

Barry's Bay Wastewater System

2013 Annual Report



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Ontario Clean Water Agency
Agence Ontarienne Des Eaux

This report has been prepared to meet the requirements set out in the facility Certificate of Approval #2702-7TKNBE issued August, 31, 2009.

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Appendix A – Facility Performance Report

Appendix B – Biosolids Quality Report

Compliance Report Card

| Compliance Event | # of Events | Details |
|-------------------------------------|-------------|--|
| Ministry of Environment Inspections | 1 | There were no actions required as a result of this inspection |
| Ministry of Labour Inspections | 0 | |
| Effluent Parameter Exceedances | 5 | 3 Effluent phosphorus 1 Effluent pH 1 Effluent Acute Lethality |
| Bypass/Overflows | 0 | |
| Community Complaints | 1 | Back-up in collection system |
| Spills/Abnormal Discharge | 1 | Caused by collection blockages |

System/Process Description

The Barry’s Bay Wastewater Treatment System is designed to accept 1250 m³/day of raw sewage. There are three (3) sewage pumping stations that collect raw sewage from the community and convey the raw sewage to the treatment system. Flow is conveyed to the treatment plant from the Lakeshore Drive Pumping Station.

Primary Treatment

The raw flow passes through a screw auger and grinder mechanism. This screw is designed to remove debris too large to fit through the screen. The debris is taken to landfill. The flow continues through grit channels which are designed to reduce the flow velocity to allow the heavy in-organics time to settle.



Chemical Addition

Sodium Hydroxide (Caustic Soda) is added to the process for Alkalinity and Phosphorus control. This chemical was changed from Sodium Hydroxide to PHAS 8 on May 3, 2012.



Secondary Treatment

The flow is then split between two (2) train Sequencing Batch Reactor (SBR) Systems. The flow enters a series of tanks the first being an Anaerobic Tank.



The next tank is an ISAM or an Anoxic Tank and the third tank is an SBR. Each SBR uses fine bubble aeration and has automatic return activated sludge capabilities.



During an SBR “Decant Cycle” the clear effluent is drained to an equalization tank and pumped to the tertiary filters. The sludge from the bottom of the aeration is either returned to the Anoxic Tank or wasted to the Anaerobic Tank.



Tertiary Treatment

The flow enters into a continuous backwash, up-flow, deep bed sand filter.



The filtrate is disinfected using ultraviolet light and discharged to Kamaniskeg Lake.



Solids Handling

Solids from the Primary tank are pumped to the aerated digester system. Once the solids have been aerated and the process turned from anaerobic to aerobic, they are pumped into the sludge holding tank.



Septage Receiving

The Barry’s Bay Treatment Plant also has a Septage Receiving Station. The process includes screening, flow meter, aeration and odour control. It also has the ability to allow operations staff to adjust the flow into the treatment process.

