



Wastewater Lagoons Annual Report 2024



February 10, 2025, Version 1.0.

Wastewater Lagoons Annual Report 2024

Version 1.0

Prepared by:

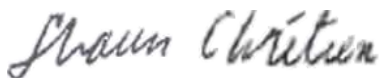


Andy Bilash
Manager of Wastewater Treatment

25-Mar 2025

Date

Approved by:



Shawn Chretien
Director of Water Wastewater Treatment &
Compliance

25-Mar 2025

Date

Contents

Introduction to the Annual Wastewater Report	4
Capreol Lagoon.....	4
Chelmsford Lagoon.....	7
Garson Lagoon	8
Wahnapitae Lagoon	9
Appendices	13
• 2024 Capreol Lagoon Annual Performance Report.....	13
• 2024 Capreol Lagoon Vermilion Sampling	13
• 2024 Capreol Lagoon Water Levels	13
• 2024 Capreol Lagoon Groundwater Monitoring Wells Data	13
• 2024 Capreol Lagoon Groundwater Monitoring Tables	13

Introduction to the Annual Wastewater Report

Under Environmental Compliance Approval (ECA) agreements issued by the Ministry of Environment, Conservation & Parks (MECP), the City is required to annually report on the values/parameters indicated in the ECA and made available to the District Manager by March 31st of the calendar year following the period being reported upon.

The City of Greater Sudbury owns and operates four (4) Wastewater Lagoons each having their own distinct annual reporting requirements. To ensure compliance, the city will report on each facility separately. Individual annual lagoon summary reports are attached at the end of the report as appendices.

Capreol Lagoon Annual Performance Report

Capreol Lagoon is operated as an exfiltration lagoon system with a rated capacity of 5,000 m³/d. Natural processes in the lagoon cell provide treatment of the wastewater. Effluent passes over a weir and through a culvert from the North Cell to the South Cell. The effluent then filters through the ground in the South Cell and travels easterly towards the Vermilion River. The system is operated on the conditions of the Ministry of Environment, Certificate of Approval Number 8214-4UVPUZ.

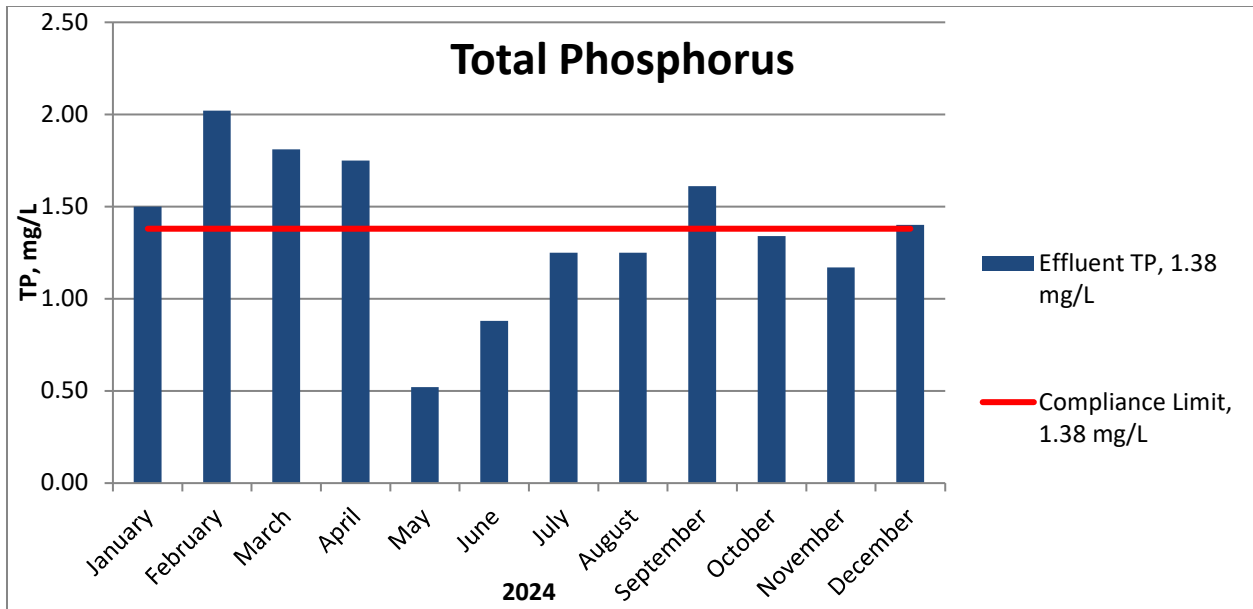
a. Summary of all monitoring data including an overview of the success and adequacy of the sewage treatment program.

All influent and effluent monitoring data is graphed and reviewed monthly by compliance and plant supervisory staff. For the Capreol Lagoon, all parameters fell within lagoon design objectives apart from effluent Total Phosphorus with an average value matching the 1.38 mg/L limit. Ferric sulphate is added at the entry point of the lagoon for phosphorus removal. Jar tests will be conducted in 2025 to optimize dosing. If abnormal influent issues occur, the city's Environmental Compliance Officers are deployed to investigate and react.

