



Public Works

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February 15, 2015

District Manager
Ministry of the Environment and
Climate Change
London District Office
C/o
Mr. Tom Clubb
Drinking Water Programs Supervisor
Ministry of the Environment and
Climate Change
3232 White Oak Road, 3rd Floor
London, ON N6E 1L8

Dear Sir:

RE: 2014 Biosolids Annual Report containing Reports on the Biosolids Land Application Program, the Stormwater Management Facility for the Biosolids Centralized Storage Facility (BCSF), and the Inspection of the BCSF

Attached is the monitoring report for 2014 for Oxford County's biosolids land application program from the BCSF (storage site for Woodstock, Tillsonburg, and Ingersoll WWTPs), the Thamesford WWTP and the Tavistock Lagoon cleanout. Also included is a report on the Stormwater Management Facility and an inspection report for the BCSF.

I trust this report fulfills the intent of the annual reporting requirements of the Environmental Compliance Approval (ECA) #'s A800939, 3816-76HRTS, 5950-7XQKXS, 9997-82RS5A, 6974-6FKKAY, 5936-8RKKNU, 0342-7WCKCJ, and 8633-76AHSB.

Yours truly,

A handwritten signature in black ink, appearing to read "Don Ford", is written over the typed name.

Don Ford, BA, CMM II, C. Tech.
Wastewater Supervisor, Oxford County

c.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager of Environmental Services, Oxford County

Overview of the Biosolids Land Application Program

Oxford County owns and operates nine wastewater treatment plants they are listed in Table 1 along with their treatment process and method of biosolids treatment and handling.

Table 1

Plant Name	Treatment Process	Biosolids Treatment and Handling
Woodstock WWTP	Conventional Activated Sludge	Anaerobic digestion, centrifuge dewatering, and transport to storage at BCSF prior to land application.
Ingersoll WWTP	Conventional Activated Sludge	Anaerobic digestion, centrifuge dewatering, and transport to storage at BCSF prior to land application.
Tillsonburg WWTP	Conventional Activated Sludge	Aerobic digestion, centrifuge dewatering, and transport to storage at BCSF prior to land application.
Thamesford WWTP	Extended aeration	Aerobic digestion and liquid storage on site prior to land application.
Drumbo WWTP	Sequencing Batch Reactor	No digestion, co-thickened sludge removed for further treatment by truck to the Woodstock WWTP.
Tavistock WWTP	Lagoon System	Stored in lagoons on site until land applied usually between 10 to 20 years storage.
Norwich WWTP	Lagoon System	Stored in lagoons on site until land applied usually between 10 to 20 years storage.
Plattsville WWTP	Lagoon System	Stored in lagoons on site until land applied usually between 10 to 20 years storage.
Mount Elgin WWTP	STEG/STEP Effluent Recirculation Sand Filter and Common Drainage field.	Homeowners have septic tanks maintained by Oxford County requiring septage removal on an as needed basis to the Ingersoll or Woodstock WWTP.

There are five main elements of the Biosolids Management Master Plan which include: more enforcement of the Oxford County Sewer use by-law, dewatering of stabilized biosolids at each of the major wastewater treatment plants, transporting thickened sludge from smaller plants to the nearest major wastewater treatment plant for processing, land application of all biosolids on farms having a non-agricultural source material (NASM) plan, and centralized storage of biosolids when the material cannot be land applied.

The enforcement of the Oxford County sewer use bylaw was an important step, and to this end, Oxford County hired two enforcement personnel, one staff member in 2006 and a second in 2009. Also the wastewater division acquired additional sophisticated

automatic sampling equipment. These changes were made with the goal of improving the quality and reducing the quantity of biosolids produced.

Since the completion of the dewatering upgrade in March of 2013 the Ingersoll WWTP has been producing dewatered biosolids which are transported and stored at the BCSF.

Oxford County contracted the removal and land application of biosolids from Tavistock WWTP Cell 2 which began in the fall of 2013 and continued into 2014.

The Biosolids from all facilities were compliant with the Nutrient Management Act (NMA) regulations governing NASM.

Sampling Description

Sampling is carried out as per the ECA.

The samples are analyzed by SGS Lakefield Research Ltd., a CAEAL certified lab. The results are entered into an excel spreadsheet and checked for compliance with the regulations at the time of being entered. The analytical results of the dewatered biosolids are also summarized on a spreadsheet which is used for the calculation of monthly and yearly averages.

