0.009	0.002	0.113	1.82	0.0060	0.070	0.00005	0.0105	0.155
April	0.005	0.002	0.007	0.002	0.113	3.01	0.0025	0.075	0.00113	0.0083	0.153
May	0.005	0.002	0.006	0.002	0.106	1.38	0.0025	0.065	0.00005	0.0080	0.141
June	0.005	0.002	0.163	0.002	0.135	2.46	0.0025	0.080	0.00005	0.3170	0.215
July	0.005	0.002	0.009	0.002	0.105	1.36	0.0025	0.065	0.00005	0.0190	0.14
August	0.005	0.002	0.012	0.002	0.134	1.72	0.0064	0.070	0.00005	0.0129	0.191
September	0.005	0.002	0.008	0.002	0.100	2.39	0.0025	0.091	0.00005	0.0102	0.128
October	0.005	0.002	0.008	0.002	0.112	1.63	0.0025	0.078	0.00005	0.0119	0.153
November	0.005	0.002	0.008	0.002	0.110	3.11	0.0025	0.078	0.00005	0.0099	0.139
December	0.005	0.002	0.010	0.002	0.113	1.35	0.0025	0.071	0.00005	0.0131	0.16
Annual Average	0.005	0.002	0.0215	0.002	0.111	2.93	0.0031	0.077	0.00015	0.0369	0.153

Data in red are 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	0.118	0.002	0.002	0.002	0.010	0.48	0.0025	0.054	0.00005	0.0025	0.252	0.024
February	0.005	0.125	0.002	0.002	0.002	0.014	0.87	0.0025	0.064	0.00005	0.0025	0.233	0.032
March	0.005	0.129	0.002	0.002	0.002	0.013	1.08	0.0025	0.070	0.00005	0.0025	0.273	0.030
April	0.005	0.124	0.002	0.002	0.002	0.012	0.80	0.0025	0.054	0.00005	0.0025	0.26	0.024
May	0.005	0.125	0.002	0.002	0.002	0.011	0.82	0.0025	0.055	0.00005	0.0025	0.262	0.022
June	0.005	0.133	0.002	0.002	0.002	0.014	1.73	0.0025	0.071	0.00005	0.0054	0.262	0.029
July	0.005	0.124	0.002	0.002	0.002	0.010	1.31	0.0025	0.066	0.00005	0.0096	0.258	0.024
August	0.005	0.138	0.002	0.002	0.002	0.009	1.00	0.0025	0.068	0.00005	0.0057	0.263	0.025
September	0.005	0.135	0.002	0.008	0.002	0.162	4.48	0.0121	0.080	0.00005	0.0070	0.247	0.186
October	0.005	0.180	0.002	0.002	0.002	0.014	1.27	0.0025	0.065	0.00005	0.0025	0.259	0.034
November	0.005	0.143	0.002	0.002	0.002	0.010	0.71	0.0025	0.049	0.00005	0.0025	0.312	0.029
December	0.005	0.125	0.002	0.002	0.002	0.011	0.54	0.0025	0.043	0.00005	0.0025	0.309	0.032
Annual Average	0.005	0.1333	0.002	0.0025	0.002	0.024	1.2567	0.0033	0.0617	0.0001	0.004	0.2658	0.0408

Data in red are half the MDL

APPENDIX F – Biosolids Analysis

Appendix F – Biosolids Analysis

Ashbridges Bay Treatment Plant - Summary of Dewatered Biosolids Analysis for 2021

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	39,800	45,950	47,300	44,150	49,100	49,500	41900	44,800	38,400	49,650	47,750	36,500		44,567
Ammonia(N)	5,555	6,035	5,780	5,750	6,090	7,040	5,685	5,705	5,120	6,445	5,445	6,470		5,927
Nitrate as N	0.25	1.88	1.31	1.12	0.60	0.42	1.18	0.42	0.38	1.30	1.37	0.25		1
Nitrite as N	0.35	0.61	0.35	0.82	0.76	0.70	0.77	0.35	0.63	0.98	1.17	0.79		1
As	2.515	1	1	1.585	1.545	2.03	2.65	2.33	1.55	2.755	2.875	1.51	170	2
B**	5	5	17	5	5	5	22.6	24.7	17.45	5	24.15	25.85		13
Cd	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.77	0.50	0.50	0.50	0.50	34	1
Cr	74.3	74.0	69.8	86.5	69.6	66.4	118.9	132.0	91.6	71.6	69.2	63	2,800	82
Co	2.98	3.62	3.61	4.18	4.19	3.45	4.17	3.48	3.84	3.53	3.74	3.605	340	4
Cu	681	721	710	775	695	707	651	683	613	633	624	670	1,700	680
Pb	30.8	31.1	32.4	38.7	34.6	31.7	41.1	38.9	39.2	32.4	32.0	32.1	1,100	35
Mn	273	281	266	273	263	229	274	269	291	257	251	253		265
Hg	0.38	0.47	0.50	0.50	0.40	0.46	0.39	0.42	0.42	0.48	0.36	0.36	11	0
Mo	8.40	9.22	8.73	9.98	9.17	10.07	10.00	9.54	9.74	8.71	9.12	9.5	94	9
Ni	30.0	29.4	27.3	36.2	29.9	26.8	73.8	56.7	37.4	30.0	30.9	28.9	420	36
Total P	33,750	31,250	33,400	30,700	30,850	29,500	28,800	31,150	33,850	31,350	30,000	31,000		31,300
K	956	982	996	1197	959	917	1125	1050	1205	1435	1365	1265		1,121
Se	0.70	2.65	1.49	3.07	2.87	1.59	1.24	0.70	3.40	5.09	2.37	1.39	34	2
Zn	639	636	637	715	665	701	673	700	637	630	594	616	4,200	653
TS%	26.5	25.2	26.2	26.4	27.5	26.1	28.9	28.6	28.7	27.9	26.2	25.8		27
VS%	63.4	65.3	65.4	62.7	63.2	66.8	61.6	60.2	57.1	60.4	62.3	64.5		63
E. Coli ²	603,111	236,848	132,865	497,105	518,786	984,103	297,275	631,001	251,163	408,018	308,980	180,448	2,000,000	420,808

¹As per MECP Regulations for Biosolids Utilization on Agricultural lands.

