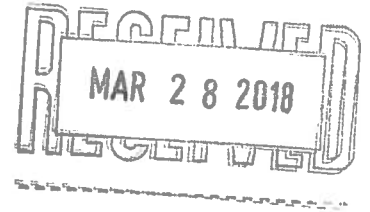


From: Rebecca Marshall <RMarshall@ocwa.com>
Sent: Wednesday, March 28, 2018 2:17 PM
To: Ilersich, Sherry (MOECC); Elaine Gunnell; Roxanne St. Germain
Cc: Rebecca Marshall; Duquette, Lori (ENE)
Subject: Temagami South Lagoon 2017 Annual Report
Attachments: Temagami South Lagoon Annual Report 2017.pdf



Good Afternoon,

The Temagami South 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

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Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Temagami South Wastewater Treatment Lagoon

Annual Performance Report **January 1, 2017 to December 31, 2017**

Prepared by the Ontario Clean Water Agency, Northeastern Ontario Hub

EXECUTIVE SUMMARY

In 2017, the Temagami South Lagoon was able to meet most of the requirements of Environmental Compliance Approval (ECA) #3-1567-98-006 for Municipal and Private Sewage Works. Condition 4(4.4) of the ECA requires the Owner to prepare and submit a performance report to the Ministry of the Environment's District Manager on an annual basis, within 90 days of the end of the reporting period, for the preceding calendar year. The 2017 Annual Performance Report was prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Municipality of Temagami and is based on information kept on record by OCWA. The report has been completed in accordance with the approval and contains but is not limited to the following information as per the ECA;

- a summary of all monitoring data including an overview of the success and adequacy of the sewage treatment program;
- a comprehensive interpretation of all monitoring data and analytical data obtained during the reporting period, and a comparison to the effluent quality and quantity criteria described in condition 1;
- a summary of any effluent quality assurance or control measures undertaken during the reporting period;
- a tabulation and description of all bypasses, emergency and upset conditions, events that took place during the reporting period;
- a summary of the calibration and maintenance procedures conducted on all monitoring equipment;

The Temagami South Lagoon operated well and produced good quality effluent throughout the reporting period meeting the effluent limits specified in the ECA with the exception of the Biochemical Oxygen Demand (BOD5) objective during the spring discharge period.

All requirements specified in the approval and any issues experienced at the facility are further explained throughout the report.

Annual Performance Report

Sewage System Name:	Temagami South Wastewater Treatment Lagoon
Sewage System Address:	Part of Parcels 19125 and 16810 (22 Jack Guppy Way), Municipality of Temagami, ON
Sewage System Owner:	Corporation of the Municipality of Temagami
Sewage System Number:	110002327
Environmental Compliance Approval:	3-1567-98-006, issued November 8, 1998 and 3-1567-98-006 Notice No. 1, issued December 3, 2008
Reporting Period:	January 1, 2017 to December 31, 2017

Facility Description

Capacity of Works:	232 m ³ /day
Service Area:	Temagami, District of Nipissing
Service Population:	350
Effluent Receiver:	Snake Island Lake
Major Process:	Two Cell Phosphorous Removal Lagoon

The Temagami South Wastewater Treatment Lagoon is a Class I facility with a daily average flow capacity of 232 m³/day. It consists of a 7.0 acre two-celled waste stabilization lagoon with a storage capacity of 45,800 m³. The system provides phosphorus removal with the addition of ferric sulphate.

Wastewater from Temagami South is collected by a low pressure/shallow buried sanitary collector sewer system. Each home or business is equipped with a low-pressure grinder pump which pumps wastewater to the collection system.

The system discharges seasonally into Snake Island Lake. The discharge period occurs from May 1 to June 15 and from October 15 to November 30, at a rate that is not to exceed 33.3 L/s or 2877.12 m³/day.

