Wastewater Services Division
2020 Annual Report

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Accessible version of this document is available by contacting Wastewater Services at 519-837-5627 or TTY 519-826-9771

Acronyms and Abbreviations

ADF	Average daily flow
TBOD	5 day biochemical oxygen demand
CALA	Canadian Association for Laboratory Accreditation
BOD5	Biochemical Oxygen Demand 5 day
CPE	Comprehensive Performance Evaluation
CCP	Composite Correction Program
CFU	Colony-forming unit
ECA	Environmental Compliance Approval (formerly called Certificate of Approval)
EPA	US Environmental Protection Agency
GRCA	Grand River Conservation Authority
I/I	Inflow/Infiltration
ISO/IEC	International Organization for Standardization (ISO) and the International Electrotechnical Commission
MLD	Millions Litres per Day
MOECC	Ontario Ministry of the Environment and Climate Change
NH3	Ammonia
NO3 – N	Nitrate - Nitrogen
NO2 – N	Nitrite - Nitrogen
OCWA	Ontario Clean Water Agency
Ptot	Total Phosphorous
PH	Scale of Acidity 0-14
RBC	Rotating biological contactors
SCADA	Supervisory Control and Data Acquisition System
SBR	Sodium Bisulphite Residual
TAN	Total ammonia nitrogen
TBOD	Total 5-day biochemical oxygen demand
TCR	Total Chlorine Residual
TKN	Total Kjeldahl nitrogen
TP	Total phosphorus
TSS	Total suspended solids
TWAS	Thickened Waste Activated Sludge
WWOP	Watershed-wide Wastewater Optimization Program
WWTP	Wastewater treatment plant

The City of Guelph is committed to providing a high level of service in the collection, treatment and management of wastewater. The City of Guelph Wastewater Service's environmental policy outlines long-term commitments to provide reliable wastewater services and enhance our environmental stewardship now and into the future.

Prevent pollution and protect the environment;

Improve our environmental performance;

Plan and review our objectives and targets; and,

Evaluate and fulfill compliance requirements.

Introduction

Wastewater Plants and Systems in Ontario are governed by the Ministry of the Environment, Conservation and Parks (MECP) and are also subject to federal legislation.

The purpose of a wastewater treatment system is to remove solids and nutrients to minimize impact from the effluent on the receiving waterbody. The Environmental Compliance Approval (ECA), issued under the Environmental Protection Act, is a facility specific document through which the MECP sets discharge quality limits for that facility based on the sensitivity of the receiving waters. To comply with the ECA, the City of Guelph (the City) prepares an Annual Performance Report covering the operation and overall performance of the wastewater plant and the wastewater system.

This Annual Performance Report is for the period from January 1st to December 31st, 2020, which is a legislative requirement under Condition 10 (6) of ECA number 8835-9QJKSD and Condition 8, subsection 4 of Certificate of Approval (C of A) #0510-7MKTNA and C of A #8602-76HPDC. This Annual Performance Report must also be forwarded to the MECP no later than March 31st.

Facility And Process Overview

The Guelph Wastewater Treatment Plant (WWTP) operating within the Wastewater Services Division provides treatment of domestic, commercial, institutional and industrial wastewater collected from the City and the neighbouring community of the Township of Guelph/Eramosa. The facility, located at 530 Wellington Street West, provides tertiary treatment with disinfected effluent being discharged to the Speed River.

Wastewater flows into the plant via a sanitary sewer and is pumped to the Headworks by inlet screw pumps for preliminary treatment (screening and grit removal). Following the Headworks, the flow is split between the four plants (Referred to as Plant 1, 2, 3, and 4), where wastewater receives primary and secondary treatment in conventional activated sludge processes. Chemical phosphorous removal is achieved through a dual point ferric chloride injection system. The secondary effluent from Plants 1, 2, and 3 combines upstream of tertiary rotating biological contactors (RBCs), which provide ammonia removal via nitrification. Plant 4 is designed to provide ammonia removal in the secondary treatment process. The path of Plant 4 secondary effluent depends on the plant flow rate. Plant 4 effluent is pumped to the RBCs until the combined RBC flow reaches 55 ML/d, with excess Plant 4 flows pumped directly to the tertiary filters. Filter effluent is disinfected using sodium hypochlorite, followed by dechlorination with sodium bisulphite towards the end of the outfall pipe prior to discharging into the Speed River.

Primary sludge generated at the plant is co-thickened in the primary clarifiers, while WAS

generated from the secondary clarifiers is thickened in a rotating drum thickener (RDT). Following thickening, sludge is anaerobically digested in the plant primary digesters. Digested sludge is then drawn from the secondary digester and dewatered by the belt filter presses.