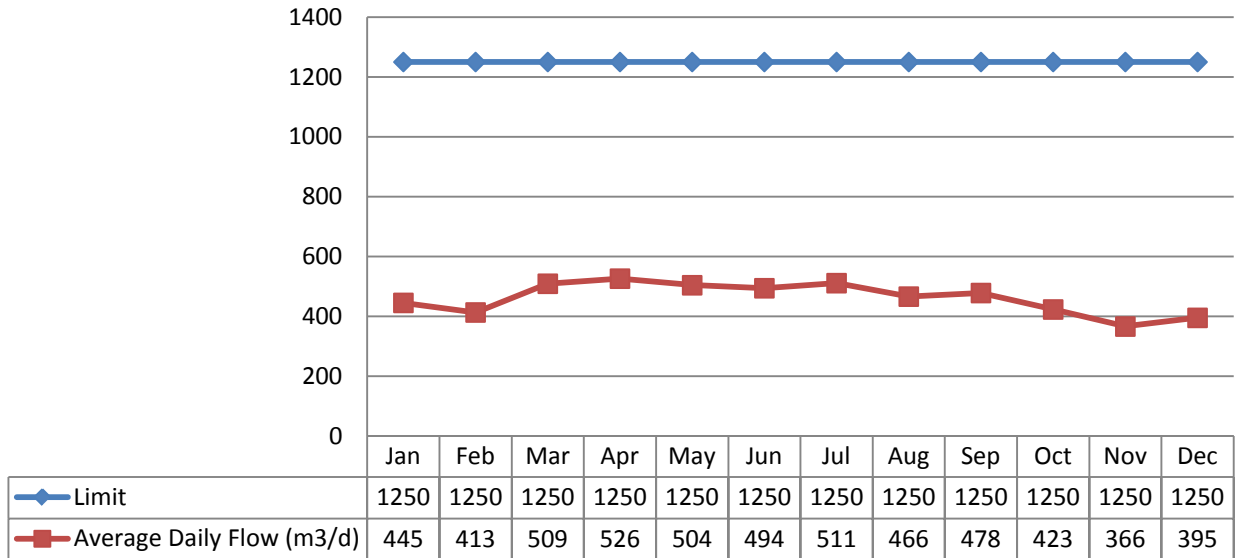


Proposed Alterations, Extensions, or Replacement to Works

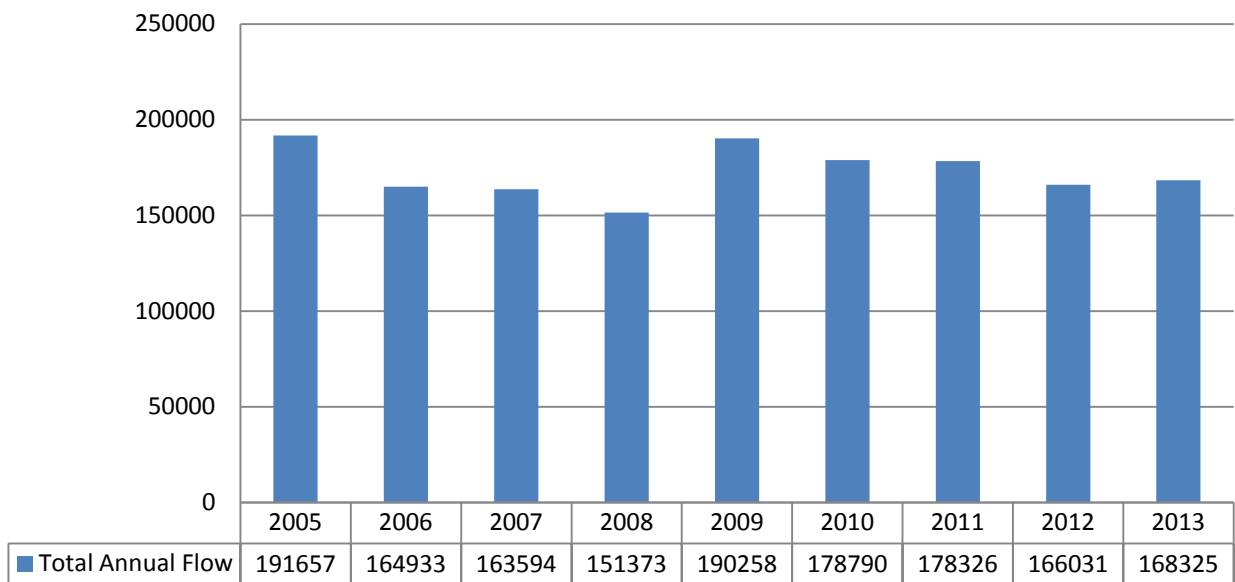
The construction project team are working through and will continue to work through the outstanding facility deficiencies.

Treatment Flows

Raw Flow (m3/d)



Annual Comparison (m3)



Leachate Flow (m3/d)

There was no leachate accepted at this facility in 2013.

Septage Flow (m3/d)

There was no septage accepted at this facility in 2013.

Effluent Quality Assurance or Control Measures

The Madawaska Valley facilities are part of OCWA’s operational Ottawa Valley Hub. The facilities are supported by hub, regional and corporate resources. Operational Services are delivered by OCWA staff who live and work in the community.

OCWA operates facilities in compliance with applicable regulations. The facility has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents, with annual reviews.

OCWA has additional “Value Added” and operational support services that the Madawaska Valley Township benefits from including:

- Access to a network of operational compliance and support experts at the regional and corporate level, as well as affiliated programs that include the following:
 - Quality & Environmental Management System, Occupational Health & Safety System and an internal compliance audit system.
 - Process Data Collection (PDC) facility operating information repository, which consolidates field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.
 - Work Management System (WMS) that tracks and reports maintenance activities, and creates predictive and preventative reports.
 - Outpost 5 wide-area SCADA system allows for process optimization and data logging, process trending, remote alarming and optimization of staff time.
- Client reporting which includes operational data, equipment inventory, financial statements, maintenance work orders, and capital status reports
- Site-Specific Contingency Plans and Standard Operating Procedures
- Use of accredited laboratories
- Access to a network of operational compliance and support experts at the hub, region and corporate level
- Additional support in response to unusual circumstances, and extra support in an emergency.
- Use of sampling schedules for external laboratory sampling

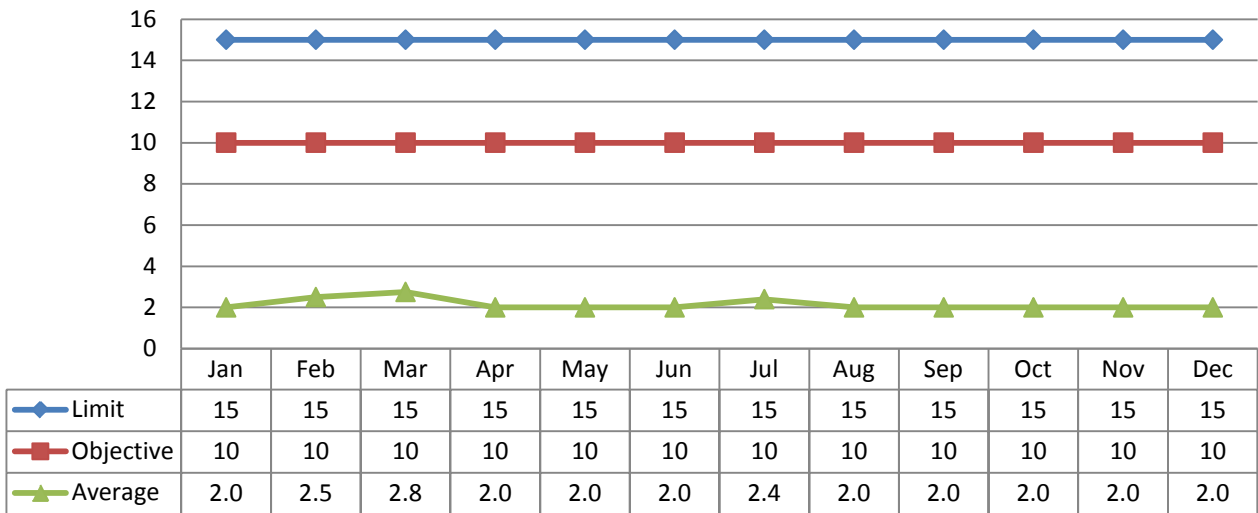
Effluent Quality

The limits are based on requirements in the facilities Certificate of Approval. Laboratory samples are submitted to an accredited laboratory (SGS Lakefield) for regulatory analysis.