1.0 Monitoring Data

1.1 Monitoring Program as Outlined in the Environmental Compliance Approval

BOD₅ = Five-day biochemical oxygen demand measured in an unfiltered sample
 TSS = Total Suspended Solids
 TP = Total Phosphorus
 TKN = Total Kjeldahl Nitrogen
 (NH₃⁻ + NH₄) N = Nitrogen as Ammonium and Ammonia

H₂S = Hydrogen Sulphide

1.1.1 Raw Sewage (Influent)

Parameter	Type of Sample	Minimum Frequency
BOD ₅	grab	quarterly
TSS	grab	quarterly
TP	grab	quarterly
TKN	grab	quarterly

1.1.2 Lagoon Cell Contents

Parameter	Type of Sample	Minimum Frequency
TP	grab	prior to discharge
H ₂ S	grab	prior to discharge
<i>E. coli</i>	grab	prior to discharge

1.1.3 Final Effluent

Parameter	Type of Sample	Minimum Frequency
BOD ₅	grab	five per discharge
TSS	grab	five per discharge
TP	grab	five per discharge
(NH ₃ ⁻ + NH ₄) N	grab	five per discharge

Note: Collected at 0%, 25%, 50%, 75% and 100% drawdown in the lagoon, during the discharge period.

1.2 Data

1.2.1 Influent Flow

Month	Average Flow (m ³ /day)	Maximum Flow (m ³ /day)	Total Flow (m ³ /day)
January	119	124	3557
February	126	135	3529
March	127	182	3946

Month	Average Flow (m ³ /day)	Maximum Flow (m ³ /day)	Total Flow (m ³ /day)
April	125	161	3742
May	121	131	3741
June	120	138	3586
July	137	153	4254
August	393	965	7854
September	116	131	3471
October	113	127	3498
November	131	147	3922
December	151	193	4677

1.2.2 Summary of Influent Flow

Maximum Flow (m ³ /day)	Average Flow (m ³ /day)	Rated Capacity (m ³ /day)	% Capacity	Exceedance
965	141	232	61	No

1.2.3 Raw Sewage (Influent)

Parameter	Average	Maximum
BOD ₅ (mg/L)	125	260
TSS (mg/L)	178	282
TP (mg/L)	4.77	7.5
TKN (mg/L)	32.3	49.7

1.2.4 Lagoon Cell Contents

Parameter	Spring	Fall
TP (mg/L)	0.261	0.139
H ₂ S (mg/L)	<0.04	<0.02
<i>E. coli</i> (cfu/100 mL)	3400	<5

Note: cfu = colony forming units

1.2.5 Effluent Flow Summary

Discharge Period	Volume (m ³)	Average Flow (m ³ /day)	Flow Rate (L/sec)	Compliance
Spring - May 10 to 23	21255	1635	18.9	2877.1 m ³ /day or 33.3 L/sec
Fall - Oct.16 to Nov.6	16656	1041	12	

1.2.6a Effluent – Spring

Parameter (mg/L)	Seasonal Average	Compliance Limit	Compliance Period	Exceedance
BOD ₅	18.4	25	seasonal average	No
TSS	14.4	25	seasonal average	No
TP	0.203	1.0	seasonal average	No
TAN (NH ₃ ⁻ + NH ₄) N	18.4	N/A	N/A	N/A

1.2.6b Effluent – Fall

Parameter (mg/L)	Seasonal Average	Compliance Limit	Compliance Period	Exceedance
BOD ₅	7.2	25	seasonal average	No
TSS	12.8	25	seasonal average	No
TP	0.148	1.0	seasonal average	No
TAN (NH ₃ ⁻ + NH ₄) N	2.54	N/A	N/A	N/A

1.2.7a Effluent – Spring Loadings

Parameter (kg/day)	Average	Compliance Limit	Compliance Period	Exceedance
BOD ₅	30	71.9	seasonal average	No
TSS	24	71.9	seasonal average	No
TP	0.33	2.9	seasonal average	No

1.2.7b Effluent – Fall Loadings

Parameter (kg/day)	Average	Compliance Limit	Compliance Period	Exceedance
BOD ₅	7	71.9	seasonal average	No
TSS	13	71.9	seasonal average	No
TP	0.15	2.9	seasonal average	No

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 BOD₅, suspended solids and total phosphorus.