Dewatered sludge is treated by the Lystek process prior to land application.

The Guelph WWTP is classified as a Class IV plant (Certificate No. 718) which is dated July 15, 1988. The Guelph WTTP is currently rated at 64,000 m3/d. There are four (4) plants on site. Plant 1, 2, 3 and 4 have a rated capacity of 16,000 m3/d, 13,000 m3/d, 13,000 m3/d and 22,000 m3/d respectively.

The Guelph Wastewater Collection System is classified as a Class III (Certificate #1160) which is dated January 10, 2020. The collection system is comprised of 530 km of sewer and 5 Sewage Pumping Stations, Barton Estates SPS (C of A # 3-1019-93-006), Kortright East SPS (C of A # 0510-7MKTNA) Northern Heights SPS (C of A # 8602-76HPDC), Terraview SPS (C of A # 2760- 4MNHDB) and Nima Trails SPS* (ECA# 3147-ATDKS4). *to be commissioned in 2021

The MECP performs periodic inspections on wastewater systems, comprised of facility inspections and review of information and data for the inspection period. Inspection scope covers documentation, staff competency, process operation and monitoring, wastewater quality monitoring, and corrective actions to operational events. The City is always committed to ensuring environmental protection and compliance with legislative requirements. We maintain transparency with all findings of potential non-compliance incidents and outcomes of internal assessment being reported to MECP local office

Comprehensive Performance Evaluation

A key component of a Comprehensive Performance Evaluation (CPE) is to perform a process loading assessment. This evaluation examines the measured flow and mass loading for the population and compares it to typical per capita contributions.

As seen by the table below the City of Guelph WWTP was largely typical in terms of process loading for 2020.

Parameter	Actual	Typical
Per Capita Flows and Loads	**-**	**-**
Per Capita Wastewater Flow	390 L/d per person	350-500 L/d per person
Per Capita BOD_5 Loading	99.7 g/d per person	80 g/d per person
Per Capita TSS Loading	90 g/d per person	90 g/d per person
Per Capita TKN Loading	13 g/d per person	13 g/d per person
Ratios	**-**	**-**
Flows: Peak Day/Annual Average	2.81	2.5-4.0
Raw: TSS/BOD_5	1.08	0.8-1.2
Raw: TKN/BOD_5	0.15	0.1-0.2

Another important part of the CPE is to conduct a Sludge Accountability assessment on the process. Sludge accountability compares measured sludge production from the data collected and compares it to projected sludge production results. This comparison, which has a best practice acceptable range of plus/minus 15%, is valuable in measuring the reliability of the data being collected to properly represent the facility performance. Contributing factors to successful sludge accountability include accurate sampling and knowledgeable facility staff to take care of the day to day process requirements.

For 2020, the City of Guelph sludge accountability assessment resulted in a -13.9% data accuracy which is within the acceptable variability and therefore validates the reliability of the data collection and analysis.

Sludge Accountability Summary 2020

Reported Sludge	**kg/d**
Intentional Wasting	16,815.6
Unintentional Wasting	180.7
Sidestream	1,504
Total	15,492
Projected Sludge	-
Primary Sludge Production	7,357
Biological Sludge Production	4,767
Chemical Sludge Production	1,478
Total	13,603
Sludge Accountability	-13.9 %

Note: plus/minus 15% is best practice

Recogntion

In 2020 for 2019 performance, the facility was honoured to be recognized by the Grand River Watershed Wide Optimization Program with a silver level award for the efforts in process control to improve the quality of the Grand River.

The demonstrated commitment of wastewater services to the optimization of all aspects of the process control has made the facility known as one of the leading WWTP along the Grand River Watershed. The main objective of an optimization program is to work with staff, regulatory agencies, external partners and stakeholders to achieve exemplary, sustainable and economical performance from physical and human assets.

A copy of the letter received from Grand River Conservation Authority in 2020 to recognize the Guelph WWTP for the 2019 Performance is included as Appendix A.

Operational Performance

Wastewater Flow

This section summarizes the influent characteristics for the Guelph WWTP. Flow data for the 2020 reporting period is included as Table 1 of this report as well as represented in Figure 1.

A comparison of total flow per month between 2019 and 2020 can be seen in Figure 2.

