

## 2023 Year End Report: Huntsville Golden Pheasant Wastewater Treatment Plant (WWTP)



Environmental Compliance Approval: # 6591-&M9LU6 amended under ECA#9847B6KR4X  
Jan 14, 2019

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## Introduction

The Huntsville Golden Pheasant Clean Wastewater Treatment Plant, which services the Town of Huntsville, is owned, and operated by the District Municipality of Muskoka. The plant is located at 620 Highway 60, Huntsville. It services a population of approximately 7,500 people.

The Plant operated under the Ministry of Environment Conservation and Parks (MECP) Environmental Compliance Approval (ECA) # 6591-7M9LU6, issued December 2008 and under MECP Environmental Compliance Approval (ECA) (Air) #66234YLK6T issued August 2001. On January 14, 2019, the ECA #9847-B6KR4X was issued by the Ministry of Environment as an amended ECA to account for upgrades to the UV disinfection system, the installation of a Soda Ash batching system for alkalinity addition and to provide for the construction of a Sludge Thickening System. Also, the amended ECA allows for the addition of an additional process tank and conversion of the aeration/mixing systems from coarse air to fine bubble diffusion which will significantly improve plant efficiency. Under the terms of the ECA, the plant is permitted to treat an average daily flow of 4,456 m<sup>3</sup>/day, and a peak flow of 13,330 m<sup>3</sup>/day. Additionally, effluent limit criteria are as follows:

*Table 1 Effluent Limit Criteria*

<b>Effluent Parameter</b>	<b>Concentration</b>
CBOD	15 mg/L
Total Suspended Solids	15 mg/L
Total Phosphorous	0.30 mg/L 227.9 kg/year (combined with the Huntsville Mountview CWP)
E. coli	80 counts/100mL
pH	6.0 – 9.5 inclusive

The plant is a conventional activated sludge treatment process, consisting of primary and secondary clarifiers with aeration basins. Tertiary filtration and Ultra-Violet disinfection is also part of the treatment process. The facility is also equipped with anaerobic digesters for bio-solids stabilization and a dewatering process for final disposal.

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 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, 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 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 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. In regard to CBOD5, Exceedance Notification # 1-4KV6PG was created for the month of December when the plant experienced an unusual influent flow that challenged the process. Operations observed, sampled, and adjusted accordingly until the process was regained.

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 #9847-B6KR4X.

## Quantity of Flow Summary

The plant has a daily average flow design capacity of 4,456 m<sup>3</sup>/day. The actual average daily flow for the 2023 was 2963m<sup>3</sup>/day, however, the 3-year average is 2457m<sup>3</sup>/day, which represents 55.1% of the plant capacity. None of the individual system components exceeded the design flow rating.

## Plant Operational Upsets or Process Failures

In early April, an extreme weather event (heavy rain & snow melt) added strain on the Wastewater Treatment Plant due to sudden high flows, which resulted in a short lived filter bypass event (reference# 1-34XWTB) of 261m<sup>3</sup>. Operations staff were able to quickly address the issue to reduce the amount bypassed.

The biosolids generation system experienced a major mechanical due to a failure with the centrifuge in late May. This created the necessity to haul liquid sludge to an off-site treatment center

for an extended period until repair could be made. The centrifuge equipment was recommissioned in late December and has been running well since.

Final effluent parameter CBOD5, Exceedance Notification # 1-4KV6PG was created for the month of December when the plant experienced an unusual influent flow that challenged the process. Operations observed, sampled, and adjusted accordingly until the normal biological process and effluent quality was restored.

### Summary of Maintenance in 2023

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 of emergency testing (under load) of the standby generators.
- Annual servicing of emergency standby generators.
- Annual replacement of U.V. bulbs.
- Periodic infrared inspection of Motor Control panels.
- Annual calibration of flow metering devices.
- Annual cleaning of all sewage pumping stations if required.
- 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 55.1% and is in compliance with specified effluent parameter criteria. In addition, there has been no significant treatment process upsets and plant bypasses. As a result, there is no need for improvements to the existing works for these reasons, however, as Mountview Wastewater Treatment Plant is scheduled for conversion to a pump station then decommissioned in 2026 and 2027, and the flows from Mountview collection area directed then to Golden Pheasant, a suite of phased projects is underway to provide sufficient treatment capacity.

