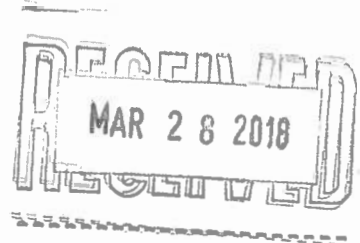


11517

**From:** Rebecca Marshall <RMarshall@ocwa.com>  
**Sent:** Wednesday, March 28, 2018 9:54 AM  
**To:** Roxanne St. Germain; Elaine Gunnell; Ilersich, Sherry (MOECC)  
**Cc:** Rebecca Marshall; Duquette, Lori (ENE)  
**Subject:** Temagami North Lagoon 2017 Annual Performance Report  
**Attachments:** Temagami North Lagoon Annual Report 2017.pdf



Good Morning,

The Temagami North Lagoon Annual Performance Report for 2017 has been prepared and is attached. This report is required under the systems Environmental Compliance Approval to be submitted to the MOECC each year within 90 days of the end of the period being reported on.

Regards,  
**Rebecca Marshall** | Process and Compliance Technician | North Eastern Ontario Hub | Ontario Clean Water Agency | Tel: 705-648-4267 | Fax: 705-567-7974 | Email: [rmarshall@ocwa.com](mailto:rmarshall@ocwa.com)

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# **Temagami North Wastewater Treatment Lagoon**



## **2017 Annual Performance Report**

*January 1, 2017 to December 31, 2017*

**Prepared by the Ontario Clean Water Agency**

## Executive Summary

Section 12(5) of Environmental Compliance Approval No 1975-AN3RZW issued June 21, 2017 requires the owner of the Temagami North Lagoon to prepare an annual performance report within ninety days following the end of the period being reported on. The report shall contain, but shall not be limited to, the following information;

- A summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 8, including an overview of the success and adequacy of the Works;
- A description of any operating problems encountered and corrective actions taken;
- A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
- A summary of any effluent quality assurance or control measures undertaken in the reporting period;
- A summary of the calibration and maintenance carried out on all effluent monitoring equipment;
- A description of efforts made and results achieved in meeting the Effluent Objectives of Condition 7;
- A summary of the report collected under Condition 10 (7) including the lagoon sludge level, the total volume of dewatered sludge disposed off-site, and where the dewatered sludge was disposed;
- A summary of any complaints received during the reporting period and any steps taken to address the complaints;
- A summary of all By-pass, spill or abnormal discharge events;
- A copy of \*all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report on the implementation of each modification;
- A report summarizing all modifications completed as a result of Schedule B, Section 3; and
- Any other information the Water Supervisor may require from time to time.

The Temagami North Lagoon produced high quality effluent throughout the reporting period meeting the compliance limits specified in the Environmental Compliance Approval. All requirements specified in the Approval and any issues experienced at the facility are further explained throughout the report.

## Annual Performance Report

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<b>Sewage System Name:</b>	Temagami North Wastewater Treatment Lagoon
<b>Sewage System Address:</b>	37 Cedar Avenue, Village of Temagami North
<b>Sewage System Owner:</b>	Corporation of the Municipality of Temagami
<b>Sewage System Number:</b>	120000783
<b>Environmental Compliance Approval:</b>	1975-AN3RZW, issued June 21, 2017
<b>Reporting Period:</b>	January 1, 2017 to December 31, 2017

## Facility Description

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<b>Capacity of Works:</b>	390 m <sup>3</sup> /day average, 1200 m <sup>3</sup> /day peak
<b>Service Area:</b>	Temagami, District of Nipissing
<b>Service Population:</b>	300
<b>Effluent Receiver:</b>	Net Lake
<b>Major Process:</b>	Two Cell Aerated Lagoon

The Temagami North wastewater treatment system is classified as a Class I facility with a rated capacity of 390 m<sup>3</sup>/day and a peak flow rate of 1200 m<sup>3</sup>/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 pump station directs all sewage from the community to the treatment lagoon.

The treatment lagoon consists of two cells with a combined holding capacity of 4105 m<sup>3</sup>. Each cell has an area that is aerated by blowers; the blowers are located inside a building at the site. Ferric Sulphate is added between Cell #1 and Cell #2 for pH stabilization. The lagoon continually discharges into Net Lake.