The average total daily flow for the year 2020 is 53.142 Megalitres per day (MLD). A maximum total daily flow of 149.083 Megalitres (ML) was recorded on January 12, 2020

Table 1, Wastewater Flow Data, 2020

2020	Average Total Daily Flow ML	Maximum Total Daily Flow ML
January	73.941	149.083
February	58.599	65.119
March	66.170	80.784
April	58.156	65.325
May	54.424	58.316
June	50.943	60.258
July	44.380	50.960
August	48.326	55.546
September	46.820	57.289
October	44.838	49.622
November	45.432	49.891
December	45.676	51.519
Annual Average	53.142	X
Winter Average	57.964	X
Summer Average	49.698	X

Figure 1, 2020 Average Daily Flow and Maximum Daily Flow

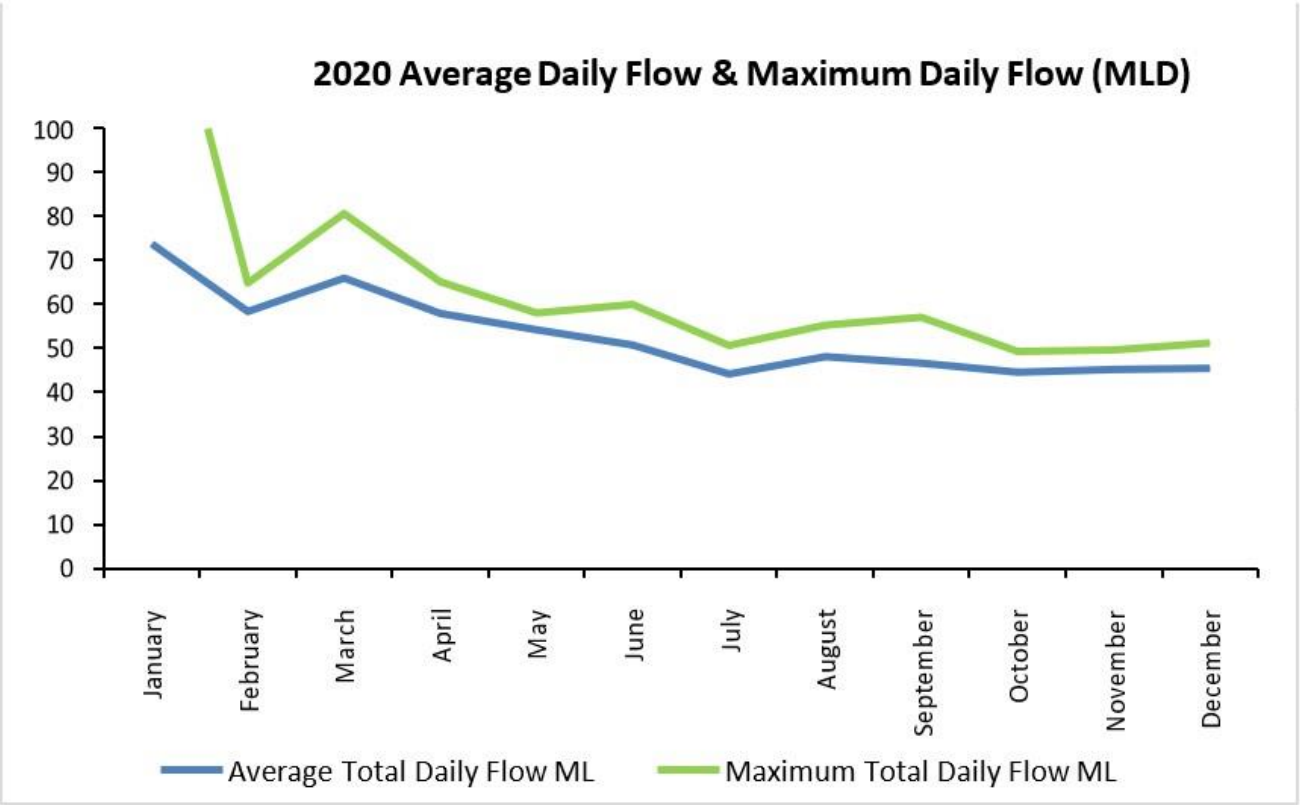
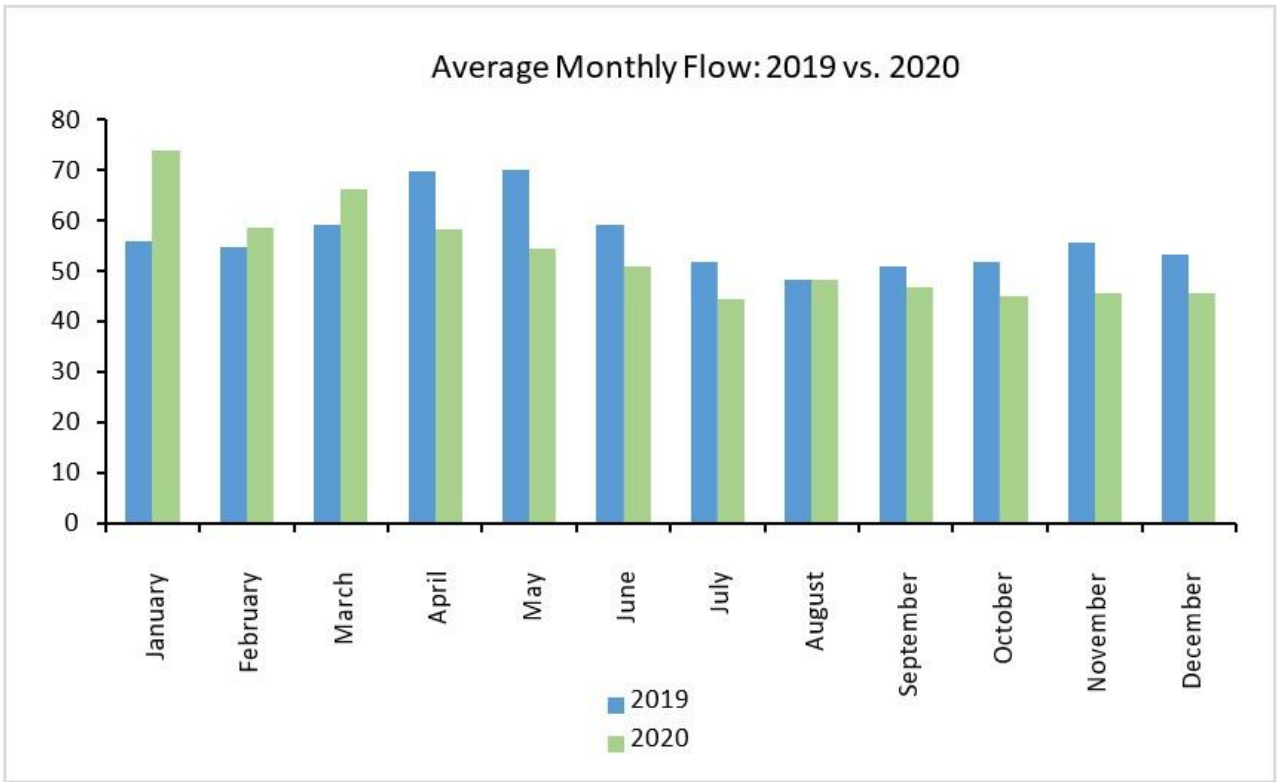


