



Val Côté

Sewage Treatment Lagoon Sewage Collection System

Annual Operating Report
January 1 to December 31, 2023

Prepared by Ontario Clean Water Agency, Northeastern Ontario Hub

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Name of Facility:	Val Côté Lagoon
Address:	Lot 15, Concession VII, Mattice-Val Côté, Township District of Cochrane, Ontario
MOE Works #:	120002460
Environmental Compliance Approval (ECA):	7473-92QSLZ, issued December 12, 2012
Sewage Collection System (CLI-ECA):	291-W601, issued September 5, 2023
Report Period:	From January 1 to December 31, 2023

Facility Description:

Capacity of Works	57.7 m ³ /day
Service Area	Community of Val Côté
Effluent Receiver	Six Mile River
Major Process	Dual celled, seasonal discharge waste stabilization lagoon

The Val Côté wastewater treatment lagoon is a Class 1 facility with a design average daily flow of 57.7 m³/day.

The system is fed by individual low-pressure grinder pumps, which feed two cells, each having an effective volume of 6,054.5 m³. The system is a seasonal discharge waste stabilization pond that discharges to the Six Mile River.

The spring discharge period commences no earlier than one week after the ice is off the lagoon and terminating no later than June 30th; the minimum duration is five days. The maximum allowed discharge rate is 28 L/s and an average daily flow of 2,419 m³/d.

The fall discharge occurs from September 24th to December 15th with a minimum duration of fourteen days. The maximum allowed discharge rate is 10 L/s and an average daily flow of 864 m³/d.

1.0 Monitoring Data
1.1 Monitoring Program as Outlined in the Environmental Compliance Approval

<i>cBOD₅ - Five-day carbonaceous biochemical oxygen demand measured in an unfiltered sample</i> <i>TP - Total Phosphorus</i> <i>TSS - Total Suspended Solids</i>

1.1.1 Final Effluent

Parameter	Type of Sample	Minimum Frequency
cBOD ₅	<i>grab</i>	
pH	<i>grab</i>	<i>Taken on the start, middle and end of each discharge period.</i>
Temperature	<i>grab</i>	
Total Phosphorous	<i>grab</i>	
Total Suspended	<i>grab</i>	

1.2 Data

1.2.1 Effluent Flow

	Spring Discharge	Fall Discharge
Maximum flow rate (L/s)	9.85	1.93
<i>Compliance flow rate (L/s)</i>	<i>28</i>	<i>10</i>
Average Daily Volume (m ³ /d)	595	101
<i>Objective maximum volume (m³/d)</i>	<i>2,419</i>	<i>864</i>
Discharge Duration (days)	14	14
<i>Specified Minimum Duration</i>	<i>5</i>	<i>14</i>

Refer to Appendix A for Summary of Flow Data

1.2.2 Effluent (Spring Discharge)

The following data is from the spring discharge period of June 7th to June 20th, 2023. A non-compliance occurs when the mean of any three consecutive grab samples exceed the compliance limit. During the spring discharge, the average total phosphorous exceeded the limit; see Section 5.0 Instances of Non-Compliance for more details.

Parameter (mg/L)	Average	Maximum	Compliance
cBOD ₅	2.2	34	15
pH (units)	7.74	9.12	-
Temperature (°C)	19.8	24.5	-
Total Phosphorous	1.11	1.49	1.0
Total Suspended Solids	2.5	4	20

1.2.3 Effluent (Fall Discharge)

The following data is from the fall discharge period of October 17th to October 30th, 2023. A non-compliance can occur when the mean of any three consecutive grab samples exceed the compliance limit.

Parameter (mg/L)	Average	Maximum	Compliance
cBOD ₅	2.3	3.2	15
pH (units)	7.55	7.79	-
Temperature (°C)	7.2	10.5	-
Total Phosphorous	0.254	0.301	1.0
Total Suspended Solids	14.5	36.5	20

Refer to Appendix B for a Monthly Summary of Sampling and Monitoring Data

1.2.4 Effluent (Spring Discharge) – Seasonal Loadings

Parameter (kg/day)	Loadings	Compliance
cBOD ₅	1.31	Average 36.29
Total Suspended Solids	1.49	Average 48.38
Total Phosphorous	0.66	Average 2.42

1.2.5 Effluent (Fall Discharge) – Seasonal Loadings

Parameter (kg/day)	Loadings	Compliance
cBOD ₅	0.24	Average 12.96
Total Suspended Solids	1.46	Average 17.28
Total Phosphorous	0.03	Average 0.86

Refer to Appendix C for a Summary of Effluent Loading

1.3 Monitoring Program as Outlined in the Sewage Collection System (CLI-ECA)

BOD₅ - Five-day biochemical oxygen demand measured in an unfiltered sample
TSS - Total Suspended Solids
TP - Total Phosphorus
TKN - Total Kjeldahl Nitrogen
E.coli - Escherichia coli

1.4 CLI-ECA Additional Data

The collection system consists of individual low-pressure grinder pumps without any flow monitoring devices. There are no pumping stations or collection system overflow locations. There is currently no need for future modifications.