²CFU/g dry weight.

APPENDIX G – Maintenance Activities

APPENDIX G – 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 2021 for Work Area 1.

- Overhauled D Building Screen #4, replaced gear box plate and screens, replaced broken links
- Overhauled D Building Screen #2
- Overhauled Primary Tank #7 track towards collector and replaced worn out cog wheel
- Repaired D Building, Screen #1 and replaced broken chains
- Overhauled primary clarifier #8 bridge west side bearing
- Overhauled D Building Screening Transfer Pump #5
- Changed lobes and broken rubber coupling sleeve on primary tank #12, scum pump #1
- Replaced and rebuilt screw in compactor
- Replaced sludge pump motor for D Building Primary Tank
- Replaced noisy bearings on raw sewage pump #2 in M Building
- Overhauled D Building Screen Transfer #1
- Replaced disc brakes on Crane Unit in M Building
- Repaired leaking packing on raw sewage pump #4 in M Building
- Overhauled D Building screenings grinder
- Replaced EM Drive Board for Raw Sewage Pump
- Overhauled D Building Screen Transfer Pump #6
- Overhauled motor and gear box for Primary Clarifier #12 Bridge
- Replaced Scum Hopper Pump# 1 for Primary Tank# 10-11
- Overhauled D Building Screen #5
- Overhauled Grit Tank #15 and replaced conveyor motor

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 2021 for Work Area 2.

- Manufacturer heat exchanger skid
- Overhaul Final Tank #4 Secondary sludge collector flight chain
- Fabrication/Installation of support bracket for the plant flushing water in the mix liquor for tank #3
- Overhaul of RAS Pump for Final Tank #11
- Overhaul of Aeration Blower #1
- Overhaul of Secondary Clarifier 5, replacement of skimmer and drive unit and scum collector bearing
- Overhaul of Aeration Blower #10
- Replacement of section of Return Activated Sludge Header
- Overhaul of Plant Water strainer in blower building basement
- Replacement of Glycol Flow Switch for Final Tank #11 clarifier
- Overhaul of RAS Pump for Final Tank #5
- Installation of WAS pump for existing pump, replaced under warranty
- Replacement VFD for WAS pump for Final Tank #6

APPENDIX G – Maintenance Activities

- Installation of motor for secondary treatment odour control system fan
- Repair of leaking plant water line
- Overhaul of Final Clarifier #7
- Replacing of skimmer drive shaft and hub for Final Clarifier #10

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 2021 for Work Area 3.

- Overhaul of Centrifuge #8
- Overhaul of Centrifuge #4
- Overhaul of Centrifuge #9
- Overhaul of Schwing Pump #2
- Replacement of polymer feed pump #10
- Replacement of bearing on Centrifuge #1
- Replacement of Centrate Pump #2 and valves
- Centrifuge #12 main motor for overhaul and reinstalled
- Replacement of Centrate Pump #1 valves
- Fabricated and installed new polymer line
- Overhauled Schwing pump and power pack pump
- Replaced conveyor screws on Schwing pump #3
- Overhaul of Centrifuge #5

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 2021 for Work Area 4.

- Overhauled two discharge poppet valves and hydraulic cylinders, and replaced ram on cake transfer pump 201
- Modified water box piping on power pack 201A
- Replaced bushing on power pack 201B
- Ram change on cake transfer pump 202
- Repaired poppet valve seal issue on power pack 202A
- Upgraded water box on screw extractor 202A
- Installed new conveyor and gearboxes on screw feeder 202B
- Replaced ram and two discharge poppet hydraulic cylinders for cake transfer pump 203
- Replaced hydraulic tank and rebuilt associated fittings, pumps and hoses for power pack 203A
- Installed new water box sensor for power pack 203A
- Replaced screw conveyor and bushing, and refurbished screw feeder extension shaft for screw feeder 203B
- Rebuilt pneumatic cylinder for hopper #1 inlet knife gate valve

APPENDIX G – Maintenance Activities

- Replaced worn liners on hopper conveyors
- Replaced hoses for sodium hypochlorite dosing pumps
- Installed new spill container for sodium hypochlorite tank

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 were completed in 2021 for Work Area 5.

