

2022 Year End Report: Bracebridge Wastewater Treatment Plant (WWTP)



Environmental Compliance Approval: # 3237-BDGQDG

Engineering and Public Works Department

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Introduction

The Bracebridge Wastewater Treatment Plant (WWTP), which services the Town of Bracebridge, is owned and operated by the District Municipality of Muskoka. The plant is located at 1000 Lagoon Lane and was commissioned in 2011. It services a population of approximately 8,600 people.

The treatment facility consists of 60 acres of facultative lagoons and a membrane bioreactor (MBR) treatment plant. The first two lagoons were constructed in 1959. They were 23 acres in size. By 1976, additional capacity was required to meet the needs of the town. At that time, an additional 37 acres of lagoon were constructed, bringing the total to 60 acres.

In 1983, an extended aeration treatment plant was commissioned to provide additional capacity for the growing population and in 2011, that plant was decommissioned, and a new membrane bioreactor (MBR) plant was constructed within the same 60 acres.

In February of 2022, the construction and commissioning of a new wastewater receiving facility, referred to as the 'Headworks' was completed. All sanitary wastewater from the Town's collection system is received at this facility, where it is screened via 3mm step screens. The material removed with the step screens is washed to remove a large number of organics and compressed to remove excess water and then discharged into the endless bag system. The mostly dried, bagged material is disposed of into an onsite refuse bin. The screened wastewater then flows through the grit vortex to allow the heavier inorganic material to settle out, be collected and pumped as a slurry to the grit classifiers and hydro-cyclones. The mostly dried grits are discharged into the endless bag system and disposed of into the onsite refuse bin. The refuse bin is emptied, and material is hauled off site weekly by local solid waste contractor. The raw sewage with solids removed, is then pumped to the MBR plant for secondary treatment. Aluminum Sulphate is used as the coagulant and disinfection is by ultra-violet lights. The only other chemical added to the wastewater treatment process is Soda Ash, for alkalinity. The final effluent is discharged into the Muskoka River by way of a diffused outfall.

The Plant operates under the MECP Environmental Compliance Approval (Sewage) # 3237-BDGQDG, issued July 2019. Under the terms of the Certificate of Approval, the plant is permitted to treat an average daily flow of 8,000 m³/day peak flow rating of 18,000 m³/day. Effluent limit criteria are as follows:

Table 1 Effluent Limit Criteria

Effluent Parameter	Concentration
CBOD	10 mg/L
Total Suspended Solids	10 mg/L
Total Phosphorous	0.4 mg/L
Total Ammonia Nitrogen Summer (May 15 to September 30)	5.0 mg/L
Total Ammonia Nitrogen Winter (October 01 to May 14)	10.0 mg/L
E. coli	80 counts/100 ml (Monthly geometric Mean Density)

Membrane Bioreactors (MBR) rely upon the membrane equipment for liquids/solids separation

prior to discharge of the effluent. The membrane equipment installed at the Lagoon Lane WWTP is an immersed system, i.e., a system that is designed for installation within the membrane tanks and utilizes 0.04 micron hollow fiber membranes.

Waste sludge (biosolids) from the MBR process is sent to one of the three facultative lagoons.

General Information

A review of the District of Muskoka's infrastructure needs is conducted annually by the Director of Water and Sewer Services, Area Manager and Chief Operator, and recommendations for maintenance, rehabilitation and renewal programs are considered.

Efforts to eliminate the discharge of untreated or partially treated wastewater to receiving waters are being accomplished by a long-term financial commitment to correct excessive infiltration into the wastewater collection system by means of sewer main rehabilitation/replacement, manhole rehabilitation and pumping station rehabilitation programs.

The treatment facility is capable of effective operation during emergencies, maintenance shutdowns, and power failures. This is achieved through such measures as preventive maintenance of duty/standby units, the duplication of major treatment components, the provision of standby power sources and extensive use of the SCADA systems. All pumping stations and treatment control systems use SCADA (Supervisor Control and Data Acquisition), in combination with Data Highway Plus, IoT, Ethernet and Programmable Logic Controllers.

All operators are qualified to operate the systems efficiently and effectively to achieve the highest level of treatment at all times. A commitment to provide Operator training and certification is being sustained.

Regulatory sampling is carried out to meet the requirements outlined in the ECA, and additional in-house operational sampling, beyond these regulatory requirements is being performed on a routine basis. These efforts have resulted in an effective treatment process which ensures that effluent discharges consistently meet effluent objectives and are environmentally safe. All final effluent sample results for the MBR facilities met their effluent limits.