Influent	2024	2023	2022	2021	2020
BOD ₅ (mg/L)	47	79	84	98	105
TSS (mg/L)	81	72	140	83	73
TP (mg/L)	1.47	2.02	2.13	2.87	1.90
TKN (mg/L)	10.3	12.4	14.6	19.4	13.7

Effluent	2024	2023	2022	2021	2020
Avg Daily Flow (m ³ /d)	2732	2621	2312	2368	3007
BOD ₅ (mg/L)	17.10	24.24	25.63	25.78	26.97
TSS (mg/L)	18.33	20.12	29.20	25.39	23.41
TP (mg/L)	1.38	1.38	1.74	2.02	1.58
Total Ammonia (mg/L)	7.36	9.87	6.70	8.79	8.02

Effluent (Loading)	2024	2023	2022	2021	2020
TSS (kg/d)	50.16	52.34	66.93	59.80	68.95
TP (kg/d)	3.63	3.40	4.55	2.87	4.50
Total Ammonia (kg/d)	18.82	24.59	14.28	20.51	21.58



b. Comprehensive interpretation of all monitoring and analytical data obtained during the reporting period, and a comparison to the "baseline data" described in condition 4.1 for the ECA.

All analytical data described in condition 4.1 as well as parameters outlined in condition 2.1 are monitored as required. Annual performance report with all information will be included in this report.

c. Summary of any quality assurance or control measures undertaken during the reporting period.

Operations conduct rounds which are recorded in lagoon logbook. Lift station flow monitoring record continuous trending for influent flows. Lab analysis is performed several times per week in addition to samples being collected and sent out for third party testing. Lagoon monthly reports are created containing flow, in house lab results and third-party lab results. This data is transferred to monthly and annual performance reports by a data clerk ensuring all information is accounted for. It is then sent to the area supervisor for final review.

d. Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism, or thing forming a part of the works.

The operating and maintenance staff at the Capreol Lagoon conducts scheduled and emergency maintenance of the WWTP equipment. The City of Greater Sudbury utilizes a Computerized Maintenance Management System (CMMS) known as Antero to issue work orders and maintain records for regular maintenance and emergency repair at the WWTP.

Corrective (1)
Pump out valve chamber
Regular Scheduled Maintenance (3 Completed)
Monitor Wells
Exercise Valves
Regulated Works Orders (1 Completed)
Operations Manual Review

- e. **An account of any environmental and operating problems encountered at the site of the sewage treatment plant and the mitigative measures taken during the reporting period.**

The lagoon has experienced issues with effluent phosphorus removal. CGS staff have chemically treated the lagoon since 2022 and continue to study chemical dosing strategies.

- f. **Summary of any alterations, extensions or replacements in the process or operation of the works which are considered for implementation over the next reporting period, especially those which may require approval under the Ontario Water Resources Act.**

Due to annual daily flow averages for 2023 surpassing 2500 m³/day, the sampling frequency increased from monthly to every two weeks per the *Wastewater Systems Effluent Regulations* under the federal *Fisheries Act*. This also creates the obligation to test for acute lethality every quarter.

- g. **A list of users of Vermilion River, located on the downstream of the sewage works, up to a distance agreed to by the District Manager.**

Attached is a map of flow downstream of the Capreol lagoon with distances. A list of downstream residential property owners is available if required.



- h. **An interpretation of data, opinion on performance of the lagoon treatment plant, impact on the environment and, need for remedial measures, if required based on surface water results.**

Based on annual surface water performance report (included) all ECA parameters have been adhered to for this reporting year. No need for remedial measures for next reporting year. Efforts will be undertaken to improve phosphorus removal using ferric sulphate dosing at the Vermilion lift station.

Chelmsford Lagoon

Annual Performance Report

Chelmsford lagoon is operated as an offline emergency storage lagoon for the Chelmsford Water Pollution Control Plant approved under Certificate of Approval No. 3-1572-94-956. The lagoon receives all sewage diverted from the existing Main Street sewage pumping station during extreme wet weather flow events. The sewage held in the lagoon shall be treated and discharged to the Whitson River or returned to the Chelmsford Water Pollution Control Plant via the Main Street sewage pumping station for further treatment and discharge to the Whitson River.

a. Summary of all monitoring data including an overview of the success and adequacy of the sewage treatment program.

Samples are collected at the Chelmsford lagoon during high flows requiring emergency storage at various times of the year. All wastewater diverted to the lagoon is stored then brought back to the Chelmsford WWTP for full treatment. Due to a below average spring melt and no major weather events the Chelmsford Lagoon was not needed for emergency storage therefore no monitoring data was collected.

b. Comprehensive interpretation of all monitoring and analytical data obtained during the reporting period, and a comparison to the effluent quality and quantity criteria stipulated in Conditions 1.1 through 1.6 together with Total Phosphorus loadings discharged to the Whitson River from the Chelmsford Water Pollution Control Plant and from the sewage lagoon during the (lagoon) discharge period.