## 1.0 Monitoring Program

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### 1.1 Monitoring Program as Outlined in the Environmental Compliance Approval

cBOD<sub>5</sub> = Five-day carbonaceous biochemical oxygen demand measured in an unfiltered sample  
 TSS = Total Suspended Solids  
 TP = Total Phosphorus  
 TKN = Total Kjeldahl Nitrogen  
 (NH<sub>3</sub><sup>-</sup> + NH<sub>4</sub>) N = Nitrogen as Ammonium and Ammonia  
 pH = Potential of Hydrogen

### 1.1.1 Raw Sewage (Influent)

Parameter	Type of Sample	Minimum Frequency
BOD <sub>5</sub>	24 hour composite	monthly
TSS	24 hour composite	monthly
TP	24 hour composite	monthly
TKN	24 hour composite	monthly

### 1.1.2 Final Effluent

Parameter	Type of Sample	Minimum Frequency
cBOD <sub>5</sub>	24 hour composite	monthly
TSS	24 hour composite	monthly
TP	24 hour composite	monthly
(NH <sub>3</sub> <sup>-</sup> + NH <sub>4</sub> ) N	24 hour composite	monthly
<i>E. coli</i>	grab	monthly
pH	grab	weekly

## 1.2 Data

### 1.2.1 Influent Flow

Month	Average Flow (m <sup>3</sup> /day)	Maximum Flow Rate (m <sup>3</sup> /day)	Total Flow (m <sup>3</sup> /day)
January	178	384	5533
February	219	583	6128
March	293	420	9079
April	747	1555	22417
May	552	1113	17117
June	268	341	8037
July	282	599	8742
August	394	807	12226
September	190	270	5711

Month	Average Flow (m <sup>3</sup> /day)	Maximum Flow Rate (m <sup>3</sup> /day)	Total Flow (m <sup>3</sup> /day)
October	194	295	6004
November	301	825	9018
December	319	972	9902

### 1.2.2 Summary of Influent Flow

Annual	Flow (m <sup>3</sup> /day)	Rated Capacity (m <sup>3</sup> /day)	% Capacity	Exceedance
Average	329	390	84	No
Peak Rate	1555	1200	130	Yes

### 1.2.3 Raw Sewage (Influent)

Parameter	Range (min - max)	Average
BOD <sub>5</sub> (mg/L)	12 - 64	<37
TSS (mg/L)	1 - 260	61
TP (mg/L)	0.188 - 2.4	0.903
TKN (mg/L)	2.3 - 22.8	10.6

### 1.2.4 Effluent

Parameter	Range (min- max)	Average	Compliance Limit	Compliance Period
cBOD <sub>5</sub> (mg/L)	1.8 - 15	5.25	30	annual average
TSS (mg/L)	<1 - 31	<11.81	40	annual average
TP (mg/L)	0.02 - 0.91	0.17	N/A	N/A
(NH <sub>3</sub> <sup>-</sup> + NH <sub>4</sub> ) N (mg/L)	0.22 - 5.97	2.27	N/A	N/A
pH	6.55 - 9.3	7.89	6.0 to 9.5	at all times
<i>E. coli</i> (cfu/100 mL)	<5 - 5600	<1191	N/A	N/A

Notes: "<" means values include results that were less than the laboratory's method detection limit  
 cfu ≡ colony forming units.

### 1.3 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<sub>5</sub>, suspended solids and total phosphorus.

#### 1.3.1 Performance Summary

Parameter	Influent	Effluent	% Removal
BOD <sub>5</sub> /cBOD <sub>5</sub> (mg/L)	<37	5.25	86
TSS (mg/L)	61	<11.81	81
TP (mg/L)	0.903	0.17	81

## 2.0 Interpretation of Monitoring and Analytical Data

The Temagami North Wastewater Lagoon exceeded its peak flow rate capacity on one occasion during the reporting period but maintained compliance with the annual average daily flow into the sewage plant. The raw sewage (influent) flow is a measurement based on the total volume of sewer water taken each day. Table 1.2.1 Influent Flow Data summarizes the flow data for 2017. 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<sup>3</sup>/day. The average daily flow for 2017 was 329 m<sup>3</sup>/day; representing 84 % of the capacity. The peak flow rate was 1555 m<sup>3</sup>/day, exceeding the rated capacity by 130%. The flow was exceeded once, on April 10<sup>th</sup>, due to heavy precipitation and snow melt.

The effluent quality is based on the carbonaceous biochemical oxygen demand, total suspended solids, and pH levels. The annual averages for all parameters are listed in table 1.2.4 *Effluent*.

Carbonaceous Biological Oxygen Demand (cBOD<sub>5</sub>) represents the oxygen demand from organic compounds and the oxidation of inorganic compounds such as ferrous iron and sulphide. High cBOD<sub>5</sub> 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 2017, the average cBOD<sub>5</sub> complied with the limit of 30 mg/L.

Total suspended Solids (TSS) in effluent are composed of settleable 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. In 2017, the average TSS complied with the limit of 40 mg/L.

