Killaloe Wastewater System

2013 Annual Report

Prepared By
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Ontario Clean Water Agency
Agence Ontarienne Des Eaux

This report has been prepared as a general summary of results and events. There is no Certificate of Approval governing this facility and it is thereby operated based solely on guidelines.

Table of Contents

Compliance Report Card

Compliance Event	# of Events	Details
Ministry of Environment Inspections	1	Inspection took place March 6, 2013. There were no actions required identified in this inspection.
Ministry of Labour Inspections	0	
Effluent Parameter Exceedances	0	
Bypass/Overflows	0	
Community Complaints	0	
Spills	0	

System/Process Description

The Killaloe Wastewater Treatment System consists of a sewage treatment plant and one sewage pumping station. In the event of a power failure, emergency power is supplied from the main treatment facility to the pumping station.

Sewage collects from the Town of Killaloe at the pumping station which is then pumped to the treatment facility located at 113 Keetch Street.

Primary Treatment

Once the raw sewage reaches the plant it is discharged into the grit channels. The flow through the channels is slowed down to allow the grit to settle. The settled grit is manually removed from the channel. The flow is measured using a v-notch weir.

Chemical Addition

Caustic Soda is added to optimize nutrient removal. It is added at the end of the aeration process and ahead of the clarifier tank. This chemical reacts with phosphates in the sewage and forms an insoluble phosphate which settles out in the clarifier.

Secondary Treatment

The influent water which is still carrying suspended and dissolved wastes, is then biologically treated using the extended aeration process. The flow travels from the grit channels to aeration tanks. The coarse aerators supply oxygen to the aeration tank and provide mixing creating mixed liquor.

The flow continues to the clarifier which allows settling. The activated sludge which settles to the bottom of the clarifier is either returned to the head of the aeration tank or is diverted to the digester. The clear water (final effluent) remaining after the clarifier, overflow the clarifier weirs and is collected in the channel leading to the chorine contact chamber. Here Sodium Hypochlorite (a chlorine solution) is added to disinfect the effluent. A clear, virtually bacteria-free water then flows into Brenann's Creek.


Solids Handling

Sludge collected in the clarifier is further processed (stabilized) in an aerobic digester and is spread on agricultural land during the summer months(April 1- November 30). In winter months (December 1 – March 31), sludge is stored in the holding tank (approx.150 m3) until the weather conditions and regulations permit spreading.


Proposed Alterations, Extensions, or Replacement to Works

There were no major proposed alterations, extensions or replacements completed at the works in 2013.

Effluent Quality Assurance or Control Measures

The Township of Killaloe, Hagarty and Richards 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 area.

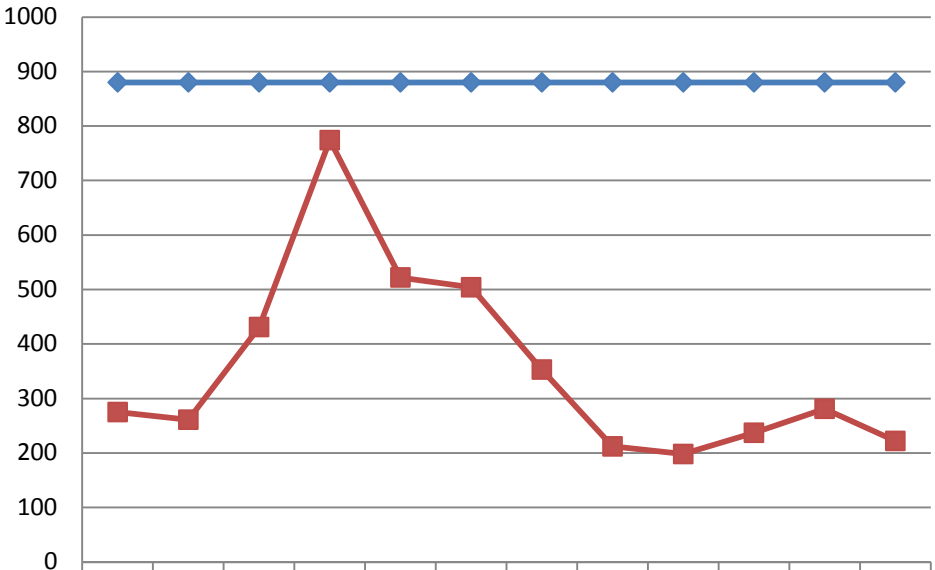
OCWA operates facilities in compliance with applicable regulations. The facility has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents, with annual reviews.

