Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Temagami North Wastewater Treatment Lagoon

2020 Annual Performance Report

January 1, 2020 to December 31, 2020

Prepared by the Ontario Clean Water Agency, Northeastern Ontario Hub
On behalf of the Municipality of Temagami

INTRODUCTION

Section 11, item 4 of Environmental Compliance Approval No 1636-BMMLKY issued for the Temagami North Lagoon on April 30, 2020 requires the owner to prepare a performance report on a calendar year basis. The report is to be submitted to the District Manager of the Ministry of the Environment, conservation and Parks by March 31st of the calendar year following the period being reported on. The report must contain, but not be limited to, the following information;

- a summary and interpretation of all Influent monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
- a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;
- a summary of all operating issues encountered and corrective actions taken;
- a summary of all normal and emergency repairs and maintenance activities e. carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
- a summary of any effluent quality assurance or control measures undertaken;
- a summary of the calibration and maintenance carried out on all Influent, and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
- a summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
    a. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;
    b. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;
- a tabulation of the volume of sludge generated, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed; a tabulation of the measured volume of sludge accumulated in the lagoon cells in five year intervals and the estimated volume in the interim years and when sludge was disposed of during the reporting period, a summary of disposal locations and volumes of sludge disposed at each location;
- a summary of any complaints received and any steps taken to address the complaints;
- a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
- a summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification;

- a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted;
- any changes or updates to the schedule for the completion of construction and commissioning operation of major process (es) / equipment groups in the Proposed Works;
- a summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;
- a tabulation of the temperature and dissolved oxygen profile data;
- calculation of the mean volume weighted hypolimnetic dissovled oxygen (MVWHDO) following the guidance set out in Appendix C of the Ministry's *Lakeshore Capacity Assessment Handbook; Protecting Water Quality in Inland Lake on Ontario Precambrian Shield;*
- trend analysis of the MVWHDO over time

All requirements specified in the Environmental Compliance Approval are further explained throughout the report.

ANNUAL PERFORMANCE REPORT

Sewage System Name:	**Temagami North Wastewater Treatment Lagoon**
Sewage System Address:	37 Cedar Avenue, Village of Temagami North
Sewage System Owner:	Corporation of the Municipality of Temagami
Sewage System Number:	120000783
Environmental Compliance Approvals:	7518-BBQPKC, issued June 18, 2019
(in effect during reporting period)	1636-BMMLKY, issued April 30, 2020
Reporting Period:	January 1, 2020 to December 31, 2020

Facility Description

Rated Capacity of Works:	390 m^3/day annual average
Peak Daily Flow Rate	1200 m^3/day
Service Area:	Temagami, District of Nipissing
Service Population:	300
Effluent Receiver:	Net Lake
Major Process:	Two Cell Aerated Lagoon

The Temagami North wastewater treatment system is classified as a Class I facility with a rated capacity of 390 m^3/day and a peak flow rate of 1200 m^3/day. Sewage from the mobile trailer park collects in a lift station which discharges to the main sewer line. Sewage from this line, and other homes in the area, collect at the pump station adjacent to the water treatment plant. This sewage pumping station directs all sewage from the community to the treatment lagoon.

The treatment lagoon consists of the following;

- One aerated lagoon (Cell #1) with a total holding capacity of approximately 4,105 m^3 with approximate depth of 3.05 m and approximate surface area of 1,300 m^2 , equipped with twelve fine bubble aeration units with a design capacity of 148 m^3/hr of air evenly distributed within the entire cell;
- One (aerated lagoon (Cell #2) with a total holding capacity of approximately 20,950 m^3 with approximate depth of 1.5 m and approximate surface area of 13,300 m^2, equipped with twenty two fine bubble aeration units with a design capacity of 148 m^3/hr of air within the first half portion of the cell;
- Three air blowers each with a rated capacity of 82 m^3/hr at 62 kPa (two on duty, one on standby) located in a blower building and equipped with air distribution and cleaning system

Ferric Sulphate is added between Cell #1 and Cell #2 for pH stabilization. The lagoon continually discharges into Net Lake, which feeds into Cassels Lake.

1.0 Monitoring Program

Monitoring Program as Outlined in the Environmental Compliance Approval

Legend
BOD_5 - Five-day biochemical oxygen demand
$cBOD_5$ - Five-day carbonaceous biochemical oxygen demand
TSS - Total Suspended Solids
TP - Total Phosphorus
TKN - Total Kjeldahl Nitrogen
pH - Potential of Hydrogen
E. coli - Escherichia coli
$(NH_3^- + NH_4)$ N - Nitrogen as Ammonium and Ammonia
DO = Dissolved Oxygen

1.1 Influent (Raw Sewage)

1.1.1 Influent Monitoring Requirements

Parameter	Type of Sample	Minimum Frequency
BOD_5	24 hour composite	Monthly from Jan 1 to April 30 Weekly from May 1 to Dec 12
TSS	24 hour composite	
TP	24 hour composite	
TKN	24 hour composite	

Note: Changes are a result of the new ECA

1.1.2 Influent Monitoring Schedule

Parameters	2020 Schedule	2020 Sample Dates	2021 Sample Dates
BOD_5 TSS TP TKN *Monthly from Jan 1 to April 30* *Weekly from May 1 to Dec 12*	January 14	January 14	See Appendix D for the 2021 Sample Calendar and accompanying Legend and Breakdown.
	February 11	February 11	
	March 10	March 10	
	April 15	April 14	
	May 12	See Appendix C for the 2020 Sample Calendar and accompanying Legend and Breakdown.	
	June 9		
	July 14		
	August 11		
	September 9		
	October 14		
	November 10		
	December 8		

Note: Changes are a result of the new ECA

1.1.2.1 Deviations from the 2020 Influent Monitoring Schedule

1. April 15: the scheduled sample date was changed to April 14th because an operator could not be there on the 15th. It was a short work week and operators needed to adjust their schedules accordingly.

2. May 1 to December 31: The new ECA issued on April 30, 2020 requires influent samples to be taken weekly so the entire monitoring schedule had to be changed accordingly. The schedule (Sample Calendar) for 2020 can be found in Appendix C.

3. June 30: Samples were collected on Monday June 29 instead of Tuesday to accommodate for the lab being closed on Wednesday July 1.