There was no lagoon discharge for this reporting year.

c. Summary of any effluent quality assurance or control measures undertaken during the reporting period.

No effluent has been discharged from the lagoon for this reporting year.

d. Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism, or thing forming a part of the works.

The operating and maintenance staff at the Chelmsford Lagoon conducts scheduled and emergency maintenance of the Lagoon equipment. The City of Greater Sudbury utilizes a Computerized Maintenance Management System (CMMS) known as Antero to issue work orders and maintain records for regular maintenance and emergency repair at the Lagoon.

Corrective (0)
No correctives in this reporting year

Regular Scheduled Maintenance (1 Completed)
Exercise Valves

Regulated Works Orders (0 Completed)
No regulated work orders in this reporting year

e. An account of any environmental and operating problems encountered at the site of the sewage lagoon and the mitigative measures taken during the reporting period.

There were no issues or operational problems for this reporting year.

f. Summary of any alterations, extensions or replacements in the process or operation of the works which are considered for implementation over the next reporting period, especially those which may require approval under the Ontario Water Resources Act.

There were no alterations, extensions or replacements in the process or operation for this reporting year.

Garson Lagoon

Annual Performance Report

The Garson Lagoons have been converted into a sanitary sewage temporary detention facility to manage peak wet weather flows, located in Lot 7, Concession 2, Greater Sudbury City.

a. Description of any operating problems encountered, and corrective actions taken.

There were no operating problems for this reporting year.

b. Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism, or thing forming part of the Works.

The operating and maintenance staff at the Garson Lagoon conducts scheduled and emergency maintenance of the Lagoon equipment. The City of Greater Sudbury utilizes a Computerized Maintenance Management System (CMMS) known as Antero to issue work orders and maintain records for regular maintenance and emergency repair at the Lagoon.

Corrective (1)
Work Valves

Regular Scheduled Maintenance (1 Completed)
Exercise valves

Regulated Works Orders (2 Completed)
Operation Manual review
Anchor point inspection

c. Summary of any complaints received during the reporting period and any steps taken to address the complaints.

No complaints for this reporting year.

d. Summary of all by-passes, spill, or abnormal discharge events; and

No bypasses or discharge events for this reporting year.

e. Any other information the District Manager requires from time to time.

There was no additional information for this reporting year

Wahnapiatae Lagoon

Annual Performance Report

The Wahnapiatae Lagoon has a Rated Capacity of 1,246 m³/d and consists of a 16.1 ha area waste stabilization pond with three cells, Cell No. 1 (5.4 ha), Cell No. 2 (5.4 ha) and Cell No. 3 (5.3 ha). The lagoon has influent works, interconnecting structures, effluent works, and an effluent ditch from the pond to the Wanapitei River.

a. Summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the Works.

All influent and effluent monitoring data is graphed and reviewed monthly by compliance and plant supervisory staff. For the Wahnapiatae lagoon, all parameters fell within plant design objectives and compliance limits.

Month	Raw Flows (Act meter)		Raw					
	Total	Avg Day	CBOD	TSS	TP	TAN	TKN	BOD
	m ³	m ³ /d	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Nov-23	24073	802						
Dec-23	17988	580						
January	16389	529	26	1340	1.9	4.10	13.4	31
February	15187	524	29	918	3.5	7.62	14.2	32
March	32034	1033	17	864	0.9	0.94	5.3	19
April	44280	1476	33	112	1.0	21.00	17.5	39
May	25031	807	42	106	1.9	14.00	20.4	50
June	15528	518	23	456	2.2	11.10	14.3	33
July	15219	491	13	4540	4.1	6.90	28.0	28
August	11194	361	19	1410	1.8	12.20	26.1	30
September	11291	376	34	2410	3.7	14.20	27.0	47
October	12321	397	17	103	0.3	21.90	23.30	21
November	19240	641	20	39	0.2	15.10	18.70	30
December	19445	627	24	11	0.1	14.6	18.5	21
Total	237159							
Average			25	1026	1.80	12.0	18.9	31
Spring EFF	149951							
Fall EFF	90584							
Q1 RAW			24	1041	2.1	4.22	10.97	31
Q2 RAW			33	225	1.7	15.37	17.40	45
Q3 RAW			22	2787	3.2	11.10	27.03	29
Q4 RAW			20	51	0.2	17.20	20.17	24

Pre Discharge Sampling - Spring									
	Cell #1			Cell #2			Cell #3		
Date	May.14/24	May.14/24	NA	Apr.9/24	Apr.9/24	Apr.9/24	Apr.9/24	Apr.9/24	Apr.9/24
CBOD (mg/L)	1.0	1.0		1.6	2.1	2.0	1.7	1.4	1.6
TSS (mg/L)	0.7	3.3		3.0	6.0	2.0	10.0	2.0	2.0
TP (mg/L)	0.005	0.004		0.016	0.029	0.036	0.048	0.028	0.013
TAN (mg/L)	3.68	3.58		4.30	4.58	3.36	4.61	6.61	6.85
pH	6.9	6.8		6.70	6.80	6.70	6.90	7.10	7.10
H ₂ S (mg/L)	NA	NA		0.02	0.02	0.02	0.02	0.02	0.02

