

2021 Year End Report: Gravenhurst Wastewater Treatment Plant (WWTP)



Environmental Compliance Approval: # 7847-ABVPD3

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Introduction

The Gravenhurst Wastewater Treatment Plant (WWTP), which services the Town of Gravenhurst, is owned and operated by the District Municipality of Muskoka. The plant is located at 1083 Muskoka Beach Road, and was commissioned in May, 1993. It is capable of servicing a population of 9,500 people.

The Beach Road WWTP receives influent wastewater from a gravity sewer main, which runs underneath Muskoka Beach Road. The majority of the wastewater is from the James St Sewage Pumping Station that is located on the site of the original Gravenhurst sewage treatment plant in central Gravenhurst. In addition the collection system contains fourteen other sewage pumping stations. The pumping stations serve residential areas of Gravenhurst as well as customers as diverse as the Taboo Resort and Beaver Creek Correctional Institution. The WWTP also has a septage receiving facility, which processes septic and holding tank wastes that are trucked in.

The Plant operates under the MECP Environmental Compliance Approval (ECA) # 7847-ABVPD3, issued September 9, 2016. Under the terms of the Environmental Compliance Approval, the plant is permitted to treat an average daily flow of 5,165 meters cubed per day, and a peak flow of 13,791 meters cubed per day. Additionally, effluent limit criteria are as follows:

Table 1 Effluent Limit Criteria

| Effluent Parameter | Concentration | Total Effluent Loading |
|--|--|------------------------|
| CBOD | 10 mg/L | 51.65 kg/day |
| Total Suspended Solids | 10 mg/L | 51.65 kg/day |
| Total Phosphorous | 0.3 mg/L | 1.6 kg/day |
| Total Ammonia Nitrogen Summer (May 15 to September 30) | 5 mg/L | 51.65 kg/day |
| 32sa Total Ammonia Nitrogen Winter (October 01 to May 14) | 10 mg/L | 25.8 kg/day |
| E. coli | 100 organisms/100mL for any month | N/A |
| pH | To be between 6.0 and 9.5 at all times | N/A |

The treatment process is conventional activated sludge with tertiary filtration and ultra violet disinfection before discharge of the effluent to Lake Muskoka. Biosolids from the primary and secondary plant processes are to anaerobic digesters. The stabilized biosolids are then dewatered with a centrifuge. The centrifuge cake is hauled off site for disposal at Lystek's Organic Material Recovery Centre in Southgate.

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 shut downs, 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, and programmable logic controllers.

All operators are qualified to operate the systems efficiently and effectively in order 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 ECA regarding monthly allowable concentrations and total effluent loading throughout the entire 2020.

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 (#7847ABVPD3).

Quantity of Flow Summary

The plant has a daily average flow design capacity of 5,165 meters cubed per day. The actual average daily flow for the 2021 was 2,858 meters cubed per day, however, the 3 year average is 2,939 meters cubed per day, which represents 57% of the plant capacity. None of the individual system components exceeded the design flow rating.

Plant Operational Upsets or Process Failures

There were no plant operational problems in 2021.

Summary of Maintenance

There were no significant plant upgrades on major infrastructure in 2021.

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

- Monthly testing of emergency testing (under load) of the standby generators.
- Annual servicing of emergency standby generators.
- Annual replacement of U.V. bulbs.
- Annual calibration of flow metering devices.
- Annual cleaning of all sewage pumping stations.
- Marine inspection of effluent outfall and diffuser completed in 2017. (5 year cycle)

Evaluation of the Need for Improvement Works

The treatment facility is operating at a plant capacity of 57% and is in compliance with specified effluent parameter criteria. In addition, there has been no significant treatment process upsets and plant bypasses. There are planned major capital upgrades for life-cycle process equipment replacements to occur in 2023 with engineering design work next year.

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 Lakefield Research, 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) | 67 | 274 | 184 | 520.5 |
| Suspended Solids (mg/L) | 116 | 452 | 293 | 678.6 |
| Total Phosphorus (mg/L) | 1.55 | 13.8 | 3.81 | 14.9 |
| TKN (mg/L) | 1.3 | 64 | 22.7 | 86.5 |

Effluent Analysis

The information reported in the Final Effluent sample results summary table 3 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 Ammonia objective for October exceeded the objective, it was under the compliance limit and quickly came back under the objective within a matter of days. The event of Ammonia over the objective was comprised of three sample results, both in-house lab and external lab results, with an ammonia range of 1.4 – 5.9 milligrams per litre. This was a result of a locked up return activated sludge pump variable frequency drive (VFD), once identified the VFD was quickly and successfully reset, within a day the nitrification process had recovered.