OCWA has additional "Value Added" and operational support services that the Township of Killaloe, Hagarty and Richards 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

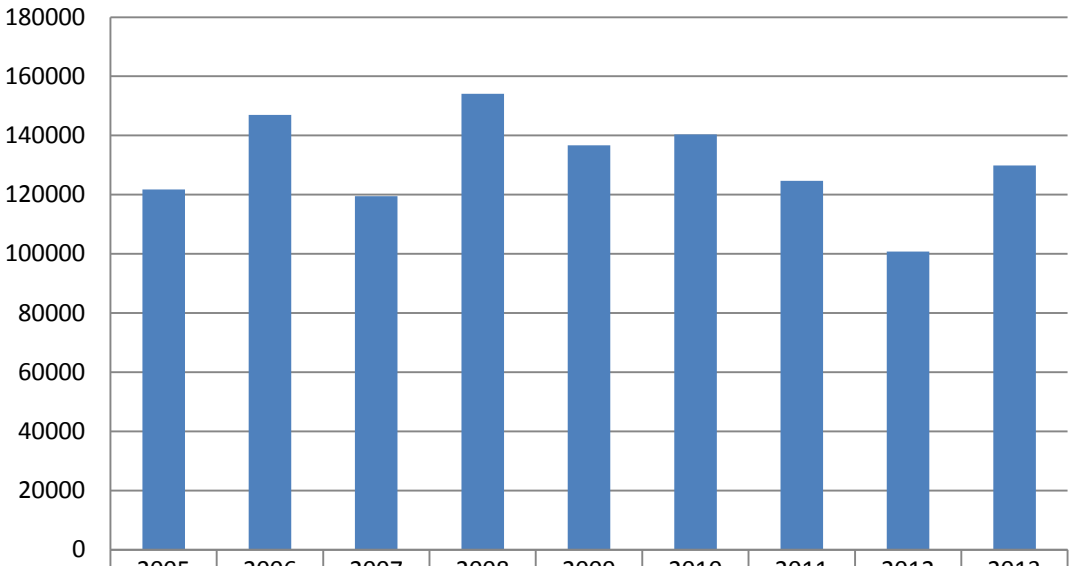
Treatment Flows

Raw Flow (m3/d)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	880	880	880	880	880	880	880	880	880	880	880	880
Average Daily Flow (m3/d)	275	261	431	774	522	504	353	212	198	237	281	222

Annual Comparison (m3)



	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Annual Flow	121720	146981	119494	154127	136667	140401	124631	100748	129853

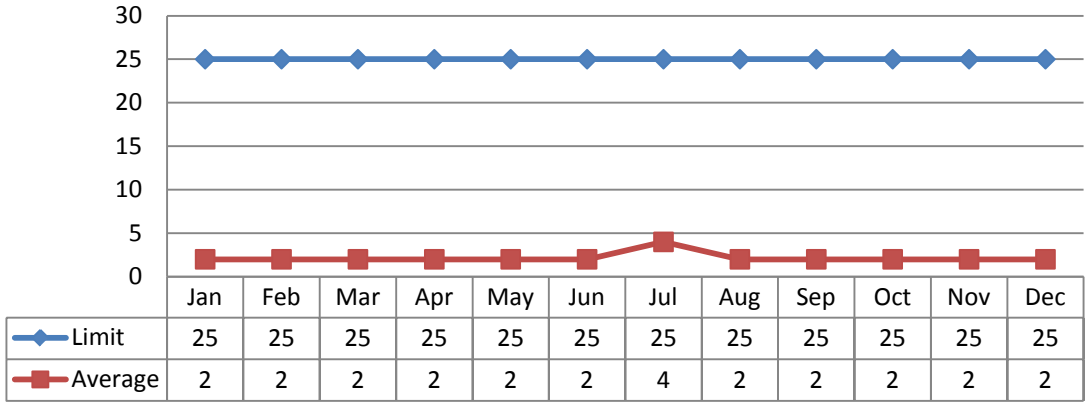
Effluent Quality

There is no certificate of approval or Environmental Compliance Approval for this facility. This facility operates to ensure current guidelines are not exceeded.