Pre Discharge Sampling - Fall									
	Cell #1			Cell #2			Cell #3		
Date	26-Nov-24	26-Nov-24	26-Nov-24	Oct.23/24	Oct.23/24	Oct.23/24	Oct.23/24	Oct.23/24	Oct.23/24
CBOD (mg/L)	3.3	3.2	4	1.0	1.0	0.9	0.9	0.7	1.1
TSS (mg/L)	1.3	1.0	9	4.00	1.30	1.30	4.70	1.30	1.30
TP (mg/L)	0.315	0.013	0.017	0.020	0.015	0.006	0.120	0.007	0.006
TAN (mg/L)	9.1	9.3	8.00	0.27	0.12	0.85	0.01	0.01	0.0
pH	7.1	7.0	7.0	6.9	6.8	6.7	6.7	6.8	7.0
H ₂ S (mg/L)	0.02	0.02	0.02	0.02	0.02	0.0	0.02	0.02	0.02

Spring Discharge									
	Cell #1			Cell #2			Cell #3		
Date	May.22/24	May.29/24	Jun.5/24	Apr.19/24	Apr.26/24	May.6/24	Apr.19/24	Apr.26/24	May.8/24
CBOD (mg/L)	3.3	5.0	1.1	3.2	2.2	1.3	3.8	2.9	5.0
TSS (mg/L)	10.0	7.0	19.0	7.0	2.0	1.3	14.0	2.3	5.3
TAN (mg/L)	3.23	1.65	1.26	0.02	1.08	3.24	0.04	0.08	0.23
TP (mg/L)	0.018	0.045	0.027	2.870	3.890	0.175	3.600	5.680	0.072
pH	6.70	6.70	6.80	6.90	7.10	7.10	7.00	7.00	7.00
E.Coli (CFU/100 mL)	26	14	186	2	1	4	6	1	40

Fall Discharge									
	Cell #1			Cell #2			Cell #3		
Date	No Discharge			Nov.5/24	Nov.12/24	Nov.19/24	Nov.6/24	Nov.13/24	Nov.29/24
CBOD (mg/L)				2.3	1.5	2.1	1.0	1.4	3.7
TSS (mg/L)				4.70	4.00	0.67	4.0	5.0	14.70
TAN (mg/L)				0.26	0.28	0.70	0.01	0.01	0.9
TP (mg/L)				0.016	0.002	0.006	0.013	0.030	0.021
pH				6.4	6.6	6.8	6.7	6.9	7.0
E.Coli (CFU/100 mL)				19	41	1	6	2	62

Spring Pre Discharge Averages			
	Cell #1	Cell #2	Cell #3
CBOD (mg/L)	1.00	1.90	1.57
TSS (mg/L)	1.99	3.67	4.67
TP (mg/L)	0.00	0.03	0.03
TAN (mg/L)	3.63	4.08	6.02
pH	6.85	6.73	7.03
H ₂ S (mg/L)		0.02	0.02

Fall Pre Discharge Averages			
	Cell #1	Cell #2	Cell #3
CBOD (mg/L)	No Discharge	0.97	0.90
TSS (mg/L)		2.20	2.43
TP (mg/L)		0.01	0.04
TAN (mg/L)		0.41	0.01
pH		6.80	6.83
H ₂ S (mg/L)		0.02	0.02

	Spring	Fall	ECA Limits
CBOD (mg/L)	3.1	2.0	30.00
TSS (mg/L)	7.5	5.5	40.00
TAN (mg/L)	1.2	0.4	NA
TP (mg/L)	1.8	0.0	NA
pH	6.9	6.7	6.0-9.5
E.Coli (CFU/100 mL)	31.1	21.8	NA

Spring Discharge Dates:	
Cell #1	May.22 - Jun.5/24
Cell #2	Apr.19 - May.6/24
Cell #3	Apr.19 - May.8/24
Approx. Discharge Volume - 134, 863 m ³ .	

Fall Discharge Dates:	
Cell #1	No Discharge
Cell #2	Nov.5 – 19, 2024
Cell #3	Nov. 6 – 29, 2024
Approx. Discharge Volume 93,593 m ³ .	

b. Description of any operating problems encountered, and corrective actions taken.

Issues with beaver dams in the lagoon required intervention by licensed trappers. Overgrowth of cattails has also started causing flow issues. During Fall discharge period, it was found that cell #1 discharge pipe had a blockage, after several attempts the blockage could not be cleared. After subsequent conversations with staff and authorities, it was decided that opening equalization valves between cells would drain cell #1 to other two drained cells with no residual issues thus not having to discharge cell #1. Capital planning and operations are formulating a plan for lagoon cleaning.

c. Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism, or thing forming part of the Works.

