



2022 Year End Report: Huntsville Mountview Wastewater Treatment Plant (WWTP)



Environmental Compliance Approval: # 1-0088-67-763806

Engineering and Public Works Department

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Introduction

The Huntsville Mountview Wastewater Treatment Plant, which services the Town of Huntsville, is owned and operated by the District Municipality of Muskoka. The plant is located at 20 Mountview Drive, Huntsville. It services a population of approximately 9,000 people.

The Plant operates under the Ministry of Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) (Sewage) #1-0088-67-763806, and as amended May 13 2010, and MECP ECA (Air) # 1771-7FJJZ5, issued June 2008. Under the terms of the ECA, the plant is permitted to treat an average daily flow of 3,640 meters cubed per day, and a peak flow of 13,638 meters cubed per day. Additionally, effluent limit criteria are as follows:

Table 1 Effluent Limit Criteria

Effluent Parameter	Concentration
CBOD	15 mg/L
Total Suspended Solids	15 mg/L
Total Phosphorous	0.50 mg/L 227.9 kg/year (combined with the Huntsville Golden Pheasant WWTP)

The plant is comprised of two separate facilities, both of which are conventional activated sludge treatment processes, consisting of primary and secondary clarifiers with aeration basins. Disinfection is accomplished by chlorination. The facility is also equipped with anaerobic digesters for bio-solids stabilization. The initial plant was commissioned in 1958 and is capable of handling approximately one-third of the total treatment capacity of the facility. The remaining portion of the plant was commissioned in 1976.

Waste sludge from the plant process is digested anaerobically at the plant and periodically hauled off site for disposal.

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 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 (#1-0088-67763806).

Quantity of Flow Summary

The plant has a daily average flow design capacity of 3,640 m³/day. The actual average daily flow for the 2022 was 2,779m³/day, however, the 3-year average is 2,792m³/day, which represents 77% of the plant capacity. None of the individual system components exceeded the design flow rating.

Plant Operational Upsets or Process Failures

In Fall of 2021, the floating roof system atop the secondary anaerobic digester lost buoyancy. The secondary digester was taken out of service and its contents shipped off site for further treatment. It remained out of service in 2022. Also in 2022, the Primary Digester also suffered operational challenges. An automatic level system was installed to provide more consistent level control to prevent overflows such as one that occurred when the primary digester was overfilled resulting in a spill that was contained to the immediate area around the digester in the parking lot. This spill was cleaned up and disinfected. As construction to convert the Mountview plant to a pump station is expected to commence in 2023, it is likely the secondary digester will remain offline until plant decommissioning. Operation of the primary digester will be limited to operating more as a holding vessel with increased frequency of hauling from this vessel to Golden Pheasant WWTP to reduce odours. This will continue until plant decommissioning.

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 (and not limited to):

- Monthly testing (under load) of the standby generators.
- Annual servicing of emergency standby generators.
- Annual calibration of flow metering devices.
- Annual cleaning of all sewage pumping stations if required.
- 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 77% and is in compliance with specified effluent parameter criteria. In addition, there has been no significant treatment process upsets and plant bypasses. Planning work to convert the Mountview Wastewater Treatment Plant to a sewage pump station continued in 2022. Ainley Group were awarded the contract to design of the replacement pump station and sewage forcemain to the Golden Pheasant Wastewater Treatment Plant. This conversion project is expected to begin construction in 2023 with completion expected in 2024.

Evaluation Summary of Proposed Work Requiring Approval under OWRA

Mountview Wastewater Treatment Plant has long been planned for conversion to a pumping station which directs flow to the Golden Pheasant Wastewater Treatment Plant. This project will complete design and begin construction in 2023. These changes to the works will require approval under OWRA and pre-consultation was held in 2022 to address this requirement.

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)	43	470	255	91.8
Suspended Solids (mg/L)	71	741	337	121.3
Total Phosphorus (mg/L)	1.90	6.1	4.12	1.5
Total Ammonia Nitrogen (mg/L)	13.0	40.4	25.5	9.2

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 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)	2.0	4.3	3.1	1.12
Suspended Solids (mg/L)	2.0	9.0	6.0	2.16
Ammonia (mg/L)	8.4	23.5	15.0	5.40
E. Coli (#/100 mL)	0	594	61.8	N/A
Total Phosphorus (mg/L)	0.03	0.26	0.13	0.05
pH	7.13	7.81	7.62	N/A

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.

Final Effluent Sampling Summary

All samples were collected following the frequency and methods required by the facility approval. For the coming year, 2023, no changes to the sampling plan are being considered at this time.

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 was hauled to an approved landfill site. Private contractors were used by the District of Muskoka to transfer all material for disposal in 2021, and will continue to do so in 2022. It is anticipated that there will be a significant increase in the frequency of bio solids hauled in 2022 due to failure of the roofing system of the secondary anaerobic digester. It is anticipated that increased frequency of haulage for additional treatment at Golden Pheasant will be far more cost efficient than replacement of the digester roof systems this close to plant decommissioning.