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.

BOD5

Concentration (mg/L)

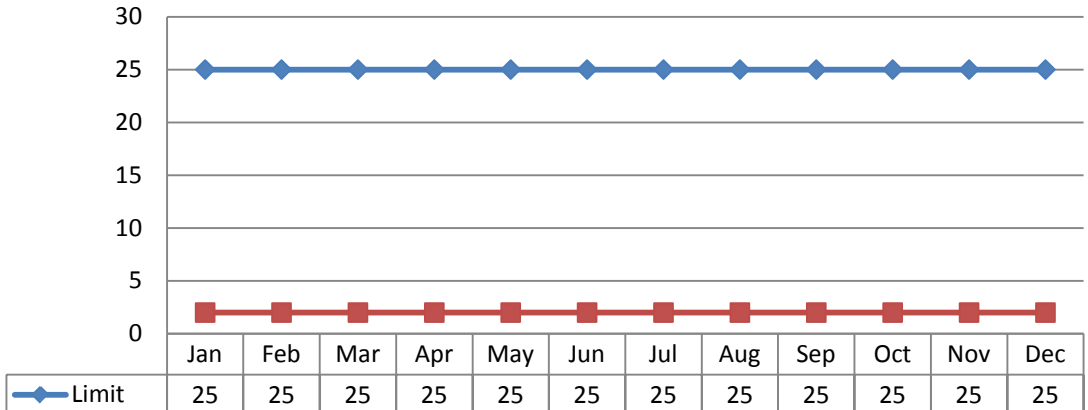


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	25	25	25	25	25	25	25	25	25	25	25	25
Average	2	2	2	2	2	2	4	2	2	2	2	2

CBOD

CBOD effluent samples were collected to satisfy the requirements of the Federal Regulations.

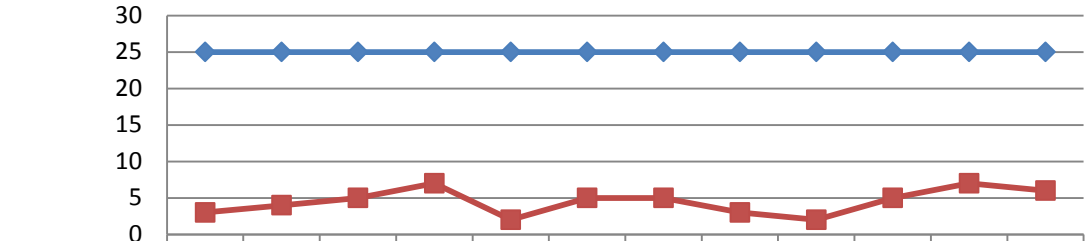
Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	25	25	25	25	25	25	25	25	25	25	25	25
Average	2	2	2	2	2	2	2	2	2	2	2	2

Total Suspended Solids

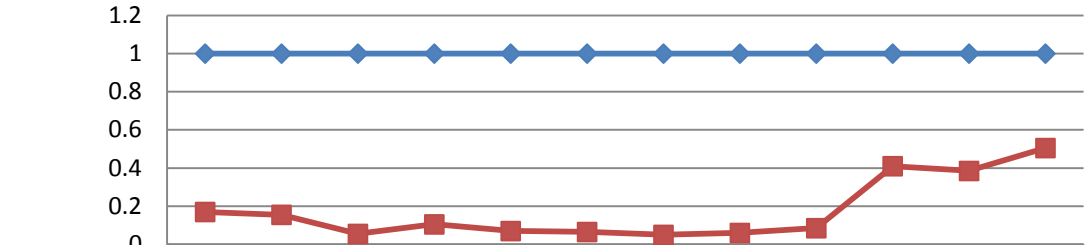
Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	25	25	25	25	25	25	25	25	25	25	25	25
Average	3	4	5	7	2	5	5	3	2	5	7	6