- Replaced digester gas compressor #3 for digester 19 & 21
- Overhauled valve for Digester #15 gas line
- Prepared new wiring for Digester #15 heating valve
- Rebuilt Mixing Pump for Digesters 5-8
- Overhauled TWAS transfer pump #5 and replaced gearbox
- Replaced hub and aligned TWAS transfer pump #3
- Overhauled TWAS Transfer Pump #4
- Overhauled Flotation Tank #3
- Overhauled Flotation Tank #6
- Overhauled Flotation Tank #7
- Overhauled Flotation Tank #8
- Replace level indicating transmitter and calibrate
- Overhauled sludge transfer pump for digester 5-8
- Replaced and installed pump and new mechanical seal for TWAS transfer pump #2
- Replace broken skimmer on flotation tank #5
- Rebuilt TWAS transfer pump #1
- Repaired electrical malfunction on polymer feed pump #7
- Rebuilt floatation tank #4 recycling pump, and installed new mechanical seal
- Replaced broken shaft, damaged skimmer for floatation tank 1 collector mechanism
- Replaced skimmer on floatation tank 5 collector mechanism
- Replaced skimmer and flocculator tube valve for floatation tank 6 collector mechanism
- Repaired broken shaft on floatation tank 8 collector mechanism
- Replaced inlet valve at digester gas compressor #3
- Cleaned and exercised inlet and outlet valves for digester gas compressor #1
- Replaced modulating heating valves on Digester 19 & 22
- Overhauled sludge transfer pump for Digester 15
- Overhauled digester gas compressor #6 for digesters 13-16
- Overhauled sludge recirculation pump for Digester 16
- Replaced and reinstalled new VFD for Digester Sludge Transfer Pump 19

APPENDIX G – Maintenance Activities

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 2021 for Work Area 6.

- Cleaned burner and adjusted fuel/air ratio for boiler #4
- Investigated glycol leakage and replaced heat exchanger in dewatering building
- Repaired leakage issue on digester gas compressor #2
- Repaired fire damaged panels on Boiler #1
- Replaced regulator and pilot vent solenoid on Boiler #3
- Dismantled, rehabilitated, and re-assembled D Building Old Screen Room heat exchanger
- Dismantled, rehabilitated, and re-assembled Auxiliary Building heat exchanger
- Installed new lighting and replaced existing lighting in P Building
- Replaced leaking drain lines in Z Building
- Replaced defective motor on Z building office air conditioner unit
- Repaired, covered, and painted service air lines to address corrosion issue
- Repaired Seawall tunnel Air Handling Unit tubing
- Replaced defective mount on M Building Air Handling Unit
- Cleaned and rehabilitated Digester Gas Control Building heat exchanger
- Repaired wiring issue on D Building glycol pump motor

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 2021 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
- Developed new protocol was developed to the various work area supervisors regarding fire alarm inspection/testing as well as develop a plan to replace the inefficient fire alarm panels in the various work areas
- A procedure has been developed to provide each work area with the guidelines and protocol for handling situations where fire sprinkler lines are out of service due to repairs.
- Maintained inspection on fire extinguisher, fire hose/standpipe cabinet and fire hydrants.

APPENDIX G – Maintenance Activities

City Water System & Backflow Preventers (BFP)

- Attending all service calls and repairing done on priority basis.
- Installation of oil filled pressure gauges at all main water feed lines

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.
- Implemented a comprehensive program across the plant with signs installed at the gate entrance, office entrance, along the roadway, in the washroom, meeting rooms, workshops, elevators etc. These signs provided information on social distancing, limitation of the number of persons inside a location the use of masks, hand washing hand sanitizing and other related safety requirements.
- Sanitizing stations were installed at various locations across the plant.
- Implemented new policy of disinfecting twice per day all offices and common rooms including change rooms, training room and stairwells.
- Scheduling waste oil pick up, ensure all empty drums, paint cans, etc. are in the storage area so they can be removed from the plant. All waste oil manifest copy are send to the appropriate personnel
- Reviewed and upgraded overhead crane maintenance operation and maintenance program

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 NTP. Below is a number of maintenance activities that was completed in ABTP for the year 2021.

- Upgraded lighting in machine shop lobby
- Replaced fluorescent fixtures and installed LED light fixtures in Digester stairs, Digester basement corridors
- Replaced halogen lighting and installed photo light sensor at oil service area
- Replaced heaters at south final effluent and east bypass samplers
- Completed alarm sump pump project review
- Installed emergency lighting throughout plant to areas that had issues
- Installed cabling and parts for actuator control box in primary house of TNT
- Maintained PQM and PA Systems throughout plant
- Maintained auto-samplers throughout plant
- Maintained UPS batteries for critical RPUs throughout plant

APPENDIX H – Staff Training Courses

APPENDIX H – Staff Training Courses

Training attended by Ashbridges Bay Treatment Plant operations and skilled trades staff in 2021 includes the list of courses below.