The operating and maintenance staff at the Wahnapiatae Lagoon conducts scheduled and emergency maintenance of the Lagoon equipment. The City of Greater Sudbury utilizes a Computerized Maintenance Management System (CMMS) known as Antero to issue work orders and maintain records for regular maintenance and emergency repair at the Lagoon.

Corrective (1)	Regular Scheduled Maintenance (1 Completed)	Regulated Works Orders (1 Completed)
Install plow markers on chamber	Exercise valves	Operation Manual Review

d. Summary of any effluent quality assurance or control measures undertaken in the reporting period.

Operations conduct rounds which are recorded in lagoon logbook. On site flow monitoring record continuous trending for influent flows from the lift station. Lab analysis is performed several times per week in addition to samples being collected and sent out for third party testing during lagoon discharge periods in the spring and fall. Lagoon monthly reports are created containing flow, in house lab results and third-party lab results. This data is transferred to monthly and annual performance reports by a data clerk ensuring all information is accounted for. It is then sent to the area supervisor for final review.

e. Summary of the calibration and maintenance carried out on all effluent monitoring equipment.

The calibration of flow meters was conducted by a third party contractor in accordance with the requirements of the Wahnapiatae Lagoon ECA. Records and certificates are kept electronically.

f. Description of efforts made, and results achieved in meeting the Effluent Objectives of Condition 6.

A Request for quotes will be sent out for lagoon cleaning for upcoming Calendar year.

g. Summary of any complaints received during the reporting period and any steps taken to address the complaints.

There were no complaints for this reporting year

h. Summary of all By-pass, spill, or abnormal discharge events

There were no By-passes, spills or discharge events for this reporting year

i. Any other information the District Manager requires from time to time.

No other information for this reporting year

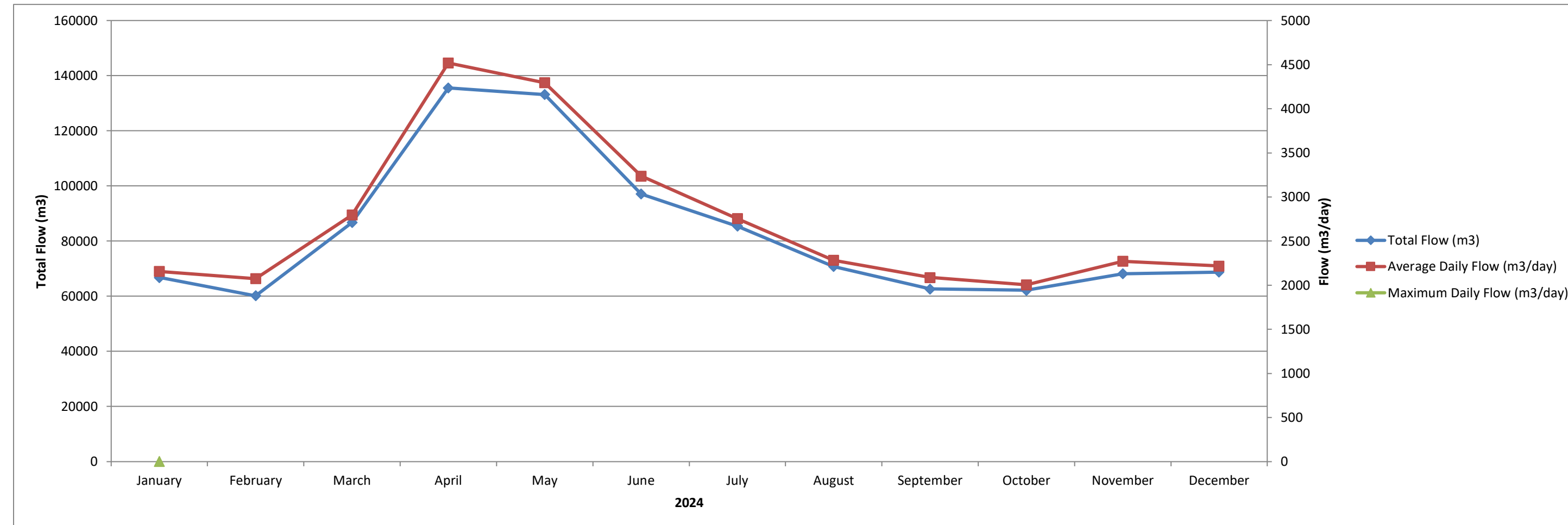
Appendices

- 2024 Capreol Lagoon Annual Performance Report
- 2024 Capreol Lagoon Vermilion Sampling
- 2024 Capreol Lagoon Water Levels
- 2024 Capreol Lagoon Groundwater Monitoring Wells Data
- 2024 Capreol Lagoon Groundwater Monitoring Tables



