

February 15, 2019

Ministry of the Environment
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Attn.: Mr. Tom Clubb

**Re: Listowel Wastewater Treatment Facility
2018 Annual Report**

Please find enclosed the 2018 Annual Report for the Municipality of North Perth – Listowel Wastewater Treatment Facility. In accordance with Amended Environmental Compliance Approval # 0161-ALLQ8G, this report outlines;

1. Summary and interpretation of all monitoring data and comparison to compliance limits;
2. Description of any operating problems and corrective actions taken;
3. Summary of the maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
4. Summary of effluent quality assurance or control measures;
5. Summary of the calibration and maintenance on all effluent monitoring equipment;
6. Description of efforts made and results achieved in meeting the Design Objectives;
7. Tabulation of the volume of sludge generated and an outline of the anticipated volumes to be generated in the next reporting period and a summary of the locations of where the sludge was disposed;
8. Summary of complaints received and the steps taken to address the complaints;
9. Summary of all By-pass, spill or abnormal discharge events
10. Summary of quantity and quality of different types of imported wastewater co-treated at the Works and an overview of the success of the co-treatment;
11. Tabulation of the quantities and characteristics of the sewage from all different sources in the reporting period on a monthly basis and an outline of any changes in the anticipated quantities and characteristics of the sewage from all different sources in the next reporting period;
12. A copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report of the implementation of each modification;

13. A report summarizing all modifications completed as a result of Schedule A, Section 3; and
14. Any other information the Water Supervisor requires from time to time.

Regards,

Mark Hackett
Manager of Environmental Services, Municipality of North Perth

1. MONITORING DATA AND ANALYTICAL RESULTS

The utility monitoring reports for the year are attached in accordance with the Environmental Compliance Approval guidelines for the period January to December 2018.

The total influent flow in 2018 was 2319.767 ML. The annualized average daily flow was 6.374 MLD. The design capacity for the treatment facility is 9.03 MLD. The maximum influent daily flow for the year was 24.843 MLD, which was recorded in the month of February. The total influent flow includes the Atwood Wastewater System, which added 76.963 ML and the Septage Receiving Station, which added an additional 128.265 ML.

The total effluent flow for the year was 2337.644 ML and the annualized average effluent daily flow for the year was 6.408 MLD. The maximum effluent daily flow for the year was 16.890 MLD, which was recorded in the month of January.

The annualized influent concentrations and loadings for Carbonaceous Biochemical Oxygen Demand (CBOD₅), Suspended Solids, Total Phosphorus and Total Kjeldahl Nitrogen are summarized in the table below. The concentrations and loadings were calculated using the annualized averages of the monthly averages.

| Influent Quality Parameter | Average Concentration (mg/L) | Average Loading (kg/d) |
|-----------------------------------|-------------------------------------|-------------------------------|
| CBOD ₅ | 489 | 2886.6 |
| Suspended Solids | 563 | 3206.1 |
| Total Phosphorus | 9.67 | 60.7 |
| Total Kjeldahl Nitrogen | 88.4 | 516.5 |

The annualized effluent concentrations various parameters are summarized in the table below. The concentrations were calculated using the annualized averages of the monthly averages.

| Effluent Quality Parameter | Average Concentration mg/L | Concentration Criteria mg/L December 1 - March 32 | Concentration Criteria mg/L April 1 – November 30 | Compliance |
|----------------------------|----------------------------|---|---|------------|
| CBOD ₅ | 2.3 | < 15 | < 10 | Monthly |
| Suspended Solids | 3.67 | < 15 | < 10 | Monthly |
| Total Phosphorus | 0.16 | < 0.73 | < 0.36 | Monthly |
| Ammonia + Ammonium | 0.36 | < 3.62 | < 2.2 | Monthly |
| Total Kjeldahl Nitrogen | 1.8 | | | |
| E. Coli | 37.1 | 200 counts/100 mL | 200 counts/100 mL | Monthly |
| pH | 7.74 | | | |
| Temperature | 16.6 | | | |
| Dissolved Oxygen | 8.1 | > 5 | > 5 | Monthly |