Figure 2, Average Monthly Flow



Raw Influent Wastewater Quality

Considerable effort is undertaken in monitoring the characteristics of WWTP influent, effluent and intermediate process streams to provide the necessary data for process optimization by plant staff and meet Environmental Compliance Approval monitoring and reporting requirements. Twenty-four hour flow proportional composite samples are routinely collected and analyzed. The raw influent wastewater data analyzed by the Guelph WWTP and CALA (Canadian Association for Laboratory Accreditation) certified outside laboratories is combined and a monthly summary is presented in Table 2.1.

2020	pH	[1]$cBOD_5$ (mg/L)	BOD_5 (mg/L)	TSS (mg/L)	P_{Tot} (mg/L)	TKN (mg/L)	TAN (mg/L)
January	7.53	160.0	158.3	231	4.08	33.7	19.9
February	7.50	165.0	182.5	228	4.97	40.5	24.9
March	7.53	170.0	181.7	238	4.16	37.1	20.2
April	7.52	173.3	218.3	287	4.88	32.2	20.9
May	7.48	202.0	218.0	269	5.43	37.8	22.7
June	7.47	174.0	202.0	244	5.36	34.7	21.6
July	7.49	212.0	246.0	276	5.46	39.1	21.0
August	7.53	181.7	198.3	266	5.18	36.2	18.3
September	7.55	235.0	248.3	302	5.91	35.6	22.4
October	7.54	230.0	250.0	301	5.80	38.1	23.3
November	7.53	240.0	262.0	394	5.77	47.9	25.2
December	7.45	177.0	195.0	273	5.60	41.1	28.1
Annual Average	7.51	193.3	213.4	275.6	5.2	37.8	22.4
Winter Average	7.51	182.4	195.9	242.4	4.7	38.1	23.3
Summer Average	7.51	201.1	225.9	293.0	5.6	38.5	22.1

Final Effluent Quality

Primary sedimentation and secondary activated sludge treatment is provided by four separate treatment trains namely Plants 1, 2, 3 and 4. Plants 1, 2, and 3 incorporate conventional activated sludge with the secondary effluent from each of these three plants directed to a common pump well. The combined secondary effluent is lifted by vertical turbine pumps to the rotating biological contactors (RBC) influent distribution channel and evenly split to each of the four RBC trains. Each of the four RBC trains consists of eight shafts in series. The process objective of the RBC's is to provide additional biological treatment for the oxidation of ammonia. Effluent from the RBC trains is discharged to a common sand filter influent channel and distributed to the sand filters for additional suspended solids capture. The Plant 4 treatment train incorporates extended aeration activated sludge and is capable of complete nitrification. As such plant 4 secondary effluent can be directed to a separate pump well which discharges to the common sand filter influent channel for distribution to the sand filters for additional suspended solids capture. Plant 4 secondary effluent can also be directed through the RBC's as plants 1, 2 and 3.