1.2 Final Effluent

1.2.1 Effluent Monitoring Requirements

Parameter	Type of Sample	Minimum Frequency
$cBOD_5$	24 hour composite	Monthly from Jan 1 to April 30 Weekly from May 1 to Dec 12
TSS	24 hour composite	
TP	24 hour composite	
TKN *(Jan 1 to April 30)*	24 hour composite	
TAN (*May 1 to Dec 12)*	24 hour composite	
E. coli	grab	
pH	grab	weekly
Dissolved Oxygen	grab	Weekly from May 1 to Dec 12
Temperature	grab	
Un-ionized Ammonia	Calculation	

Note: Changes are a result of the new ECA

1.2.2 Effluent Monitoring Schedule

Parameters	2020 Schedule	2020 Sample Dates	2021 Sample Dates
$CBOD_5$ TSS TP TKN *E.coli* *Monthly from Jan 1 to April 30* *Weekly from May 1 to Dec 12*	January 14	January 14	See Appendix D for the 2021 Sample Calendar and accompanying Legend and Breakdown
	February 11	February 11	
	March 10	March 10	
	April 15	April 14	
	May 12	See Appendix C for the 2020 Sample Calendar and accompanying Legend and Breakdown	
	June 9		
	July 14		
	August 11		
	September 9		
	October 14		
	November 10		
	December 8		
pH (weekly)	Thursday January 2	Thursday January 2	
	Monday January 6	Monday January 6	
	Monday January 13	Monday January 13	
	Sunday January 19	Sunday January 19	
	Monday January 27	Monday January 27	
	Monday February 3 & 10	Monday February 3 & 10	
	Tuesday February 18	Tuesday February 18	
	Monday February 24	Monday February 24	
	Mon March 2, 9, 16, & 23	Mon March 2, 9, 16, & 23	
	Tuesday March 31	Tuesday March 31	
	Every Tuesday for the rest of 2020	Every Tuesday in April	

1.2.2.1 Deviations from the 2020 Influent Monitoring Schedule

1. April 15: the scheduled sample date was changed to April 14th because an operator could not be there on the 15th. It was a short work week and operators needed to adjust their schedules accordingly.

2. May 1 to December 31: The new ECA issued on April 30, 2020 requires influent samples to be taken weekly so the entire monitoring schedule had to be changed accordingly. The schedule (Sample Calendar) for 2020 can be found in Appendix C.

3. June 30: Samples were collected on Monday June 29 instead of Tuesday to accommodate for the lab being closed on Wednesday July 1.

1.3 Monitoring Data

1.3.1 Influent Flow Data

Month	Average Flow (m^3/day)	Maximum Flow Rate (m^3/day)	Total Flow (m^3/day)
January	266	317	8,240
February	243	267	7,041
March	382	916	11,849
April	810	1,278	24,304
May	461	1,027	14,306
June	297	397	8,898
July	288	361	8,929
August	273	355	8,473
September	395	588	11,850
October	495	1,208	15,343
November	418	646	12,544
December	317	577	9,816
2020	387	1,278	141,592

1.3.2 Summary of Influent Flow

Annual	Flow (m^3/day)	Rated Capacity (m^3/day)	% Capacity	Exceedance
Average	387	390	99	No
Peak Rate	1,278	1200	107	Yes

The Temagami North Wastewater Lagoon maintained compliance with the annual average daily flow into the sewage plant but exceeded the peak flow rate on nine occasions during the reporting period.

The raw sewage (influent) flow is a measurement of the total volume of waste water into the plant each day. *Table 1.2.1 Influent Flow Data* summarizes the flow data for 2020. The average flows and the maximum daily flows are presented for each month. Compliance is achieved when the average for the year does not exceed 390 m^3/day and the maximum daily flow does not exceed 1,200 m^3/day.

The average daily flow for 2020 was 387 m^3/day; representing 99 % of the capacity. The peak flow rate was 1,278 m^3/day, exceeding the rated capacity by 107%. The peak flow rate was exceeded on two occasions during the year due to rain and/or snow melting;

1.3.3 Dates and Amounts of Flow Exceedances

- April 5 = 1,278 m^3
- October 26 = 1,208 m^3

*Both exceedances are due to heavy precipitation/snowmelt

1.3.4 Influent Flow - Comparison of Historical Flows

Year	Average Flow (m^3/day)	% Capacity	Peak Flow (m^3/day)	% Capacity	Total
2013	288	73.8	1,664	139	105,089
2014	330	84.6	1,563	130	120,523
2015	323	83	2,340	195	117,594
2016	288	74	1,201	100.1	111,312
2017	329	84	1,500	130	119,914
2018	310	79.5	1,314	109	113,180
2019	376	96	1,552	129	137,393
2020	387	99	1,278	107	141,592

1.3.5 Influent (Raw Sewage) - Summary of Results

Parameter	Range (min - max)	Average
BOD_5 (mg/L)	1.3 - 332	80
TSS (mg/L)	14.5 - 895	213
TP (mg/L)	0.235 - 7.26	2
TKN (mg/L)	6.1 - 33.7	14.4

1.3.6 Influent - Comparison of Historical Results

	Annual Average Concentrations (mg/L)							
Parameter	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
BOD_5 (mg/L)	111	102	132	53	<37	40	27	80
TSS (mg/L)	132	167	309	103.4	61	47	45	213
TP (mg/L)	1.7	<1.98	2.27	1.46	0.903	1.13	0.90	2
TKN (mg/L)	17.5	15.6	48.6	12.9	10.6	9.8	9.5	14.4

1.3.7 Effluent - Summary of Results

	Annual Summary			
Parameter	**Range** (min to max)	**Average**	**Compliance Limit**	**Loadings** (kg/d)
$cBOD_5$ (mg/L)	< 0.5 to 3.2	1.45	20	0.6
TSS (mg/L)	<1 to 76	4.97	30	1.9
TP (mg/L)	0.02 to 0.313	0.047	0.6	0.02
TKN (mg/L)	6 to 8.8	7.3	N/A	N/A
TAN	<0.01 to 2.66	0.627	6	0.24
pH	6.3 to 9	7.4	6 to 9	N/A
E. coli (cfu/100 mL)	<5 to 8000	551	N/A	N/A
Dissolved Oxygen	7.44 to 13.4	9.7	N/A	N/A
Temperature ^oC	0.1 to 26.3	12.11	N/A	N/A
Un-ionized Ammonia	0 to 0.05	0.006	N/A	N/A

Notes: "<" means values include results that were less than the laboratory's method detection limit
cfu ≡ colony forming units.
Prior to May 1st compliance limits were based on annual averages: 30 mg/d for cBOD, 40 mg/d for TSS and 6 to 9.5 for pH.