Summary of Complaints received throughout the reporting period

There were no complaints received during the 2022 reporting period. There were a few calls from interested citizens in 2022 enquiring as to when the Mountview Wastewater Treatment Plant is scheduled for conversion to a sewage pump station.

Huntsville Mountview Wastewater Treatment Plant Collection Summary

New Sewer Services:

A total of 35 customers connected to existing sewer laterals in 2022, 1 of which were installed in 2022.

One 125 mm PVC sewer service was installed by the owner's contractor. This service is located at 30 West Street N.

New Sewer Mains:

A total of 140 meters of 200 mm gravity sewer was replaced in 2022 on Main Street West as part of the "Diggin' Downtown" infrastructure upgrades.

A total of 680 meters of 200mm gravity sewer was installed in 2022 on Eagle Crest Ave by Owner's contractor.

New Maintenance Holes:

Two maintenance holes were replaced in 2022 on Main Street West as part of the Diggin Downtown infrastructure upgrades.

Thirteen maintenance holes were installed by Owner's contractor in 2022 on Eagle Crest Ave.

Two maintenance hole top sections were repaired or replaced with auto stable frame and covers in 2022.

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

No sewer forcemains were replaced in 2022.

Main Line Sewer Blockage

There were no sewer main blockages in 2022.

Sewer Lateral Blockage

There was 1 sewer lateral blockage in 2022. The cost to repair was \$24,931.88.

Service Low Pressure Sewer Blockages:

There were no low-pressure sewer blockages in 2022.

Frozen Sewer Force Mains:

No sewer forcemains froze 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.

Air Release Valve Inspections:

All 41 air-vacuum release valves were inspected in 2022.

Sewer Locates:

Field staff addressed 858 written locate requests in 2022.

Table 4 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	60,730	1,959	2,687	2013	N/A	
February	65,381	2,109	3,693	2118	N/A	
March	107,626	3,472	5,343	2290	N/A	
April	138,984	4,483	6,275	3979	N/A	
May	108,331	3,495	4,336	3291	N/A	
June	101,784	3,283	4,431	2623	N/A	
July	72,704	2,345	2,727	1984	N/A	
August	75,148	2,424	3,450	2113	N/A	
September	51,447	1,660	3,676	2127	N/A	
October	73,691	2,377	3,775	2446	N/A	
November	73,815	2,461	3,049	2234	N/A	
December	84,830	2,736	4,488	2111	N/A	

Total Flow: 1,014,472
 Average Day: 2,779
 Maximum Day: 6,275
 Minimum Day: 1,9

Table 5 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 01/22	CA13072	631			1.84	4.50	587
May 10/22	CA12526	176			3.08	4.00	180
Aug 02/22	CA12100	96			1.56	2.51	153
Nov 08/22	CA13289	244			1.58	3.20	240
Yearly Average		287			2.02	3.55	290
Maximum		631			3.08	4.50	587
Minimum		96			1.56	2.51	153

Table 6 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 01/22	CA13072		55.2	<0.06	0.07	27.8	
May 10/22	CA12526		34.3	<0.06	<0.03	29.7	
Aug 02/22	CA12100		23.1	0.06	0.06	19.9	
Nov 08/22	CA13289		28.0	0.06	0.03	22.2	
Yearly Average			35.2	0.06	0.05	24.9	
Maximum			55.2	0.06	0.07	29.7	
Minimum			23.1	0.06	0.03	19.9	

Table 7 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 01/22	CA13072	5		7.83	0.03	0.12	6
May 10/22	CA12526	4		7.55	0.04	0.12	2
Aug 02/22	CA12100	2		7.55	< 0.03	0.17	6
Nov 08/22	CA13289	2		8.10	< 0.04	0.14	4
Yearly Average		3.3		7.76	0.04	0.14	4.5
Maximum		5		8.10	0.04	0.17	6
Minimum		2		7.55	0.03	0.12	2

Table 8 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 01/22	CA13072		21.2	5.41	0.16	20.5	
May 10/22	CA12526		17.0	0.44	0.08	15.6	
Aug 02/22	CA12100		0.17	4.24	0.03	20.9	
Nov 08/22	CA13289		0.14	9.30	0.83	9.90	
Yearly Average			9.63	4.85	0.28	16.7	
Maximum			21.2	9.30	0.83	20.5	
Minimum			0.14	0.44	0.03	9.90	

Table 9 Effluent Loading and Concentration Summary 2022: CBOD5

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	3.50	6.86	9.41
February	4.25	8.96	15.70
March	3.60	12.50	19.24
April	3.50	15.69	21.96
May	3.20	11.18	13.88
June	2.60	8.54	11.52
July	3.25	7.62	8.86
August	2.60	6.30	8.97
September	2.00	3.32	7.35
October	2.50	5.94	9.44
November	2.80	6.89	8.54
December	4.00	10.95	17.95
Average Monthly	3.15	8.73	12.73
Effluent Objective	N/A	N/A	N/A
Non-Compliance	15.0	46.07	46.07