To achieve the required treatment capabilities required by the ECA, the following upgrades will be necessary:

- Installation of additional high efficiency blowers and aeration diffusers.
- Additional process tankage including one new clarifier unit with provision for a fourth clarifier in future.
- Increase to waste activated sludge thickening systems capacity.
- New filtration system
- Increased UV disinfection capacity
- New inlet works equipment

### Evaluation Summary of Proposed Work Requiring Approval under OWRA

All upgrade works described are subject to approval under OWRA. An application for amendment to the facility ECA was submitted and approval received in January 2019 which

permits alteration/improvement of the works as part of the first phase of contracts which are now complete. Further application was submitted in December of 2023 and approval will be required prior to commencement of construction of the second phase of contracts, expected to commence in the second quarter of 2024.

### 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)	38	253	126	280.35
Suspended Solids (mg/L)	54	413	184	409.4
Total Phosphorus (mg/L)	0.28	4.1	4.1	9.12
Total Ammonia Nitrogen (mg/L)	4.7	22.1	22.1	49.17
pH	6.49	7.44	7.06	N/A

### 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

Final effluent parameter CBOD5, Exceedance Notification # 1-4KV6PG was created for the month of December when the plant experienced an unusual influent flow that challenged the process. Operations observed, sampled, and adjusted accordingly until the process was regained.

### Final Effluent Analysis Summary

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

Final effluent parameter CBOD5, Exceedance Notification # 1-4KV6PG was created for the month of December when the plant experienced an unusual influent flow that challenged the process. Operations observed, sampled, and adjusted accordingly until the process was regained.

*Table 3 Final Effluent Analysis Summary*

Parameter	Minimum	4 Week Average Maximum	Annual Average	Average Loading kg/day
COBD5 (mg/L)	2	20.75	3.76	10.98
Suspended Solids (mg/L)	2	4.3	2.99	8.90
Ammonia (mg/L)	0.1	5.37	0.37	2.85
E. Coli (#/100 mL)	0	143	5.3	N/A
Total Phosphorus (mg/L)	0.03	0.08	0.04	0.12
pH	6.26	7.67	6.84	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, 2024, no changes to the sampling plan are being considered currently.

### 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 2023 and will continue to do so in 2024. It is not anticipated that there will be a significant increase in the total volume of bio solids produced in 2024.

### Biosolids Co-Treatment

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 2023 and will continue to do so in 2024. It is not anticipated that there will be a significant increase in the total volume of bio solids produced in 2024.

Summary of Complaints received throughout the reporting period:

There were no complaints received in the reporting period.

## Huntsville Golden Pheasant Wastewater Collection Summary

### New Sewer Services:

A total of 40 customers connected to existing sewer laterals in 2023.

### New Sewer Mains:

A total of 356.6 meters of gravity sewer was installed in 2023.

### New Maintenance Holes:

There were 7 maintenance holes installed in 2023.

### Sewer Main Replacements:

There were no sewer main replacements in 2023.

### Low Pressure Sewer Breaks:

There were no low-pressure sewer breaks in 2023.

### Sewer Force Main Breaks:

There was 1 sewer forcemain break in 2023.

### Sewer Force Main Replacement

There were no sewer force mains replaced in 2023.

### Main Line Sewer Blockage

There was 1 sewer main blockage in 2023.

### Sewer Lateral Blockage

There were no sewer lateral blockages in 2023.

### Service Low Pressure Sewer Blockages:

There were no low-pressure sewer blockages in 2023.

### Frozen Sewer Force Mains:

There were no frozen sewer force mains in 2023.

### Frozen Sewer Service Laterals:

There were no sewer service laterals froze in 2023.

### Frozen Low Pressure Sewer Services:

There were no low-pressure sewer services froze in 2023.

### Sewer Flushing/Video:

There was 1500.7m of sanitary sewer flushed. Approximately 2900.3m that was flushed, and video inspected in 2023.

### Sewer Locates:

Field staff addressed 955 written locate requests in 2023.

### Air Release Valves:

All 41 air-vacuum release valves were inspected in 2023.