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 2017, the effluent pH complied with the limit range of 6 to 9.5. The Temagami North Lagoon has a history of elevated pH in the late summer months but this was controlled in 2017 by monitoring the pH closely and increasing the ferric addition anytime the pH started

rising. The majority of vegetation surrounding the lagoon was removed in August 2016 and this continues to aid in maintaining the pH within compliance limits.

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**

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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.

Any bypass or upset events that occur are tested, monitored and reported to the Spills Action Center (SAC).

### **4.0 Maintenance Procedures Performed on the Works**

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Routine maintenance was conducted as per OCWA's Maximo Preventative Maintenance software program. Major maintenance and upgrades that took place during 2017 includes the following:

- In December 2016 a gate valve broke on the sewage pipe that leads to the top cell of the lagoon and sewage started overflowing out of the manhole on the property. This was temporarily fixed in January 2017 and then the valve was replaced in June 2017. The work was completed without incident.

### **5.0 Environmental and Operating Problems and Corrective Actions**

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The Temagami North Lagoon system is operating within its required capacity but for several years, inflow 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 will be working towards addressing these flow issues.

- Temagami North Lagoon exceeded the maximum daily flow limit of 1200m<sup>3</sup> once on April 10<sup>th</sup> with a flow of 1555m<sup>3</sup> due to heavy precipitation and snow melt.



## **6.0 Efforts Made to Meet Effluent Objectives**

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The Temagami North Wastewater Treatment Lagoon was operated efficiently, producing quality treated wastewater that almost always meets the Objectives specified in Condition 7 of the ECA. There was one TSS result of 31 in March which slightly exceeds the objective limit but all other results were below. 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**

<b>Parameter</b>	<b>Average</b>	<b>Maximum</b>	<b>Objective</b>	<b>Exceedance</b>
cBOD <sub>5</sub> (mg/L)	5.25	15	25	No
TSS (mg/L)	<11.81	31	30	Yes
pH	0.17	0.91	6.5 to 8.5	Yes

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 2017.

## **7.0 Proposed Alterations, Extensions or Replacements to the Works**

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The Municipality is investigating options to meet the ECA requirement to install a disinfection system. The municipality must also consider plans for expansion now that the lagoon is consistently over 80% capacity. No definite plans have been made at this time.

## 8.0 Sludge Reporting

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No sludge was removed from the lagoon in 2017. The sludge in the lagoon was measured on September 19, 2017 using a “Sludge Judge”.

### 8.1 Sludge Measurement

Location	Lagoon Depth	Sludge Depth (feet)
1 <sup>st</sup> Aeration Line	6 feet	2 feet
2 <sup>nd</sup> Aeration Line	6 feet	1 foot
3 <sup>rd</sup> Aeration Line	6 feet, 4 inches	6 inches
4 <sup>th</sup> Aeration Line	6 feet, 3 inches	6 inches

## 9.0 Calibration and Maintenance of all Monitoring Equipment

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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 2017.

All equipment is calibrated based on the manufactures recommendations. Refer to Table 9.1 for a summary of calibrations conducted in 2017.

### 9.1 Calibration Summary

Date	Instrument	% Accuracy
May 4	Flow Meter	99.6

## Appendix A: 2017 Monthly Process Data Report

Raw Data (mg/L)	Count	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
BOD <sub>5</sub>	12	21	55	30	23	31	12	20	46	56	58
Total Suspended Solids	13	31	49	144	32	41	1	19	46	91	32
TKN	13	9.74	22.80	10.02	5.17	8.67	2.30	8.60	8.35	12.20	16.2
Total Phosphorus	13	0.61	0.50	0.68	0.56	0.73	0.19	0.72	0.90	1.55	1.32

Final Effluent (mg/L)	Count	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
cBOD <sub>5</sub>	12	2.7	2.3	5.9	3.7	7.5	2.8	9.6	7.8	15	2.1
Total Suspended Solids	13	8.5	1.0	27	5.5	26	6	18	14.5	16	2
Total Phosphorus	13	0.09	0.09	0.54	0.12	0.18	0.12	0.21	0.11	0.10	0.02
Total Ammonia Nitrogen	13	2.36	3.4	5.215	3.5	0.123	0.832	0.022	0.077	1.86	2.5
<i>E. coli.</i> (cfu/100 mL)	13	5600	600	2750	34	5	<5	<5	5	10	20
pH - Average	51	7.936	7.953	7.74	8.3	8.36	8.3	8.684	8.185	6.748	7.48
pH - Minimum	7.66	7.7	7.2	7.7	7.7	7.9	7.81	7.02	6.55	6.91	7.3
pH - Maximum	8.06	8.31	7.99	9.0	9.0	8.6	9.3	9.11	6.85	7.71	7.5