All data in this report is a compilation of test results received from SGS Canada and their accredited laboratory, Lakefield Research. All in-plant sampling, analysis and recording of results conforms, in order of precedence, to the following 3 standards: Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the American Water Works Association/Water Environment Federation (AWWA/WEF) publication "Standard Methods for the Examination of Water and Wastewater".

Executive Summary

In all respects, test results of the treated effluent for the parameters of CBOD5, suspended solids, ammonia, total phosphorous, and E. Coli are in compliance with the limits outlined in the Certificate of Approval regarding monthly allowable concentrations and total effluent loading throughout the entire year.

Overall, the plant treatment processes performed satisfactorily and are deemed to be adequate. All sample test results of the final effluent were within levels outlined in the plant ECA (#3237-

BDGQDG).

Quantity of Flow Summary

The plant has a daily average flow design capacity of 8,000 m³/day. The actual average daily flow for the year was 3584 m³/day, however, the 3-year average is 3,878 m³/day, which represents 48.5% of the plant capacity. None of the individual system components exceeded the design flow rating.

Plant Operational Upsets or Process Failures

There were 3 major equipment failures that occurred in 2022, of which none were the cause to a non-compliance event.

In August, 1 of 3 axial flow mixed liquor feed pumps failed and required replacement, with an estimated delivery time of 20 weeks.

In July of 2022, a branch of the aeration piping broke off inside aeration tank #2. Once the pipe was repaired, it was evident the entire aeration piping system had become plugged with sludge, requiring each of the 1500-disc membrane diffusers to be removed, cleaned and replaced. This repair project is still in progress.

In November, fine screen #2 suffered a failure of the main screen drive gearmotor. A replacement gear motor was purchased and ready to be installed. At that time, it was discovered that the hollow stainless auger shaft was sheared as well. The unit will be out of service until more temperate weather arrives to make the repair.

Summary of Maintenance

There were no significant plant upgrades on major infrastructure in 2022.

All equipment information at this plant is entered into a computer database. From this information, a scheduled preventive maintenance program has been established. The maintenance program includes (but is not limited to):

- Annual maintenance of Ozone Odour Control system
- Monthly testing (under load) of emergency standby generators
- Annual servicing of emergency standby generators
- Annual replacement of U.V. bulbs
- Annual membrane recovery cleans
- Annual calibration of flow metering devices
- Annual cleaning of all sewage pumping stations
- Marine inspection of effluent outfall and diffuser completed in 2022. (5-year cycle)

Evaluation of the Need for Improvement Works

The treatment facility is operating at a plant capacity of 48.5% and is in compliance with specified effluent parameter criteria. There has been no significant treatment process upsets nor plant bypasses and as a result, there is no need for improvements to the existing works.

Interpretation of Analytical Results

All sample results for Raw Sewage and Final Effluent are reported in this section. Other tables in this report include Chemical Usage, Biosolids Quality, and Biosolids Quantity.

Raw Sewage

The information reported in the Raw Sewage sample results summary table consists of test results of analysis conducted on composite samples of the plant influent flow as required by the plant ECA. Samples are sent for analysis to SGS Canada Inc. in Lakefield, as well as analysis conducted on site using Standard Methods or equivalent. Weekly analysis has been performed and reported as specified under the terms outline in the ECA.

Influent Analysis

Table 2 Influent Analysis

Influent Parameter	Minimum	4 Week Average Maximum	Annual Average	Average loading kg/day
BOD5 (mg/L)	87	46	268	336
Suspended Solids (mg/L)	93	93	403	492
Total Phosphorus (mg/L)	2.13	6.56	5.20	5.60
TKN (mg/L)	18.5	56.2	37.4	45.1

Effluent Analysis

The information reported in the Final Effluent sample results summary tables 14-19 consists of test results of analysis conducted on final effluent composite samples. Bacteriological samples, however, consisted of grab samples. Weekly analysis has been performed and reported as specified under the terms outlined in the ECA.

Effluent Objective Analysis

The effluent objectives were met during all sample periods.

Final Effluent Analysis Summary

All final effluent samples tested for CBOD5, suspended solids, ammonia, E. Coli, and total phosphorous were below non-compliance limits outlined in the ECA.