Table 4 Effluent Flow Summary - 2020

Month	Plant Total Monthly (m <sup>3</sup> )	Average Day Flow (m <sup>3</sup> /d)	Maximum Day Flow (m <sup>3</sup> /d)	Minimum Day Flow (m <sup>3</sup> /d)	Lagoons Monthly Flow (m <sup>3</sup> )	Facility Total Monthly Flow (m <sup>3</sup> )
January	101,882	3287	6120	2389		101882
February	78946	2819	3413	2424		78946
March	100340	3237	4501	2459		100340
April	134455	4482	6943	3499		134455
May	94603	3052	5699	2049		94603
June	75583	2519	3567	1861		75583
July	89154	2876	3471	2220		89154
August	82491	2661	3486	1673		82491
September	73097	2437	3471	1515		73097
October	80410	2594	3396	1432		80410
November	81420	2714	3101	2378		81420
December	89201	2877	3492	2358		89201

Total Flow: 1081584  
 Average Day: 2963  
 Maximum Day: 6943  
 Minimum Day:

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

Sample Date	Sample Identification Number	BOD5 mg/L	Phosphate	Total Phosphorus mg/L	Suspended Solids mg/L
Jan 25, 2023	CA13786	101	0.3	1.76	127
May 3, 2023	CA13174	65	0.03	1.00	108
Aug 16, 2023	CA12688	457	0.14	2.48	139
Oct 24, 2023	CA15830	218	1.62	3.11	136
<b>Yearly Average</b>		210	0.52	2.09	128
<b>Maximum</b>		457	1.62	3.11	139
<b>Minimum</b>		65	0.03	1.00	108

Table 6 Influent 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
Jan 25, 2023	CA13786	18.7	0.06	0.03	16.4
May 3, 2023	CA13174	15.2	0.39	0.32	13.8
Aug 16, 2023	CA12688	32.2	0.06	0.03	27.8
Oct 24, 2023	CA15830	26.6	0.06	0.03	24.8
<b>Yearly Average</b>		23.2	0.14	0.10	20.7
<b>Maximum</b>		32.2	0.39	0.32	27.8
<b>Minimum</b>		15.2	0.06	0.03	13.8

Table 7 Chemical Usage Summary: Clarion A405P

Month	Average Dosage mg/L	Total kg
January	30.2	6204
February	23.4	4092
March	24.7	3901
April	21.5	5940
May	25.9	4752
June	31.5	4884
July	28.0	5148
August	24.4	3960
September	24.4	3564
October	25.7	4224
November	29.9	5016
December	32.8	5940

Total Yearly Kilograms: 57625 kg

Table 8 Chemical Usage Summary: Soda Ash

Month	Average Dosage mg/L	Total kg
January	65.3	4337
February	73.3	3917
March	65.3	4337
April	39.1	3794
May	30.5	2246
June	54.1	3352
July	41.9	2917
August	45.4	2938
September	48.9	2804
October	46.1	2798
November	42.4	2518
December	46.5	2869

Total Yearly Kilograms: 38827 kg

Table 9 Effluent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 1

Sample Date	Sample Identification Number	CBOD5 mg/L	pH	Phosphate	Total Phosphorus mg/L	Suspended Solids mg/L
Jan 25, 2023	CA13786	2	7.52	0.03	0.06	5
May 3, 2023	CA13174	2	7.87	0.03	0.03	2
Aug 16, 2023	CA12688	3	7.46	0.03	0.06	4
Oct 24, 2023	CA15830	2	7.61	0.03	0.04	3
<b>Maximum</b>		2.3	7.66	0.03	0.06	3.5
<b>Minimum</b>		2	7.46	0.03	0.03	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
Jan 25, 2023	CA13786	0.5	23	0.05	0.4
May 3, 2023	CA13174	1.9	10.1	0.07	2.0
Aug 16, 2023	CA12688	0.6	21.6	0.03	0.1
Oct 24, 2023	CA15830	0.5	15	0.03	0.1
<b>Yearly Average</b>		0.9	17.3	0.05	0.7
<b>Maximum</b>		1.9	21.6	0.07	2.0
<b>Minimum</b>		0.5	10.1	0.03	0.1

Table 11 Effluent Loading and Concentration Summary 2023: COBD5

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	2.25	7.39	13.77
February	2.5	7.05	8.53
March	2.00	6.47	9.00
April	2.00	8.96	13.89
May	2.40	7.32	13.68
June	2.40	6.05	8.56
July	2.40	6.90	8.33
August	2.20	5.85	7.67
September	2.25	5.48	7.81
October	2.00	5.19	6.79
November	2.00	5.43	6.20
December	20.75	59.71	72.47