Biosolids analysis is provided to the contractor and farmer for their use at the time of land application by directly providing the sample analysis results in PDF format to the biosolids contracted land applier when received electronically from the external lab.

Discussion of Results

Table 2 highlights the analytical results for metals versus the NMA maximum criteria. All sources of biosolids were compliant and were acceptable to be used as a nutrient for the land application program. More information can be found in Exhibit 1 for analytical results for different sources of biosolids.

The biosolids were resampled at the farm at the time of application and those results (2014) can be found in Exhibit 2. These samples provide a further check on the quality of the material. All 2014 samples complied with the NMA criteria as well.

The Biosolids contractor provides Nutrient reports to individual farmers on each application to aid in the beneficial use of the product as a nutrient. The contractor's table of NASM plans indicating spreading applications is included in Exhibit 3.

In summary, Oxford County's Biosolids Management program provided effective production, transport, storage, and eventual reuse as a nutrient via land application of all biosolids generated under the program. All operation and maintenance activities were

performed by Oxford County staff in the wastewater treatment plants. The transportation of the biosolids from the facilities to the storage building was done through Super Save Disposal (Ontario) Inc. working on Oxford County's behalf or by Oxford County's own forces under ECA # A900939. There were no notable upsets or spills during the year of operation and no complaints have been received to date.

Comparison of Generated Biosolids to NMA Criteria for Metals in mg/kg Dry Solids

Table 2

Parameter	Woodstock WWTP	Ingersoll WWTP	Tillsonburg WWTP	Thamesford WWTP	Tavistock WWTP*	NMA Metals Criteria
Metals mg/kg dry solids	2014 Annual Average	2014 Annual Average	2014 Annual Average	2014 Annual Average	2014 Annual Average	Maximum
Arsenic	6	5.3	4.1	6	3.9	170
Cadmium	1.2	0.7	0.7	0.4	Below Detection Limit	34
Cobalt	3.7	5	2	1.5	4.8	340
Chromium	60	77	24	24	55.6	2800
Copper	670	623	600	309	29.1	1700
Mercury	1.0	0.5	0.5	0.056	Below Detection Limit	11
Molybdenum	11	20	7.3	8	6.7	94
Nickel	70	30	45	16	17.1	420
Lead	45	20	22	5	23.2	1100
Selenium	8	10	8	7	1.8	34
Zinc	994	1248	733	422	58.2	4200

*The County undertook biosolids removal from the Tavistock WWTP (lagoons) in 2014.

Biosolids Centralized Storage Facility (BCSF) Operation

The BCSF is located near Salford, Ontario adjacent to the Oxford County Waste Management Facility (landfill) and behind the compost area.

The Biosolids Centralized Storage Facility (BCSF) was built for the storage of the dewatered biosolids for periods such as winter months when the dewatered product cannot be directly land applied. The storage building is designed to provide a minimum of 240 days storage. It is also designed with segregated storage bays so that should material be determined to be non-compliant, it can be removed and taken to landfill and not mixed with compliant biosolids destined for land application. Please see in Table 3 below the 2014 production rate, type, and destination for biosolids.

The BCSF has sufficient room to house 7,000 m³ of material and will be built in two phases. The existing building includes 12 bays; and a future Phase 2 would add an

additional four bays. The BCSF has sufficient space to accommodate the 240-day storage requirements for the plants, although not all systems dewater and store at this time. For example, the Thamesford WWTP will stay with a liquid land application program for the time being and phased into dewatering in the future.

Biosolids Production Rate, Type and Destination in 2014

Table 3

FACILITY	2014 Biosolids Land Applied	2014 Biosolids Stored	2014 Raw Sludge Hauled Between Plants	Total Biosolids Generated 2014	Biosolids Type	2014 Destination
Woodstock WWTP	3258 wet tonnes at 30% solids	–		3,609 wet tonnes at 26% solids	Anaerobic dewatered	BCSF & Land Application
Ingersoll WWTP	788 wet tonnes at 23% solids	–		865 wet tonnes at 22% solids	Co-thickened Primary Sludge & Anaerobic dewatered	BCSF & Land Application
Tillsonburg WWTP	930 wet tonnes at 25% solids	–		1,039 wet tonnes at 24% solids	Aerobic dewatered	BCSF & Land Application
Thamesford WWTP	4,484 m ³ at 2.8% solids	–		4,484 m ³ at 2.8%	Aerobic liquid	Land Application
Drumbo SBR		–	1,566 m ³ at 2% solids	n/a	Co-thickened Primary Sludge	Woodstock WWTP
Tavistock WWTP	4360 wet tonnes at 70% solids	–			Lagoon Cleanout	Land Application