2.0 Interpretation of Monitoring and Analytical Data

The effluent quality is based on the carbonaceous biochemical oxygen demand, total suspended solids, and total phosphorus levels.

The Carbonaceous Biochemical Oxygen Demand (cBOD₅) is a 5-day test, which represents the oxygen demand from organic compounds and the oxidation of inorganic compounds such as ferrous iron and sulphide. High BOD₅ or cBOD₅ in effluent means a large quantity of oxygen was needed to break down the organic matter, and identifies a large amount of organic matter in the effluent indicating inadequate treatment. The spring and fall seasonal averages for cBOD₅ complied with the limit of 15 mg/L. The cBOD₅ loading was 1.31 kg/day during the spring discharge, which complies with the limit of 36.29 kg/day, and 0.24 kg/day during the fall discharge, complying with the limit of 12.96 kg/day.

Total Suspended Solids (TSS) in effluent are composed of settleable solids and nonsettleable solids depending on the size, shape and weight of the solid particles. Settable solids are large sized particles that tend to settle more rapidly in a given period of time. The spring and fall seasonal averages for TSS complied with the limit of 20 mg/L. The TSS loading was 1.49 kg/day during the spring discharge, which complies with the limit of 48.38 kg/day, and 1.46 kg/day during the fall discharge, complying with the limit of 17.28 kg/day.

Total Phosphorus (TP) refers to the amount of phosphorus in a sample. Excess TP stimulates algae and weed growth that may cause fluctuations in dissolved oxygen in the receiving waters. The average TP concentration during the spring discharge was 1.11 mg/L, which exceeded the limit of 1.0 mg/L. The average TP concentration during the fall discharge was 0.254 mg/L, which complied with the limit of 1.0 mg/L. The average TP loading was 0.66 kg/day during the spring discharge, which complied with the limit of 2.42 kg/day, and 0.03 kg/day during the fall discharge, complying with the limits of and 0.86 kg/day.

The monitoring parameters of cBOD₅, and TSS at the Val Côté Sewage Treatment Lagoon, were well within the compliance limits specified in the facility's ECA during the discharge periods. However, although alum treatment was conducted on the north cell prior to the spring discharge the final effluents total phosphorous concentrations did not lower until near the end of the discharge. Operations did not wait a full week following the Alum treatment; this resulted in high concentrations on the start and mid samples, resulting in an ECA exceedance

due to an average of 1.11 mg/L for the three consecutive samples. Refer to section 5.0 Instances of Non-Compliance for more details.

3.0 Calibration and Maintenance Procedures Performed on the Works

- No major structural, equipment, apparatus or mechanical maintenance was carried out for 2023
- Lagoon maintenance, including non-scheduled maintenance, is monitored using the Maximo Work Management software program.
- All routine and preventative maintenance measures were conducted as scheduled in 2023.
- Alum treatment was conducted on the North cell prior to the spring discharge period
- Alum treatment was conducted on both cells prior to the fall discharge period

4.0 Bypasses, Overflows, or Emergency Events

There were no abnormal discharge events during the reporting period.

5.0 Complaints

There were no complaints during the reporting period.

6.0 Instances of Non-Compliance

There was an instance of non-compliance during the reporting period:

June 7 – 20 ECA 7473-92QSLZ; Section 6, Table 1 & Section 7.3 (SAC Ref: 1-3MWNZR)

Average Total Phosphorous Exceedance on 3 consecutive samples;

The individual sample results are as follows:

June 07 at 11:15 = 1.06 mg/L

June 13 at 11:29 = 1.49 mg/L

June 20 at 12:31 = 0.78 mg/L

Average = 1.11 mg/L

The discharge was terminated on June 20 after the final sample was taken. Upon review of the logbook it was also noted that although alum treatment was performed, there was not a full week given before the discharge was started (Section 7.3).

The cell contents (pre-discharge) samples were taken three weeks prior to the discharge as required and the results of the south cell ranged from 0.714 mg/L to 0.860 mg/L, the north cell Ranged from 1.06 mg/L to 1.24 mg/L. Prior to the discharge Operators added 10 bags (250 kg) of alum to the North Cell. The ORO and operators involved have been made aware of the requirements related to Section 7.3 of the ECA, and will also consider using more Alum during the next treatment.