The final treated effluent passes through a Parshall flume and is measured by an ultrasonic transmitter. The transmitter is calibrated yearly to ensure accuracy of total flows. A Plant Flow Diagram is included as Appendix B.

Effluent quality requirements as specified in the ECA differ for summer and winter conditions. These limits and performance charts can be reviewed in Appendix C and the calibration records can be found in Appendix D.

An automatic sampling system collects a series of flow paced aliquots from the chlorine contact chamber and combines them in a container within a refrigerated compartment to produce a 24- hour flow proportional composite sample of the treated WWTP effluent. This composite sample is then analyzed by the GEL, which is ISO 17025 accredited by the CALA. The results from the GEL are tabulated in Table 3, which provides a monthly summary of final effluent quality data.

Residual chlorine and sodium bisulphite are constantly monitored in the chlorine contact chamber in keeping with the year-round requirement for disinfection. Both sodium hypochlorite and sodium bisulphite application and control are provided by ORP instrumentation. The objective of 200 E. Coli CFU/100mL of sample was met. Performance data is presented in Table 3.

As mandated by Environment Canada, the facility has optimized the disinfection/de-chlorination system to reduce the total residual chlorine to the speed river to 0.02 mg/L or less.

In 2014, the GEL received formal ISO/IEC 17025 Accreditation by CALA (certificate A3222) and has maintained this accreditation which is shown in Appendix E. The fulfillment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results.

2020	Min pH	Max pH	Average pH	Temp ^{0}C	$cBOD_5$ Concentration mg/L	$cBOD_5$ Loading kg/d	BOD5 Concentration mg/L	BOD5 Loading kg/d	TSS Concentration mg/L	TSS Loading kg/d	TP kg/d Concentration mg/L	TP kg/d Loading kg/d	TKN mg/L	TAN Concentration mg/L	TAN Loading kg/d	NO_3-N mg/L	NO_2-N mg/L	E. Coli CFU/100 mL	TCR mg/L	SBR (mg/L)
January	7.5	8.0	7.7	13.0	5.3	519.3	10.2	1096.4	8.2**	851.3	0.19	17.9	5.14	4.18*	330.32	16.48	0.64	17	0.00	1.55
February	7.7	7.9	7.8	12.7	2.2	127.4	3.7	217.9	2.5	151.1	0.10	5.9	3.83	2.47	149.7	21.72	0.52	10	0.00	1.70
March	7.7	7.8	7.7	12.6	2.8	190.1	5.8	406.4	2.9	197.9	0.09	6.2	5.80	4.24*	287.4	18.12	0.58	10	0.00	1.46
April	7.7	7.9	7.8	13.8	2.5	144.2	3.4	200.5	2.5	144.3	0.09	5.0	2.08	1.00	60.6	23.91	0.26	10	0.00	1.93
May	7.7	8.0	7.8	15.8	2.1	115.1	2.6	145.2	2.8	153.3	0.10	5.2	1.44	0.20	11.2	24.56	0.10	11	0.00	1.70
June	7.8	8.1	7.9	18.5	2.0	102.2	2.6	135.0	3.3	163.9	0.13	6.5	1.37	0.09	4.7	23.55	0.08	10	0.00	1.51
July	7.9	8.0	8.0	18.2	2.1	73.7	2.3	79.9	3.4	118.1	0.17	5.9	1.69	0.40	15.1	23.95	0.11	23	0.00	1.23
August	7.8	8.0	7.9	20.4	2.1	106.7	2.4	120.6	3.3	160.1	0.16	7.7	2.88	1.47	73.5	18.95	0.34	20	0.00	1.36
September	7.8	8.0	7.9	20.6	2.3	110.5	2.5	119.8	3.3	154.6	0.17	7.8	2.03	0.89	43.7	22.32	0.18	11	0.00	1.66
October	7.8	8.0	7.9	19.3	2.1	92.8	2.4	109.2	3.2	142.4	0.18	7.9	1.61	0.22	10.6	23.90	0.16	16	0.00	1.53
November	7.7	8.0	7.9	14.7	2.0	90.5	2.3	101.8	2.2	97.5	0.10	4.6	1.59	0.30	13.8	30.21	0.11	11	0.00	1.95
December	7.7	7.9	7.7	17.5	2.4	114.4	2.9	134.3	2.8	128.4	0.12	5.5	2.63	1.28	59.6	29.05	0.22	12	0.00	1.75
Annual Average	7.7	8.0	7.9	16.4	2.5	148.9	3.6	238.9	3.4	205.2	0.13	7.2	2.67	1.40	88.3	23.06	0.28	13.5	0.0	1.61
Winter Average			7.8	14.1	2.9	208.3	5.0	391.4	3.7	285.3	0.12	8.0	3.80	2.50	168.2	23.12	0.41	12.1	0.0	1.68
Summer Average			7.9	18.1	2.2	106.4	2.6	130.0	3.1	148.1	0.14	6.6	1.87	0.61	31.3	23.02	0.18	14.4	0.0	1.56