Capital Projects Training

- ABTP - DECANter ADVANCED SPEED CONTROLLER
- ABTP - VOGELSANG - PUMPS, INLINE ROTA-CUT AND X-PIPPER

Health and Safety Training

- 2021 JHSC RECOGNITION EVENT – VIRTUAL CONFERENCE
- 6 TIPS TO ACHIEVE WORK-LIFE BALANCE
- ARC FLASH FOR NON-QUALIFIED PERSONS (2020)
- ASBESTOS AWARENESS
- ASKING THE RIGHT QUESTIONS MODULE
- CHAINSAW SAFETY AWARENESS (2019-2022)
- CHANGE CURVE
- CONDENSED OHS COMPETENCY FOR FRONTLINE SUPERVISORS
- CONFINED SPACE AWARENESS
- CONFINED SPACE AWARENESS - 1/2 DAY (2019-2022)
- CONFINED SPACE RESCUE - 2 DAY
- COPING WITH SHIFT WORK (2019-2021)
- COVID-19 VACCINATION CLINIC INTRODUCTION: ROLES AND RESPONSIBILITIES
- COVID-19 VACCINATION CLINIC ROLES: LINE MONITORS AND SCREENERS
- COVID-19 VACCINATION: UNDERSTANDING THE BENEFITS AND RISKS
- DESIGNATED SUBSTANCES AWARENESS
- DESIGNATED SUBSTANCES AWARENESS (2019-2022)
- ERGONOMICS FOR YOUR DESK CHAIR
- FALL PREVENTION AWARENESS - CANADA
- FALL PROTECTION AWARENESS
- FUNDAMENTALS OF LADDER SAFETY AWARENESS
- HEALTH AND SAFETY ASPECTS OF CONTRACTS FOR SERVICES
- HEALTH AND SAFETY COMPETENCY FOR FRONT-LINE SUPERVISORS
- HEALTH AND SAFETY COMPETENCY FOR FRONT-LINE SUPERVISORS: ONE-DAY REFRESHER
- HEALTH AND SAFETY ORIENTATION TRAINING PROGRAM - PART B
- HOT WORK PERMIT SYSTEM AWARENESS (2019-2021)
- INCIDENT MANAGEMENT TEAM TRAINING (EHSC)
- INCIDENT REPORTING (2020)
- INFECTION PREVENTION AND CONTROL
- IN-SERVICE HEALTH & SAFETY ORIENTATION
- JOINT HEALTH AND SAFETY COMMITTEE (JHSC) CERTIFICATION TRAINING – CERTIFICATION REFRESHER
- 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
- LADDER SAFETY 2.0 CANADA
- LOCK OUT, TAG OUT & TEST AWARENESS (2019-2021)
- LOCKOUT, TAG OUT AND TEST AWARENESS
- MACHINE GUARDING 2.0 - CANADA
- MENTAL HEALTH PROMOTION
- MENTAL HEALTH, WELLNESS AND RESILIENCE IN THE WORKPLACE
- MOULD AWARENESS
- MOULD AWARENESS (2019-2022)

APPENDIX H – Staff Training Courses

- MUSCULOSKELETAL DISORDER (MSD) AWARENESS E-LEARNING COURSE
- PSYCHOSOCIAL RISK ASSESSMENT
- QUATROSAFETY TRAINING FOR CITY OF TORONTO SUPERVISORY STAFF
- QUICK CUT SAW SAFETY AWARENESS
- RIGGING SAFETY AWARENESS (2019-2021)
- SAFE LIFTING WITH THE POWER LIFT TECHNIQUES
- SCAFFOLD SAFETY AWARENESS (2019-2022)
- SLIPS, TRIPS AND FALL PREVENTION
- SSLTC-WHMIS GLOBAL HARMONIZED SYSTEM (GHS) 2020
- SUCCESSFACTORS FOR DIVISIONAL ADMINISTRATORS - GETTING STARTED
- SUPERVISOR HEALTH AND SAFETY AWARENESS IN 5 STEPS
- TRAFFIC CONTROL AND TCP TRAINING
- TRAFFIC CONTROL ROADWAY WORK (2019-2022)
- TRENCHING AND EXCAVATION AWARENESS (2019-2021)
- WHMIS 2015 E-LEARNING MODULE
- WORKER HEALTH AND SAFETY AWARENESS IN 4 STEPS
- WORKING AT HEIGHTS (2019-2021)
- WORKING AT HEIGHTS REFRESHER

Site Specific Training

- ABTP - MSA ALTAIR 4XR - GAS MONITORS
- ABTP - E2 PLAN ANNUAL EXERCISE AND TAILGATE TRAINING
- ABTP - ECA GENERAL AWARENESS
- ABTP - ERIS GENERAL TRAINING
- ABTP - PRU PHOSPHORUS REMOVAL UPGRADES
- ABTP CAPITAL P BUILDING: CEPT COAGULANT AND PHOSPHOROUS REMOVAL SYSTEM TRAINING
- ABTP CAPITAL P BUILDING: CEPT FLOCCULANT SYSTEM MAINTENANCE TRAINING
- ABTP CAPITAL P BUILDING: CEPT FLOCCULANT SYSTEM TRAINING
- ABTP CAPITAL P BUILDING: CEPT FLOCCULANT SYSTEM TRAINING FOR EICTS
- PART 1: GETTING STARTED WITH ERIS
- PART 2: E-LOGBOOKS
- PART 3: MAKING MANUAL DATA ENTRIES
- PART 4: DATA QUERIES
- PART 5: TRENDS
- PART 6: DATE SELECTOR AND RUNNING REPORTS

Mandatory Tailgate

- ABTP - 2021 01 REPORTING
- ABTP - 2021 05 REPORTING
- ABTP - 2021 08 REPORTING
- ABTP - 2021 11 REPORTING
- ABTP - TAILGATE INJURY REPORTING
- ABTP - TAILGATE AIR QUALITY AND YOUR HEALTH
- ABTP - TAILGATE CIVILITY IN THE WORKPLACE
- ABTP - TAILGATE COVID PROTOCOLS - PREVENTING THE SPREAD COVID-19 AT WORKPLACE
- ABTP - TAILGATE EQUIPMENT SAFETY INSPECT IT BEFORE YOU USE IT
- ABTP - TAILGATE ERGONOMICS INJURIES SIMPLE PRECAUTIONS
- ABTP - TAILGATE EYEWASH STATION AND EMERGENCY SHOWER
- ABTP - TAILGATE HEAD PROTECTION HARD HATS/SAFETY SHOES/FLASH UNIFORM
- ABTP - TAILGATE HEAT STRESS
- ABTP - TAILGATE INFECTION CONTROL