	Monthly Averages (mg/L) *as per ECA# 1636-BMMLKY, issued April 30, 2020*			
Month	**cBOD**	**TSS**	TP	TAN
May	2.15	3.63	0.051	0.4
June	0.82	1.9	0.026	0.3
July	0.68	2.13	0.032	0.357
August	1.05	1.25	0.024	0.118
September	1.02	5.2	0.024	0.268
October	1.63	1.63	0.029	0.398
November	1.58	3.63	0.032	1.063
December	2.14	3.1	0.068	1.954
Objective	**15**	**20**	**0.4**	**5**
Exceedance	**No**	**No**	**No**	**No**

1.3.8 Effluent - Comparison of Historical Results

	Annual Average Concentrations (mg/L)							
Parameter	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
$cBOD_5$ (mg/L)	3.9	6.6	4.4	5.4	5.3	2.6	2.3	1.45
TSS (mg/L)	19.9	15.2	10.9	13	11.8	2.4	6.3	4.97
TP (mg/L)	0.27	0.3	0.24	0.13	0.17	0.08	0.11	0.047
TKN	N/A	N/A	N/A	N/A	N/A	N/A	5.8	7.3
TAN (mg/L)	1.71	1.6	2.22	1.35	2.3	1.39	N/A	0.627
pH	8.5	8	7.7	7.8	7.9	7.8	7.4	7.4
E. coli (cfu/100 mL)	49.8	56.7	129	230	1,191	712	1,770	551
Dissolved Oxygen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.7
Temperature ^oC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.11
Un-ionized Ammonia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.006

1.3.9 Summary of Dissolved Oxygen & Temperature Data from Net Lake

September 15, 2020	Depth (m)	Dissolved Oxygen (min - max)	Temperature (min - max)
Eastern Arm	0 to 34	5.6 to 9.51	4.24 to 15.97
Western Arm	1 to 34	1.15 to 9.82	4.24 to 15.39

Notes: Sampling was completed on: September 15, 2020
Complete results can be found in Appendix B

1.4 Sewage Treatment Program Success and Adequacy

The Performance Summary details results and efficiency of the lagoon performance demonstrating pollutant removal rates from raw sewage concentrations through to final effluent for $cBOD_5$, Total Suspended Solids and Total Phosphorus. The below table demonstrates that the lagoon treatment process is performing very well and is significantly reducing the amount of pollutants in the effluent.

1.4.1 Performance Summary

Parameter	**Influent**	**Effluent**	**% Removal**
BOD_5/$cBOD_5$ (mg/L)	80	1.45	98
TSS (mg/L)	213	4.97	98
TP (mg/L)	2	0.047	98

2.0 Interpretation of Monitoring and Analytical Data

The raw sewage (influent) flow is a measurement based on the total volume of sewer water taken in each day. Table *Influent Flow Data* summarizes the flow data for 2020. The average and maximum daily flows are presented for each month. Compliance is achieved when the average for the year does not exceed 390 m^3/day. The average daily flow for 2020 was 387 m^3/day; representing 99 % of the capacity.

The effluent quality is based on the Carbonaceous Biochemical Oxygen demand, Total Suspended Solids, Total Phosphorous, Total Ammonia Nitrogen and pH levels.

Carbonaceous Biological Oxygen Demand ($cBOD_5$) represents the oxygen demand from organic compounds and the oxidation of inorganic compounds such as ferrous iron and sulphide. High $cBOD_5$ in effluent means a large quantity of oxygen was needed to break down the organic and inorganic matter in the effluent indicating inadequate treatment. In 2020, the monthly and annual averages of $cBOD_5$ complied with the limit of 30 and 20 mg/L as required but the previous and current ECA's respectively.

Total Suspended Solids (TSS) in effluent are composed of settleable and non-settleable 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. In 2020, the average TSS complied with the limit of 40 and 30 mg/L as required but the previous and current ECA's respectively.

Total Phosphorus (TP) refers to the amount of phosphorus in a sample. Excess phosphorous stimulates growth in algae and weeds which may cause fluctuations in dissolved oxygen levels in the receiving waters. The average TP level complied with the limit of 0.6 mg/L as required by the current ECA.

The pH of a solution is an indication of its acidic and basic properties and measured on a scale ranging between 0 and 14. Very high or very low pH levels can be corrosive to pipes, screening equipment and pumps, can damage biological processes and form undesirable toxic gases or heavy metals. In 2020, the effluent pH complied with the limit range of 6 to 9.5 and 6 to 9 as required by the previous and current ECA's respectively.

Ammonia is one of several forms of nitrogen that exist in aquatic environments and can cause direct toxic effects on aquatic life. When ammonia is present in water at high enough levels, it is difficult for aquatic organisms to sufficiently excrete the toxicant, leading to toxic buildup in internal tissues and blood, and potentially death. Environmental factors, such as pH and temperature, can affect ammonia toxicity to aquatic animals. The seasonal average ammonia concentrations remained well below the effluent objective maximum of 6 mg/L.

In 2020, the effluent was of good quality and met the compliance criteria established in the Certificate of Approval. Refer to Appendix A for the Monthly Process Data Report, which summarizes the monitoring and sampling analysis conducted at the facility.

3.0 Effluent Quality Assurance and Control Measures Undertaken

The mechanical elements in the facility are in good repair, and each member of the operational staff possesses a high level of process knowledge and regulatory competence.

Samples are collected as required and analyzed by Testmark Laboratories located in Kirkland Lake, Ontario. Licensed Operators conduct in-house tests for monitoring purposes using procedures as per Standard Methods of Water and Wastewater.

The Temagami North Lagoon has a history of elevated pH in the late summer months but this was controlled in 2020 by monitoring the pH closely and increasing the ferric addition when the pH started rising. The pH was within the limit range all year demonstrating that the control measures were effective in 2020.

4.0 Maintenance Procedures Performed on the Works

Routine maintenance was conducted as per OCWA's Maximo Preventative Maintenance software program. Major maintenance and upgrades that took place during 2020 includes the following:

- Generator Servicing at Spruce Drive Pumping Station (SPS)
- Pump #1 at Spruce Drive SPS repaired
- UPS at Spruce Drive SPS repaired
- Lifting chains were purchased for Spruce Dr. SPS
- Houly flow meters installed at Spruce Drive SPS

Note: The Municipality and OCWA are planning to have the sludge removed from both cells in 2021.

5.0 Environmental and Operating Problems and Corrective Actions

The Temagami North Lagoon system is operating within its required capacity but over the past few years the influent flow rates have been consistently above 80% capacity. The high flow rates indicate that a major portion of the measured flow is a result of infiltration of storm water and annual snowmelt. The Municipality of Temagami was working towards addressing these flow issues but has had to focus on the requirement for a disinfection system first. The Municipality cannot afford to expand the lagoon and install a new disinfection system at the same time.