Overview of the Stormwater Management Facility for the Biosolids Centralized Storage Facility (BCSF)

The stormwater management facility services a total drainage area of 4.85 ha consisting of leaf and yard waste composting pad and a biosolids centralized storage facility (BCSF)

located east of the Oxford County Waste Management Facility. It was designed to attenuate stormwater runoff from storm events and was constructed as per the ECA.

Sampling Procedure

Samples are collected semi-annually during spring and fall after a significant rainfall event and analyzed for the following:

Alkalinity
Total Ammonia Nitrogen
Chloride
Iron
Nitrate Nitrogen
Nitrite Nitrogen
TKN
Total Phosphorus
Total Suspended Solids
Sulphate
CBOD
COD
Phenol
pH
Temperature
Conductivity
Dissolved Oxygen

Stormwater Management Facility Performance & Effluent

The facility is inspected regularly and a log book of the inspections is maintained at the BCSF. The results of the sampling program are included in Exhibit 4 in a summary Table.

Spills, Upset and Abnormal Conditions

There were no spills or abnormal discharge events in 2014.

Inspection of the BCSF

The Biosolids Centralized Storage Facility was cleaned and an in-house inspection took place on October 2, 2014.

Waste Management Facility staff swept the building prior to inspection and a vacuum truck was used to pump out the sump pits.

The following is a list of items found during inspection and the actions taken.

Inspection Item	Action Taken
<ul style="list-style-type: none"> There are cracks in the concrete floor at the aisle end of the concrete divider wall of Bays 1, 3, 4, 5, 6, 7, 8, 9, 10, 11&12. 	No action required at this time, minor cracks.
<ul style="list-style-type: none"> In the centre aisle east of Bay 5 there is a piece of concrete reinforcing steel exposed. 	No action required at this time.
<ul style="list-style-type: none"> In Bay 12 on the south side near the west end, there are two places in the floor that are broken. 	No action required at this time.
<ul style="list-style-type: none"> There are minor cracks in the exterior walls on all sides of the building, some have minor staining, but none of them have opened up. 	There is no action required.
<ul style="list-style-type: none"> In Bay 11 near the east opening, on the south side there is a broken piece of concrete approximately 24” in diameter. 	There is no action required.

Summary

The stormwater management facility provided effective attenuation of stormwater in 2014 with no adverse or abnormal conditions occurring.

The BCSF provided winter storage for the Oxford County biosolids land application program and was in excellent overall condition. No complaints were received about the operation of either facility in 2014.