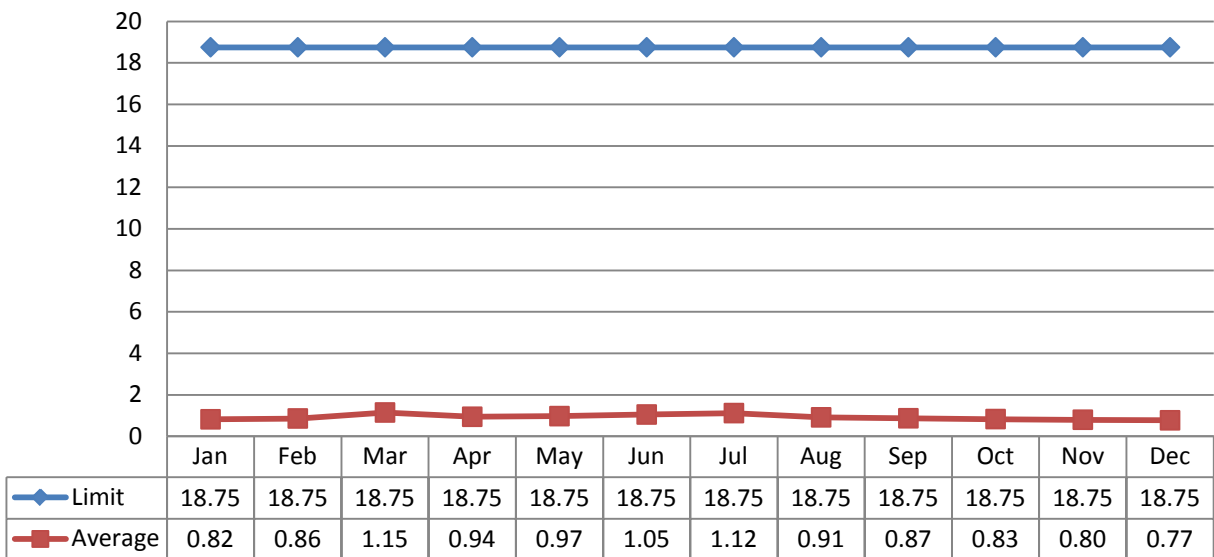
The Canadian Government is phasing in sewage regulations. This year additional sampling had to be collected to meet these regulations. The results are submitted to Environment Canada on a quarterly basis.

CBOD5

Concentration (mg/L)

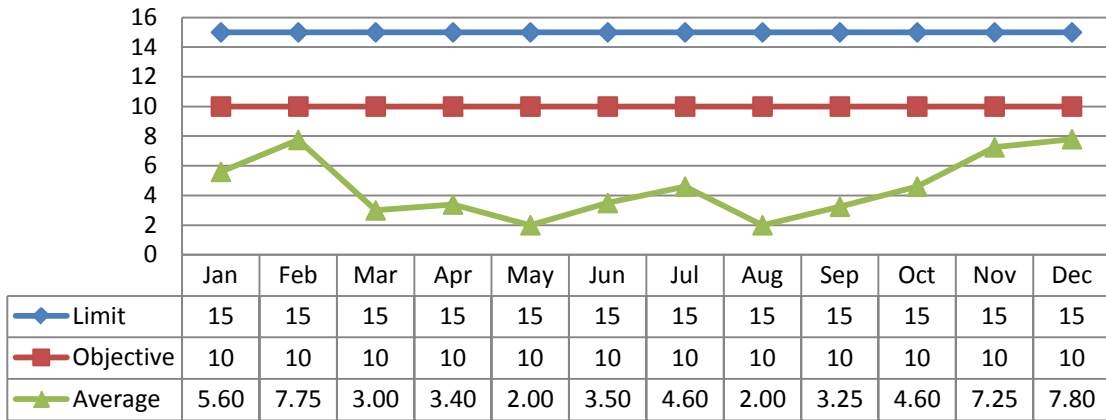


Loading (kg/d)

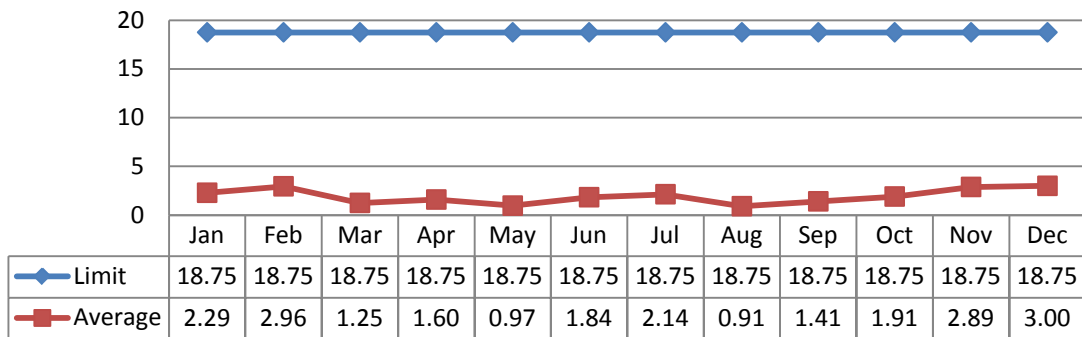


Total Suspended Solids

Concentration (mg/L)



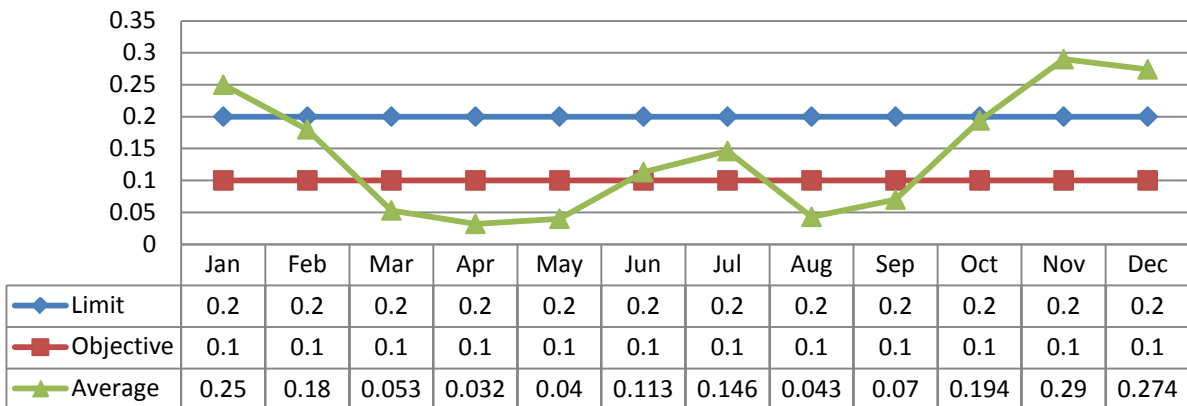
Loading (kg/d)