Total Phosphorus

Concentration (mg/L)

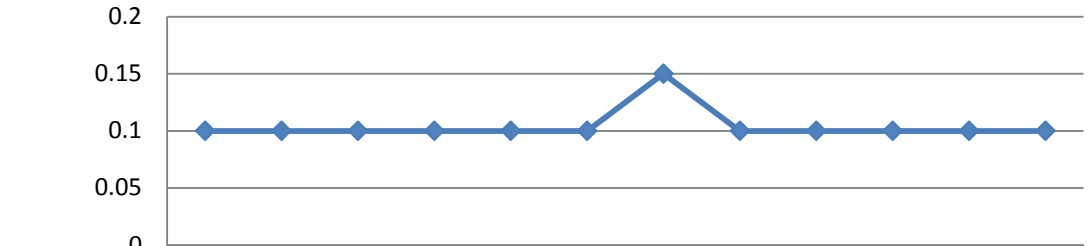


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	1	1	1	1	1	1	1	1	1	1	1	1
Average	0.17	0.155	0.055	0.105	0.07	0.065	0.05	0.06	0.085	0.41	0.385	0.505

Total Ammonia Nitrogen

There is no guideline limit on Ammonia Nitrogen.

Concentration (mg/L)

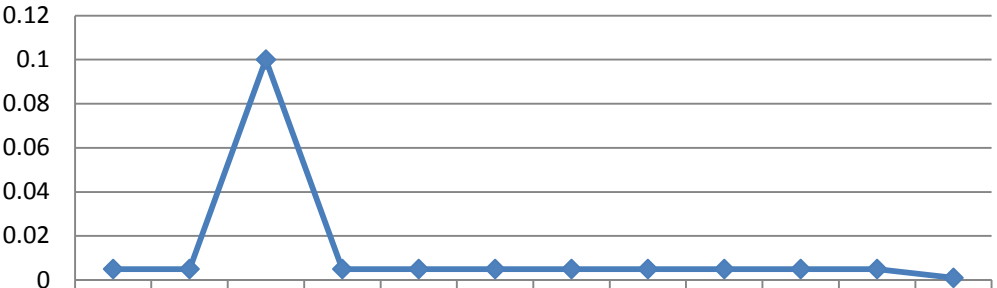


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	0.1	0.1	0.1	0.1	0.1	0.1	0.15	0.1	0.1	0.1	0.1	0.1

Federal Unionized Ammonia

This parameter is required to be sampled under the Federal Regulation. This 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.

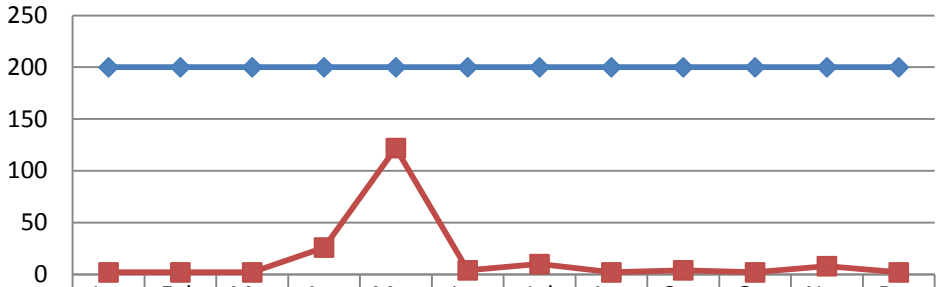
Concentration (mg/L)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	0.005	0.005	0.1	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001