EXHIBIT 1

Woodstock WWTP Dewatered Sludge 2014

Lab Number	CA12021-JAN14	CA12629-JAN14	CA13279-FEB14	CA13450-FEB14	CA12220-MAR14	CA13537-MAR14	CA13216-APR14	CA12655-APR14	CA12184-MAY14	CA13699-MAY14	CA13116-JUN14	CA13557-JUN14	CA15044 JUL14	CA13493 JUL14	CA13924-JUL147	CA12199-AUG14	CA12700-AUG14	CA12991-SEP14	CA12653-SEP14	CA13265-OCT14	CA12670-OCT14	CA13050-NOV14	CA12586-NOV14	CA13090-DEC14	CA12701-DEC14		
Sample Date	02-Jan-14	29-Jan-14	13-Feb-14	24-Feb-14	11-Mar-14	25-Mar-14	07-Apr-14	22-Apr-14	06-May-14	21-May-14	02-Jun-14	18-Jun-14	02-Jul-14	15-Jul-14	29-Jul-14	11-Aug-14	26-Aug-14	08-Sep-14	23-Sep-14	07-Oct-14	14-Oct-14	04-Nov-14	18-Nov-14	02-Dec-14	29-Dec-14	Average	
Specific Gravity	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0	
Oil & Grease (total)	53000	60000	58000	61000	53000	59000	56000	57000	60000	52000	64000	39000	62000	64000	69000	67000	64000	32000	55000	62000	69000	77000	78800	72000	71000	59360	
pH	6.48	7.36	6.86	7.76	7.07	7.67	7.80	6.89	8.07	6.83	6.97	7.91	7.87	7.09	7.14	7.13	7.59	6.83	7.20	6.70	6.50	6.98	7.72	7.78	7.84	7.27	
Alkalinity (as CaCO3)	820	3960	680	6960	1490	2660	2350	1260	2190	1690	1960	3690	2910	4160	2150	1990	3210	1990	570	300	390	340	1370	1120	2210	2094	
Total Solids	26.3	25.3	25.5	25.5	26.4	26.0	25.6	26.2	27.3	26.6	26.1	25.2	26.2	26.0	26.0	27.3	26.3	27.0	26.8	27.3	26.6	26.0	26.4	26.2	26.3	26.3	
Volatile Solids	14.1	14.4	14.2	14.1	14.2	14.0	14.3	14.2	14.9	15.0	14.7	14.4	14.2	14.6	14.2	14.5	14.8	14.8	14.6	14.8	14.7	14.4	14.4	15.2	14.8	14.5	
Total Nitrogen-kjeldahl (N)	9800	9800	9400	9900	7400	9300	8700	11000	9900	8800	5600	7900	7800	10000	11000	9800	9300	11000	9000	9600	3800	9200	10000	11000	7900	9060	
Ammonia+Ammonium (N)	200	800	100	1000	800	900	1200	400	1000	700	800	1200	1200	600	500	700	700	900	1000	500	500	700	900	600	600	732	
Nitrite as N	8.0	0.3	0.3	0.6	0.4	0.7	0.2	2.4	0.2	1.0	0.3	4.8	0.2	6.7	1.6	2.3	0.2	0.4	0.2	0.3	1.4	0.4	1.1	0.5	2.0	1.5	
Nitrate as N	58	0.3	0.3	0.8	0.3	0.6	0.3	2.1	0.3	2.4	0.3	0.3	0.3	0.3	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	2.9	
Nitrite+Nitrate as N	66	0.3	0.3	1.4	0.4	1.3	0.3	4.5	0.3	3.4	0.3	4.8	0.3	6.7	2.1	2.7	0.3	0.4	0.3	0.3	3.3	0.3	0.3	0.3	0.4	4.2	
As Arsenic	6.1	4.3	10.0	12.0	8.0	6.0	1	11	8.0	4.0	8.0	8	4	5	6	4.0	6	9	4	4	4	5	4	4	4	6	
B Boron	35	24	46	24	42	5	24	13	41	36	28	34	29	28	28	29	24	31	28	60	34	39	31	28	31	31	
Ca Calcium	40000	42000	40000	40000	38000	41000	39000	40000	41000	42000	43000	42000	41000	42000	41000	42000	43000	48000	43000	42000	42000	42000	42000	41000	37000	40960	
Cd Cadmium	1.2	0.47	1.10	4.90	1.10	0.80	0.4	1.0	1.3	1.2	0.60	2	0.9	2	1.0	1.0	0.8	1	1.0	1.0	0.9	1.3	1	1.6	1.2	1.2	
Co Cobalt	5.6	3.2	3.0	3.1	4.2	4	2.4	3	4.7	5.5	4.0	4.9	1.0	2	1.0	3.7	3.9	5.2	4.0	4.0	4.1	3	3.7	3	6.8	3.7	
Cr Chromium	69	67	65	70	63	68	64	67	66	64	59	64	57	54	58	56	63	57	58	58	61	55	58	59	60	60	
Cu Copper	700	720	720	710	700	690	690	700	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690