APPENDIX H – Staff Training Courses

- ABTP - TAILGATE LADDER SAFETY
- ABTP - TAILGATE LOCKOUT, TAG & TEST (LOTO) PROGRAM
- ABTP - TAILGATE NITROGEN GAS AND IT'S USE
- ABTP - TAILGATE PREVENTING BACK INJURIES
- ABTP - TAILGATE PSYCHOSOCIAL PROGRAM, RISK ASSESSMENTS & MENTAL HEALTH IN OUR WORK PLACE
- ABTP - TAILGATE SAFE LIFTING
- ABTP - TAILGATE SAFETY ON THE ROAD
- ABTP - TAILGATE SLIPS TRIPS FALLS
- ABTP - TAILGATE TW EMERGENCY PLAN AWARENESS
- ABTP - TAILGATE WINTER DRIVING
- ABTP - TAILGATE WORKPLACE VIOLENCE
- ABTP - TAILGATE WHMIS 2015 NEW CHEMICAL SAFETY INFO SYSTEM
- ECS - CORPORATE HEALTH & SAFETY POLICY REVIEW TAILGATE/SAFETY TALK
- ECS - EMERGENCY PREPAREDNESS TAILGATE/SAFETY TALK
- ECS - MUSCULOSKELETAL DISORDERS TAILGATE/SAFETY TALK
- ECS - REPORTING INJURIES AND ILLNESSES TAILGATE/SAFETY TALK
- ECS - WORKPLACE VIOLENCE TAILGATE/SAFETY TALK
- ERGONOMICS- TORONTO WATER MANDATORY TAILGATE NOVEMBER 2021
- PHYSICAL AND CYBER SECURITY AWARENESS- TORONTO WATER MAY MANDATORY TAILGATE 2021
- SAFETY DATA SHEET INTERPRETATION FOR WHMIS 2015
- SAFETY TALK: FORKLIFT
- SAFETY TALK: HEAT STRESS
- SAFETY TALK: REVIEW OF SERVING PEOPLE WITH DISABILITIES TIP SHEET
- SAFETY TALK: TOR EYE AND FACE PERSONAL PROTECTION
- TORONTO WATER COVID RESPONSE PROTOCOLS (JANUARY 2021 MANADATORY TAILGATE)
- VEHICLE IDLING- MANDATORY TAILGATE AUGUST 2021
- WORKPLACE VIOLENCE- TORONTO WATER MANDATORY TAILGATE FEBRUARY 2021

Technical Training

- AIR PURIFYING RESPIRATORS (2020)
- ASSET MANAGEMENT - 1. DECOMMISSIONING ASSETS
- BACKFLOW PREVENTION AWARENESS (2019-2022)
- BASIC LAB PROCEDURES FOR WATER OPERATORS
- BASIC PUMPS AND PUMPING HYDRAULICS
- BASIC VIBRATION ANALYSIS
- CENTRIFUGAL AND POSITIVE DISPLACEMENT PUMP OPERATION (2020-2022)
- CISCO JABBER VOICE & INSTANT MESSAGING
- CLASSROOM REVIEW OF COMMON WEAR ITEMS FOR PLANT MACHINERY (2019-2021)
- CREATING PRESENTATIONS IN POWERPOINT 2013
- CREATING WORKBOOKS, WORKSHEETS, AND DATA IN EXCEL 2013
- DRINKING WATER QUALITY MANAGEMENT STANDARD (2020)
- ELECTRICAL AWARENESS
- ELECTRICAL SAFETY AWARENESS
- ELECTRICAL SAFETY FOR DISTRICT OPERATIONS & MAINTENANCE OPERATORS (2019-2021)
- EMAIL ETIQUETTE: 01. TO EMAIL OR NOT TO EMAIL?
- EMAIL ETIQUETTE: 02. SPELLING AND GRAMMAR CHECK
- EMAIL ETIQUETTE: 03. SUBJECT LINE
- EMAIL ETIQUETTE: 04. FORMATTING YOUR EMAIL
- EMAIL ETIQUETTE: 05. SENDING ATTACHMENTS
- EMAIL ETIQUETTE: 06. REPLY TIME
- EMAIL ETIQUETTE: 07. WHEN TO CC AND BCC