Table 3 Final Effluent Analysis Summary

Parameter	Minimum	4 Week Average Maximum	Annual Average	Average Loading kg/day
COBD5 (mg/L)	2	2	2	2.35
Suspended Solids (mg/L)	2	3	2.2	2.57
Total Phosphorus (mg/L)	0.03	0.16	0.04	0.05
Ammonia (mg/L)	0.10	0.88	0.26	0.31
E. Coli (#/100 mL)	0	3	0.04	1.08

Final Effluent Sampling Summary

Average daily flow comparisons by day of week ensure ECA requirements for scheduled sampling are taken at a time, and in a location characteristic of the quality and quantity of the sewage stream over the time period being monitored. Average daily flow rates by day of the week compare the flow to the average daily flow for the entire year. This data is used to determine if a particular day of the week is best to ensure samples are taken to meet the requirements of scheduled monitoring sections of the ECA's. Sampling plans are reviewed and updated yearly based on the previous yearly flow data. For 2023 the sample collection day will be Tuesday's.

Biosolids Generation

The quality and quantity of biosolids both generated and hauled from the facility for disposal is outlined in the table provided. Waste activated sludge is pumped from the MBR plant to the Lagoon Cell #3. The lagoon provides storage and stabilization for the waste activated sludge.

In 2022, a contractor was hired to mix the biosolids in Lagoon Cell #3, and to disperse these solids between Cells 1 & 2. Due to mechanical equipment failure, and lack of temperate weather, the contractor was unable to perform this work. This work is now scheduled for June of 2023.

It is not anticipated that there will be a significant increase in the total volume of bio solids produced in 2023.

Co-Treatment Flow Summary

The treatment plant has the capability to co-treat additional wastes through the Septage Receiving Facility, which is located on site at the Septage Lagoons. Septage and holding tank waste are hauled in by vacuum trucks, and discharged into the receiving cell, which is then blended into the plant influent flow. In addition, leachate from the District owned Rosewarne Landfill is trucked to the Septage Receiving Facility on a scheduled basis.

The plant ECA (Sewage) # 3237-BDGQDG, states that the average quantity of partially treated septage lagoon effluent shall not exceed 180 m³/day. The highest monthly average for partially treated septage lagoon effluent was 150.7 m³/day in June 2022 with no problems observed at this volume.

In 2022, 6576 m³ of hauled septage was received at Lagoon Lane septage lagoon and an additional 21,580 m³ of District Rosewarne Landfill leachate was accepted for disposal. There was transfer of wastewater from the treatment lagoons 1 through 3 to the MBR plant as required to maintain the required freeboard in 2022. All septage, leachate and wastewater disposed of

into the Bracebridge septage lagoon was processed through the lagoon system with the supernatant from septage lagoon cell#3 pumped to the plant inlet chamber, upstream of the headworks. Septage cell #3 supernatant transfer volumes are summarized in the following table:

Table 4 Septage Cell 3 Transfer Summary

Month	Minimum Daily Flow (m3)	Maximum Daily Flow (m3)	Total Monthly Flow (m3)
January	10.86	134.2	1,441
February	21.81	190.98	2,080
March	45.28	226.35	3,838
April	66.40	158.50	3,390
May	68.09	158.47	3,549
June	113.18	226.36	4,522
July	111.64	226.35	4,125
August	32.72	161.31	2,797
September	33.46	181.09	2,796
October	37.49	230.01	4,099
November	0	94.36	884
December	26.41	475.97	3,121

Summary of Complaints received throughout the reporting period.

There were no complaints received in the reporting period.

Bracebridge Wastewater Collection Summary

New Sewer Services:

A total of 81 customers connected to existing sewer laterals in 2022.

New Sewer Mains:

A total of 900 meters of gravity sewer was installed in 2022 as well as approx. 600 meters of low-pressure sewer in the Clearbrook Subdivision.

Sewer Main Replacements:

Approx 90 meters of sewer main was replaced on Mary St in 2022 as part of District of Muskoka capital projects.

Low Pressure Sewer Breaks:

There were no low-pressure sewer breaks in 2022.

Sewer Force Main Breaks:

There were no sewer forcemain breaks in 2022.

Sewer Force Main Replacement:

There were no Sewer Force Main replacements in 2022.

Main Line Sewer Blockage:

There were no sewer main blockages in 2022.

Sewer Lateral Blockage:

There were no sewer lateral blockages in 2022.

Service Low Pressure Sewer Blockages:

There were no low-pressure sewer blockages in 2022.

Frozen Sewer Force Mains:

There were no frozen sewers mains in 2022.

Frozen Sewer Service Laterals:

No sewer service laterals froze in 2022.

Frozen Low Pressure Sewer Services:

No low-pressure sewer services froze in 2022.