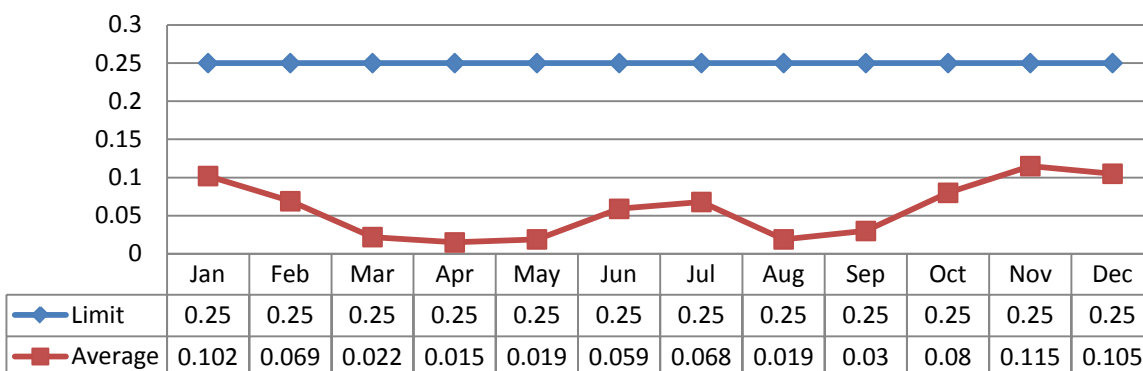
Total Phosphorus

The phosphorus level was exceeded in January 2013, November 2013 and December 2013. All of these incidents were reported to the Ministry of Environment. More details are provided in this report under Operating Problems.

Concentration (mg/L)



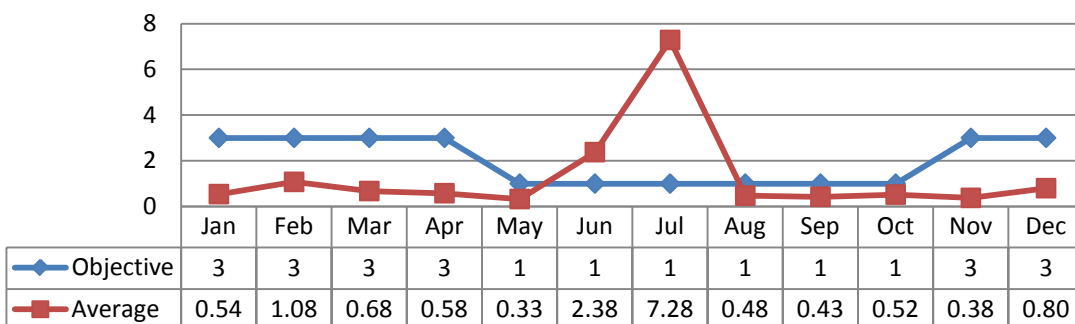
Loading (kg/d)



Total Ammonia Nitrogen

There is no limit for Total Ammonia Nitrogen. The compliance requirement for Total Ammonia Nitrogen is that the effluent is “Non-acutely lethal. For these results see the Acute Lethality Parameter. High ammonia levels in July were a result of moving the process to the other treatment train for maintenance purposes to the SBR tank. See Operating Problems for further details.

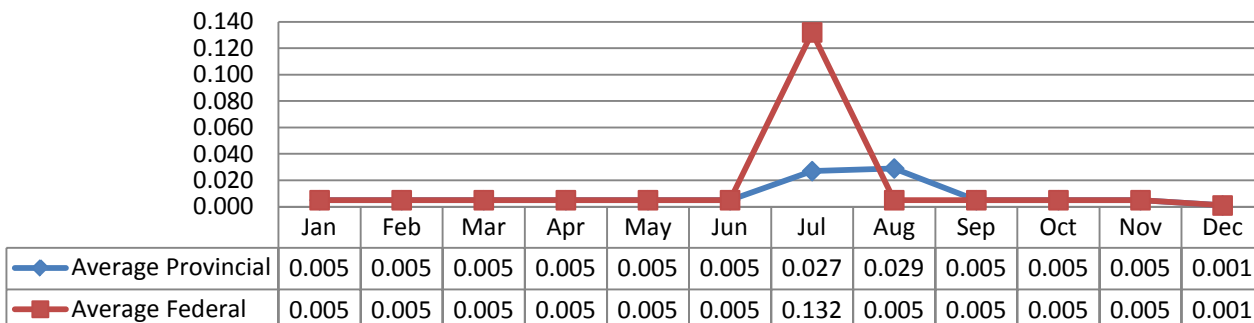
Concentration (mg/L)



Un-Ionized Ammonia

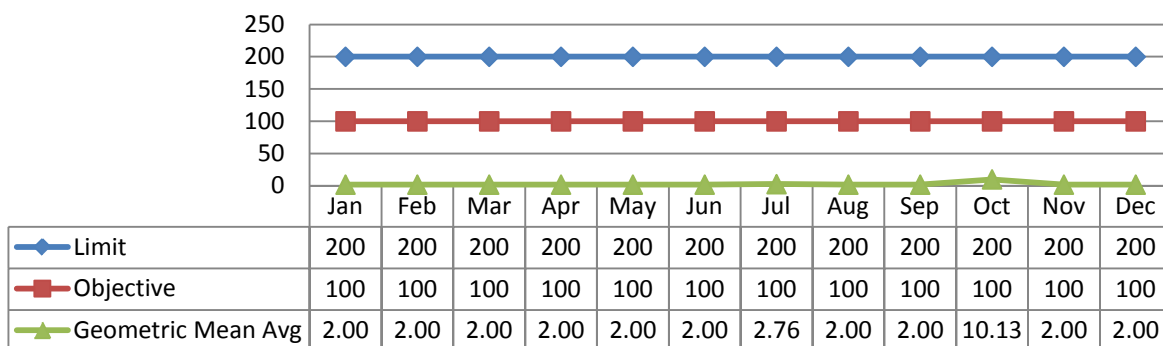
This parameter is required under Provincial and Federal Regulations. The Federal un-ionized ammonia is calculated differently than the provincial un-ionized ammonia in that the testing is completed at a sample temperature of 15°C.