Hg Mercury	0.9	0.9	0.8	0.8	0.5	0.6	0.6	0.6	0.6	0.6	0.4	0.6	0.54	0.37	0.74	0.82	1.75	1.9	1.5	1.8	2.5	1.2	0.87	1.9	1.0	1.0	
K Potassium	800	790	670	740	770	780	770	900	890	790	800	910	1200	900	790	740	690	740	690	720	740	700	650	700	670	779	
Mg Magnesium	4700	5000	5100	5000	4400	5400	5300	5700	5700	5500	5700	5900	4400	5500	5300	5800	6200	6900	6200	6000	6200	5800	5400	5400	5100	5504	
Mo Molybdenum	13	9.2	11.0	10.0	10.0	10	10	10	7	11	11	11	7	11	11	11	13	13	10	12	13	16	12	11	11	11	
Na Sodium	790	940	890	940	960	990	940	1000	920	990	890	930	890	900	890	870	820	900	860	870	850	860	880	910	840	881	
Ni Nickel	73	72	66	65	62	63	55	63	61	58	62	61	17	72	76	74	74	74	74	81	83	83	83	91	100	70	
P Phosphorus	31000	33000	33000	34000	31000	34000	33000	35000	35000	33000	33000	34000	29000	31000	29000	29000	28000	28000	29000	28000	29000	28000	29000	28000	29000	30880	
Pb Lead	38	4	8	39	47	37	37	35	44	31	34	34	48	35	36	39	48	40	36	48	41	62	34	40	35	45	
Se Selenium	4	4	8	8	8	8	8	8	8	8	11	8	11	8	8	8	7	7	7	7	7	8	8	8	8	8	
Zn Zinc	1100	1100	1100	1100	1000	1000	1000	1000	1000	960	960	960	970	960	960	980	930	1000	970	1000	1000	1000	1100	1100	960	994	
E Coli (cfu/1gm dried wt)	6.471	22,925	17,282	1,923	14,767	9,615	27,365	289,855	15,244	84,373	244,361	176,380	23,800	435,780	292,308	1,507,997	865,693	336,750	1,997,041	2,532,588	2,274,395	851,224	2,076,125	265,252	106,667	136,431	Geomean
E Coli (cfu/100gm)	170,000	580,000	440,000	49,000	390,000	250,000	700,000	7,400,000	400,000	2,300,000	6,500,000	4,600,000	600,000	11,400,000	7,600,000	39,600,000	24,300,000	9,200,000	54,000,000	68,000,000	62,000,000	22,600,000	54,000,000	7,000,000	2,800,000	3,587,346	Geomean
All results less than MDL taken as MDL																											
Results Compared to Criteria																											
As Arsenic	6.1	4.3	10.0	12.0	8.0	6.0	1.0	11.0	8.0	4.0	8.0	8.0	4.0	5.0	6.0	4.0	6.0	9.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0	6.0	
Cd Cadmium	1.20	0.47	1.10	4.90	1.10	0.80	0.40	1.00	1.30	1.20	0.60	2.00	0.90	2.00	1.00	1.00	0.80	1.00	1.00	1.00	0.90	1.30	1.00	1.60	1.20	1.20	
Co Cobalt	6	3	3	3	4	4	2	3	4.7	5.5	4.0	4.9	1.0	2.0	1.0	3.7	3.9	5.2	4.0	4.0	4.1	3.0	3.7	3.0	6.8	3.7	
Cr Chromium	69	67	65	70	63	68	64	67	66	64	59	64	57	54	58	56	63	57	58	58	61	55	58	59	60	60	
Cu Copper	700	720	720	710	700	690	690	700	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690
Hg Mercury	0.9	0.9	0.8	0.8	0.5	0.6	0.6	0.6	0.6	0.4	0.6	0.54	0.37	0.74	0.82	1.75	1.9	1.5	1.8	2.5	1.2	0.87	1.9	1.0	1.0	1.0	
Mo Molybdenum	13	9	11	13	10	10	10	10	7	11	11	11	7	11	11	11	13	13	10	12	13	16	12	11	11	11	
Ni Nickel	73	72	66	65	62	63	55	63	61	58	62	61	17	72	76	74	74	74	81	83	83	83	91	100	70	70	
Pb Lead	38	4	8	39	47	37	37	35	44	31	34	34	48	35	36	39	48	40	36	48	41	62	34	40	35	45	
Se Selenium	4	4	8	8	8	8	8	8	8	8	11	8	11	8	8	8	7	7	7	7	7	8	8	8	8	8	
Zn Zinc	1100	1100	1100	1100	1000	1000	1000	1000	1000	960	960	960	970	960	960	980	930	1000	970	1000	1000	1000	1100	1100	960	994	