Notified SAC on July 14th.

APPENDIX A: Summary of Flow Data

	01/2023	02/2023	03/2023	04/2023	05/2023	06/2023	07/2023	08/2023	09/2023	10/2023	11/2023	12/2023
Effluent Discharge / Flow - m ³ /d												
Count	0	0	0	0	0	14	0	0	0	14	0	0
Max						851				167		
Mean						595.43				100.96		
Min						222				25.6		
Total						8336				1413.5		
Effluent Discharge / Flow Rate - l/s												
Count	0	0	0	0	0	14	0	0	0	14	0	0
Max						9.85				1.93		
Mean						6.89				1.17		
Min						2.57				0.3		

APPENDIX B: Monthly Summary of Sampling and Monitoring Data

Val Cote Spring Discharge Period - one week after ice out to June 30

	07-Jun	13-Jun	20-Jun
Carbonaceous BOD	2.1	1.5	3
Field pH	7.04	7.06	9.12
Field Temperature	18	17	24.5
Total Phosphorus (as P)	1.06	1.49	0.78
Total Suspended Solids	1.5	2	4

Val Cote Fall Discharge Period – September 24 to December 15

	17-Oct	24-Oct	30-Oct
Carbonaceous BOD	1.5	3.2	2.3
Field pH	7.79	7.65	7.22
Field Temperature	10.5	8	3
Total Phosphorus (as P)	0.226	0.301	0.235
Total Suspended Solids	< 1	36.5	6

APPENDIX C: Summary of Effluent Loading
Loading Calculations

$$\boxed{\text{Seasonal average result } \frac{\text{mg}}{\text{L}}} \times \boxed{\frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}}} \times \boxed{\text{seasonal average flow } \frac{\text{m}^3}{\text{year}}} = \boxed{\text{Loading } \frac{\text{kg}}{\text{year}}}$$

convert from mg/L to kg/m³

Spring Calculation
cBOD₅ Loading Calculation

$$\frac{2.2 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{595 \text{ m}^3}{\text{a}} = \frac{1.31 \text{ kg}}{\text{a}}$$

Total Suspended Solids (TSS) Loading Calculation

$$\frac{2.5 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{595 \text{ m}^3}{\text{a}} = \frac{1.49 \text{ kg}}{\text{a}}$$

Total Phosphorous Loading Calculation

$$\frac{1.110 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{595 \text{ m}^3}{\text{a}} = \frac{0.66 \text{ kg}}{\text{a}}$$

Fall Calculation
cBOD₅ Loading Calculation

$$\frac{2.3 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{101 \text{ m}^3}{\text{a}} = \frac{0.24 \text{ kg}}{\text{a}}$$

Total Suspended Solids (TSS) Loading Calculation

$$\frac{15 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{101 \text{ m}^3}{\text{a}} = \frac{1.46 \text{ kg}}{\text{a}}$$

Total Phosphorous Loading Calculation

$$\frac{0.254 \text{ mg}}{1 \text{ L}} \times \frac{1000 \text{ L}}{1 \text{ m}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}} \times \frac{101 \text{ m}^3}{\text{a}} = \frac{0.03 \text{ kg}}{\text{a}}$$

APPENDIX D: CLI-ECA Reporting Sections

Collection ECA # 291-W601 Schedule E	Section in Report
4.6.3 If applicable, includes a summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations.	1.3 Monitoring Program as Outlined in the Sewage Collection System (CLI-ECA) 1.4 CLI-ECA Additional Data 4.0 Bypasses, Overflows, or Emergency Events
4.6.4 Includes a summary of any operating problems encountered and corrective actions taken.	4.0 Bypasses, Overflows, or Emergency Events
4.6.5 Includes a summary of all calibration, maintenance, and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System.	3.0 Calibration and Maintenance Procedures Performed on the Works
4.6.6 Includes a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints.	5.0 Complaints
4.6.7 Includes a summary of all Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat.	3.0 Calibration and Maintenance Procedures Performed on the Works
4.6.8 Includes a summary of all Collection System Overflow(s) and Spill(s) of Sewage, including: a) Dates; b) Volumes and durations; c) If applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E.coli; d) Disinfection, if any; and e) Any adverse impact(s) and any corrective actions, if applicable.	4.0 Bypasses, Overflows, or Emergency Events
4.6.9 Includes a summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including the following items, as applicable: a) A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted. b) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines. c) An assessment of the effectiveness of each action taken. d) An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives. e) Public reporting approach including proactive efforts.	1.4 CLI-ECA Additional Data