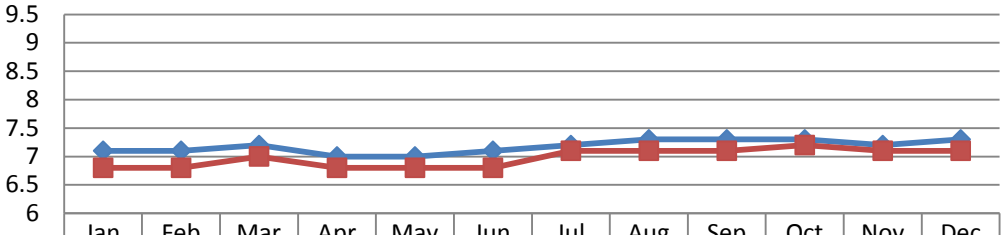
E-coli

Concentration (cfu/100mL)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	200	200	200	200	200	200	200	200	200	200	200	200
Geometric Mean Avg	2	2	2	26	122	4	10	2	4	2	8	2

pH



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Monthly pH	7.1	7.1	7.2	7	7	7.1	7.2	7.3	7.3	7.3	7.2	7.3
Min Monthly pH	6.8	6.8	7	6.8	6.8	6.8	7.1	7.1	7.1	7.2	7.1	7.1

Operating Problems

There were no operating problems to report on in 2013.

Biosolids

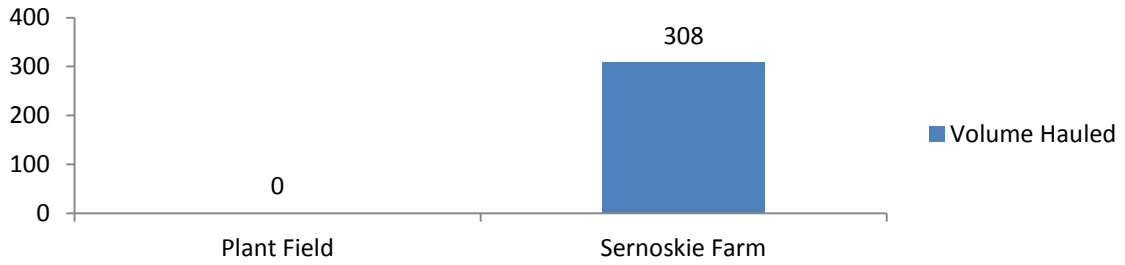
Sludge generated from the treatment plant is spread on agricultural land during the spreading season as per the Nutrient Management Act O.Reg 267/03. There are two certified organic conditioning sites:

Site Name	Certificate #	Issued Date	Expiration Date
Sernoskie Field	S-4123-32	April 23, 2008	December 1, 2013*
Plant Site	S-4123-33	October 28, 2008	December 1, 2013*

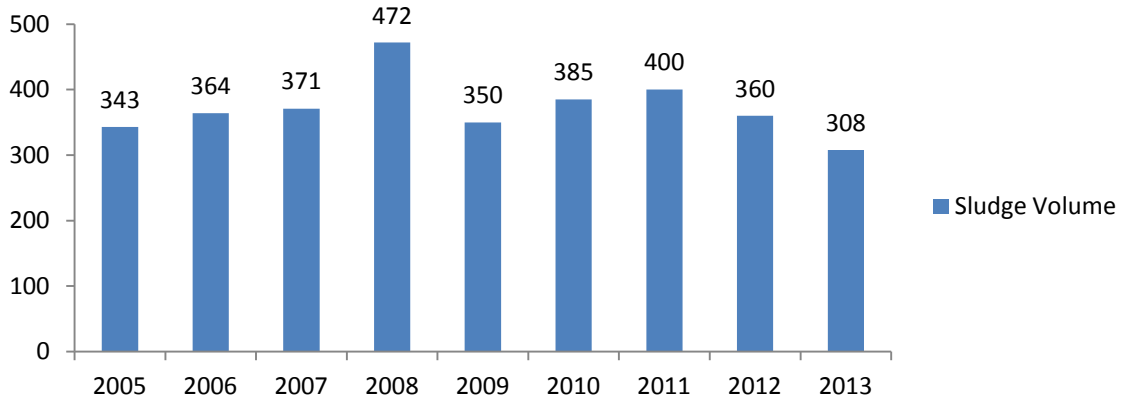
* Applications are being submitted for Nutrient Management Field Plans for their continued use for biosolids application.