Notes:

1. All cBOD5 and BOD5 analysis is conducted by independent CA ERL accredited laboratory only.
2. SBR, Sodium bisulphite residual
3. All analyses based on 24-hour flow paced composite samples.
4. The Summer period is April 1 to October 31. The Winter period is November 1 to March 31.
5. Escherichia Coli values are calculated geometric means.

Solids Handling and Disposal

The raw sludge produced at the WWTP is thickened in the primary clarifiers and pumped to the anaerobic digestion system which consists of four primary digesters and one secondary digester. The waste activated sludge from all plants are thickened in a rotary drum thickener and then transferred to one of the primary digesters.

Following stabilization by anaerobic digestion, biosolids are transferred from the secondary digester to the dewatering facility. The dewatering facility consists of four belt filter presses and associated auxiliary equipment. Dewatering filtrate is treated in the Anammox process before being returned to headworks. Stabilized biosolids are either dewatered and removed from site as a cake to a non-landfill destination or further treated on site through the Lystek process. The Lystek material is then land applied as a fertilizer as per the Canadian Food Inspection Agency (CFIA) fertilizer registration. This results in a complete environmentally sustainable model to manage biosolids.

A simplified solids flow diagram of the WWTP is presented in Appendix B.

The latest CFIA approved certification is presented in Appendix F.

A summary of solids production, handling and disposal is presented Table 4 and a Lystek Fertilizer management in Table 5.

The rotary drum thickener (to thicken Waste Activated Sludge) is automated to run 24hrs/day, provided sufficient waste activated sludge is available. The unit used a combination of cationic and anionic polymers at a ratio of approximately 1.32:1 to assist in thickening the waste activated sludge to 3.32% solids. Table 6 will reveal in more detail the monthly totals.

During the reporting period 3,684 dry tonnes of dewatered biosolids were generated. This reporting period resulted in 100% biosolids diversion from landfill. The majority of dewatered biosolids were land applied during land application season or stored and processed for land application. The facility anticipates a higher quantity of biosolids generation for the next reporting period.

Table 4, Solid Handling and Disposal

Month	Avg. Digested Total Solids (%)	Digested Solids Pumped to Dewatering (m3/month)	Average Dewatered Cake Total Solids (%)	Cake production (wet tonnes)	Cake production (dry tonnes)
Jan	1.87*	23,343	21.89	1,382.97	302.73
Feb	1.82	25,107	19.68	1,503.07	295.80
Mar	1.43	29,201	20.18	1,739.47	351.03
April	1.80	23,178	20.30	1,353.97	274.86
May	2.07	25,903	21.34	1,375.51	293.53
June	1.90	21,032	21.55	1,348.42	290.58
July	2.20	21,556	21.75	1,278.13	277.99
Aug	1.72	18,602	22.66	1,223.35	277.21
Sept	1.90	21,359	22.08	1,312.56	289.81
Oct	2.27*	22,722	21.32	1,636.31	348.86
Nov	2.15*	24,682	24.11	1,462.75	352.67
Dec	1.83	23,968	23.15	1,424.17	329.70
Average	1.85	23,388	21.67	1,420.06	307.06
Total		280,653		17,040.68	3,684.78

Notes: * Indicates value was taken from on-line total solids meter

Total Volume for Land Application =17,040.68 Wet Tonnes

Dundalk - Lystek International, 191 Eco Park Way, Dundalk, ON N0C 1B0

Table 5, Guelph Biosolid volumes in 2020

Description	Unit of Measure	Estimated Quantity	Actual Quantity	Difference (%)
Lystek (Non-Freezing)	m3	8,000	363	-95.47%
Cake (Non-Freezing)	wet tonnes	8,000	10,527	31.58%
Cake (Freezing)	wet tonnes	6,000	6,041	0.67%
Lystek (Freezing)	m3	1,000	0	-100.00%*

Notes: Significant difference in percent of quantity is a result of downtime in the Lystek process related to system upgrades.