2024 Capreol Wastewater Treatment Lagoon Performance

Month	Flows		Excess Capacity	BOD5						Total Suspended Solids						Total Phosphorus						Total Ammonia						Un-ionized		TKN	
	Total	Avg Day		Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Raw	Effluent	Loading	Raw Loading	Removed	Plant	Ammonia	Raw	Effluent	
	m ³	m ³ /d		10 ³ m ³	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	mg/L	mg/L	kg/d	kg/day	kg/day	Efficiency	µg/L	mg/L	mg/L
January	66787	2154	0.000	43	23.3	50.20	93	42	45.8%	60	19.3	41.58	129	88	67.8%	1.9	1.50	3.23	4.09	0.86	21.1%	11.80	13.07	28.16	25.42	-2.74	-10.8%	24.07	13.5	12.9	
February	60140	2074	0.000	74	44.3	91.87	153	62	40.1%	59	26.0	53.92	122	68	55.9%	2.5	2.02	4.19	5.18	1.00	19.2%	9.78	13.70	28.41	20.28	-8.13	-40.1%	28.64	13.4	12.8	
March	86692	2797	0.000	44	19.5	54.53	123	69	55.7%	115	13.0	36.35	322	285	88.7%	0.9	1.81	5.06	2.52	-2.54	-101.1%	2.62	11.30	31.60	7.33	-24.27	-331.3%	24.63	6.0	9.9	
April	135552	4518	0.000	58	14.1	63.71	262	198	75.7%	53	20.3	91.72	239	148	61.7%	1.2	1.75	7.91	5.42	-2.49	-45.8%	4.98	8.42	38.04	22.50	-15.54	-69.1%	40.35	5.9	7.6	
May	133153	4295	0.000	30	13.2	56.70	129	72	56.0%	40	16.3	70.01	173	103	59.6%	0.8	0.52	2.23	3.44	1.20	35.0%	3.03	2.34	10.05	13.01	2.96	22.8%	74.81	5.6	4.9	
June	97086	3236	0.000	30	7.8	25.24	97	72	74.0%	32	28.4	91.91	104	12	11.3%	1.0	0.88	2.85	3.24	0.39	12.0%	8.26	1.95	6.31	26.73	20.42	76.4%	9.50	10.4	5.8	
July	85383	2754	0.000	41	11.9	32.78	113	80	71.0%	66	12.6	34.70	182	147	80.9%	1.4	1.25	3.44	3.86	0.41	10.7%	6.67	2.89	7.96	18.37	10.41	56.7%	111.76	10.5	4.9	
August	70766	2283	0.000	21	19.5	44.51	48	3	7.1%	30	20.0	45.66	68	23	33.3%	1.4	1.25	2.85	3.20	0.34	10.7%	9.30	4.53	10.34	21.23	10.89	51.3%	5.22	10.3	5.7	
September	62613	2087	0.000	69	14.6	30.47	144	114	78.8%	62	17.1	35.69	129	94	72.4%	1.1	1.61	3.36	2.30	-1.06	-46.4%	6.20	5.05	10.54	12.94	2.40	18.5%	16.68	8.9	8.0	
October	62144	2005	0.000	29	8.2	16.44	58	42	71.7%	338	22.5	45.10	678	632	93.3%	1.0	1.34	2.69	2.04	-0.64	-31.4%	10.50	7.53	15.09	21.05	5.95	28.3%	85.04	11.0	7.4	
November	68137	2271	0.000	77	9.7	22.03	175	153	87.4%	84	16.5	37.48	191	153	80.4%	2.3	1.17	2.66	5.22	2.57	49.1%	13.00	8.10	18.40	29.53	11.13	37.7%	37.71	14.1	7.9	
December	68734	2217	0.000	47	19.1	42.35	104	62	59.4%	33	8.0	17.74	74	56	76.0%	2.1	1.40	3.10	4.66	1.55	33.3%	11.40	9.45	20.95	25.28	4.32	17.1%	63.56	13.8	10.3	
Total	997187		0				1499	968	64.6%				2411	1809	75.0%				45	2	3.5%				244	18	7.3%				
Average		2732		47	17.10	44.24	125	81	60.2%	81	18.33	50.16	201	151	65.1%	1.47	1.38	3.63	3.76	0.13	-2.8%	8.13	7.36	18.82	20.31	1.48	-11.9%	43.50	10.3	8.2	



Lagoon Type: Exfiltration
Design Capacity: 5000 m³/day
Population Served: 3,408

Compliance Parameters:

	Concentration	
BOD ₅	30 mg/L	Annual Avg
TSS	40 mg/L	Annual Avg
Total Phosphorus	1.38 mg/L	Annual Avg

Note: Effluent = North to South Cell Effluent
 Annual Average of T.P. measured at the overflow culvert located between the north and south cell.