The effluent pH slightly exceeded the objective for one day on February 8, 2021 and was at all times below the limit. All other pH readings for the year were within the objective level. Other 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 | 3.25 | 2.2 | 6.2 |
| Suspended Solids (mg/L) | 2 | 3.5 | 2.4 | 6.9 |
| Total Phosphorus (mg/L) | 0.03 | 0.06 | 0.04 | 0.11 |
| Ammonia(mg/L) | 0.1 | 1.6 | 0.3 | 0.78 |
| E. Coli (#/100 mL) GEOMEAN | 0 | 40.3 | 7.5 | N/A |
| pH | Min- 6.6 | Max- 8.55 | 7.23 | N/A |

Final Effluent Sampling Summary

All samples were collected following the frequency and methods required by the facility approval. For the coming year, 2022, no changes to the sampling plan are being considered.

Biosolids Generation

The quality and volume of biosolids hauled from the facility for disposal is outlined in the table provided. Dewatered biosolids from the plant is hauled off site for disposal at Lystek's Organic Material Recovery Centre in Southgate. A contractor was used by the District of Muskoka to transfer all material for disposal in 2021, and will continue to do so in 2022. It is not anticipated that there will be a significant increase in the total volume of bio solids produced in 2022.

Biosolids Co-Treatment

The treatment plant has the capability to co-treat additional wastes through the Hauled Waste Receiving Facility, which located on site at headworks of the plant. Septage and holding tank waste are hauled in by vacuum trucks, and dumped into the 76 cubic meter tank, which is then blended into the plant influent flow. Biosolids and water treatment sludge generated by smaller municipal treatment facilities may be processed in this fashion as well. Tables summarizing the septage analytical characteristics and monthly loading rates of the hauled wastes that have been co-treated at the plant in 2021 are included in this report.

Co-Treatment Flow Summary

The plant ECA (Sewage) #7847-ABVPD3, issued September 9, 2016 states that the monthly average quantity of septage and holding tank waste being co-treated at the plant shall not exceed 20 meters cubed per day. The certificate further stipulates that the monthly average volume of biosolids being cotreated shall not exceed a monthly average flow of 20 meters cubed per day, and that volumes of water treatment plant sludges being co-treated shall not exceed a monthly average flow of 20 meters cubed per day as well.

The highest monthly average for septage was 12.2 meters cubed per day in July 2021 with no problems observed by this volume; samples of the septage waste were collected monthly. The highest monthly average for biosolids was 4.3 meters cubed per day which occurred in September. There were no operational issues with the volume and quality of the biosolids hauled in in 2021. Biosolids being hauled in from the local non-municipal wastewater treatment plant (Red Leaves Resort) provided their set of analytical sample results, It is noted that no analytical samples were obtained for the biosolids received in May. For 2022, biosolids being hauled in from Red Leaves will have all sampling completed, however this sampling is not conducted by the District.

No water plant sludges were received in 2021.

Summary of Complaints received throughout the reporting period

There were no complaints received in the reporting period.

Gravenhurst Wastewater Collection Summary 2021

New or Replaced Sewer Mains

There was 200m new sewer main installed on Daffodil Court .

18m of new sewer at Skyline Talisman Development was installed for commercial purposes.

New Sewer Services:

22 new customers connected to existing municipal services in 2021.

Sewer Lateral Blockages:

5 lateral blockages occurred on the municipal side in 2021.

Sewer Pump Stations:

All stations were cleaned by high velocity water pressure. All debris was vacuumed out and hauled to the appropriate landfill site. The internal air-release vacuum valves at the four newest stations were removed, cleaned, reinstalled and tested for proper operation as part of the annual maintenance program.

Main Line Sewer and Maintenance Hole Blockages:

There were 5 main line sewer blockages in 2021. These blockages were cleared prior to any spill to the environment

There were two maintenance hole (MH) blockages that resulted in raw wastewater spills to the environment. On April 3, 2021 a MH blockage resulted in a spill of approximately 50 Litres of wastewater at 150 Talisman Drive, this was reported to MECF and cleaned up by District and contractor staff.

On May 17, 2021 a MH at District owned housing on Lofty Pines overflowed due to a blockage resulting in a spill of wastewater of 60 Litres. This was reported to MECF and cleaned up by District and contractor staff.