6.0 Efforts Made to Meet Effluent Objectives

The Temagami North Wastewater Treatment Lagoon was operated efficiently, producing quality treated wastewater that met the Objectives, specified in the current ECA, for cBOD, TSS, TP and TAN all year. The pH was within the objective range for all but three days in 2020.

Once the pH starts to climb ferric is added in order to meet the objective. The mechanical elements in the facility are in good repair and the operational staff possesses a high level of process knowledge and regulatory competence.

6.1 Effluent Objectives

6.1.1 Objectives as per ECA# 7518-BBQPKC, issued June 18, 2019

Parameter	Annual Average	Objective	Exceedance
$cBOD_5$ (mg/L)	1.45	25	No
TSS (mg/L)	4.97	30	No

6.1.2 Objectives as per ECA# 1636-BMMLKY, issued April 30, 2020

	Monthly Averages (mg/L)			
Month	**cBOD**	**TSS**	TP	TAN
May	2.15	3.63	0.051	0.4
June	0.82	1.9	0.026	0.3
July	0.68	2.13	0.032	0.357
August	1.05	1.25	0.024	0.118
September	1.02	5.2	0.024	0.268
October	1.63	1.63	0.029	0.398
November	1.58	3.63	0.032	1.063
December	2.14	3.1	0.068	1.954
Objective	**15**	**20**	**0.4**	**5**
Exceedance	**No**	**No**	**No**	**No**

	Annual Min - Max	Objective	Period	Exceedance
pH (units)	6.3 to 9	6.5 to 8.5	At all times	Yes

*The pH was within the objective range all year except on July 28th (9), August 25th (6.3) and September 15th (6.3).

6.1.3 Efforts made to Achieve Objectives

The following activities are included in regular operator and supervisory activities to assure the quality of the sewage treatment operations including effluent quality and flow monitoring data:

- The facility is inspected by a certified operators on a regular basis
- Certified operators conduct regular tests and monitor data from certain equipment at the plant and record this information on facility spreadsheets
- Certified operators monitor chemical usage and make adjustments as required
- Operation and Compliance staff review process data and laboratory reports to keep track of routine operation of the treatment plant to ensure compliance with the Ministry Guidelines.

- All laboratory results and selected operational data are logged in a process data management system (PDM/WISKI 7).
- All effluent quality data is reviewed by the Operations and Compliance staff to identify any changes in concentrations and/or emerging trends.
- All instrumentation is tested and maintained as per manufacturer's recommendations.
- All routine maintenance has been scheduled in OCWA's Workplace Maintenance System (WMS) and was completed in 2020.

7.0 Proposed Alterations, Extensions or Replacements to the Works

The Municipality is planning to install a disinfection system at the lagoon; a new ECA was issued by the Ministry approving a new UV system. However, this project is on hold until the Municipality has sufficient financial resources to complete it.

8.0 Sludge Reporting

No sludge was removed from the lagoon in 2020.

8.1 Sludge Volume - Cell 1

Date	Sampling Points	Average Depths (m)		Sludge Volume (m^3)	% of Capacity
		Water	Sludge		
Sept 19, 2019	9	2.4	0.25	325	8
Oct. 14, 2020	8	2.4	0.26	338	8.2

As per the ECA: Depth = 3.05 m, Capacity = 4,105 m^3 and Surface Area = 1,300 m^2

8.2 Sludge Volume - Cell 2

Date	Sampling Points	Average Depths (m)		Sludge Volume (m^3)	% of Capacity
		Water	Sludge		
Sept 19, 2019	18	1.8	0.3	3,990	19
Oct. 14, 2020	11	1.8	0.3	3,990	19

As per the ECA: Depth = 1.5 m, Capacity = 20,950 m^3 and Surface Area = 13,300 m^2

The volume of sludge is predicted to be the less in 2021 provided sludge is removed from both cells in the spring as planned by OCWA and the Municipality.

9.0 Calibration and Maintenance of all Monitoring Equipment

Plant maintenance, including non-scheduled maintenance, is monitored using the Maximo Preventative Maintenance software program. All routine and preventative maintenance measures were conducted as scheduled in 2020. All equipment is calibrated based on the manufactures recommendations.

9.1 Calibration Summary

Date	Instrument	% Accuracy
May 22, 2020	Flow Meter	98.97

10. Summary of Efforts Made to Achieve Conformance with Procedure F-5-1

- In 2016 new submersible pumps with higher capacities were installed at Spruce Drive and Cedar Avenue Pump Stations.
- In 2017 the gate valve on the sewage pump leading to the top cell was replaced after it broke and caused sewage to spill out of a manhole at the lagoon.
- Both pumping stations are equipped with emergency power
- Ferric is added to the bottom cell to manage the pH in the warmer months in an effort to meet effluent objectives. The pH levels were within the objective range for most of the 2020 year; there was only one pH result above the objective and just two results were slightly below.
- The Municipality will consider options for expanding the lagoon once the disinfection system has been installed and paid for.
- The pumping stations can easily manage the amount of wastewater flow and bypassing has not been an issue.
- The lagoons seem to be adequate for the volume of wastewater being received and overflowing has not been a concern.

The Temagami North Lagoon produced high quality effluent throughout the reporting period meeting the compliance limits specified in the Environmental Compliance Approval.

Appendix A

2020 Monthly Process Data Reports

Influent Process Report

Parameter	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020
Raw / Biochemical Oxygen Demand: BOD5 - mg/L												
Count Lab	1	1	1	1	4	5	4	4	5	4	4	5
Max Lab	25	16	27	23	17	32	110	332	240	230	79.6	280
Mean Lab	25	16	27	23	13.5	14.12	69.13	218	135.28	113.9	46.9	87.42
Min Lab	25	16	27	23	10	1.3	6.3	79.7	42	70.1	22	16
Total Kjeldahl Nitrogen: TKN - mg/L												
Count Lab	1	1	1		4	5	4	4	5	4	4	5
Max Lab	11.8	9.3	9.6	8.6	11.8	20.7	19.8	33.7	30.7	19.3	9.9	27.2
Mean Lab	11.8	9.3	9.6	8.6	9.25	11.88	16.5	24.93	18.92	16	7.8	14.4
Min Lab	11.8	9.3	9.6	8.6	6.7	8.3	13.7	12.1	8.1	13.5	6.1	7.9
Total Phosphorus: TP - mg/L												
Count Lab	1	1	1	1	4	5	4	4	5	4	4	5
Max Lab	0.801	0.386	0.729	0.765	0.444	2.27	3.52	7.26	4.38	3.16	0.967	5.88
Mean Lab	0.801	0.386	0.729	0.765	0.351	1.044	2.628	4.762	3.315	2.675	0.582	1.917
Min Lab	0.801	0.386	0.729	0.765	0.235	0.568	1.35	0.819	0.776	2.38	0.366	0.388
Raw / Total Suspended Solids: TSS - mg/L												
Count Lab	1	1	1	1	4	5	4	4	5	4	4	5
Max Lab	30	15	46	47	18	128	367	895	576	420	76	693
Mean Lab	30	15	46	47	16.13	67.4	232	572	414	299.8	46.5	216
Min Lab	30	15	46	47	14.5	27	71	60	80	178	31	30