1.3.1a Performance Summary – Spring

Parameter	Influent	Effluent	% Removal
BOD ₅ (mg/L)	125	18.4	85
TSS (mg/L)	178	14.4	92
TP (mg/L)	4.77	0.203	96

1.3.1b Performance Summary – Fall

Parameter	Influent	Effluent	% Removal
BOD ₅ (mg/L)	125	7.2	94
TSS (mg/L)	178	12.8	93
TP (mg/L)	4.77	0.148	97

2.0 Interpretation of Monitoring and Analytical Data

The Temagami South Sewage Treatment Lagoon operated well within its required capacity. 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 and maximum flows are presented for each month. Compliance is achieved when the average annual influent flow does not exceed 232 m³/day and when the seasonal average effluent does not exceed 2877.1 m³/day. In 2017, the average annual flow was 141 m³/day which represents 61% of the rated capacity and the maximum seasonal average effluent flow was 1635 m³/day, which represents 57% of the compliance limit. The total amount of sewage treated in 2017 was 49,777 m³.

The effluent quality is based on the seasonal average of the biochemical oxygen demand, total suspended solids, and total phosphorus levels. The annual averages for all parameters are listed in table 1.2.6 *Effluent*.

Biological Oxygen Demand (BOD₅) is the amount of oxygen used by micro-organisms as they decompose organic matter in the effluent sample for five days. High BOD₅ 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. In 2017, the average BOD₅ for both seasons complied with the limit of 25 mg/L.

Suspended Solids (TSS) in effluent are composed of settleable solids 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 2017, the average TSS for both seasons complied with the limit of 25 mg/L.

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. In 2017, the average TP for both seasons complied with the limit of 1 mg/L.

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 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 lagoon system is inspected by a certified OCWA operator regularly during the work week.
- Certified operators conduct daily reviews of selected data from continuous monitoring equipment which is captured by OCWA's remote monitoring system.
- Certified operators monitor chemical usage and make adjustments as required
- Operation and Compliance staff reviews daily round sheets and laboratory reports to keep track of routine operation of the treatment plant and ensure compliance with the ECA.
- All process and laboratory data is logged in a process data management system (PDM/WISKI 7).
- All effluent quality data is reviewed by the ORO 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 scheduled in OCWA's Workplace Maintenance System (WMS), was completed in 2016.

Quality Control elements of the monitoring program include the following:

- Samples are collected as required and analyzed by Accuracy Environmental Laboratories located in Kirkland Lake, Ontario. Analyses are conducted in accordance

with the Standard Council of Canada (SCC), in cooperation with the Canadian Association for Laboratory Accreditation Inc. (CALA) formerly, the Canadian Association for Environmental Analytical Laboratories (CAEAL).

- Quality control procedures are method specific and include laboratory duplicate samples, spiked blanks and spiked duplicates.
- Any bypass or upset events that occur in the system are tested, monitored and reported to the local Health Unit and Spills Action Center (SAC) and local Health Unit.

4.0 Bypasses, Sewer Main Breaks, Emergency, and Upset Events

There were no bypass, sewer main breaks, emergency or upset events for 2017.

5.0 Calibration and Maintenance of all Monitoring Equipment

Plant maintenance, including non-scheduled maintenance, is monitored using the OCWA's Preventative Maintenance software program. Monitoring equipment is calibrated based on the manufactures recommendations. All routine and preventative maintenance measures were conducted as scheduled in 2017. Refer to Table 5.1 for a summary of calibrations conducted in 2017.