APPENDIX H – Staff Training Courses

- EMAIL ETIQUETTE: 08. USING REPLY ALL
- EMAIL ETIQUETTE: 09. FORWARDING EMAILS
- FHO SAFETY TALK - SITE EVACUATION
- FHO TOXIC CHEMICAL RELEASE PREPAREDNESS AND RESPONSE CONTINGENCY PLAN FOR RESPONDERS
- FIRE HYDRANT & VALVE - OPERATION, INSPECTION, MAINTENANCE & INSTALLATION (2020)
- FIRE SAFETY AND EXTINGUISHER USE
- FORMATTING CELLS AND WORKSHEETS IN EXCEL 2013
- FORMATTING DATA IN EXCEL 2013
- G OPERATOR SEDAN/SUV ORIENTATION
- G PERMIT VEHICLE OPERATOR ORIENTATION
- GIS BASICS - VIRTUAL INSTRUCTOR LED TRAINING (VILT)
- HANSEN VERSION 7.7 TRAINING CUSTOMER SERVICE REQUEST MODULE (2019-2021)
- HARMFUL ALGAL BLOOM PLAN
- HOW EXACTLY DOES BINARY CODE WORK? | JOSÉ AMÉRICANO N L F DE FREITAS
- IMAGE LIBRARY INTRODUCTORY TRAINING (WEBEX)
- INDUSTRIAL MAINTENANCE TECHNICIAN- MECHANICAL & ELECTRICAL (IMT-M & E)
- INITIATING AND PLANNING A PROJECT
- INTERMEDIATE MAPPING WITH QGIS - VIRTUAL INSTRUCTOR-LED TRAINING (VILT)
- LOGBOOK ENTRY (2020-2022)
- MANDATORY CERTIFICATE RENEWAL COURSE (2021 - 2023)
- MATHEMATICS FOR OPERATORS: MODULE 1 (2019-2021)
- ONLINE CT CALCULATOR AND PHOSPHATE ANALYSIS
- OPERATIONS MANAGEMENT: MANAGEMENT OF QUALITY
- SAFE DRINKING WATER ACT AND APPLICABLE DRINKING WATER REGULATIONS
- SEWAGE WORKS AND SURFACE WATER SPILL RESPONSE
- TOOLS FOR TRACKING PROJECT PERFORMANCE IN PROJECT 2013
- TRANSPORTATION OF DANGEROUS GOODS (2021-2023)
- USING PIVOTTABLES, PIVOTCHARTS, AND ADVANCED CHARTS IN EXCEL 2013
- VEHICLE OPERATOR ORIENTATION
- WASTEWATER TREATMENT OPERATIONS – EXAM PREP LEVELS III/IV (5 DAYS)
- WATER LEAK DETECTION LISTENING COURSE
- WATER SERVICE THAWING OPERATION USING THE D.B.H. MACHINE
- WINTERWISE: THE COLD HARD FACTS ABOUT DISTRIBUTION SYSTEMS
- WMS AVANTIS WORKSHOP (2020)
- WORKING WITH E-MAIL IN OUTLOOK 2013
- WT-77-CT EMERGING ISSUES IN WATER TREATMENT

Other Training

- ACCEPTABLE USE OF INFORMATION TECHNOLOGY ASSETS POLICY
- "EVERYTHING HAPPENS FOR A REASON" -- AND OTHER LIES I'VE LOVED: KATE BOWLER
- 10 TIPS TO MANAGE YOUR ANGER
- 3 SECRETS OF RESILIENT PEOPLE | LUCY HONE
- 3 WAYS TO BE A BETTER ALLY IN THE WORKPLACE | MELINDA EPLER
- 4 PRESENTATION MYTHS YOU NEED TO AVOID
- 8 STEPS TO EFFECTIVE ONE ON ONES
- 8 STEPS TO EFFECTIVE TEAM MEETINGS
- ABTP - LEAN SEMINAR SERIES DAY 3
- ACCEPTABLE USE OF INFORMATION TECHNOLOGY ASSETS POLICY
- ACCESSIBILITY 101
- ADAPTING YOUR CONFLICT STYLE
- AGILE LEADERSHIP AND TEAM SKILLS

APPENDIX H – Staff Training Courses

- AGILE MANAGEMENT AND ADAPTIVE PLANNING
- AGILE MANIFESTO PRINCIPLES
- AGILE METHODS AND FRAMEWORKS
- AGILE PROJECT MANAGEMENT OVERVIEW
- AGILE PROJECT SCOPE AND PRIORITIZATION
- ALIGN TEAMS FOR SUCCESS MODEL
- ALIGN TEAMS RACI MODEL
- ALLOW YOUR PEOPLE TO BRING THEIR HUMANITY TO WORK: WHAT LEADERS CAN DO TO IMPROVE EMPLOYEE ENGAGEMENT
- ANALYZING EMPLOYEE PERFORMANCE: CAN-DO, WILL-DO: ACTIONS
- ANALYZING EMPLOYEE PERFORMANCE: CAN-DO, WILL-DO: INTRODUCTION
- ANALYZING EMPLOYEE PERFORMANCE: CAN-DO, WILL-DO: QUESTIONS AND TIPS
- AODA - CUSTOMER SERVICE STANDARD
- AODA - IASR AODA - IASR TRANSPORTATION STANDARD
- AODA - IASR DESIGN OF PUBLIC SPACES STANDARD
- AODA - IASR EMPLOYMENT STANDARD
- AODA - IASR GENERAL REQUIREMENTS
- AODA - IASR INFORMATION AND COMMUNICATIONS STANDARD
- ASKING GOOD QUESTIONS AND LISTENING
- ASSIGN TASKS TO YOUR TEAM MEMBERS
- ASSIGN TRAINING TO YOUR STAFF
- ATTENDANCE MANAGEMENT
- BASIC PRESENTATION SKILLS: PLANNING A PRESENTATION
- BECOMING A GREAT LEADER: CHARACTERISTICS
- BEING AN EFFECTIVE TEAM MEMBER
- BRAIN BITES - EMPATHY: THE KEY TO ACTIVE LISTENING
- BUILD AN INCLUSIVE TEAM CULTURE
- BUILDING RELATIONSHIPS
- BUILDING RESILIENCE
- BUSINESS COACHING: BUILDING THE COACHING RELATIONSHIP
- BUSINESS COACHING: CONDUCTING COACHING SESSIONS
- BUSINESS COACHING: USING DIFFERENT COACHING STYLES
- BUSINESS EMAIL COMPROMISE
- BUSINESS PLANNING ESSENTIALS: PERFORMING KEY ANALYSES
- BUSINESS PLANNING ESSENTIALS: PREPARING A BUSINESS PLAN
- CHAIR WORK - YOGA, FITNESS AND STRETCHING AT YOUR DESK
- CHANGE LEADER ACTIONS FOR NEGATIVE EMOTIONS AND BEHAVIORS
- CHANGE LEADER ACTIONS FOR POSITIVE EMOTIONS AND BEHAVIORS
- CHANGE LEADER ACTIONS TO ACCELERATE CHANGE
- CHANGES TO SAP HR BI REPORTS
- CITY BENEFIT AND PENSION SESSIONS
- COMMITMENTS THAT MAKE REMOTE WORK SUCCESSFUL
- COMPETENCY ASSESSMENT TUTORIAL FOR NON-UNION EMPLOYEES
- CONFLICT OF INTEREST - PART 2
- CONFLICT RESOLUTION & NEGOTIATION SKILLS
- CONFLICT RESOLUTION: CONFLICT ETHICS (PART 7 OF 7)
- CONFRONTING ANTI-BLACK RACISM MANDATORY VIRTUAL TRAINING FOR ECS STAFF
- CRITICAL CONVERSATIONS
- CUSTOMER SERVICE CONFRONTATION AND CONFLICT
- CUSTOMER SERVICE FUNDAMENTALS: BUILDING RAPPORT IN CUSTOMER RELATIONSHIPS
- DECISION MAKING: THE FUNDAMENTALS