Sewer Flushing/Video:

Approximately of 8,100 m of sewer main was flushed and video inspected in 2022 at a cost of approx. \$35000.00.

Sewer Locates:

District staff assisted sub-contractors with 1164 locate requests in 2022.

Table 5 Effluent Flow Summary - 2022

Month	Plant Total Monthly (m ³)	Average Day Flow (m ³ /d)	Maximum Day Flow (m ³ /d)	Minimum Day Flow (m ³ /d)	Lagoons Monthly Flow (m ³)	Facility Total Monthly Flow (m ³)
January	92,742	2,992	3,772	2,693		92,742
February	87,436	3,123	5,993	2,984		87,436
March	134,671	4,344	7,380	2,442		134,671
April	155,081	5,169	6,419	4,278		155,081
May	143,106	4,616	6,515	3,211		143,106
June	108,234	3,608	4,612	2,854		108,234
July	98,289	3,171	3,661	2,783		98,289
August	95,202	3,071	3,745	2,650		95,202
September	91,199	3,040	3,852	2,580		91,199
October	107,936	3,482	5,841	2,252		107,936
November	90,371	3,012	4,587	2,250		90,371
December	103,727	3,346	4,685	2,731		103,727

Total Flow: 1,307,993
Average Day: 3,584
Maximum Day: 7,380
Day: 2,250

Table 6 Influent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 1

Sample Date	Sample Identification Number	BOD5 mg/L	Alkalinity (Total as CaCO3) mg/L	pH	Phosphate	Total Phosphorus mg/L	Suspended Solids mg/L
Feb 02/22	Raw Influent	210	209	7.07		4.53	178
May 04/22	Raw Influent	246	200	6.66		2.55	168
Aug 10/22	Raw Influent	437	242	7.10		9.1	1160
Nov 02/22	Raw Influent	131	229	7.46		4.36	334
Yearly Average		256.0	220.0	7.1		5.1	460.0
Maximum		437.0	242.0	7.5		9.1	1160.0
Minimum		131.0	200.0	6.7		2.6	168.0

Table 7 Influent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 2

Sample Date	Sample Identification Number	Conductivity mg/L	Total Kjeldahl Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Total Ammonia Nitrogen mg/L	Chloride mg/L
Feb 02/22	Raw Influent		34.8	<0.06	<0.03	25.8	
May 04/22	Raw Influent		23.1	<0.06	0.11	19.9	
Aug 10/22	Raw Influent		64.0	<0.06	<0.03	23.5	
Nov 02/22	Raw Influent		32.6	<0.06	<0.03	28.6	
Yearly Average			38.6	0.06	0.1	24.5	
Maximum			64.0	0.06	0.1	28.6	
Minimum			23.1	0.06	0.0	19.9	

Table 8 Chemical Usage Summary: Alum

Month	Average Dosage mg/L	Total Litres
January	27.3	4,516.7
February	33.1	4,925.9
March	32.8	7,357.0
April	26.4	6,764.1
May	26.2	6,251.0
June	26.9	5,088.3
July	25.3	4,269.8
August	25.9	4,273.5
September	23.9	3,810.0
October	27.3	4,479.3
November	26.7	3,884.9
December	31.9	5,697.9
Average	27.8	5109.9
Total		61318

Total Yearly Kilograms: 61,318

Table 9 Chemical Usage Summary: Soda Ash

Month	Average Dosage mg/L	Total kg (dry)
January	5.6	600.0
February	6.3	600.0
March	4.1	600.0
April	3.6	600.0
May	3.9	600.0
June	2.5	300.0
July	0.0	0.0
August	2.8	300.0
September	0.0	0.0
October	5.7	600.0
November	6.4	600.0
December	5.2	600.0
Average	3.8	450.0
Total		7000

Total Yearly Kilograms:7000

Table 10 Chemical Usage Summary: Sodium Hypochlorite

Month	Average Flowrate - Hypo Clean	Total litres
January	85 ml/min	1,612.5
February	85 ml/min	1,640.7
March	85 ml/min	771.7
April	85 ml/min	1,016.9
May	85 ml/min	435.0
June	85 ml/min	277.0
July	85 ml/min	583.2
August	85 ml/min	147.9
September	85 ml/min	144.4
October	85 ml/min	261.5
November	85 ml/min	175.9
December	85 ml/min	264.0
Average		610.9
Total		7330.4