Effluent Process Report

	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020
Effluent/Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L												
Count Lab	1	1	1	1	4	5	4	4	5	4	4	5
Max Lab	2.1	1.8	2.5	2	3.2	1.2	< 1	1.4	1.2	2.1	2.2	2.8
Mean Lab	2.1	1.8	2.5	2	2.15	0.82	< 0.675	1.05	1.02	1.625	1.575	2.14
Min Lab	2.1	1.8	2.5	2	1.2	0.5	< 0.5	0.8	0.6	1.2	0.6	0.8
Effluent / Temperature Field: Lab Upload - °C												
Max IH	1.5	0.1	0.5	5.8	22.3	23	26.3	24.1	20.3	11.6	11.6	4.3
Mean IH	0.62	0.1	0.28	3.1	13.525	19.72	20.825	21.375	17.1	8.675	4.7	1.88
Min IH	0.1	0.1	0.1	2	7.5	17.8	10	18.1	13	4.4	2	1
Effluent / Total Ammonia Nitrogen: NH3 + NH4+ as N - mg/L												
Count Lab	0	0	0	0	4	5	4	4	5	4	4	5
Max Lab					0.57	0.64	0.72	0.4	0.52	0.79	1.31	2.66
Mean Lab					0.4	0.3	0.357	< 0.118	0.268	0.398	1.063	1.954
Min Lab					0.32	0.12	0.14	< 0.01	0.06	0.11	0.92	1.45
Effluent / Total Kjeldahl Nitrogen: TKN - mg/L												
Count Lab	1	1	1	1	0	0	0	0	0	0	0	0
Max Lab	8.8	6.9	7.5	6								
Mean Lab	8.8	6.9	7.5	6								
Min Lab	8.8	6.9	7.5	6								
Effluent / Total Phosphorus: TP - mg/L												
Count Lab	1	1	1	1	4	5	4	4	5	4	4	5
Max Lab	0.313	0.07	0.113	0.091	0.086	0.029	0.043	0.026	0.031	0.032	0.036	0.096
Mean Lab	0.313	0.07	0.113	0.091	0.051	0.026	0.032	0.024	0.024	0.029	0.032	0.068
Min Lab	0.313	0.07	0.113	0.091	0.027	0.02	0.024	0.021	0.02	0.022	0.028	0.043