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.

Volumes (m3)



Annual Comparison



Quality

The biosolids sampling results are summarized in Appendix B.

Field Summary

Sernoskie Farm

	2008	2009	2010	2011	2012	2013	Total	Available Space
Hauled Volume	388.00				130.00	154.00	518.00	No Limit
Kg's Solids	493.78				137.27	162.62	631.06	7368.94
Kg's Nitrogen	6.19				0.08	0.10	6.27	128.73
Kg's Phosphorus					5.12	6.07	5.12	374.88

Plant Field

	2009	2010	2011	2012	2013	Total	Available Space
Hauled Volume	350.0	385.0	400.0	230.0	0.0	1365.0	No Limit
Kg's Solids	1613.9	1828.0	2594.7	1232.8	0.0	7269.4	730.6
Kg's Nitrogen	11.7	0.7	5.0	1.5	0.0	18.9	116.1
Kg's Phosphorus	44.4	46.2	63.6	37.3	0.0	191.4	No Limit

Summary of Complaints

There were no complaints received in 2013.

Summary of Bypass/Overflows

There were no events reported for this system in 2013.

Summary of Spills/Abnormal Discharges

There were no spills or abnormal discharges from this system in 2013.

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 Township of Killaloe, Hagarty and Richards 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	79
Operational Maintenance Work Orders Completed	30
Weekly Maintenance Work Orders Completed	276