Total Yearly Litres: 7330

Table 11 Chemical Usage Summary: Citric Acid

Month	Average Flowrate- Acid Clean	Total Litres
January	85 ml/min	774
February	85 ml/min	0
March	85 ml/min	96
April	85 ml/min	36
May	85 ml/min	65
June	85 ml/min	35
July	85 ml/min	287
August	85 ml/min	156
September	85 ml/min	70
October	85 ml/min	94
November	85 ml/min	86
December	85 ml/min	158
Average		155
Total		1857

Total Yearly Litres: 1857

Table 12 Effluent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 1

Sample Date	Sample Identification Number	CBOD5 mg/L	Alkalinity (Total as CaCO3) mg/L	pH	Phosphate	Total Phosphorus mg/L	Suspended Solids mg/L
Feb 02/22	Final Effluent	<2				0.16	<2
May 04/22	Final Effluent	<2				<0.03	<2
Aug 10/22	Final Effluent	<2				<0.03	<2
Nov 02/22	Final Effluent	<2				<0.03	2
Yearly Average		2.0				0.2	2.0
Maximum		2.0				0.2	2.0
Minimum		2.0				0.2	2.0

Table 13 Effluent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 2

Sample Date	Sample Identification Number	Conductivity mg/L	Total Kjeldahl Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Total Ammonia Nitrogen mg/L	Chloride mg/L
Feb 02/22	Final Effluent		1.5	12.1	<0.03	0.1	
May 04/22	Final Effluent		1.3	1.67	0.04	1.0	
Aug 10/22	Final Effluent		0.8	1.87	<0.03	0.2	
Nov 02/22	Final Effluent		1.0	4.2	<0.03	<0.1	
Yearly Average			1.2	5.0	0.06	0.4	
Maximum			1.5	12.1	0.06	1.0	
Minimum			0.8	1.7	0.06	0.1	

Table 14 Effluent Loading and Concentration Summary 2022 CBOD5

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	2.00	1.93	2.43
February	2.00	2.23	4.28
March	2.00	2.80	4.76
April	2.00	3.45	4.28
May	2.00	2.98	4.20
June	2.00	2.41	3.07
July	2.00	2.05	2.36
August	2.00	1.98	2.42
September	2.00	2.03	2.57
October	2.00	2.25	3.77
November	2.00	2.01	3.06
December	2.00	2.16	3.02
Average Monthly	2.00	2.35	3.35
Effluent Objective	5.0		
Non-Compliance	10.0		

Table 15 Effluent Loading and Concentration Summary 2022: Suspended Solids

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	3.50	3.38	4.26
February	2.00	2.23	4.28
March	2.50	3.50	5.95
April	2.00	3.45	4.28
May	2.00	2.98	4.20
June	2.20	2.65	3.38
July	2.00	2.05	2.36
August	2.20	2.18	2.66
September	2.00	2.03	2.57
October	2.00	2.25	3.77
November	2.00	2.01	3.06
December	2.00	2.16	3.02
Average Monthly	2.20	2.57	3.65
Effluent Objective	5.0		
Non-Compliance	10.0		

Table 16 Effluent Loading and Concentration Summary 2022: Total Ammonia Nitrogen Summer

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
May	0.20	0.30	0.42
June	0.60	0.72	0.92
July	0.24	0.25	0.28
August	0.20	0.20	0.24
September	0.10	0.10	0.13
October	0.25	0.28	0.47
Average Monthly	0.27	0.31	0.41
Effluent Objective	2.0		
Non-Compliance	5.0		

Table 17 Effluent Loading and Concentration Summary 2022: Total Ammonia Nitrogen Winter

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	0.10	0.10	0.12
February	0.60	0.67	1.28
March	0.35	0.49	0.83
April	0.20	0.34	0.43
November	0.16	0.16	0.24
December	0.10	0.11	0.15
Average Monthly	0.25	0.31	0.51
Effluent Objective	2.0		
Non-Compliance	10.0		

Table 18 Effluent Loading and Concentration Summary 2022: Fecal Coliform

Month	Geomean (#/100mL)	Maximum Daily (#/100mL)
January	0.00	0.00
February	0.00	0.00
March	0.00	0.00
April	0.00	0.00
May	0.00	0.00
June	0.31	11.00
July	0.08	1.00
August	0.00	0.00
September	0.00	0.00
October	0.08	1.00
November	0.00	0.00
December	0.00	0.00
Average Monthly	0.04	1.08
Effluent Objective	<2	
Non-Compliance	80	