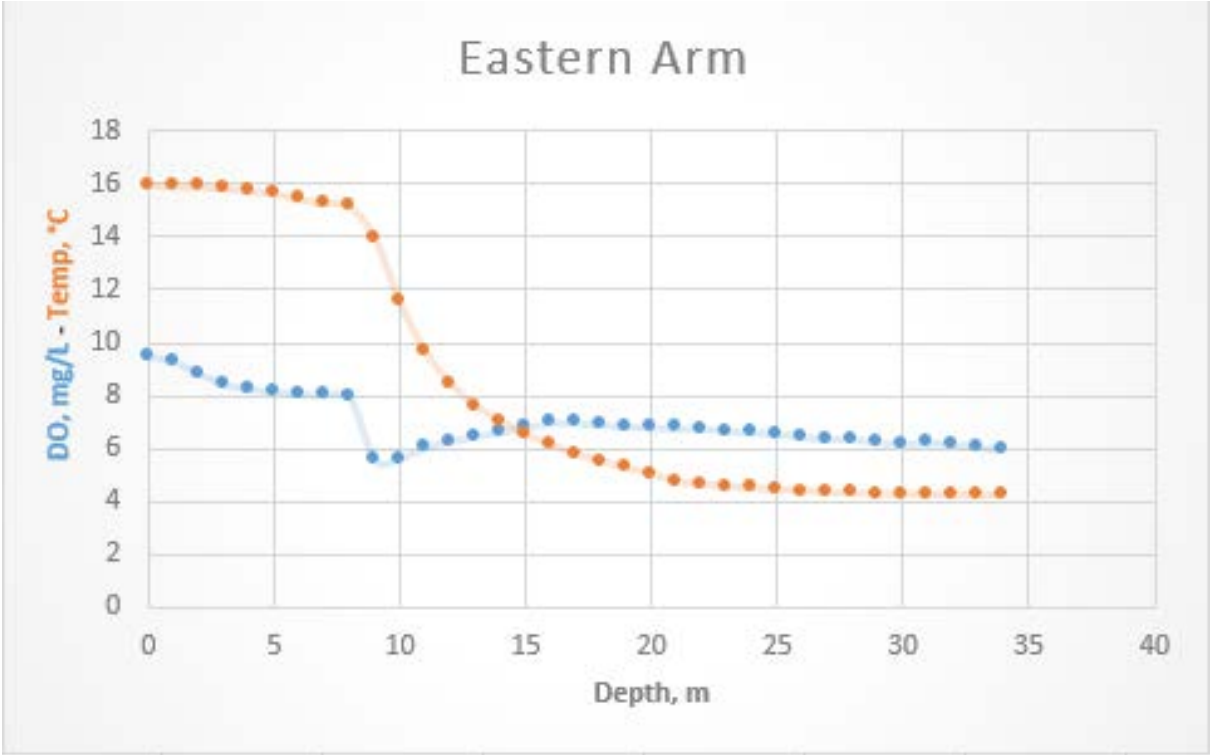
Effluent Process Report - continued

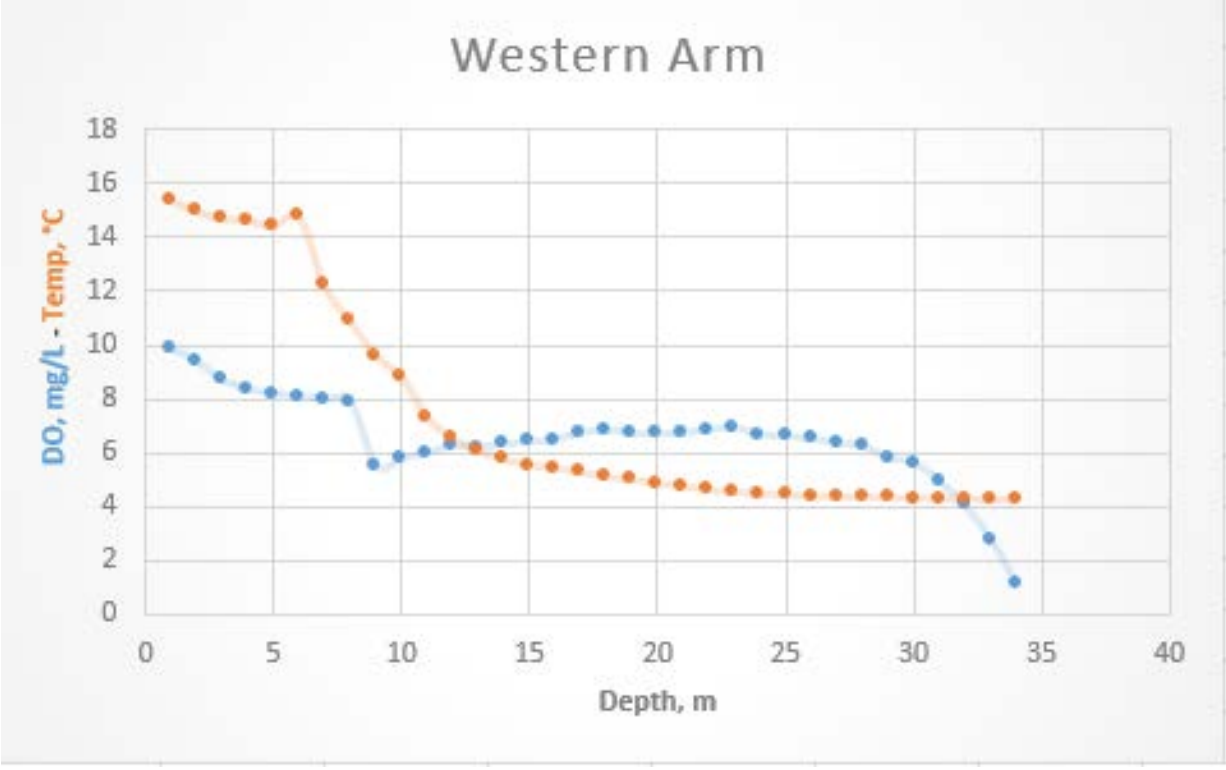
	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020
Effluent / Total Suspended Solids: TSS - mg/L												
Count Lab	1	1	1	1	4	5	4	4	5	4	4	5
Max Lab	76	5	6	7	< 8.5	< 3	< 3.5	< 2	< 21.5	< 3	7	5.5
Mean Lab	76	5	6	7	< 3.625	< 1.9	< 2.125	< 1.25	< 5.2	< 1.625	< 3.625	< 3.1
Min Lab	76	5	6	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Effluent / Un-ionized Ammonia: NH3 - mg/L												
Count IH	0	0	0	0	4	5	4	4	5	4	4	5
Max IH					0.031	0.009	0.05	0.001	0.005	0.01	0.006	0.006
Mean IH					0.008	0.003	0.021	0	0.002	0.006	0.003	0.005
Min IH					0.001	0.001	0.002	0	0	0.002	0.002	0.004
Effluent / pH Field: Lab Upload - ---												
Max IH	7.4	7.3	7.2	7.1	8.5	7.69	9	7.8	8.5	8.1	7.67	7.58
Mean IH	7.4	7.3	7.2	7.1	7.315	7.314	7.988	7.103	7.19	7.988	7.387	7.386
Min IH	7.4	7.3	7.2	7.1	6.81	7.02	7.4	6.3	6.3	7.8	7.2	7.11
Effluent / E. Coli: EC - cfu/100mL												
GMD	410	635	2400	800	43.145	14.565	11.487	14.714	22.206	240.117	367.633	1320.351
Count Lab	1	1	1	1	4	4	5	4	5	4	4	5
Max Lab	410	635	2400	800	220	< 180	40	< 25	90	855	1900	8000
Mean Lab	410	635	2400	800	80	< 50	< 16	< 17.5	31	478.75	756.25	2294
Min Lab	410	635	2400	800	15	< 5	< 5	< 5	10	15	95	570
Effluent /Dissilved Oxygen												
Count Lab	0	0	0	0	4	5	4	4	5	4	4	5
Max Lab	0	0	0	0	12.2	9.59	10.6	8.8	10.8	11.4	11.6	13.4
Mean Lab	0	0	0	0	66.2	60.0	20.3	15.8	34.0	449.6	917.1	2717.3
Min Lab	0	0	0	0	7.95	7.44	8.3	7.75	7.66	10.3	9.53	9.54

Appendix B

Results of Dissolved Oxygen & Temperature Monitoring in Net Lake

September 15	Eastern Arm		Western Arm	
Depth, m	DO conc, mg/L	Temp, °C	DO conc, mg/L	Temp, °C
1	9.31	15.94	9.82	15.39
2	8.85	15.91	9.39	14.96
3	8.44	15.86	8.68	14.7
4	8.27	15.75	8.37	14.65
5	8.16	15.68	8.19	14.44
6	8.09	15.42	8.1	14.76
7	8.03	15.31	7.99	12.2
8	7.96	15.16	7.9	10.87
9	5.6	13.98	5.52	9.6
10	5.63	11.54	5.77	8.8
11	6.05	9.7	6	7.32
12	6.28	8.46	6.26	6.52
13	6.49	7.62	6.2	6.06
14	6.63	7.04	6.33	5.74
15	6.8	6.54	6.41	5.54
16	6.98	6.14	6.49	5.4
17	6.99	5.8	6.74	5.26
18	6.91	5.52	6.84	5.1
19	6.86	5.26	6.72	4.98
20	6.8	5.06	6.7	4.86
21	6.78	4.76	6.73	4.74
22	6.77	4.66	6.87	4.62
23	6.67	4.56	6.91	4.52
24	6.63	4.5	6.67	4.46
25	6.58	4.44	6.62	4.42
26	6.46	4.4	6.52	4.38
27	6.37	4.36	6.36	4.36
28	6.39	4.32	6.24	4.34
29	6.24	4.3	5.81	4.32
30	6.2	4.26	5.62	4.3
31	6.22	4.26	4.91	4.28
32	6.19	4.26	4.04	4.28
33	6.05	4.24	2.75	4.26
34	6.01	4.24	1.15	4.24


Eastern Arm
DO, mg/L - Temp, °C
Depth, m
0
2
4
6
8
10
12
14
16
18
0
5
10
15
20
25
30
35
40


Western Arm
DO, mg/L - Temp, °C
Depth, m
0
2
4
6
8
10
12
14
16
18
0
5
10
15
20
25
30
35
40