APPENDIX H – Staff Training Courses

- DEFENSIVE DRIVING 2.0 CANADA
- DELEGATE EFFECTIVELY I
- DELEGATE EFFECTIVELY II
- DEVELOPING A LEARNING CULTURE
- DEVELOPING THE CAPACITY TO THINK STRATEGICALLY
- DEVELOPING THE STRATEGIC THINKING SKILL OF SEEING THE BIG PICTURE
- DIVERSITY AND INCLUSION FUNDAMENTALS
- DIVISIONAL PURCHASE ORDER TRAINING
- DOMESTIC/INTIMATE PARTNER VIOLENCE FOR EMPLOYEES
- DOMESTIC/INTIMATE PARTNER VIOLENCE FOR SUPERVISORS
- DRIVE COACHING FRAMEWORK
- ELI PRIVACY ACKNOWLEDGMENT
- ELIMINATING SEXUAL HARASSMENT _IT'S EVERYONE'S BUSINESS
- EMOTIONAL INTELLIGENCE
- EMOTIONAL INTELLIGENCE: DEVELOPING EMPATHY
- EMPATHY MODULE
- EMPOWER YOUR PEOPLE: CONVERSATIONAL MOVES FOR ENGAGING YOUR TEAM IN CREATIVE COLLABORATION
- END YOUR WRITING WITH A CALL TO ACTION
- ESSENTIALS IN CREATING ACCESSIBLE DOCUMENTS - VIRTUAL INSTRUCTOR-LED TRAINING (VILT)
- ETIME - SELF TIME ENTRY ESS RECORD WORKING TIME
- ETIME - SELF REPORTING MSS APPROVE WORKING TIME
- EXCEL 2013 INTERMEDIATE
- EXCEL 2013 INTRODUCTION
- EXTERNAL TRAINING APPROVAL FOR MANAGERS
- EXTERNAL TRAINING FOR END-USERS
- FAST GOALS
- FAST GOALS II
- FIRST TIME MANAGER: UNDERSTANDING A MANAGER'S ROLE
- FORGET THE PECKING ORDER AT WORK | MARGARET HEFFERNAN
- FORGING AHEAD WITH PERSEVERANCE AND RESILIENCE
- FOSTERING A RESPECTFUL WORKPLACE
- FRAUD PREVENTION AND WHISTLEBLOWER PROTECTION - PART 2
- FUNDAMENTALS OF CUSTOMER SERVICE: THE TWO FACTORS IN CUSTOMER SERVICE (PART 3 OF 11)
- GETTING RESULTS WITHOUT AUTHORITY: BUILDING RELATIONSHIPS AND CREDIBILITY
- HANDLING COMPLAINTS MODULE
- HIRING RIGHT FIRST TIME MODULE
- HUMAN RIGHTS 101
- IMPROVING YOUR EMOTIONAL INTELLIGENCE SKILLS: SELF-AWARENESS AND SELF-MANAGEMENT
- INCLUSIVE LEADERSHIP
- INDIGENOUS AWARENESS TRAINING: TRUTH AND RECONCILIATION
- INNOVATE & CREATE: LEVERAGE THE POWER OF GENERATIONS
- INTERPERSONAL COMMUNICATION: COMMUNICATING WITH CONFIDENCE
- INTERPERSONAL COMMUNICATION: LISTENING ESSENTIALS
- INTERVIEW PROCESS AT THE CITY FOR HIRING MANAGERS
- INTRODUCTION TO CYBER SECURITY AWARENESS
- INTRODUCTION TO INDIGENOUS LEARNING
- JUST THE FACTS: INTRODUCTION
- JUST THE FACTS: MALWARE
- JUST THE FACTS: MOBILE SECURITY
- JUST THE FACTS: PHISHING