Concentration (mg/L)

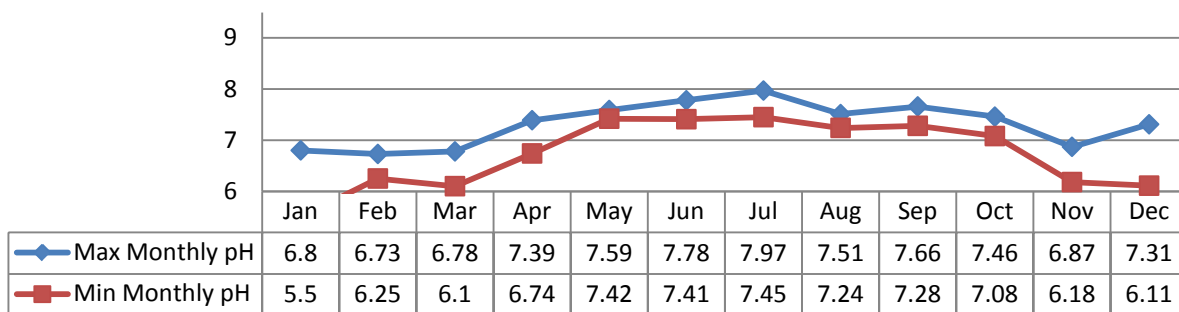


E-coli

Concentration (cfu/100mL)



pH



Acute Lethality

There were four (4) samples collected in 2013 and tested for acute lethality (Rainbow Trout and Daphnia Magna). Results are displayed as % mortality.

| Quarter | Rainbow Trout | Daphnia Magna |
|-------------------------|---------------|---------------|
| 1 st Quarter | 0% | 0% |
| 2 nd Quarter | 0% | 0% |
| 3 rd Quarter | 100%* | 0% |
| 4 th Quarter | 0% | 0% |

*See Operating Problems for Details

Leachate Quality

No Leachate was received to this facility in 2013.

Septage Quality

No septage was received to this facility in 2013.

Operating Problems

During the 2013 reporting year the plant was undergoing deficiency corrections. The process has been transferred from one train to the other on several occasions. Only one train is operational at a time as the flows are not large enough to support both trains.

January Effluent Phosphorus

- Average = 0.25 mg/L

January 29 Effluent pH

- Laboratory Result 5.5 – In-house 7.68

Upon review of operations during the period the process was moved from one Train 2 to Train 1 mid November. As a result the phosphorus averages went from 0.08 mg/L in November to 0.18mg/L in December and 0.25 mg/L in January. The monthly average for February 2013 was in compliance at 0.18 mg/L. It should also be noted that the temperatures in the SBR were lower (between 5-8 C) due to the cold weather in January.

July Acute Lethality

On June 24, 2013 the process was shifted from Train 1 to Train 2 for repairs to the SBR tank. This caused an upset to the process. A composite sample was collected on June 26 showing the ammonia had increased from 1.3 mg/L on June 18 to 7.6 mg/L on June 25.

During the process switchover an increase in solids throughout the process reduced the dissolved oxygen (DO). Operations have increased aeration to the SBR to facilitate in the nitrification process. Also wasting has been increased to remove extra solids. Operators will continue to monitor the process and make additional adjustments as needed.

November Effluent Phosphorus

- Average = 0.29 mg/L

During the month of October we removed a large volume of sludge from the process for winter. The wasting rates are being adjusted to decrease the plants current sludge age. Spreadsheets have been provided from the process engineers to assist with solids control. The alum has also been slightly increased.

December Effluent Phosphorus

- Average = 0.274 mg/L

During the month of October we removed a large volume of sludge from the process for winter. The wasting rates are being adjusted to decrease the plants current sludge age. The alum has also been slightly increased. Operations has continued to monitor the process and the phosphorus has been reduced below the required limit at the end of the month. The sample results that have been received for January also show further reduction.

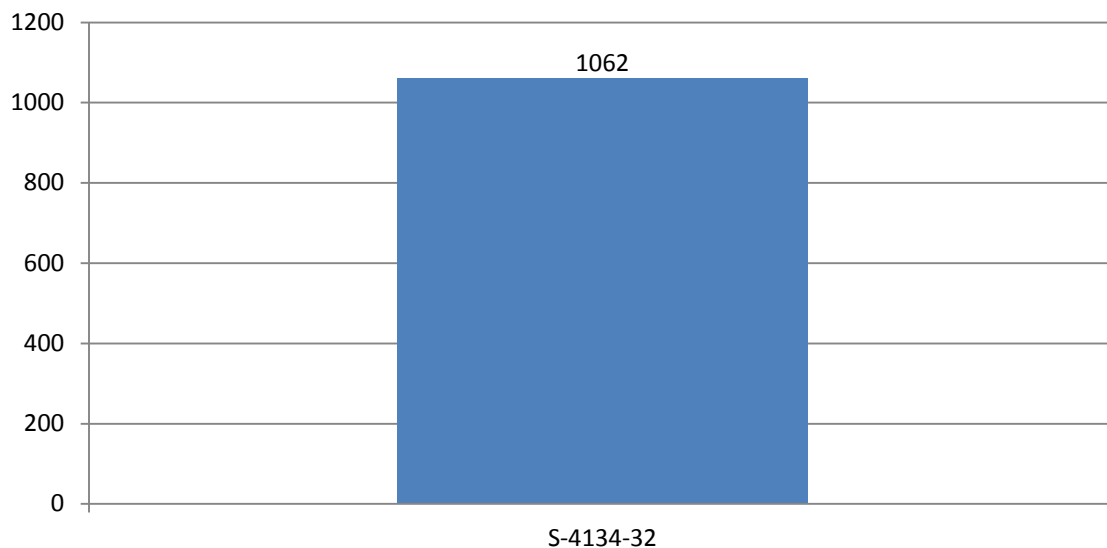
Biosolids

Sludge generated from the treatment plant was spread on agricultural land during the spreading season as per the Nutrient Management Act O.Reg 267/03. Biosolids are stored on-site in the Sludge Storage Tank, until the fields are ready for application.