All of the effluent monthly concentration criteria as per the Environmental Compliance Approval were achieved for the reporting period,

The annualized effluent loadings for various parameters have been calculated based on the monthly average effluent daily flows and monthly effluent monthly concentrations. They are summarized in the table below.

| Effluent Parameter | Loading Kg/day | Monthly Average Loading (kg/d) @ period B Temp.< 5 | Average Monthly Loading (kg/d) @ period A Temp. >5 |
|-------------------------|----------------|--|--|
| CBOD ₅ | 14.8 | 135.6 | 90.4 |
| Suspended Solids | 25.7 | 135.6 | 90.4 |
| Total Phosphorus | 1.0 | 6.56 | 3.28 |
| Ammonia + Ammonium | 2.8 | 32.8 | 20.0 |
| Total Kjeldahl Nitrogen | 11.6 | | |

The table below evaluates the performance of the wastewater treatment process. The efficiency is expressed as % removal and was calculated using the annualized influent and effluent concentrations and annualized influent and effluent loadings for each parameter.

| Parameter | Concentration % Removal | Loading % Removal |
|-------------------------|--------------------------------|--------------------------|
| CBOD ₅ | 99.5 % | 99.5% |
| Suspended Solids | 99.3 % | 99.2% |
| Total Phosphorus | 98.4 % | 98.4% |
| Total Kjeldahl Nitrogen | 98.0 % | 97.8% |

2. OPERATIONAL UPSETS

There were no operational upsets during the reporting period.

3. MAINTENANCE ACTIVITIES

- All blowers inspected including vibration analysis by contractor
- Blower #3 had complete refurbishment
- Inspection, cleaning and replacement of UV lights as required
- Final Effluent Pump #1 motor and pump refurbishment
- Inkerman Street Pump Station had PLC replaced and an electrical overhaul
- Highway #23 Pump Station Refurbishment of Pumps #1 and #3
- All on-line dissolved oxygen and suspended solids sensors where inspected and calibrated by contractor
- Filter #2 had sand replaced and pumps rebuilt
- Filters received chemical treatment to clean porous plates

4. QUALITY ASSURANCE OR CONTROL MEASURES

A 24hr composite sampler, model American Sigma, located at the inlet head works of the treatment plant obtains the influent sample. The sample is drawn from the screen effluent channel prior to grit removal. A 100 mL sample is taken every 30 minutes.

A 24hr composite sampler, model American Sigma, located at the effluent UV channel obtains the effluent sample. A 100 mL sample is taken every 30 minutes.

A sampler for the Septage Receiving Station was installed in 2016 to take samples automatically from loads received.

The influent and effluent samples as well as Septage Receiving Station samples are sent to ALS Labs in Waterloo for independent analysis. A portion of the same sample is analyzed in-house for suspended solids, pH, dissolved oxygen, nitrates, ammonia, phosphorus and temperature. All laboratory instruments used in-house are regularly calibrated as per manufacturer's recommendations and the methodology follows "Standard Methods for the Examination of Water and Wastewater".

5. MONITORING EQUIPMENT CALIBRATION & MAINTENANCE

The Spectrophotometer used in the WWTP lab was calibrated. All of the various flow meters in use were calibrated and a copy of their reports is attached.

6. MEETING DESIGN OBJECTIVES

Through the best efforts of the operators, the treatment plant achieved all of the effluent parameter design objectives for the reporting period. The objectives were met as follows:

- CBOD₅ – achieved 12 out of 12 months
- TSS – achieved 12 out of 12 months
- TP – achieved 12 out of 12 months
- Ammonia – achieved 12 out of 12 months

7. SLUDGE GENERATED AND ANTICIPATED VOLUMES AND LOCATIONS

The waste activated sludge generated from the process is estimated to be a total volume of 141,735 m³ for 2018. The aerobic digester and sludge storage facility was utilized for the entire year. Approximately 500 m³ of supernatant was transferred to the east onsite lagoon to allow enough room to continue the wasting process needed to operate the plant efficiently. For 2018, 18,260 m³ of digested sludge was hauled from the sludge holding cell. In 2019, similar volumes of sludge generation are expected.