* Lystek is currently not operational in the "Freezing" period as there is currently no winterized storage and truck loading capability.

Table 6, Thickened Waste Activated Sludge (TWAS)

2020	Volume to TWAS m^3	Volume from TWAS m^3	Reduction %	Solids % D.S.	Cationic Polymer Consumption m^3	Anionic Polymer Consumption m^3
Jan	4,775	1,097	77	4.39	25	24
Feb	12,022	2,016	82	3.49	62	47
Mar	11,339	1,946	83	1.55	78	51
Apr	9,561	4,695	51	2.17	64	47
May	9,824	2,637	73	3.17	69	42
Jun	18,311	2,191	88	4.03	107	80
Jul	21,844	1,892	91	3.85	121	95
Aug	21,563	1,832	92	3.84	119	95
Sep	19,372	4,149	79	3.22	108	79
Oct*	-	-	-	-	-	-
Nov	20,551	16,983	17	3.00	151	91
Dec	18,866	12,858	32	4.32	139	92
Average	-	-	64	3.43	-	-
Totals	168,028	52,296	-	-	1,043	743

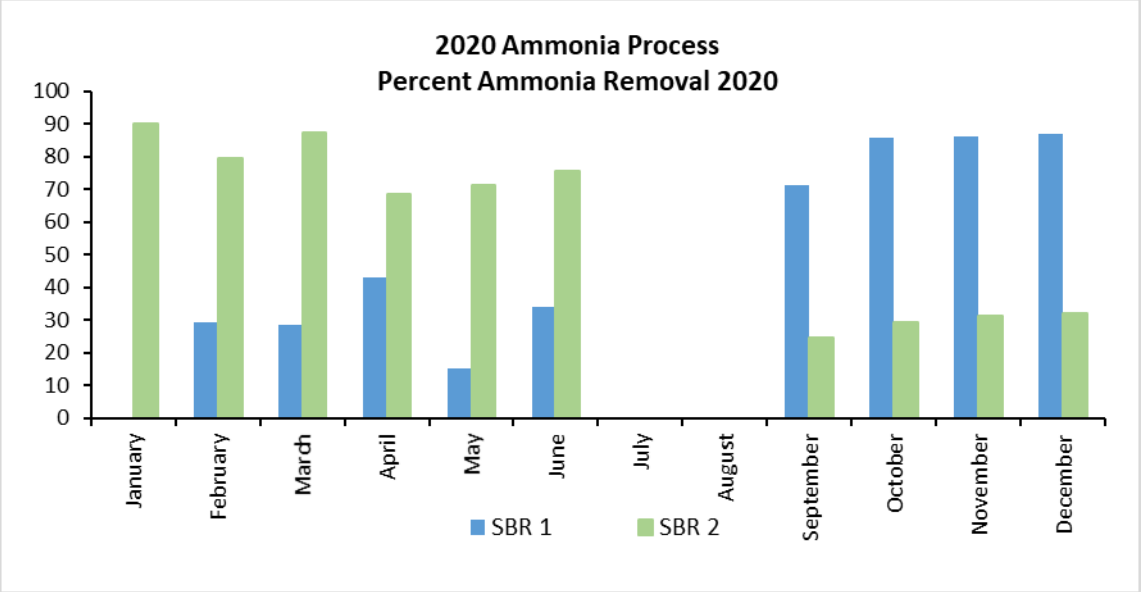
Notes:* TWAS Out of service due to system maintenance and parts availability constraints.

Side Stream Treatment

Anammox

The Anammox process is a side stream treatment of filtrate from solids dewatering consisting of two (2) Sequencing Batch Reactors (SBR). Each is designed to remove 173 kg/day of ammonia from the side stream filtrate. The annual average percent removal by SBR 1 is 47% and SBR 2 is 59%. Figure 3 represents the percent removed per month in each SBR. Both SBR's were out of service periodically throughout the months of July and August to address equipment repairs.

Figure 3, Anammox



Unusual Events/Process Upsets

Overflow

An overflow is a controlled discharge of wastewater to the environment from a designed location at the plant other than the approved final effluent outfall. There were no overflow events during the reporting period.

Spills

A spill is an unplanned discharge of wastewater to the environment from any location that is not specifically designed for this purpose. There were two (2) spill events during the reporting period. These events were reported to the MECP Spills Action Centre as per standard operating protocol.