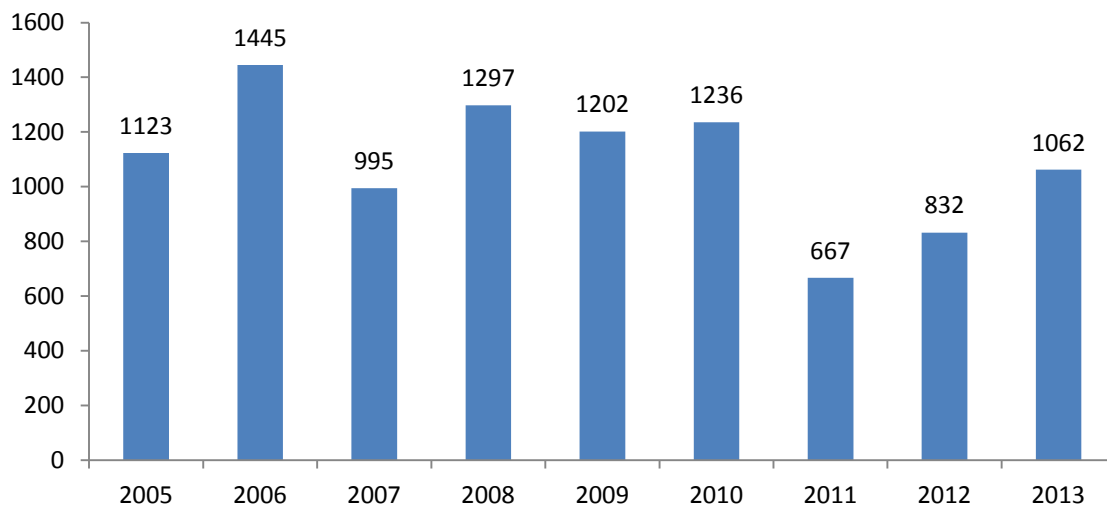
| Site Name | Certificate # | Issued Date | Expiration Date |
|---------------|---------------|-----------------|------------------|
| W. Dombroskie | S-4134-32 | August 25, 2005 | December 1, 2015 |

Sludge haulage was provided by the Ontario Clean Water Agency (Waste Management System Certificate of Approval # A841393) and Thomas Pumping (Waste Management System Certificate of Approval # 3622-5SEK2V). All Ontario Regulations and Waste Management System Certificate are followed.

Hauled Volumes (m3)



Annual Comparison (m3/year)



Quality

The biosolids sampling results are summarized in Appendix B. All results are well within the established guidelines.

Field Summary

S-4134-32

| | 2011 | 2012 | 2013 | 2014 | 2015 | Total | Available Space |
|-----------------|--------|---------|---------|------|------|---------|-----------------|
| Hauled Volume | 156.00 | 585.00 | 1062.00 | 0.00 | 0.00 | 1803.00 | No Limit |
| Kg's Solids | 578.72 | 1699.75 | 3385.35 | 0.00 | 0.00 | 5663.82 | 2336.18 |
| Kg's Nitrogen | 1.53 | 7.14 | 25.77 | 0.00 | 0.00 | 34.44 | 100.56 |
| Kg's Phosphorus | 15.68 | 47.79 | 109.18 | 0.00 | 0.00 | 172.65 | 207.35 |

Summary of Complaints

The following were received community complaints related to the operations of the Barry’s Bay WWTP and Collection System.

| Date | Address | Collection /Treatment | Nature of Complaint | Nature of Complaint |
|------------|--------------|-----------------------|---------------------|---|
| 29/01/2013 | Opeongo Line | Collection | Blockage | Blocked collection line caused sewer to back-up into basement. Incident was also reported to SAC. |

Summary of Bypass/Overflows

There were no events reported for this facility in 2013.

Summary of Spills/Abnormal Discharges

On January 29, 2013 a blockage in the sewer main on Opeongo Line caused a backup into basement on Opeongo Line in the Village of Barry’s Bay.

In response OCWA staff immediately began work to reduce the backed-up sewage volume in the collection system by removing the blockage. Operators removed debris, grease and sand from the main. It was reported to the operator that approximately 0.6 m³ of raw sewage backed-up into the Bank of Montreal. No sewage came out of the maintenance hole. OCWA staff flushed the line from MH38 to MH40.

The resident had a plumber on-site. Operators at the site talked to the owner and did not see the basement where the back-up occurred.

Maintenance

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer’s and/or industry standards. Maintenance is completed using various tools and operational supports. The Ottawa Valley Hub has specialized certified staff such as Millwrights, Electricians and Instrumentation Specialists to name a few.

OCWA uses a Workplace Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is completed and added to the system.

Capital projects are listed and provided to the Madawaska Valley Township in the form of a “Capital Forecast”. This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement.

| | |
|--|-----|
| Preventative Maintenance Work Orders Completed | 143 |
| Operational Maintenance Work Orders Completed | 30 |
| Weekly Maintenance Work Orders Completed | 672 |
| Corrective Maintenance Work Orders Completed | 2 |

Maintenance Highlights

| WO # | Summary of completed work |
|---------|---|
| 2602889 | Install UV switch box to allow UV units to run in series or parallel based on demand. |
| 2830699 | Sewer Cleaning on Opeongo Road due to excessive grease build-up causing blockages. |

Calibration

OCWA has a certified Instrumentation Technician on staff, that completes the flow meter calibrations. Any on-line analyzer calibrations are completed by facility staff and documented on facility work orders.

Calibration of the effluent flow meter was completed June 25, 2013.

Appendix A – Facility Performance Report



Ontario Clean Water Agency Performance Assessment Report Wastewater/Lagoon

From 01/01/2013 to 12/31/2013

Facility: [5979] - Barry's Bay Wastewater Treatment Plant & Collection System
Works: [110001854] - Barry's Bay Wastewater Treatment Plant & Collection System