Appendix C

2020 Sampling Schedule

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar Legend

Sampling Week	Weekly	Monthly	Every Two Weeks	Quarterly	Semi-Annual	Annual
1	✓	✓	✓	✓		✓
2	✓	✓	✓	✓	✓	
3	✓	✓		✓		
4	✓	✓			✓	
5	✓	✓	✓			
6	✓	✓				
7	✓		✓			
8	✓					

NOTE:	Speak with ORO for details on Drawdown Sampling for the Temagami South Lagoon			
WINDOWS:	SPRING:	May 1 to Jun 15	FALL:	Oct 15 to Nov 30

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Breakdown

'Weekly' Samples Include:	
Bacti Sampling (water systems)	Grab
North Cobalt Lagoon Raw	Composite
North Cobalt Lagoon Effluent	Composite
North Cobalt Lagoon *E.coli*	Grab
Cobalt Wetlands Effluent	Composite
Cobalt Wetlands E.coli	Grab
Haileybury STP Raw	Composite
Haileybury STP Effluent	Composite
Haileybury STP *E.coli*	Grab
Temagami North Lagoon Effluent	Composite
Temagami North Lagoon Raw	Composite
Temagami North Lagoon Effluent E. coli	Grab

'Every Two Weeks' Samples Include:	
New Liskeard Lagoon Effluent	Composite

'Monthly' Samples Include:	
Kerns School Bacti Samples	Grab
Dymond SPS Raw	Composite
Niven SPS Raw	Composite
Goodman SPS Raw	Composite
New Liskeard WTP Iron/Manganese	Grab
New Liskeard Lagoon Effluent *E.coli*	Grab
New Liskeard Lagoon Raw (Niven,Goodman,Gray)	Grab
Cobalt Wetlands Raw	Composite
Cobalt Wetlands Upstream	Grab
Cobalt Wetlands Downstream	Grab

'Quarterly' Samples Include:	
Water Samples (THM, HAA, Nitrate/Nitrite)	Grab
Marten River Fire Hall Bacti Sample	Grab
Temagami South Lagoon Raw	Grab

'Semi-Annual' Samples Include:	
Temagami South Lagoon Prior to Discharge	Grab

'Annual' Samples Include:	
Water Samples (Sch.23, Sch.24) (*See Note)	Grab
New Liskeard Lagoon Lethality	Grab
Haileybury STP Sludge	Grab

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

January 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
			New Years Day			
5	6	7	8	9	10	11
	Bacti Samples	Sampling Week 7				
12	13	14	15	16	17	18
	Bacti Samples	Sampling Week 3				
19	20	21	22	23	24	25
	Bacti Samples	Sampling Week 7				
26	27	28	29	30	31	
	Bacti Samples	Sampling Week 8				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

February 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
	Bacti Samples	Sampling Week 7				
9	10	11	12	13	14	15
	Bacti Samples	Sampling Week 6				
16	17	18	19	20	21	22
	Family Day	Bacti Samples	Sampling Week 7			
23	24	25	26	27	28	29
	Bacti Samples	Sampling Week 8				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

March 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
	Bacti Samples	Sampling Week 7				
8	9	10	11	12	13	14
	Bacti Samples	Sampling Week 6				
15	16	17	18	19	20	21
	Bacti Samples	Sampling Week 7				
22	23	24	25	26	27	28
	Bacti Samples	Sampling Week 8				
29	30	31				
	Bacti Samples	Sampling Week 7				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

April 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
	Bacti Samples	Sampling Week 8			Good Friday	
12	13	14	15	16	17	18
Easter Sunday	Easter Monday	Bacti Samples	Sampling Week 2			
19	20	21	22	23	24	25
	Bacti Samples	Sampling Week 8				
26	27	28	29	30		
	Bacti Samples	Sampling Week 7				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

May 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
	Bacti Samples	Sampling Week 8				
10	11	12	13	14	15	16
	Bacti Samples	Sampling Week 5				
17	18	19	20	21	22	23
	Victoria Day	Bacti Samples	Sampling Week 8			
24	25	26	27	28	29	30
	Bacti Samples	Sampling Week 7				
31						

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

June 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
	Bacti Samples	Sampling Week 8				
7	8	9	10	11	12	13
	Bacti Samples	Sampling Week 5				
14	15	16	17	18	19	20
	Bacti Samples	Sampling Week 8				
21	22	23	24	25	26	27
	Bacti Samples	Sampling Week 7				
28	29	30				
	Bacti Samples	Sampling Week 8				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

July 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
			Canada Day			
5	6	7	8	9	10	11
	Bacti Samples	Sampling Week 7				
12	13	14	15	16	17	18
	Bacti Samples	Sampling Week 3				
19	20	21	22	23	24	25
	Bacti Samples	Sampling Week 7				
26	27	28	29	30	31	
	Bacti Samples	Sampling Week 8				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

August 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
	Civic Holiday	Bacti Samples	Sampling Week 7			
9	10	11	12	13	14	15
	Bacti Samples	Sampling Week 6				
16	17	18	19	20	21	22
	Bacti Samples	Sampling Week 7				
23	24	25	26	27	28	29
	Bacti Samples	Sampling Week 8				
30	31					

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

September 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		Sampling Week 7				
6	7	8	9	10	11	12
	Labour Day	Bacti Samples	Sampling Week 4			
13	14	15	16	17	18	19
	Bacti Samples	Sampling Week 7				
20	21	22	23	24	25	26
	Bacti Samples	Sampling Week 8				
27	28	29	30			
	Bacti Samples	Sampling Week 7				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

October 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
	Bacti Samples	Sampling Week 8				
11	12	13	14	15	16	17
	Thanksgiving Day	Bacti Samples	Sampling Week 1			
18	19	20	21	22	23	24
	Bacti Samples	Sampling Week 8				
25	26	27	28	29	30	31
	Bacti Samples	Sampling Week 7				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

November 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
	Bacti Samples	Sampling Week 8				
8	9	10	11	12	13	14
	Bacti Samples	Sampling Week 5	Remembrance Day			
15	16	17	18	19	20	21
	Bacti Samples	Sampling Week 8				
22	23	24	25	26	27	28
	Bacti Samples	Sampling Week 7				
29	30					
	Bacti Samples					

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

December 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		Sampling Week 8				
6	7	8	9	10	11	12
	Bacti Samples	Sampling Week 5				
13	14	15	16	17	18	19
	Bacti Samples	Sampling Week 8				
20	21	22	23	24	25	26
	Bacti Samples	Sampling Week 7			Christmas Day	Boxing Day
27	28	29	30	31		
	Holiday	Bacti Samples	Sampling Week 8			