Date	Occurrences #	Event Description
November 10, 2020	#3608-BV8N2Z	Spill from Digester 2 -Mixer draft tube to ground.
November 17, 2020	# 2786-BVFHX3	Spill from Digester 2 – Mixer draft tube to catch basin.

Bypasses

A bypass is an intentional diversion of excess wastewater around one or more wastewater treatment process(es). The bypassed portion of wastewater undergoes part of the treatment process followed by disinfection and gets re-combined with fully treated flow prior to release into the Speed River at the approved discharge location and sampling point. Final effluent is sampled and tested during bypass events to assess its quality.

Occasionally, a planned bypass is necessary in order to repair an essential part of the treatment process or during construction. In those cases, Guelph submits a request to the provincial governments to perform the bypass, including a plan to minimize its impact.

While not desirable, emergency bypasses may be necessary during high flow events to prevent spills and flooding at the WWTP and backups within the sewer system that can cause basement flooding and spills to the environment. Bypasses are also essential to protect the plant core, biological treatment process (Microorganisms that treat the sewage) from being washed out, which would prevent the plant from functioning properly and potentially casing long-term treatment impacts until the biological community is re-established.

The Guelph WWTP has no provision for primary treatment or raw sewage bypass directly to the Speed River. The facility does have provision for secondary treatment bypass, complete tertiary bypass or partial tertiary bypass. During this reporting period there were nine (9) event as reported below in Table 7. These events were reported to the MECP Spills Action Centre as per standard operating protocol.

Significant Events

Beginning on January 11, 2020 and over the course of the next five (5) days, the WWTP experienced very high flows. The measured volume over this period of time of 569,531 m3 was approximately 100 % more than was typically received over the same period in previous

years. Despite the significant challenges that this storm event presented, all of the flow leaving the facility was disinfected to ensure the removal of any harmful bacteria and then de-chlorinated before entering the Speed River.

On March 12th, 2020, the significant foaming in all of the aeration tanks was evidence of non-typical sewage entering the WWTP. Subsequent troubleshooting and testing confirmed that the ammonia removal process had been negatively impacted by this non-typical sewage entering the WWTP via the wastewater collection system. The timing of this event and the of impact of the COVID-19 pandemic are believed to be have been linked to this non-typical sewage arriving at the wastewater treatment facility. It is possible that a sudden and temporary change in the characteristics of the industrial discharges at this time were part of this temporary challenge.

These two separate events caused the Guelph WWTP to have two separate ECA #8835-9QJKSD Condition 7, Effluent Limits exceedances. Both of these events where reported to the MECP as per ECA #8835-9QJKSD, Condition 10 (3) and standard operating protocol.

Table 7, Bypass Summary

SAC Occurrence#	Event Start Date	Duration	Level of Treatment	Reason	Volume (m^3)	Disinfected	cBOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	TAN (mg/L)
903964	11-Jan	5 Days	Partial Tertiary	Weather Related	87501.7	Yes	25	74	1.22	7.1
4638- BLHQ-76	5-Feb	3 hrs 5 mins	Partial Tertiary	Equipment Failure	1151.2	Yes	3	4	0.12	4.39
904125	9-Feb	2 hrs 10 mins	Partial Tertiary	Process Upset	638	Yes	3	3	0.08	2.36
0188- BLQ8RA	12-Feb	42 mins	Partial Tertiary	Process Upset	62.5	Yes	2	<2	0.10	3.5
904186	12-Mar	3 hrs 41 mins	Partial Tertiary	Process Upset	6561.3	Yes	7	14	0.29	6.22
0057- BRPJ5P	19-Jul	33 mins	Tertiary	Weather Related	2863	Yes	**	16*	0.36*	2.38*
904586	19-Jul	5 mins	Partial Tertiary	Weather Related	137.5	Yes	3	5	0.21	1.1
6652- BSZL9C	31-Aug	41 mins	Partial Tertiary	Power Failure	708.9	Yes	<2	6	0.18	1.93
2820- BSZL87	31-Aug	15 mins	Tertiary	Power Failure	71	Yes	3	15	0.35	0.32

* Alternate sample results provided for this bypass; regular sampler was not able to capture this sample.

**cBOD5 is not analyzed in alternate sample location therefore it was not available for this bypass

APPENDICIES

Appendix A – GRCA recognition letter

Appendix B – Plant Flow Diagram

Appendix C – Facility Performance Charts

Appendix D – Calibration Records

Appendix E – GEL – Accreditation Certificate

Appendix F – CFIA Certification

Appendix G - Summary of Existing Works

Appendix H - ECA and C of A's

Appendix I – Sludge Accountability Calculations

Accessible versions of these appendices are available by contacting Wastewater Services at 519-837-5627 or TTY 519-826-9771