Ingersoll WWTP De-Water Sludge May to September, 2014

Lab Number	CA13183-JAN14	CA12630-JAN14	CA13257-FEB14	CA12709-FEB14	CA12292-MAR14	CA13598-MAR14	CA12310-APR14	CA12733-APR14	CA12771-MAY14	CA13197-JUN14	CA13551-JUN14	CA12453-JUL14	CA12730-JUL14	CA13329-AUG20	CA12736-AUG14	CA13251-SEP14	CA13647-SEP14	CA12276-OCT14	CA12668-OCT14	CA12239-NOV14	CA12689-NOV14	CA13124-DEC14	CA12276-OCT14	CA12668-OCT14	CA12239-NOV14	CA12689-NOV14	CA13124-DEC14	Average	Criteria	
Sample Date	08-Jan-13	29-Jan-13	12-Feb-14	26-Feb-14	12-Mar-14	26-Mar-14	09-Apr-14	23-Apr-14	07-May-14	04-Jun-14	18-Jun-14	16-Jul-14	30-Jul-14	13-Aug-14	27-Aug-14	10-Sep-14	24-Sep-14	08-Oct-14	14-Oct-14	05-Nov-14	19-Nov-14	03-Dec-14	08-Oct-14	14-Oct-14	05-Nov-14	19-Nov-14	03-Dec-14			
Specific Gravity	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	
Oil & Grease (total)	41000	30000	35000	38000	30000	36000	38000	31000	28000	28000	21000	33000	31000	24000	27000	27000	31000	31000	41000	34000	32000	28000	31000	41000	34000	32000	28000		31889	
pH	7.80	7.03	7.82	7.47	7.05	7.49	7.63	7.36	7.35	7.10	6.82	7.38	7.07	6.95	7.51	7.44	7.39	6.93	7.33	6.86	7.25	7.44	6.93	7.33	6.86	7.25	7.44		7.28	
Alkalinity (mg/L as CaCO ₃)	6830	2280	1980	4270	2710	6070	5830	4110	2330	920	2070	3810	4640	2070	4840	5770	1180	440	1180	460	1130	913	440	1180	460	1130	913		2566	
Total Solids	21.1	21.0	21.3	21.6	21.5	22.0	21.6	21.8	21.4	23.1	22.8	24.0	23.2	22.2	22.0	21.9	22.2	21.2	21.5	21.5	21.0	20.5	21.2	21.5	21.5	21.0	20.5		21.7	
Volatile Solids	14.0	13.9	14.2	14.4	14.3	14.0	13.5	13.7	13.5	14.3	13.7	13.2	12.4	12.2	12.8	13.0	13.5	13.2	13.2	13.6	13.6	13.3	13.2	13.8	13.7	13.6	13.3		13.5	
Total Nitrogen- Kjeldahl (N)	11000	13000	11000	14000	12000	13000	9900	12000	11000	10000	8700	9900	9100	8700	8900	11000	11000	8300	11000	8300	11000	11000	8300	11000	8300	11000	11000		10567	
Ammonia+Ammonium (N)	1100	1200	1400	1400	200	1000	1600	1800	1700	900	1200	1500	1400	400	1600	1200	1200	500	1400	1100	1500	1500	1200	500	1400	1100	1500		1207	
Nitrite as N	0.6	0.6	0.6	1.2	0.2	0.7	0.2	0.2	0.2	1.1	2.0	0.2	1.6	1.3	1.7	0.5	0.5	2.1	0.8	0.2	0.5	0.2	2.1	0.8	0.2	0.5	0.2		1.4	
Nitrate as N	0.3	1.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.1	3.20	0.3	0.3	3.50	0.9	0.3	0.3	3.9	0.3	0.3	0.3	0.3	3.9	0.3	0.3	0.3	0.3		28.0	
Nitrite+Nitrate as N	0.6	1.8	0.6	1.2	0.3	0.7	0.3	0.3	0.3	2.2	3.60	0.3	1.6	3.90	2.8	0.5	0.5	4.1	0.8	0.3	0.5	4.1	0.8	0.3	0.5	0.3		29.2		
As - Arsenic	3.4	7.4	5	8	5	4	5	5	5	4	5	4	5	4	5	4	5	5	5	5	5	5	5	5	5	5	5		5	
B - Boron	37	33	50	9	46	10	17	38	40	29	45	37	43	46	36	54	58	55	50	55	61	52	55	50	55	61	52		43	
Ca - Calcium	36000	41000	39000	37000	40000	43000	43000	42000	44000	44000	49000	53000	51000	45000	44000	41000	36000	36000	40000	36000	36000	35000	40000	36000	36000	36000	35000		41074	
Cd - Cadmium	0.81	0.2	0.5	0.5	0.8	0.4	0.1	0.9	0.5	0.7	1	1.0	0.5	0.8	0.5	1.0	0.7	0.9	0.7	0.6	1.2	0.8	0.7	0.6	0.9	1.2	0.8		0.7	
Co - Cobalt	4	4.2	2.6	2.3	3.2	3.0	1.0	4.9	4.5	4.3	4.2	3	6.2	5.8	6.5	6.3	5.9	5.0	4	7.4	5.9	5.0	5.0	4	7.4	5.9		4.6		
Cr - Chromium	50	60	70	83	91	110	100	100	99	100	79	73	73	61	62	60	64	65	64	65	77	81	64	64	65	77	81		77	
Cu - Copper	610	680	620	620	640	630	590	590	650	660	570	560	600	600	600	610	640	620	610	650	640	620	640	620	610	650	640		623	