Appendix D

2021 Sampling Schedule

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Calendar Legend

Sampling Week	Weekly	Monthly	Every Two Weeks	Quarterly	Semi-Annual	Annual
1	✓	✓	✓	✓		✓
2	✓	✓	✓	✓	✓	
3	✓	✓		✓		
4	✓	✓			✓	
5	✓	✓	✓			
6	✓	✓				
7	✓		✓			
8	✓					

NOTE:	Speak with ORO for details on Drawdown Sampling for the Temagami South Lagoon			
WINDOWS:	SPRING:	May 1 to Jun 15	FALL:	Oct 15 to Nov 30

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Sampling Breakdown

'Weekly' Samples Include:	
Bacti Sampling (water systems)	Grab
North Cobalt Lagoon Raw	Composite
North Cobalt Lagoon Effluent	Composite
North Cobalt Lagoon *E.coli*	Grab
Cobalt Wetlands Effluent	Composite
Cobalt Wetlands E.coli	Grab
Haileybury STP Raw	Composite
Haileybury STP Effluent	Composite
Haileybury STP *E.coli*	Grab
Temagami North Lagoon Effluent	Composite
Temagami North Lagoon Raw	Composite
Temagami North Lagoon Effluent E. coli	Grab

'Every Two Weeks' Samples Include:	
New Liskeard Lagoon Effluent	Composite

'Monthly' Samples Include:	
Kerns School Bacti Samples	Grab
Dymond SPS Raw	Composite
Niven SPS Raw	Composite
Goodman SPS Raw	Composite
New Liskeard WTP Iron/Manganese	Grab
New Liskeard Lagoon Effluent *E.coli*	Grab
New Liskeard Lagoon Raw (Niven,Goodman,Gray)	Grab
Cobalt Wetlands Raw	Composite
Cobalt Wetlands Upstream	Grab
Cobalt Wetlands Downstream	Grab

'Quarterly' Samples Include:	
Water Samples (THM, HAA, Nitrate/Nitrite)	Grab
Marten River Fire Hall Bacti Sample	Grab
Temagami South Lagoon Raw	Grab

'Semi-Annual' Samples Include:	
Temagami South Lagoon Prior to Discharge	Grab

'Annual' Samples Include:	
Water Samples (Sch.23, Sch.24) (*See Note)	Grab
New Liskeard Lagoon Lethality	Grab
Haileybury STP Sludge	Grab

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

January 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
					New Years Day	
3	4	5	6	7	8	9
	Bacti Samples	Sampling Week 7				
10	11	12	13	14	15	16
	Bacti Samples	Sampling Week 3				
17	18	19	20	21	22	23
	Bacti Samples	Sampling Week 7				
24	25	26	27	28	29	30
	Bacti Samples	Sampling Week 8				
31						

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

February 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
	Bacti Samples	Sampling Week 7				
7	8	9	10	11	12	13
	Bacti Samples	Sampling Week 6				
14	15	16	17	18	19	20
	Family Day	Bacti Samples	Sampling Week 7			
21	22	23	24	25	26	27
	Bacti Samples	Sampling Week 8				
28						

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

March 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
	Bacti Samples	Sampling Week 7				
7	8	9	10	11	12	13
	Bacti Samples	Sampling Week 6				
14	15	16	17	18	19	20
	Bacti Samples	Sampling Week 7				
21	22	23	24	25	26	27
	Bacti Samples	Sampling Week 8				
28	29	30	31			
	Bacti Samples	Sampling Week 7				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

April 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
					Good Friday	
4	5	6	7	8	9	10
Easter Sunday	Easter Monday	Bacti Samples	Sampling Week 8			
11	12	13	14	15	16	17
	Bacti Samples	Sampling Week 2				
18	19	20	21	22	23	24
	Bacti Samples	Sampling Week 8				
25	26	27	28	29	30	
	Bacti Samples	Sampling Week 7				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

May 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
	Bacti Samples	Sampling Week 8				
9	10	11	12	13	14	15
	Bacti Samples	Sampling Week 5				
16	17	18	19	20	21	22
	Bacti Samples	Sampling Week 8				
23	24	25	26	27	28	29
	Victoria Day	Bacti Samples	Sampling Week 7			
30	31					
	Bacti Samples					

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

June 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		Sampling Week 8				
6	7	8	9	10	11	12
	Bacti Samples	Sampling Week 5				
13	14	15	16	17	18	19
	Bacti Samples	Sampling Week 8				
20	21	22	23	24	25	26
	Bacti Samples	Sampling Week 7				
27	28	29	30			
	Bacti Samples	Sampling Week 8				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

July 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
				Canada Day		
4	5	6	7	8	9	10
	Bacti Samples	Sampling Week 7				
11	12	13	14	15	16	17
	Bacti Samples	Sampling Week 3				
18	19	20	21	22	23	24
	Bacti Samples	Sampling Week 7				
25	26	27	28	29	30	31
	Bacti Samples	Sampling Week 8				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

August 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
	Civic Holiday	Bacti Samples	Sampling Week 7			
8	9	10	11	12	13	14
	Bacti Samples	Sampling Week 6				
15	16	17	18	19	20	21
	Bacti Samples	Sampling Week 7				
22	23	24	25	26	27	28
	Bacti Samples	Sampling Week 8				
29	30	31				
	Bacti Samples	Sampling Week 7				

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

September 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
	Labour Day	Bacti Samples	Sampling Week 4			
12	13	14	15	16	17	18
	Bacti Samples	Sampling Week 7				
19	20	21	22	23	24	25
	Bacti Samples	Sampling Week 8				
26	27	28	29	30		
	Bacti Samples	Sampling Week 7				

Ontario Clean Water Agency
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October 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
	Bacti Samples	Sampling Week 8				
10	11	12	13	14	15	16
	Thanksgiving Day	Bacti Samples	Sampling Week 1			
17	18	19	20	21	22	23
	Bacti Samples	Sampling Week 8				
24	25	26	27	28	29	30
	Bacti Samples	Sampling Week 7				
31						

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November 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
	Bacti Samples	Sampling Week 8				
7	8	9	10	11	12	13
	Bacti Samples	Sampling Week 5		Remembrance Day		
14	15	16	17	18	19	20
	Bacti Samples	Sampling Week 8				
21	22	23	24	25	26	27
	Bacti Samples	Sampling Week 7				
28	29	30				
	Bacti Samples	Sampling Week 8				

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December 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
	Bacti Samples	Sampling Week 5				
12	13	14	15	16	17	18
	Bacti Samples	Sampling Week 8				
19	20	21	22	23	24	25
	Bacti Samples	Sampling Week 7				Christmas Day
26	27	28	29	30	31	
Boxing Day	Holiday	Holiday	Bacti Samples	Sampling Week 8		