APPENDIX H – Staff Training Courses

- JUST THE FACTS: PHYSICAL SECURITY
- JUST THE FACTS: PUBLIC WI-FI
- JUST THE FACTS: RANSOMWARE
- JUST THE FACTS: SAFE WEB BROWSING
- JUST THE FACTS: SOCIAL ENGINEERING
- JUST THE FACTS: WORKING REMOTELY
- LEAD WITH COMPASSION
- LEADERSHIP ESSENTIALS: BUILDING YOUR INFLUENCE AS A LEADER
- LEADERSHIP ESSENTIALS: MOTIVATING EMPLOYEES
- LEADERSHIP: CREATING A CULTURE OF TRANSPARENCY
- LEADERSHIP: PRACTICAL LEADERSHIP SKILLS
- LEADING PEOPLE THROUGH CHANGE
- LEADING VIRTUAL MEETINGS
- LEAN AND SIX SIGMA
- LET'S TALK ABOUT ALLYSHIP
- LET'S TALK ABOUT BIAS
- LET'S TALK ABOUT COLONIALISM
- LET'S TALK ABOUT EQUITY
- LET'S TALK ABOUT PRIVILEGE
- LET'S TALK ABOUT SYSTEMIC INJUSTICE
- MAINTAINING A CLEAN AND HEALTHY WORK ENVIRONMENT
- MAKING AND CARRYING OUT TOUGH DECISIONS
- MALWARE
- MANAGING A PROJECT
- MANAGING E-MAIL IN OUTLOOK 2013
- MANAGING LABOUR RELATIONS: AN INTRODUCTION - PART 1
- MANAGING LABOUR RELATIONS: PART TWO
- MAXIMIZING FEEDBACK
- MISSION VALUES AND ETHICS - PART 2
- NAVIGATING, LISTS, LIBRARIES, ALERTS, AND DOCUMENT SETS IN SHAREPOINT 2013
- PASSWORD SECURITY
- PASSWORD SECURITY BRIEF
- PERFORMING BASIC TASKS IN WORD 2013
- PHISHING
- PHYSICAL SECURITY
- POSITION STATEMENT FOR IMMUNIZATION
- POSITIVE SPACE TORONTO - MODULE 1
- PRIVACY, SECURITY & CONFIDENTIALITY FOR MICS
- PROBLEM SOLVING: THE FUNDAMENTALS
- PRODUCTIVE CONFLICT
- PRODUCTIVE CONFLICT RESOLUTION MODEL
- PRODUCTIVE CONFLICT RESOLUTION STYLES
- PROJECT MANAGEMENT FUNDAMENTALS
- PROJECT MANAGEMENT: PROCUREMENT AND STAKEHOLDER
- PROTECTING PRIVACY ON THE JOB
- PROVIDING FEEDBACK
- RBA 101 - MODULE 1: INTRODUCTION TO RESULTS BASED ACCOUNTABILITY
- RBA 101 INTRODUCTION
- RBA 201 COURSE INTRODUCTION
- RECEIVING FEEDBACK AND CRITICISM
- REMOVABLE MEDIA (I.E. CDS, DVDS AND USBs)

APPENDIX H – Staff Training Courses

- RESILIENCE
- RESILIENCE MODEL
- RESPECT IN OUR WORKPLACE (2020)
- RETIREMENT PLANNING SESSIONS
- RETURN TO OFFICE: PURPOSE - WHY WE ARE RETURNING TO THE OFFICE
- RISK MANAGEMENT: TIPS TO STAY ON TOP
- SAP ARIBA - CLIENT DIVISION: APPROVING IN SAP ARIBA
- SAP ARIBA – CLIENT DIVISION: SLP SUPPLIER REQUEST, REGISTRATION & CERTIFICATE QUESTIONNAIRES
- SAP ARIBA - CLIENT DIVISION: SOURCING REQUEST
- SAP ARIBA: MODULE AND DASHBOARD NAVIGATION
- SAP INTRODUCTION: NAVIGATION AND REPORTS
- SERVE YOUR PURPOSE: REDEFINING LEADERSHIP AS SERVICE
- SHARING KNOWLEDGE FOR SUCCESS (2020)
- SOCIAL ENGINEERING
- STARTING WITH WHY: BUILD A CULTURE BY DESIGN
- STARTING WITH WHY: BUILD TRUSTING TEAMS
- STOP BEING A BYSTANDER IN YOUR OWN LIFE | TRACY EDWARDS
- STRESS MANAGEMENT: HANDLING STRESS
- TEAM PRODUCTIVITY – HIGH PERFORMANCE TEAMS FRAMEWORK
- THE ADVANTAGES OF A PURPOSE MINDSET
- THE PUZZLE OF MOTIVATION | DAN PINK
- THE TORONTO PUBLIC SERVICE BY-LAW E-LEARNING
- THE TORONTO PUBLIC SERVICE COMPETENCIES MODEL
- TORONTO WATER ORIENTATION
- TPH CUSTOMER SERVICE STANDARDS
- TRANSITIONING INTO A PROJECT MANAGEMENT ROLE
- UNDERSTANDING GENDER & SEXUAL ORIENTATION
- UNPACKING ANTI-BLACK RACISM THROUGH DIALOGUE (FOR STAFF)
- USING STRATEGIC THINKING SKILLS
- VIRTUAL TEAMS: HOW TO BUILD TRUST
- VIRTUAL TPS NEW EMPLOYEE ORIENTATION (NEO)
- WEBEX MEETINGS: COLLABORATING WITH BREAKOUT ROOMS - VIRTUAL INSTRUCTOR LED TRAINING (VILT)
- WEBEX MEETINGS: HOSTING POWERFUL MEETINGS - VIRTUAL INSTRUCTOR-LED TRAINING (VILT)
- WHAT DOES STRONG SOCIAL AWARENESS LOOK LIKE?
- WHAT IS CRITICAL THINKING?
- WHAT IS THE DIFFERENCE BETWEEN MANAGEMENT AND LEADERSHIP?
- WORKING THROUGH A LABOUR DISRUPTION
- WORKPLACE CONFLICT: RECOGNIZING AND RESPONDING TO CONFLICT
- WORKPLACE VIOLENCE LEGISLATION & POLICY REVIEW