2024 Vermillion River Sampling

Parameter (mg/L)	May.14/24		Oct.17/24		Annual Average		Monthly Phosphorus Sampling		
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Sample Date	Upstream	Downstream
Alkalinity	15	15	27	27	21	21	May.7/24	0.007	0.018
Ammonia (as N)	0.01	0.01	0.01	0.01	0.01	0.01	Jun.4/24	0.002	0.002
Chloride	0.5	0.7	1.2	2.1	0.9	1.4	Jul.2/24	0.004	0.026
Sulphate	4.6	4.6	5.1	5.2	4.9	4.9	Aug.6/24	0.007	0.011
BOD ₅	1.4	1.4	0.5	0.5	1.0	1.0	Sep.3/24	0.004	0.003
Aluminum	0.065	0.066	0.009	0.010	0.037	0.038	Oct.1/24	0.004	0.006
Antimony	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	Oct.17/24	0.004	0.005
Arsenic	0.001	0.001	0.004	0.004	0.003	0.003	Nov.5/24	0.031	0.029
Barium	0.011	0.011	0.011	0.012	0.011	0.012			
Beryllium	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005			
Cadmium	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Calcium	4.67	4.67	3.49	3.57	4.08	4.12			
Chromium	0.001	0.001	0.001	0.002	0.001	0.002			
Cobalt	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002			
Copper	0.002	0.002	0.001	0.001	0.002	0.002	Annual Average	0.008	0.013
Iron	0.18	0.20	0.32	0.35	0.25	0.28	Compliance Parameters: Downstream Total Phosphorus, 0.03 mg/L Annual average. Annual average of CBOD5 and TKN can not exceed 15% of the Upstream annual average value.		
Lead	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002			
Magnesium	1.100	1.090	0.004	0.727	0.552	0.909			
Manganese	0.019	0.020	0.001	0.017	0.010	0.019			
Mercury	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Molybdenum	0.001	0.001	0.001	0.001	0.001	0.001			
Nickel	0.003	0.003	0.002	0.002	0.003	0.003			
Potassium	0.5	0.5	0.4	0.4	0.5	0.5			
Selenium	0.0002	0.0002	0.0002	0.0074	0.0002	0.0038			
Silver	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			
Sodium	1.1	1.2	0.1	0.8	0.6	1.0			
Tellurium	0.001	0.001	0.001	0.001	0.001	0.001			
Tin	0.001	0.001	0.001	0.001	0.001	0.001			
Zinc	0.005	0.004	0.001	0.001	0.003	0.003			
pH	6.77	7.93	6.62	6.61	6.70	7.3			
pH (15 deg. C)	6.76	7.96	6.61	6.60	6.69	7.3			
T.D.S.	70	70	15	1	43	36			
T.K.N.	0.2	0.2	0.2	0.2	0.2	0			
Total Phosphorus	0.007	0.006	0.004	0.005	0.006	0			

2024 Capreol Lagoon Ground/Surface Water Levels

* Depth in metres from top of casing to water

Well I.D.	Water Level (m)*	Measure Date	Water Level (m)*	Measure Date
OW#1	3.4	Jul.16/24	3.1	Oct.17/24
OW#2	3.0	Jul.16/24	3.0	Oct.17/24
OW#3	4.0	Jul.16/24	3.45	Oct.17/24
OW#5	5.3	Jul.16/24	7.0	Oct.17/24
OW#7	Dry	Jul.16/24	Dry	Oct.17/24
OW#8	4.9	Jul.16/24	5.5	Oct.17/24
OW#10a	6.6	Jul.16/24	6.2	Oct.17/24
OW#10b	6.2	Jul.16/24	6.4	Oct.17/24
OW#11	5.4	Jul.16/24	6.0	Oct.17/24
OW#12	2.5	Jul.16/24		Oct.17/24
OW#12a	2.5	Jul.16/24	2.7	Oct.17/24
OW#13a	5.3	Jul.16/24	5.5	Oct.17/24
OW#13b	5.3	Jul.16/24	5.6	Oct.17/24
OW#14	2.2	Jul.16/24	2.2	Oct.17/24
OW#15	6.5	Jul.16/24	7.2	Oct.17/24
OW#16	5.9	Jul.16/24	6.0	Oct.17/24
OW#21	3.5	Jul.16/24	3.1	Oct.17/24
OW#22	5.3	Jul.16/24	Dry	Oct.17/24
OW#23	5.7	Jul.16/24	5.2	Oct.17/24
OW#24	2.9	Jul.16/24	2.8	Oct.17/24
OW#25	4.3	Jul.16/24	4.0	Oct.17/24
OW#26	6.0	Jul.16/24	5.9	Oct.17/24
OW#28	2.3	Jul.16/24	2.3	Oct.17/24
OW#30	2.3	Jul.16/24	2.4	Oct.17/24
River @ Bridge	1.5	Jul.16/24	1.0	Oct.17/24