Sewer Force Mains:

All the low pressure sewage force mains within the collection system were flushed by field staff through our annual preventive maintenance program.

The James St SPS forcemain was damaged and repaired at civic address 128 Old Muskoka Rd. Directional drilling by a contractor punctured the FM and a 350mm Repair clamp was installed by District Operations to repair the FM. The damage resulted in a spill of approximately 46,500 Litres and was reported to MECF and cleaned up by District and contractor staff.

Air Release Valves:

All twenty of the air release vacuum valves connected to the sewage force mains in our collection system were removed, cleaned, tested and reinstalled for the yearly maintenance inspection.

Sewer Flushing and Video Inspections:

Approximately 9122 meters of various size sanitary sewer mains were flushed using high pressure equipment. The two 250mm depressed (siphon) sewer mains from Kinister sewage pump station were swabbed from the collection chamber located in the Brydon Bay Road easement, through to the receiving chamber on Brydon Bay Road.

Sewer Rehabilitation:

There was rehab downstream of MHL37 on Muskoka Beach Rd. Repaired for collapsed pipe (New PVC sewer installed downstream of the MH)

Locates:

District staff completed 685 locate requests.

Table 4 Effluent Flow Summary 2021

| 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 | 75,567 | 2,438 | 2,674 | 2,233 | N/A | 75,567 |
| February | 67,261 | 2,402 | 2,747 | 2,216 | N/A | 67,261 |
| March | 103,628 | 3,343 | 5,086 | 2,340 | N/A | 103,628 |
| April | 93,444 | 3,115 | 3,845 | 2,597 | N/A | 93,444 |
| May | 86,312 | 2,784 | 3,387 | 2,383 | N/ | 86,312 |
| June | 81,770 | 2,726 | 4,854 | 2,256 | N/A | 81,770 |
| July | 104,362 | 3,367 | 4,440 | 2,950 | N/A | 104,362 |
| August | 85,540 | 2,759 | 3,325 | 2,261 | N/A | 85,540 |
| September | 80,940 | 2,698 | 3,559 | 2,345 | N/A | 80,940 |
| October | 81,456 | 2,628 | 2,822 | 2,377 | N/A | 94,934 |
| November | 86,521 | 2,884 | 3,549 | 2,266 | N/A | 91,057 |
| December | 96,205 | 3,103 | 4,425 | 2,503 | N/A | 93,004 |

Total Flow: 1,043,006 m³

Average Day: 2,858 m³

Maximum Day: 5,086 m³

Minimum Day: 2,216 m³

Table 5 Influent Quarterly Analysis Summary – Weekly 24 Hour Composite Sample Part 1

| Sample Date | Sample Identification Number | BOD5 mg/L | Total Phosphorus mg/L | Suspended Solids mg/L | Total Kjeldahl Nitrogen mg/L |
|-----------------------|-------------------------------------|------------------|------------------------------|------------------------------|-------------------------------------|
| February 4 | CA13716 | 185 | 3.2 | 271 | 1.8 |
| May 5 | CA13438 | 131 | 2.05 | 162 | 11.2 |
| August 18 | CA13075 | 213 | 2.19 | 271 | 14.7 |
| November 10 | CA12404 | 236 | 2.62 | 367 | 19.2 |
| Yearly Average | | 191.3 | 2.5 | 267.8 | 11.7 |
| Maximum | | 236.0 | 3.2 | 367.0 | 19.2 |
| Minimum | | 131.0 | 2.1 | 162.0 | 1.8 |

Table 6 Chemical Usage Summary: Alum

| Month | Average Dosage mg/L | Total kg (dry) |
|-----------|------------------------|----------------|
| January | 117.3 | 8,580.0 |
| Februar | 119.1 | 8,580.0 |
| March | 85.6 | 8,580.0 |
| April | 91.8 | 8,580.0 |
| May | 102.7 | 8,580.0 |
| June | 104.9 | 8,580.0 |
| July | 85.0 | 8,580.0 |
| August | 103.6 | 8,580.0 |
| September | 106.0 | 8,580.0 |
| October | 108.8 | 8,580.0 |
| November | 99.2 | 8,580.0 |
| December | 92.2 | 8,580.0 |