Table 12 Effluent Loading and Concentration Summary 2023: Suspended Solids

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	3.50	11.50	21.42
February	3.00	8.46	10.24
March	2.20	7.12	9.90
April	3.20	14.34	22.22
May	3.80	11.60	21.66
June	3.60	9.07	12.84
July	3.80	10.93	13.19
August	2.60	6.92	9.06
September	2.75	7.13	9.34
October	2.75	7.13	9.34
November	2.40	6.51	7.44
December	2.25	6.47	7.86

Table 13 Effluent Loading and Concentration Summary 2023: Total Ammonia Nitrogen Summer

<b>Month</b>	<b>Average mg/L</b>	<b>Average kg/day</b>	<b>Maximum Daily kg/day</b>
<b>May</b>	0.70	2.14	3.99
<b>June</b>	0.25	0.62	0.89
<b>July</b>	0.10	0.28	0.35
<b>August</b>	0.56	1.49	1.95
<b>September</b>	0.10	0.24	0.35

*Table 14 Effluent Loading and Concentration Summary 2023: Total Ammonia Nitrogen Winter*

<b>Month</b>	<b>Average mg/L</b>	<b>Average kg/day</b>	<b>Maximum Daily kg/day</b>
January	0.25	0.82	1.53
February	0.78	2.19	2.65
March	0.48	1.55	2.16
April	5.37	24.07	37.28
October	0.10	0.24	0.34
November	0.10	0.27	0.31
December	0.10	0.29	0.35

Table 15 Effluent Loading and Concentration Summary 2023: 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	79.00
May	0.00	1.00
June	0.00	5.00
July	0.00	1.00
August	0.00	16.00
September	3.83	24.00
October	0.00	143
November	0.00	0.00
December	0.00	0.00

Table 16 Effluent Loading and Concentration Summary 2023: Total Phosphorus

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	0.05	0.15	0.28
February	0.06	0.16	0.19
March	0.03	0.10	0.14
April	0.04	0.18	0.28
May	0.04	0.13	0.24
June	0.04	0.10	0.14
July	0.04	0.12	0.14
August	0.05	0.13	0.17
September	0.04	0.09	0.12
October	0.05	0.13	0.17
November	0.04	0.12	0.13
December	0.04	0.10	0.12

Table 17 Liquid Sludge Production Summary 2023

Month	Hauler	Liquid Volume m <sup>3</sup>	Cake Weight kg	Destination
January	ROHES		69840	Lystek
February	ROHES		42980	Lystek
March	ROHES		66740	Lystek
April	ROHES		52160	Lystek
May	ROHES	1123		ROHES
June	ROHES	448		ROHES
July	ROHES	492		ROHES
August	ROHES	653		ROHES
September	ROHES	611		ROHES
October	ROHES	766		ROHES
November	ROHES	732		ROHES
December	ROHES	395		ROHES

M3 Yearly Total Volume: 5220 m3  
 Kg Yearly Total Volume: 231720 kg

Table 18 Sludge Quality Analysis 2023

Parameter Sampled (mg/L)	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Date	Jan 2023	May 2023	Aug 2023	Oct 2023
Nitrate	0.3	0.3	3	3
Mercury	0.005	0.007	0.006	0.007
Chromium	0.16	0.28	0.25	0.18
Cobalt	0.03	0.05	0.04	0.02
Copper	3.8	5.6	8.4	5.9
Lead	0.2	0.2	0.2	0.2
Molybdenum	0.05	0.110	0.12	0.07
Nickel	0.11	0.19	0.16	0.13
Selenium	0.1	0.1	0.1	0.1
Arsenic	0.1	0.1	0.1	0.1
Zinc	5	7	10	6
Cadmium	0.008	0.019	0.015	0.009
Total Kjeldahl Nitrogen	1050	993	1120	826
Total Phosphorus	210	363	420	333
Total Solids	11000	14500	17100	13000
Volatile Solids	41	40		
Nitrite	0.2	0.2	3	3

## 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

Darren Ronson  
Manager of Water and Wastewater Operations