Maintenance Highlights

WO#	Details
2922784	Replace air header and associated parts in aeration tank

Calibration

OCWA has certified Instrumentation Technician on staff, that completes the flow meter calibrations. Calibration of the effluent flow meter was completed April 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: [5539] - Killaloe Wastewater Treatment Plant & Collection System
Works: [110001532] - Killaloe 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	8.518	7.316	13.363	23.232	16.168	15.128	10.951	6.578	5.93	7.334	8.444	6.891	129.853			
Raw: Avg. Day Flow 1000 m3/day	0.275	0.261	0.431	0.774	0.522	0.504	0.353	0.212	0.198	0.237	0.281	0.222		0.356		
Raw: Max. Day Flow 1000 m3/day	0.372	0.37	0.698	1.033	0.717	0.624	0.562	0.269	0.242	0.281	0.31	0.268			1.033	
Eff: Total Flow 1000 m3	8.518	7.316	13.363	23.232	16.168	15.128	10.951	6.571	5.93	7.334	8.444	6.891	129.846			
Eff: Avg. Day Flow 1000 m3/day	0.275	0.261	0.431	0.774	0.522	0.504	0.353	0.212	0.198	0.237	0.281	0.222		0.356		
Eff: Max. Day Flow 1000 m3/day	0.372	0.37	0.698	1.033	0.717	0.624	0.562	0.269	0.242	0.281	0.31	0.268			1.033	
Biochemical O2 Demand:																
Raw: Avg. BOD5 (mg/L)	132.0	89.0	124.0	76.0	80.0	111.0	98.0	81.0	244.0	131.0	102.0	95.0		113.583	244.0	
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			
Eff: Avg. BOD5 (mg/L)	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	4.0	< 2.0	< 2.0	< 2.0	< 2.0	2.0		< 2.167	4.0	25.0
Eff: 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			
BOD Loading (kg/d)	< 0.55	< 0.523	< 0.862	< 1.549	< 1.043	< 1.009	1.413	< 0.424	< 0.395	< 0.473	< 0.563	< 0.445		< 0.771	1.549	0
BOD5 Percent Removal	< 98.485	< 97.753	< 98.387	< 97.368	< 97.5	< 98.198	95.918	< 97.531	< 99.18	< 98.473	< 98.039	< 97.895			99.18	
Carbonaceous Biochemical Oxygen Demand:																
Eff: Avg. CBOD5 (mg/L)	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0		< 2.0	< 2.0	0
Eff: Number of Samples CBOD5	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			
CBOD5 Loading (kg/d)	< 0.55	< 0.523	< 0.862	< 1.549	< 1.043	< 1.009	< 0.707	< 0.424	< 0.395	< 0.473	< 0.563	< 0.445		< 0.712	1.549	
Suspended Solids:																
Raw: Avg. SS (mg/L)	133.0	80.0	142.0	100.0	108.0	134.0	84.0	127.0	344.0	138.0	98.0	118.0		133.833	344.0	
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)	3.0	4.0	5.0	7.0	< 2.0	5.0	5.0	3.0	2.0	5.0	7.0	6.0		< 4.5	7.0	25.0
Eff: 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			
SS Loading (kg/d)	0.824	1.045	2.155	5.421	< 1.043	2.521	1.766	0.636	0.395	1.183	1.97	1.334		< 1.691	5.421	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 arithmatic 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. Reac. ; 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: [5539] - Killaloe Wastewater Treatment Plant & Collection System
Works: [110001532] - Killaloe 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-->
Suspended Solids:																
SS Percent Removal	97.744	95.0	96.479	93.0	< 98.148	96.269	94.048	97.638	99.419	96.377	92.857	94.915			99.419	
Phosphorus:																
Raw: Avg. Phos (mg/L)	3.76	3.2	5.38	2.35	1.52	3.33	2.7	3.48	7.84	4.7	4.69	4.21		3.93	7.84	
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			
Eff: Avg. Phos (mg/L)	0.17	0.155	0.055	0.105	0.07	0.065	< 0.05	0.06	0.085	0.41	0.385	0.505		< 0.176	0.61	1.0
Eff: Number of Samples Phos	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	24.0			
Phos. Loading (kg/d)	0.047	0.04	0.024	0.081	0.037	0.033	< 0.018	0.013	0.017	0.097	0.108	0.112		< 0.052	0.112	0
Total Phos Percent Removal	95.479	95.156	98.978	95.532	95.395	98.048	< 98.148	98.276	98.916	91.277	91.791	88.005			98.978	
Nitrogen Series:																
Raw: Avg. NH3 + NH4 (mg/L)	34.2	23.7	46.0	22.6	11.9	23.3	21.4	34.1	51.3	41.4	31.4	35.4		31.392	51.3	
Raw: Number of Samples NH3 + NH4	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. NH3 + NH4 (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.15	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.104	0.2	0
Eff: Number of Samples NH3 + NH4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	24.0			
NH3 + NH4 Loading (kg/d)	< 0.027	< 0.026	< 0.043	< 0.077	< 0.052	< 0.05	< 0.053	< 0.021	< 0.02	< 0.024	< 0.028	< 0.022		< 0.037	0.077	0
Raw: Avg. TKN (mg/L)	42.8	35.3	53.6	25.1	16.2	32.1	23.4	34.5	78.8	45.9	33.2	46.6		38.958	78.8	
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			
Eff: Avg. TKN (mg/L)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	< 0.5	< 0.5	< 0.5	< 0.5	2.4	< 0.5		< 0.717	2.4	
Eff: # 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	26.0	122.0	4.0	10.0	2.0	4.0	< 2.0	8.0	< 2.0		< 5.026	< 122.0	200.0
Eff: Number of Samples E. Coli per 100 ml	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				

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2. The annual average concentrations are calculated by taking the arithmatic 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. Reac. ; 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

1/23/2014
d_bqr_aerobic_04_rpt

Facility: [5539] - Killaloe Wastewater Treatment Plant & Collection System
Works: [110001532] - Killaloe 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
231,317.0	954,545.0	1,463,964.0	654,762.0	678,272.885