Hg - Mercury	0.2	0.4	0.30	0.28	0.34	0.27	0.2	0.41	0.27	1.1	0.87	1.2	0.86	0.66	0.65	0.60	0.55	0.75	0.40	0.49	0.46	0.50	0.46	0.49	0.46	0.49	0.46		0.51	
K - Potassium	990	1000	1000	1000	1100	1100	1100	1100	1000	1000	1200	1200	1200	1300	1200	1200	1200	960	1000	1000	1000	1100	960	1000	1000	1000	1000		1071	
Mg - Magnesium	4500	5200	4900	4800	5100	6100	6000	6000	5900	5700	6500	8500	8000	8200	6900	6500	6000	5600	4800	5000	5000	4900	5600	4800	5000	5000	4900		5756	
Mn - Manganese	17	15	16	16	18	17	18	15	16	17	18	16	17	18	19	22	24	21	25	21	25	21	25	21	25	21	25		20	
Mo - Molybdenum	1200	1400	1500	1500	1400	1500	1400	1400	1400	1300	1400	1400	1300	1400	1400	1300	1400	1200	1200	1300	1400	1500	1200	1200	1300	1400		1381		
Ni - Nickel	31	32	25	28	28	30	22	28	26	24	27	31	29	31	29	30	29	30	30	35	34	36	30	35	34	36		30		
P - Phosphorus	33000	37000	36000	34000	35000	35000	34000	35000	36000	34000	36000	31000	30000	32000	33000	34000	34000	34000	34000	32000	31000	32000	33000	34000	32000	31000	32000		33444	
Pb - Lead	19	19	15	10	16	16	20	16	20	23	19	17	22	25	23	23	26	23	20	21	24	23	20	24	23	20	24		20	
Se - Selenium	5	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	10	9	9	9	10	9	9	9	10		9		
Zn - Zinc	1600	1700	1400	1400	1400	1500	1300	1300	1300	1200	1200	1100	1100	1200	9	1200	1200	1200	1200	1200	1300	1400	1200	1200	1200	1300	1400		1248	
E Coll (Cu/Tgm dried wgt)	10,006	48,095	145,608	127,699	50,769	12,273	46,253	32,614	25,198	272,609	14,035	291,788	181,269	2,483	136,054	694,698	3,868,646	3,261,241	792,171	586,865	85,919	36,062	586,865	85,919	36,062				109494	
E Coll (Cu/Tgm)	230,000	1,010,000	3,100,000	3,400,000	1,090,000	270,000	1,000,000	710,000	540,000	6,300,000	320,000	7,000,000	4,200,000	55,000	3,000,000	15,200,000	86,000,000	6,900,000	17,000,000	12,600,000	1,800,000	740,000	6,900,000	17,000,000	12,600,000				2373669	
All results less than MDL taken as MDL																														
Results Compared to Criteria																														
As - Arsenic	3.4	7.4	5.0	8.0	5.0	4.0	5.0	5.0	5.0	7.0	8.0	6.0	4.0	6.0	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.3	170	
Cd - Cadmium	0.81	0.2	0.5	0.5	0.8	0.4	0.1	0.9	0.5	0.7	1	1	0.5	0.8	0.5	1	1	0.7	0.9	0.6	1.2	0.8	0.7	0.6	0.9	1.2		0.73	38	
Co - Cobalt	4.0	4.2	2.6	2.3	3.2	3.0	1.0	4.9	4.5	4.3	4.2	3.0	6.2	5.8	6.5	6.3	5.9	5.0	4.0	7.4	5.9	5.0	5.0	4.0	7.4	5.9		5	340	
Cr - Chromium	50	60	70	83	91	110	100	100	99	100	79	73	73	61	62	60	64	65	64	65	77	81	64	64	65	77		77	2800	
Cu - Copper	610	680	620	620	640	630	590	590	650	660	570	560	600	600	600	610	640	620	610	650	640	620	640	620	610	650	640		623	1700
Hg - Mercury	0.2	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.3	1.1	0.7	1.2	0.9	0.8	0.6	0.6	0.5	0.7	0.4	0.5	0.5	0.5	0.5	0.5	0.5		0.5	11	
Mo - Molybdenum	17	15	16	16	18	17	18	15	16	17	18	16	17	18	19	20	22	21	25	21	25	21	25	21	25	21		20	84	
Ni - Nickel	31	32	25	28	28	30	22	28	26	24	27	31	29	31	29	30	29	30	30	35	34	36	30	35	34	36		30	420	
Pb - Lead	19	19	15	10	16	16	20	16	20	23	19	17	22	25	23	23	26	23	20	21	24	23	20	24	23	20		20	1100	
Se - Selenium	5	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	10	9	9	9	10	9	9	9	10</				