Table 10 Effluent Loading and Concentration Summary 2022: Suspended Solids

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	6.25	12.24	16.79
February	5.75	12.13	21.24
March	8.60	29.86	45.95
April	5.25	23.54	32.94
May	4.60	16.07	19.95
June	6.40	21.01	28.36
July	8.50	19.93	23.18
August	4.20	10.18	14.49
September	4.75	7.88	17.46
October	4.25	10.10	16.04
November	6.20	15.26	18.90
December	7.50	20.52	33.66
Average Monthly	6.02	16.56	24.08
Effluent Objective	N/A	N/A	N/A
Non-Compliance	15	46.07	46.07

Table 11 Effluent Loading and Concentration Summary 2022: Total Ammonia Nitrogen Summer

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
May	16.90	59.06	73.29
June	13.42	44.06	59.46
July	19.78	46.39	53.94
August	16.16	39.17	55.76
September	11.35	18.84	41.72
Average Monthly	15.52	41.5	56.8
Effluent Objective	N/A	N/A	N/A
Non-Compliance	N/A	N/A	N/A

Table 12 Effluent Loading and Concentration Summary 2022: Total Ammonia Nitrogen Winter

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	14.95	29.29	40.17
February	22.88	48.26	84.51
March	18.88	65.55	100.88
April	13.65	61.20	85.65
October	11.83	28.12	44.66
November	9.58	23.57	29.21
December	9.50	26.00	42.64
Average Monthly	16.44	40.28	61.10
Effluent Objective	N/A	N/A	N/A
Non-Compliance	N/A	N/A	N/A

Table 13 Effluent Loading and Concentration Summary 2022: Fecal Coliform

Month	#/100mL	Maximum Daily (#/100mL)
January	1.41	2.00
February	5.20	23.00
March	12.49	26.00
April	33.04	122.00
May	20.00	2220.00
June	0.00	360.00
July	0.00	12.00
August	0.00	1.00
September	0.00	3.00
October	0.00	51.00
November	9.09	23.00
December	13.58	21.00
Average Monthly	7.90	238.7
Effluent Objective	N/A	N/A
Non-Compliance	N/A	N/A

Table 14 Effluent Loading and Concentration Summary 2022: Total Phosphorus

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	0.11	0.22	0.30
February	0.15	0.32	0.55
March	0.15	0.52	0.80
April	0.11	0.49	0.69
May	0.14	0.49	0.61
June	0.08	0.26	0.35
July	0.13	0.30	0.35
August	0.14	0.34	0.48
September	0.09	0.15	0.33
October	0.12	0.29	0.45
November	0.16	0.39	0.49
December	0.26	0.71	1.17
Average Monthly	0.14	0.37	0.55 kg/day 201 kg/year
Effluent Objective			
Non-Compliance	0.50	892 kg/year	892 kg/year

Table 15 Liquid Sludge Production Summary 2022

Month	Hauler	Liquid Volume m ³	Cake Weight kg	Destination
January	K&K	645.32		Golden Pheasant
February	K&K	620.37		Golden Pheasant
March	K&K	696.42		Golden Pheasant
April	K&K	611.55		Golden Pheasant
May	K&K	491.99		Golden Pheasant
June	K&K	734.95		Golden Pheasant
July	K&K	951.88		Golden Pheasant
August	K&K	915.12		Golden Pheasant
September	K&K	399.16		Golden Pheasant
October	K&K	967.63		GP-437.63 530 to ROHES
November	K&K	372.47		GP-105.47 267 to ROHES
December	K&K	599.58		Golden Pheasant
Average		667.20		

Yearly Total Volume: 8,006.44
Yearly Average Volume: 667.20
Maximum Volume: 967.63
Minimum Volume: 372.47

Table 16 Sludge Quality Analysis 2022

Parameter Sampled (mg/L)	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Date	Feb 01, 2022	May 10, 2022	Aug 02, 2022	Nov 08, 2022
Sample ID	Digested Sludge	Digested Sludge	Digested Sludge	Digested Sludge
Nitrate	<0.3	<0.3	2.5	0.3
Mercury	0.007	0.006	0.009	0.001
Chromium	0.38	0.38	0.25	0.06
Cobalt	0.05	0.06	0.03	0.01
Copper	6.4	5.3	4.5	1.1
Lead	0.2	0.5	0.2	0.10
Molybdenum	0.09	0.09	0.08	0.05
Nickel	0.19	0.20	0.12	0.04
Selenium	<0.1	<0.1	< 0.10	< 0.10
Arsenic	<0.1	<0.1	< 0.1	< 0.1
Zinc	9	9	7	2
Cadmium	0.021	0.02	0.011	0.005
Ammonia+ Ammonium	544	110	443	95.8
Total Kjeldahl Nitrogen	1310	1080	1100	383
Total Phosphorus	480	440	405	88
Total Solids	19200	29500	15100	5030
Nitrite	<2	<0.2	2.5	0.6

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