| | 01/2013 | 02/2013 | 03/2013 | 04/2013 | 05/2013 | 06/2013 | 07/2013 | 08/2013 | 09/2013 | 10/2013 | 11/2013 | 12/2013 | <-- Total --> | <-- Avg. --> | <-- Max. --> | <-- Criteria--> |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|--------------|--------------|-----------------|
| Flow: | | | | | | | | | | | | | | | | |
| Raw: Total Flow 1000 m3 | 13.81 | 11.57 | 15.792 | 15.784 | 15.632 | 14.827 | 15.851 | 14.441 | 14.329 | 13.102 | 10.965 | 12.249 | 168.352 | | | |
| Raw: Avg. Day Flow 1000 m3/day | 0.445 | 0.413 | 0.509 | 0.526 | 0.504 | 0.494 | 0.511 | 0.466 | 0.478 | 0.423 | 0.366 | 0.395 | | 0.461 | | |
| Raw: Max. Day Flow 1000 m3/day | 0.798 | 0.575 | 0.809 | 0.688 | 0.723 | 0.67 | 0.69 | 0.561 | 0.614 | 0.552 | 0.419 | 0.656 | | | 0.809 | |
| Eff: Total Flow 1000 m3 | 12.68 | 10.675 | 12.919 | 14.104 | 15.05 | 15.728 | 14.429 | 14.129 | 13.026 | 12.846 | 11.948 | 11.933 | 159.467 | | | |
| Eff: Avg. Day Flow 1000 m3/day | 0.409 | 0.381 | 0.417 | 0.47 | 0.485 | 0.524 | 0.465 | 0.456 | 0.434 | 0.414 | 0.398 | 0.385 | | 0.437 | | |
| Eff: Max. Day Flow 1000 m3/day | 0.729 | 0.556 | 0.567 | 0.564 | 0.66 | 0.931 | 0.559 | 0.809 | 0.525 | 0.622 | 0.454 | 0.525 | | | 0.931 | |
| Biochemical O2 Demand: | | | | | | | | | | | | | | | | |
| Raw: Avg. BOD5 (mg/L) | 241.0 | 230.0 | 158.0 | 196.0 | 236.0 | 177.0 | 158.0 | 129.0 | 132.0 | 169.0 | 179.0 | 296.0 | | 191.75 | 296.0 | |
| Raw: Number of Samples BOD5 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 12.0 | | | |
| Carbonaceous Biochemical Oxygen Demand: | | | | | | | | | | | | | | | | |
| Eff: Avg. CBOD5 (mg/L) | 2.0 | 2.25 | 2.75 | 2.0 | 2.0 | 2.0 | 2.4 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.117 | 5.0 | 15.0 |
| Eff: Number of Samples CBOD5 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 5.0 | 53.0 | | | |
| CBOD5 Loading (kg/d) | 0.818 | 0.858 | 1.146 | 0.94 | 0.971 | 1.049 | 1.117 | 0.912 | 0.868 | 0.829 | 0.797 | 0.77 | | 0.923 | 1.146 | 18.75 |
| Suspended Solids: | | | | | | | | | | | | | | | | |
| Raw: Avg. SS (mg/L) | 280.0 | 345.0 | 72.0 | 254.0 | 230.0 | 246.0 | 75.0 | 69.0 | 67.0 | 73.0 | 60.0 | 288.0 | | 171.583 | 345.0 | |
| Raw: Number of Samples SS | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 12.0 | | | |
| Eff: Avg. SS (mg/L) | 5.6 | 7.75 | 3.0 | 3.4 | 2.0 | 3.5 | 4.6 | 2.0 | 3.25 | 4.6 | 7.25 | 7.8 | | 4.563 | 11.0 | 0 |
| Eff: Number of Samples SS | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 5.0 | 53.0 | | | |
| SS Loading (kg/d) | 2.291 | 2.955 | 1.25 | 1.598 | 0.971 | 1.835 | 2.141 | 0.912 | 1.411 | 1.906 | 2.887 | 3.002 | | 1.93 | 3.002 | 18.75 |
| SS Percent Removal | 98.0 | 97.754 | 95.833 | 98.661 | 99.13 | 98.577 | 93.867 | 97.101 | 95.149 | 93.699 | 87.917 | 97.292 | | | 99.13 | |
| Phosphorus: | | | | | | | | | | | | | | | | |
| Raw: Avg. Phos (mg/L) | 6.66 | 8.0 | 5.14 | 4.48 | 3.46 | 5.65 | 3.54 | 2.81 | 4.71 | 3.42 | 4.1 | 9.02 | | 5.083 | 9.02 | |
| Raw: Number of Samples Phos | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 12.0 | | | |

Note: 1. The Total, Average, Max and Criteria summaries are not included in the wastewater XML files submitted to the MOE.

2. The annual average concentrations are calculated by taking the arithmetic mean of the monthly average concentration in the effluent calculated for any particular calendar year.

Parameters List: OCWA PDC - MEWS

CBOD5 - Carbonaceous Biochemical Oxygen Demand 5 Day; BOD5 - Biochemical Oxygen Demand, 5 Day, Total Demand; Suspended Solids - Residue, Particulate; NH3 + NH4 as N - Ammonium + Ammonia, Total Unfil. React. ; Total Phosphorus - Phosphorus, Unfiltered Total
TKN - Nitrogen, Total Kjeldahl Unf. Tot; Nitrate as N - Nitrate, Unfiltered Reactive; Nitrite as N - Nitrite, Unfiltered Reactive; E coli - Escherichia Coli MF

Legend:

Tag group:

Eff-Final Effluent, Raw-Raw Sewage



Ontario Clean Water Agency Performance Assessment Report Wastewater/Lagoon

From 01/01/2013 to 12/31/2013

Facility: [5979] - Barry's Bay Wastewater Treatment Plant & Collection System
Works: [110001854] - Barry's Bay Wastewater Treatment Plant & Collection System

| | 01/2013 | 02/2013 | 03/2013 | 04/2013 | 05/2013 | 06/2013 | 07/2013 | 08/2013 | 09/2013 | 10/2013 | 11/2013 | 12/2013 | <-- Total --> | <-- Avg. --> | <-- Max. --> | <-- Criteria--> |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|--------------|--------------|-----------------|
| Phosphorus: | | | | | | | | | | | | | | | | |
| Eff: Avg. Phos (mg/L) | 0.25 | 0.18 | 0.053 | 0.032 | 0.04 | 0.113 | 0.146 | 0.043 | 0.07 | 0.194 | 0.29 | 0.274 | | 0.14 | 0.42 | 0 |
| Eff: Number of Samples Phos | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 5.0 | 53.0 | | | |
| Phos. Loading (kg/d) | 0.102 | 0.069 | 0.022 | 0.015 | 0.019 | 0.059 | 0.068 | 0.019 | 0.03 | 0.08 | 0.115 | 0.105 | | 0.059 | 0.115 | 0.25 |
| Total Phos Percent Removal | 96.246 | 97.75 | 98.979 | 99.286 | 98.844 | 98.009 | 95.876 | 98.488 | 98.514 | 94.327 | 92.927 | 96.962 | | | 99.286 | |
| Nitrogen Series: | | | | | | | | | | | | | | | | |
| Eff: Avg. NH3 + NH4 (mg/L) | 0.54 | 1.075 | 0.675 | 0.58 | 0.325 | 2.375 | 7.28 | 0.475 | 0.425 | 0.52 | 0.375 | 0.8 | | 1.287 | 18.1 | 1.0 |
| Eff: Number of Samples NH3 + NH4 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 5.0 | 53.0 | | | |
| NH3 + NH4 Loading (kg/d) | 0.221 | 0.41 | 0.281 | 0.273 | 0.158 | 1.245 | 3.388 | 0.216 | 0.185 | 0.215 | 0.149 | 0.308 | | 0.587 | 3.388 | 0 |
| Raw: Avg. TKN (mg/L) | 46.5 | 47.2 | 37.0 | 38.8 | 35.8 | 36.6 | 35.6 | 40.6 | 48.2 | 38.3 | 36.7 | 68.4 | | 42.475 | 68.4 | |
| Raw: # of SamplesTKN | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 12.0 | | | |
| Disinfection: | | | | | | | | | | | | | | | | |
| Eff: Geometric Mean E. Coli per 100 ml | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.759 | 2.0 | 2.0 | 10.127 | 2.0 | 2.0 | | 2.403 | 10.127 | 200.0 |
| Eff: Number of Samples E. Coli per 100 ml | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 4.0 | 5.0 | | | | |