Total Yearly Kilograms: 102,960kg

Table 7 Chemical Usage Summary: Soda Ash

| Month | Average Dosage mg/L | Total kg (dry) |
|-----------|------------------------|----------------|
| January | 61.8 | 8,000.0 |
| February | 62.7 | 8,000.0 |
| March | 45.1 | 10,000.0 |
| April | 48.4 | 9,000.0 |
| May | 54.1 | 9,000.0 |
| June | 55.3 | 13,000.0 |
| July | 44.8 | 12,000.0 |
| August | 54.6 | 10,000.0 |
| September | 55.9 | 10,000.0 |
| October | 57.3 | 11,000.0 |
| November | 52.2 | 10,000.0 |
| December | 48.6 | 12,000.0 |

Total Yearly Kilograms: 122,000kg

Table 8 Chemical Usage Summary: Polymer

| Month | Average Dosage mg/L | Total kg |
|-----------|------------------------|----------|
| January | 197.7 | 125 |
| February | 281.0 | 150 |
| March | 211.6 | 125 |
| April | 172.1 | 150 |
| May | 180.9 | 200 |
| June | 103.6 | 100 |
| July | 153.9 | 200 |
| August | 168.2 | 200 |
| September | 168.8 | 175 |
| October | 208.2 | 200 |
| November | 178.9 | 150 |
| December | 251.4 | 100 |

Total Yearly kg: 1,875kg

Table 9 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 | Total Phosphorus mg/L | Suspended Solids mg/L |
|----------------|------------------------------|------------|----------------------------------|--------|-----------------------|-----------------------|
| February 4 | CA13716 | 2 | 66 | 7.03 | 0.04 | 2 |
| May 5 | CA13438 | 2 | 67 | 6.91 | 0.04 | 2 |
| August 18 | CA13075 | 2 | 50 | 6.90 | 0.04 | 2 |
| November 10 | CA12404 | 2 | 80 | 7.43 | 0.05 | 2 |
| Yearly Average | | 2 | 65.8 | 7.0675 | 0.0425 | 2 |
| Maximum | | 2 | 80.0 | 7.43 | 0.05 | 2 |
| Minimum | | 2 | 50.0 | 6.9 | 0.04 | 2 |

Table 10 Effluent Quarterly Analysis Summary – Weekly 24 Hour Composite Sample Part 2

| Sample Date | Sample Identification Number | Total Kjeldahl Nitrogen mg/L | Nitrate Nitrogen mg/L | Nitrite Nitrogen mg/L | Total Ammonia Nitrogen mg/L |
|-----------------------|-------------------------------------|-------------------------------------|------------------------------|------------------------------|------------------------------------|
| February 4 | CA13716 | 1.8 | 27.7 | 0.03 | 0.2 |
| May 5 | CA13438 | 0.5 | 22.1 | 0.03 | 0.1 |
| August 18 | CA13075 | 0.5 | 26.5 | 0.03 | 0.1 |
| November 10 | CA12404 | 0.7 | 29 | 0.03 | 0.1 |
| Yearly Average | | 0.9 | 26.2 | 0.03 | 0.1 |
| Maximum | | 1.8 | 28.5 | 0.03 | 0.2 |
| Minimum | | 0.5 | 22.1 | 0.03 | 0.1 |

Table 11 Effluent Loading and Concentration Summary 2021: COBD5

| Month | Average mg/L | Average kg/day | Maximum Daily kg/day |
|---------------------------|---------------------|-----------------------|-----------------------------|
| January | 2.25 | 5.48 | 6.02 |
| February | 2.00 | 4.80 | 5.49 |
| March | 2.40 | 8.02 | 12.21 |
| April | 2.25 | 7.01 | 8.65 |
| May | 2.00 | 5.57 | 6.77 |
| June | 3.25 | 8.86 | 15.78 |
| July | 2.00 | 6.73 | 8.88 |
| August | 2.00 | 5.52 | 6.65 |
| September | 2.00 | 5.40 | 7.12 |
| October | 2.00 | 5.26 | 5.64 |
| Novembe | 2.00 | 5.77 | 7.10 |
| December | 2.00 | 6.21 | 8.85 |
| Average Monthly | 2.18 | 6.22 | 8.26 |
| Effluent Objective | 5 | 25.82 | |
| Non-Compliance | 10 | 51.65 | |