* estimate - current too strong/water still high

** estimate - current very strong

2024 Capreol Lagoon Groundwater Monitoring Wells

Parameter (mg/L)	OW #2		OW #3		OW #5		OW #8		OW #12a		OW #15		OW #16		Average
	May.14/24	Oct.17/24	May.14/24	Oct.17/24	May.14/24	Oct.17/24	May.14/24	Oct.17/24	May.14/24	Oct.17/24	May.14/24	Oct.17/24	May.14/24	Oct.17/24	
E.Coli (CFU/100 mL)															
Total Coliform	400	121	10	NDOGN	2	12	120	NDOGT	10	NDOGT	6	10	0	10	50
Alkalinity	89	111	155	133	13	23	70	62	108	113	14	37	20	19	69
Ammonia (as N)	4.19	4.91	14.4	12.40	0.01	0.01	3.34	2.72	2.35	1.00	0.01	0.01	0.01	0.01	3.24
Nitrate (as N)	0.05	0.05	0.05	0.05	0.05	0.06	0.55	0.20	0.05	0.05	0.05	0.05	0.05	0.05	0.10
Nitrite (as N)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
BOD ₅	3.6	0.5	2.6	0.5	2.0	0.5	6.1	3.0	9.4	0.7	1.2	0.5	1.4	0.5	2.3
D.O.C.	2.9	5.1	4.0	3.7	0.9	0.6	4.6	4.6	4.5	4.8	1.1	3.4	1.2	0.7	3.0
Hardness (as CaCO ₃)	71.5	40.2	92.3	34.2	8.8	8.6	64.2	17.5	89.0	38.0	14.0	15.9	10.3	5.2	36.4
Aluminum	0.016	0.001	0.018	0.0	0.127	0.003	0.026	0.001	1.610	0.004	0.075	0.004	0.089	0.004	0.141
Antimony	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Arsenic	0.004	0.016	0.004	0.012	0.001	0.006	0.005	0.009	0.015	0.011	0.001	0.005	0.001	0.004	0.007
Barium	0.059	0.013	0.115	0.048	0.008	0.009	0.039	0.013	0.210	0.052	0.008	0.025	0.007	0.0060	0.0437
Beryllium	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Cadmium	0.0001	0.0001	0.0007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
Calcium	20.40	12.50	25.60	10.30	2.37	2.60	18.40	5.52	26.60	11.90	3.90	4.55	2.87	1.55	10.65
Chromium	0.001	0.004	0.001	0.003	0.001	0.002	0.001	0.002	0.004	0.002	0.001	0.002	0.001	0.0020	0.0019
Cobalt	0.0018	0.0011	0.0073	0.0038	0.0003	0.0002	0.0132	0.0059	0.0082	0.0026	0.0003	0.0004	0.0002	0.0001	0.0032
Copper	0.002	0.002	0.002	0.001	0.003	0.001	0.029	0.009	0.064	0.002	0.004	0.004	0.002	0.001	0.009
Iron	5.9	1.95	10.1	6.50	0.15	0.20	3.0	0.43	4.70	1.54	0.24	0.21	0.11	0.19	2.52
Lead	0.0016	0.0002	0.0052	0.0003	0.0002	0.0003	0.0003	0.0002	0.0098	0.0002	0.0003	0.0001	0.0001	0.0002	0.0014
Magnesium	5.000	2.180	6.890	2.060	0.692	0.515	4.440	0.904	5.480	2.020	1.030	1.110	0.798	0.331	2.389
Manganese	0.29	0.153	0.98	0.580	0.004	0.002	0.450	0.127	2.55	3.59	0.013	0.048	0.003	0.001	0.628
Mercury	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.0010	0.0011
Nickel	0.004	0.005	0.005	0.009	0.004	0.002	0.009	0.004	0.006	0.005	0.001	0.003	0.001	0.0010	0.0042
Potassium	4.2	2.7	5.5	2.2	0.5	0.4	4.2	2.8	4.8	1.7	0.6	0.6	0.6	0.3	2.2
Selenium	0.0002	0.0549	0.0002	0.0377	0.0002	0.0264	0.0002	0.0212	0.0003	0.0180	0.0002	0.0146	0.0002	0.0106	0.0132
Silver	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Sodium	41.1	22.4	56.0	19.1	2.8	2.8	37.6	19.8	45.0	16.2	1.9	2.0	3.8	1.2	19.4
Tellurium	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Tin	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Zinc	0.005	0.002	0.022	0.003	0.005	0.004	0.004	0.002	0.008	0.002	0.004	0.004	0.002	0.003	0.005
pH	6.78	6.85	7.63	7.08	7.73	6.44	7.40	7.57	7.27	7.34	7.80	7.05	6.62	6.53	7.15
pH (15 deg. C)	6.77	6.84	7.65	7.08	7.76	6.44	7.41	7.57	7.28	7.35	7.83	7.05	6.61	6.51	7.15
T.K.N.	4.3	5.0	12.4	11.0	0.2	0.2	3.3	3.3	2.1	1.4	0.2	0.4	0.3	0.3	3.2
Total Phosphorus	1.360	1.360	0.094	0.326	0.008	0.010	0.960	1.220	0.286	0.170	0.021	0.033	0.026	0.006	0.420

2024 Capreol Lagoon Groundwater Monitoring Tables