Note: 1. The Total, Average, Max and Criteria summaries are not included in the wastewater XML files submitted to the MOE.

2. The annual average concentrations are calculated by taking the arithmetic mean of the monthly average concentration in the effluent calculated for any particular calendar year.

Parameters List: [OCWA PDC - MEWS](#)

CBOD5 - Carbonaceous Biochemical Oxygen Demand 5 Day; BOD5 - Biochemical Oxygen Demand, 5 Day, Total Demand; Suspended Solids - Residue, Particulate; NH3 + NH4 as N - Ammonium + Ammonia, Total Unfil. React. ; Total Phosphorus - Phosphorus, Unfiltered Total
TKN - Nitrogen, Total Kjeldahl Unf. Tot; Nitrate as N - Nitrate, Unfiltered Reactive; Nitrite as N - Nitrite, Unfiltered Reactive; E coli - Escherichia Coli MF

Legend:

Tag group:

Eff-Final Effluent, Raw-Raw Sewage

Appendix B – Biosolids Quality Report



Ontario Clean Water Agency
Biosolids Quality Report - Liquid
Digester Type: AEROBIC
Geometric Mean E. Coli

Facility: [5979] - Barry's Bay Wastewater Treatment Plant & Collection System
Works: [110001854] - Barry's Bay Wastewater Treatment Plant & Collection System
Period: 01/01/2013 to 12/31/2013

| Ecoli Sample 1 11/05/2013 | Ecoli Sample 2 11/19/2013 | Ecoli Sample 3 12/03/2013 | Ecoli Sample 4 12/17/2013 | Geometric Mean E. Coli (based on last 4 samples) cfu/g |
|------------------------------|------------------------------|------------------------------|------------------------------|---|
| 236,735.0 | 48,558.0 | 28,947.0 | 65,315.0 | 68,278.652 |



Ontario Clean Water Agency

Biosolids Quality Report - Liquid

Digester Type: AEROBIC

Metals and Criteria

Facility: [5979] - Barry's Bay Wastewater Treatment Plant & Collection System

Works: [110001854] - Barry's Bay Wastewater Treatment Plant & Collection System

Period: 01/01/2013 to 12/31/2013

| Month | Arsenic (mg/L) | Cadmium (mg/L) | Cobalt (mg/L) | Chromium (mg/L) | Copper (mg/L) | Mercury (mg/L) | Molybdenum (mg/L) | Nickel (mg/L) | Lead (mg/L) | Selenium (mg/L) | Zinc (mg/L) |
|---|----------------|----------------|---------------|-----------------|---------------|----------------|-------------------|---------------|-------------|-----------------|-------------|
| JAN 2013 | | | | | | | | | | | |
| FEB 2013 | | | | | | | | | | | |
| MAR 2013 | | | | | | | | | | | |
| APR 2013 | 0.3 | 0.04 | 0.05 | 0.4 | 20.0 | 0.04 | 0.1 | 0.2 | 0.5 | 0.3 | 12.0 |
| MAY 2013 | 0.3 | 0.05 | 0.05 | 0.4 | 22.0 | 0.043 | 0.1 | 0.3 | 0.5 | 0.3 | 14.0 |
| JUN 2013 | 0.3 | 0.03 | 0.05 | 0.1 | 6.5 | 0.011 | 0.1 | 0.1 | 0.2 | 0.3 | 4.5 |
| JUL 2013 | 0.3 | 0.05 | 0.07 | 0.5 | 27.0 | 0.039 | 0.2 | 0.3 | 0.6 | 0.3 | 17.0 |
| AUG 2013 | 0.3 | 0.05 | 0.06 | 0.4 | 23.0 | 0.047 | 0.2 | 0.3 | 0.6 | 0.3 | 14.0 |
| SEP 2013 | 0.3 | 0.03 | 0.05 | 0.4 | 22.0 | 0.006 | 0.1 | 0.3 | 0.5 | 0.3 | 14.0 |
| OCT 2013 | 0.3 | 0.03 | 0.05 | 0.3 | 20.0 | 0.036 | 0.1 | 0.3 | 0.5 | 0.3 | 13.0 |
| NOV 2013 | 0.3 | 0.05 | 0.06 | 0.7 | 43.0 | 0.064 | 0.3 | 0.5 | 1.0 | 0.3 | 27.0 |
| DEC 2013 | 0.3 | 0.03 | 0.05 | 0.3 | 19.0 | 0.032 | 0.1 | 0.2 | 0.5 | 0.3 | 13.0 |
| Average | 0.3 | 0.04 | 0.054 | 0.389 | 22.5 | 0.035 | 0.144 | 0.278 | 0.544 | 0.3 | 14.278 |
| Max. Permissible Metal Concentrations (mg/kg of Solids) | 170 | 34 | 340 | 2800 | 1700 | 11 | 94 | 420 | 1100 | 34 | 4200 |
| Metal Concentrations in Sludge (mg/kg) | 11.309 | 1.508 | 2.052 | 14.66 | 848.203 | 1.332 | 5.445 | 10.472 | 20.524 | 11.309 | 538.242 |