Table 12 Effluent Loading and Concentration Summary 2021: Suspended Solids

| Month | Average mg/L | Average kg/day | Maximum Daily kg/day |
|---------------------------|---------------------|-----------------------|-----------------------------|
| January | 2.00 | 4.88 | 5.35 |
| February | 2.50 | 6.01 | 6.87 |
| March | 2.80 | 9.36 | 14.24 |
| April | 3.25 | 10.12 | 12.50 |
| May | 2.25 | 6.26 | 7.62 |
| June | 2.50 | 6.81 | 12.14 |
| July | 2.25 | 7.57 | 9.99 |
| August | 2.40 | 6.62 | 7.98 |
| September | 2.25 | 6.07 | 8.01 |
| October | 2.00 | 5.26 | 5.64 |
| November | 2.20 | 6.34 | 7.81 |
| December | 2.25 | 6.98 | 9.96 |
| Average Monthly | 2.39 | 6.86 | 9.01 |
| Effluent Objective | 5.00 | 25.82 | |
| Non-Compliance | 10.00 | 51.65 | |

Table 13 Effluent Loading and Concentration Summary 2021: Total Ammonia Nitrogen Summer

| Month | Average mg/L | Average kg/day | Maximum Daily kg/day |
|--------------------|--------------|----------------|----------------------|
| May | 0.10 | 0.28 | 0.34 |
| June | 0.10 | 0.27 | 0.49 |
| July | 0.10 | 0.34 | 0.44 |
| August | 0.10 | 0.28 | 0.33 |
| September | 0.10 | 0.27 | 0.36 |
| October | 1.55 | 4.07 | 4.37 |
| Average Monthly | 0.34 | 0.92 | 1.06 |
| Effluent Objective | 1 | 5.16 | |
| Non-Compliance | 5 | 25.8 | |

Table 14 Effluent Loading and Concentration Summary 2021: Total Ammonia Nitrogen Winter

| Month | Average mg/L | Average kg/day | Maximum Daily kg/day |
|--------------------|--------------|----------------|----------------------|
| January | 0.10 | 0.24 | 0.27 |
| February | 0.13 | 0.30 | 0.34 |
| March | 0.50 | 1.67 | 2.54 |
| April | 0.33 | 1.01 | 1.25 |
| November | 0.10 | 0.29 | 0.35 |
| December | 0.10 | 0.31 | 0.44 |
| Average Monthly | 0.21 | 0.64 | 0.87 |
| Effluent Objective | 1.00 | 5.16 | |
| Non-Compliance | 10.00 | 51.65 | |

Table 15 Effluent Loading and Concentration Summary 2021: E.Coli

| Month | Geomean (#/100mL) | Maximum Daily (#/100mL) |
|---------------------------|--------------------------|--------------------------------|
| January | 0.00 | 0.00 |
| February | 0.00 | 0.00 |
| March | 0.00 | 0.00 |
| April | 0.25 | 1.00 |
| May | 0.50 | 2.00 |
| June | 0.75 | 1.00 |
| July | 38.75 | 81.00 |
| August | 0.20 | 1.00 |
| September | 12.75 | 49.00 |
| October | 29.50 | 118.00 |
| November | 11.80 | 43.00 |
| December | 0.00 | 0.00 |
| Average Monthly | 0.96 | 24.67 |
| Effluent Objective | 0.00 | |
| Non-Compliance | 80.00 | |

Table 16 Effluent Loading and Concentration Summary 2021: Total Phosphorus

| Month | Average mg/L | Average kg/day | Maximum Daily kg/day |
|---------------------------|---------------------|-----------------------|-----------------------------|
| January | 0.03 | 0.07 | 0.08 |
| February | 0.03 | 0.07 | 0.08 |
| March | 0.04 | 0.13 | 0.20 |
| April | 0.03 | 0.09 | 0.12 |
| May | 0.06 | 0.17 | 0.20 |
| June | 0.03 | 0.09 | 0.16 |
| July | 0.06 | 0.20 | 0.27 |
| August | 0.03 | 0.09 | 0.11 |
| September | 0.06 | 0.16 | 0.21 |
| October | 0.03 | 0.08 | 0.08 |
| November | 0.04 | 0.12 | 0.14 |
| December | 0.03 | 0.09 | 0.13 |
| Average Monthly | 0.04 | 0.11 | 0.15 |
| Effluent Objective | 0.30 | 1.55 | |
| Non-Compliance | 0.30 | 1.55 | |