The waste activated sludge generated at the wastewater treatment plant is aerobically stabilized in the aerated digester. It is then transferred into the sludge storage cell on site until it can be removed and hauled to approved agricultural sites for land application. A copy of the sludge analysis is attached. The following table summarizes the volume of sludge applied, to which site it was applied and the date of the application of the sludge:

2018 Sludge Haulage Summary

| Date | Site # | Volume (m ³) |
|------------------------------|-----------------------------------|--------------------------|
| June 11 & 12/2018 | 22254 | 3,189 |
| June 13/2018 | 22254 | 1,450 |
| | Site # 22254 Total | 4,639 |
| August 28/2018 | 22252 | 1,639 |
| | Site # 22252 Total | 1,639 |
| Aug 29, 30 & Sept 4,5,6/2018 | 22250 | 6,498 |
| | Site # 22250 Total | 6,498 |
| September 7 & 10/2018 | 22251 | 2,737 |
| September 11 & 12/2018 | 22251 | 2,747 |
| | Site # 22251 Total | 5,484 |
| | Annual Total Sludge Hauled | 18,260 |

8. SUMMARY OF COMPLAINTS RECEIVED

There were no odor complaints received during the reporting period in 2018.

9. BY-PASS, SPILLS AND ABNORMAL DISCHARGE EVENTS.

There were no by-pass, spill or abnormal discharge events during the reporting period in 2018.

10. IMPORTED WASTEWATER SUMMARY

The Septage Receiving Station was in operation for the entire year. The controlled pumping of the storage tank contents through the WWTF force main eliminated the effects of shock loading experienced in prior years. This enabled the plant to +successfully treat the imported waste on a consistent basis. The daily totals of imported wastewater received and its various parameters are reflected in the table below. An odor control system was installed in 2010 and is working well to eliminate odors from the Septage Receiving Station.

| Imported Wastewater | Average Flow (Cubic meters/day) | Average Loading (Kilograms/day) | |
|--------------------------------|---------------------------------|---------------------------------|-------|
| | | BOD ₅ | TKN |
| Septage | 98.48 | 348.0 | 50.4 |
| Atwood Pet Foods | 67.12 | 658.9 | 132.0 |
| JTC - Conestoga Meats | 47.63 | 37.1 | 13.1 |
| JTC - Sunoco | 21.61 | 23.6 | 13.3 |
| OGI - Sheik | 24.43 | 38.0 | 4.9 |
| OGI - Cheese | 8.99 | 18.2 | 11.7 |
| OGI - Alltreat | 1.13 | 0.5 | 0.1 |
| OGI - Domingos | 0.58 | 8.9 | 6.4 |
| Nafziger Waste – Tank Effluent | 12.72 | 77.8 | 7.3 |
| Nafziger Waste – Fieldgate | 24.27 | 89.1 | 20.3 |
| Nafziger Waste – New Process | 23.42 | 102.5 | 11.1 |
| Flowchem | 0.20 | 0.2 | 0.01 |
| Par Two Farms | 0.39 | 0.3 | 0.2 |

11. SUMMARY OF INFLUENT QUANTITIES AND CHARACTERISTICS

The quantities and characteristics of sewage from all sources on a monthly basis are summarized in the attached *North Perth Wastewater Treatment Plant Compliance Report 2018*. No changes are anticipated in the quantities and characteristics of sewage from the different sources in the next reporting period.

12. NOTICE OF MODIFICATIONS

There were no Notice of Modification to Sewage Works submitted to the Water Supervisor as a result of Schedule B, Section 1 in 2018.

13. SUMMARY OF SCHEDULE A, SECTION 3

There were no modifications completed in 2018 as a result of Schedule A, Section 3.

14. INFORMATION PROVIDED TO WATER SUPERVISOR

There was not any additional information required or requested to be submitted to the Water Supervisor in 2018.