5.1 Calibration Summary

Date	Instrument	% Accuracy
February 28, 2017	Influent Flow Meter	99.3 to 99.8

6.0 Maintenance Procedures Performed on the Works

No major maintenance was performed on the system in 2017. Routine maintenance schedules are entered in OCWA's computerized Workplace Management System (WMS). This is a comprehensive maintenance program that is based on a pro-active and preventive approach. This program includes but is not limited to running weekly, monthly, and annually checks as required or as recommended by manufacturer's instructions. All routine and preventative maintenance measures were conducted as scheduled in 2017.

7.0 Efforts Made to Meet Effluent Objectives

OCWA uses a number of best efforts to achieve the *Effluent Objectives*.

Operational staff has current and appropriate level of certification for the operation of the facility and continue to learn and achieve knowledge of the process and equipment. Staff also has a high level of regulatory competence.

The mechanical elements in the facility are regularly inspected, well maintained and kept in good repair. OCWA uses a computerized maintenance management program which generates works orders to ensure maintenance of equipment is proactively performed.

Raw wastewater and effluent samples are collected as required and analyzed by Testmark Laboratories, an accredited laboratory in Kirkland Lake. OCWA reviews these results on a regular basis to ensure compliance with ECA objectives and limits.

In-house sampling and testing for operational parameters provides real time results which are used to enhance process and operational performance.

Operations, maintenance and emergency procedures are available to ensure facilities are operated in compliance with applicable legal instruments. Facility staff has access to a network of operational compliance and support experts at the region and corporate levels.

OCWA provides regular status reports to the Owner which discusses operational data, maintenance activities and capital improvements.

During this reporting period, the facility met the annual effluent objectives for Total Phosphorous and Total Suspended Solids, but exceeded the objective for BOD₅ during the spring discharge. The effluent loadings objectives were met during both the spring and fall discharge seasons. Results are provided in the tables below for a comparison of the seasonal results to the system's objectives.

7.1a Spring Effluent Concentration Objectives

Parameter	Seasonal Average	Objective (Seasonal Average)	Exceedance
BOD ₅ (mg/L)	18.4	15	Yes
TSS (mg/L)	14.4	20	No
TP (mg/L)	0.203	1	No

7.1b Fall Effluent Concentration Objectives

Parameter	Seasonal Average	Objective (Seasonal Average)	Exceedance
BOD ₅ (mg/L)	7.2	15	No
TSS (mg/L)	12.8	20	No
TP (mg/L)	0.148	1	No

7.2a Spring Effluent Loading Objectives

Parameter	Average	Objective (Seasonal Average)	Exceedance
BOD ₅ (mg/L)	30	43.1	No
TSS (mg/L)	24	57.5	No
TP (mg/L)	0.33	2.9	No

7.2b Fall Effluent Loading Objectives

Parameter	Average	Objective (Seasonal Average)	Exceedance
BOD ₅ (mg/L)	7	43.1	No
TSS (mg/L)	13	57.5	No
TP (mg/L)	0.15	2.9	No

Appendix A: Monthly Process Data Report

Raw Data (mg/L)	Count	Jan	Apr	Jul	Oct	Average
BOD5	4	260	100	9.6	130	125
Suspended Solids	4	254	104	282	71	178
TKN	4	49.7	23.4	40	15.9	32.3
Total Phosphorus	4	5.66	3.52	7.5	2.41	4.77

Spring Effluent (mg/L)	Count	May	Average
BOD5	5	18.4	18.4
Suspended Solids	5	14.4	14.4
Total Phosphorus	5	0.203	0.203
NH3 + NH4 as N	5	18.4	18.4

Fall Effluent (mg/L)	Count	Oct	Nov	Average
BOD5	5	10.2	2.75	7.2
Suspended Solids	5	16.8	6.75	12.8
Total Phosphorus	5	0.177	0.106	0.148
NH3 + NH4 as N	5	2.1	3.3	2.5