Ontario Clean Water Agency

Biosolids Quality Report - Liquid

Digester Type: AEROBIC

Metals and Criteria

Facility: [5539] - Killaloe Wastewater Treatment Plant & Collection System
Works: [110001532] - Killaloe 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	<0.3	<0.03	0.05	0.4	30.0	0.005	0.2	0.4	0.7	<0.3	17.0
FEB 2013	<0.3	<0.03	0.05	0.4	33.0	0.004	0.1	0.5	0.6	<0.3	18.0
MAR 2013	<0.3	<0.03	0.06	0.3	28.0	0.005	0.1	0.4	0.5	<0.3	16.0
APR 2013	<0.3	<0.03	0.08	0.5	41.0	0.016	0.2	0.6	0.7	<0.3	22.0
MAY 2013	<0.3	<0.03	0.07	0.4	38.0	0.01	0.2	0.6	0.7	<0.3	22.0
JUN 2013	<0.3	0.04	0.09	0.6	46.0	0.016	0.2	0.7	0.8	<0.3	25.0
JUL 2013	<0.3	0.04	0.11	0.5	52.0	0.018	0.2	0.8	0.9	<0.3	28.0
AUG 2013	<0.3	0.03	0.09	0.5	46.0	0.011	0.2	0.6	0.8	<0.3	25.0
SEP 2013	<0.3	<0.03	<0.05	0.2	24.0	0.027	<0.1	0.3	0.4	<0.3	13.0
OCT 2013	<0.3	<0.03	0.07	0.4	41.0	0.011	0.2	0.5	1.1	<0.3	23.0
NOV 2013	<0.3	0.04	0.12	0.7	74.0	0.008	0.3	0.9	1.3	<0.3	40.0
DEC 2013	<0.3	<0.03	0.05	0.3	24.0	0.012	0.1	0.3	0.5	<0.3	14.0
Average	<0.3	<0.033	0.074	0.433	39.75	0.012	0.175	0.55	0.75	<0.3	21.917
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)	<9.174	<0.994	<2.268	13.252	1,215.596	0.364	<5.352	16.82	22.936	<9.174	670.234

Ontario Clean Water Agency

Biosolids Quality Report - Liquid

Digester Type: AEROBIC

Solids and Nutrients

Facility: [5539] - Killaloe Wastewater Treatment Plant & Collection System
Works: [110001532] - Killaloe Wastewater Treatment Plant & Collection System
Period: 01/01/2013 to 12/31/2013

Month	Total Sludge Hauled (m3)	Avg. Total Solids (mg/L)	Avg. Total Volatile Solids (mg/L)	Avg. Total Phosphorus (mg/L)	Ammonia (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	TKN (mg/L)	Ammonia + Nitrate (mg/L)	Potassium (mg/L)
JAN 2013		29,850.0	18,900.0	1,100.0	4.1	< 0.3	< 0.3	1,530.0	4.4	250.0
FEB 2013		37,950.0	25,600.0	1,100.0	15.7	0.3	0.8	2,190.0	16.0	240.0
MAR 2013		34,800.0	24,700.0	970.0	5.4	< 0.3	< 0.3	2,020.0	5.7	220.0
APR 2013		37,250.0	28,900.0	1,400.0	9.5	0.3	0.2	2,060.0	9.8	350.0
MAY 2013		38,850.0	27,500.0	1,300.0	26.3	< 0.3	0.7	2,530.0	26.6	290.0
JUN 2013		43,550.0	32,500.0	1,500.0	29.1	0.9	4.2	2,610.0	30.0	340.0
JUL 2013		41,750.0	31,400.0	1,700.0	27.7	1.1	0.6	2,630.0	28.8	380.0
AUG 2013	154.0	29,850.0	24,800.0	1,400.0	14.5	< 0.3	2.6	2,620.0	14.8	360.0
SEP 2013		17,900.0	15,100.0	730.0	7.8	0.9	0.5	1,280.0	8.7	190.0
OCT 2013		31,900.0	23,200.0	1,300.0	196.0	< 0.3	< 0.2	2,290.0	196.3	260.0
NOV 2013	154.0	25,050.0	19,500.0	2,200.0	182.0	< 0.3	0.2	2,220.0	182.3	470.0
DEC 2013		23,700.0	15,600.0	820.0	< 1.0	0.9	0.7	1,440.0	1.9	200.0
Average	77.0	32,700.0	23,975.0	1,293.333	43.258	< 0.517	< 0.942	2,118.333	43.775	295.833
Total	308.0									