Table 19 Effluent Loading and Concentration Summary 2022: Total Phosphorus

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	0.12	0.12	0.146
February	0.10	0.11	0.214
March	0.03	0.04	0.071
April	0.03	0.05	0.064
May	0.03	0.04	0.063
June	0.03	0.04	0.046
July	0.03	0.03	0.035
August	0.03	0.03	0.036
September	0.03	0.03	0.039
October	0.03	0.03	0.057
November	0.03	0.03	0.046
December	0.03	0.03	0.045
Average Monthly	0.04	0.05	0.07
Effluent Objective	0.3		
Non-Compliance	0.4		

Table 20 Liquid Sludge Production Summary 2022

Month	Hauler	Shipped to: Location	Shipped to: Volume
January	Pumped	FAC. CELL 3	1585.7
February	Pumped	FAC. CELL 3	2579.3
March	Pumped	FAC. CELL 3	2835.1
April	Pumped	FAC. CELL 3	3295.9
May	Pumped	FAC. CELL 3	3566.6
June	Pumped	FAC. CELL 3	5656.4
July	Pumped	FAC. CELL 3	4296.6
August	Pumped	FAC. CELL 3	4343.2
September	Pumped	FAC. CELL 3	4534.7
October	Pumped	FAC. CELL 3	2031.2
November	Pumped	FAC. CELL 3	953.4
December	Pumped	FAC. CELL 3	1773.1

Yearly Total Volume: 37,451 m3
 Yearly Average Volume: 3,121 m3
 Maximum Volume: 5656 m3
 Minimum Volume: 953 m3

Table 21 Sludge Quality Analysis 2022

Parameter Sampled (mg/L)	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Date	Feb 02/22	May 04/22	Aug 10/22	Nov 02/22
Sample ID	Waste Activated Sludge	Waste Activated Sludge	Waste Activated Sludge	Waste Activated Sludge
Nitrate	1.1	<0.3	<0.3	0.5
Mercury	0.005	0.008	0.002	0.004
Chromium	0.11	0.1	0.14	0.15
Cobalt	0.01	0.01	0.02	0.0
Copper	3.1	2.3	2.8	4
Lead	<0.1	<0.1	<0.1	0.1
Molybdenum	<0.05	0.11	0.05	0.06
Nickel	0.07	0.07	0.1	0.14
Selenium	<0.1	<0.1	<0.1	<0.1
Arsenic	<0.1	<0.1	<0.1	<0.1
Zinc	2.3	2	3	3
Cadmium	<0.005	<0.005	0.007	0.008
Ammonia	4.3	8.4	3.2	4.1
Total Kjeldahl Nitrogen	444	530	498	450
Total Phosphorus	230	200	196	280
Total Solids	6480	8340	9300	11700
Volatile Solids	5170	6170	7230	9600
Nitrite	0.4	0.4	0.6	0.5
Potassium	46	65	72	84
Total Suspended Solids	6170	8340	9300	11300

Table 22 Bypass and Overflow Event Report

BYPASS AND/OR OVERFLOW EVENT REPORT												
Location	Date	Event Start Time	Event End Time	Event Duration (hours)	Total Volume (m3)	Sampled	Flow Mes/Mod/ Est	Level of Treatment Received	Disinfection status	Reason(s)	Comments	Reference Number
135 Quebec St, Bracebridge	3/22/2022	11:00 AM	12:15 PM	1:15	1	no	Est	Sewage, Raw	No	5	concrete debris	1-10Z0KG
14 Depot Drive - A&W in Smart Centre's Development	11/29/2022	2:00 PM	5:00 PM	unknown		no	Est	Sewage, Raw	No	5	Private Infrastructure - blocked with grease	1-2AHT5D

Flow	Level of Treatment Received	Disinfection	Reason
Mod = Modelled	Sewage, Raw	No	1 = Precipitation
Mes = Measured	Sewage, Primary Treatment received	Yes, Chlorinated	2 = Spring Thaw / Snow Melt
Est = Estimated	Sewage, Secondary treatment received	Yes, UV	3 = Infiltration
	Sewage, Tertiary	Yes, Ozone	4 = Mechanical/Equipment Failure
	Sewage, Final Effluent		5 = Pipe Failure (break/leak/plugged)
			6 = Process Upsets
			7 = Power Failure
			8 = Planned Maintenance
			9 = Exceed Design Capacity
			10 = Other

Bracebridge Certification of Reports

I certify that the information in this document and all attachments are correct, accurate, and complete to the best of my knowledge.

Michael Currie
Director, Water and Wastewater Services

Beth Van Erp, C. Tech.
Manager of Water and Wastewater Operations