Table 17 Dewatered Sludge Production Summary 2021

| Month | Hauler | Liquid Volume m ³ | Cake Weight kg | Destination |
|-----------|--------|---------------------------------|-------------------|-------------|
| January | WESSUC | 632 | 19.20 | Lystek |
| February | WESSUC | 534 | 37.61 | Lystek |
| March | WESSUC | 591 | 63.31 | Lystek |
| April | WESSUC | 872 | 44.82 | Lystek |
| May | WESSUC | 1106 | 96.32 | Lystek |
| June | WESSUC | 965 | 93.29 | Lystek |
| July | WESSUC | 1300 | 82.70 | Lystek |
| August | WESSUC | 1189 | 75.53 | Lystek |
| September | WESSUC | 1037 | 60.86 | Lystek |
| October | WESSUC | 961 | 36.79 | Lystek |
| November | WESSUC | 839 | 60.27 | Lystek |
| December | WESSUC | 398 | 32.59 | Lystek |

Yearly Total tonnes: 703.3
 Yearly Average tonnes: 58.6
 Maximum tonnes: 96.3
 Minimum tonnes: 19.2

Table 18 Sludge Quality Analysis 2021

| Parameter Sampled (mg/L) | First Quarter (Feb 23) | Second Quarter (May 11) | Third Quarter (Aug 3) | Fourth Quarter (Nov 9) |
|--------------------------|------------------------|-------------------------|-----------------------|------------------------|
| Sample ID | CA13717 | CA13439 | CA13076 | CA12405 |
| Nitrate | 0.3 | 0.3 | 0.3 | 0.3 |
| Mercury | 0.01 | 0.008 | 0.005 | 0.011 |
| Chromium | 0.51 | 0.35 | 0.31 | 0.27 |
| Cobalt | 0.05 | 0.05 | 0.02 | 0.03 |
| Copper | 14 | 10 | 8.8 | 8.7 |
| Lead | 0.3 | 0.2 | 0.2 | 0.20 |
| Molybdenum | 0.15 | 0.09 | 0.1 | 0.12 |
| Nickel | 0.37 | 0.26 | 0.21 | 0.21 |
| Selenium | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Arsenic | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Zinc | 12 | 8 | 8 | 9 |
| Cadmium | 0.014 | 0.01 | 0.01 | 0.009 |
| Ammonia+ Ammonium | 695 | 714 | 548 | 482 |
| Total Kjeldahl Nitrogen | 1530 | 1650 | 1370 | 986 |
| Total Phosphorus | 644 | 450 | 52.3 | 33.3 |
| Total Solids | 20800 | 19400 | 18300 | 12500 |
| Total Suspended Solids | 20800 | 18500 | 14800 | 11800 |
| Nitrite | 0.2 | 0.2 | 0.2 | 0.2 |
| PO4 | 644 | 450 | 414 | 350 |

Table 19 Septage Quality and Quantity

| Month | BOD5 Mg/L | TSS Mg/L | Total Solids Mg/L | COD Mg/L | TP Mg/L | TKN Mg/L | Volume Septage M³ | Volume Biosolids M³ |
|------------------|----------------------|---------------------|----------------------------------|---------------------|--------------------|---------------------|---|---|
| January | 1,850 | 4,160 | 4,600 | 5,650 | 44.3 | 138 | 115.55 | 15.90 |
| February | 430 | 1,200 | 1,200 | 1,010 | 11.4 | 108 | 107.46 | 15.90 |
| March | 990 | 4,500 | 4,100 | 2,900 | 27.5 | 95.9 | 158.38 | 15.90 |
| April | 3,070 | 9,970 | 11,600 | 12,500 | 68.7 | 390 | 157.46 | 31.80 |
| May | 966 | 2,200 | 966,000 | 3,800 | 34.7 | 234 | 366.83 | 13.60 |
| June | 2,170 | 4,570 | 7,440 | 8,600 | 41.5 | 355 | 348.82 | 15.90 |
| July | 651 | 1,870 | 2,600 | 2,600 | 16 | 132 | 378.92 | 47.70 |
| August | 1,010 | 4,720 | 2,020 | 6,750 | 81.3 | 383 | 250.35 | 128.00 |
| September | 996 | 11,200 | 13,760 | 9,400 | 219 | 686 | 219.13 | 128.00 |
| October | 698 | 554 | 1,540 | 1,520 | 35.4 | 242 | 289.60 | 15.90 |
| November | 1,180 | 7,000 | 7,200 | 7,800 | 68 | 368 | 217.77 | 15.90 |
| December | 888 | 3,320 | 2140 | 2,380 | 19.2 | 144 | 187.37 | 63.60 |

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 Spicer
Director, Water and Wastewater Services

Mark Pringle, C.E.T.
Manager of Water and Wastewater Operations