Thamesford WWTP Secondary Digester January to December, 2014

Lab Number	CA12027-JAN14	CA13326-JAN14	CA12638-JAN14	CA12345-FEB14	CA12707-FEB14	CA13319-MAR14	CA13599-MAR14	CA12308-APR14	CA12702-APR14	CA12267-MAY14	CA13710-MAY14	CA13190-JUN14	CA15034-JUL14	CA12108-AUG14	CA12091-SEP14	CA13222-SEP14	CA13084-SEP14	CA12483-OCT14	CA13790-OCT14	CA13122-NOV14	CA12699-NOV14	CA13125-DEC14	Average
Sample Date	02-Jan-14	15-Jan-14	29-Jan-14	12-Feb-14	26-Feb-14	12-Mar-14	26-Mar-14	09-Apr-14	23-Apr-14	07-May-14	21-May-14	14-Jun-14	02-Jul-14	06-Aug-14	03-Sep-14	10-Sep-04	01-Oct-14	15-Oct-14	30-Oct-14	05-Nov-14	19-Nov-14	03-Dec-14	
Specific Gravity	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	6.91	7.03	7.14	7.07	6.89	7.05	7.08	7.23	7.02	7.12	7.22	7.16	7.01	7.05	7.08	6.97	6.84	6.56	7.17	6.93	7.18	7.08	7.03
Alkalinity (as CaCO3)	629	501	398	419	683	671	247	584	531	589	413	493	790	515	431	478	407	479	695	523	469	501	
Total Solids	32100	28200	24600	24700	15100	35700	34400	12500	29300	19800	27100	22800	23000	23400	20600	31500	27000	23700	25600	31400	31200	27900	26259
Volatile Solids	22200	19900	17300	16500	11200	25800	8620	23800	19000	20700	13700	15600	20300	15600	13600	21000	18000	15600	17500	21600	21800	19200	18115
Total Nitrogen-kjeldahl (N)	1040	1790	1520	2040	2160	2750	494	2670	1120	1200	1630	674	1690	1170	933	2360	288	1510	1000	1370	2290	2320	1546
Ammonia+Ammonium (N)	88.1	16.8	21.8	22.4	59.6	60.3	11.4	65.3	38.0	17.9	19.2	27.2	73.2	44.4	26.3	40.2	45.9	6.9	33.6	70.2	38.5	47.0	39.7
Nitrite as N	0.2	0.3	9.2	0.7	0.8	0.3	3.0	2	25	0.5	1.3	2.0	1.3	0.2	0.4	0.3	11	1.0	0.6	0.7	0.8	2.7	2.9
Nitrate as N	0.3	0.5	40	1.4	0.3	0.3	68	0.5	60	3.6	23	1.8	110	0.3	0.3	29	2.5	27	110	8.2	0.3	0.4	1.6
Nitrite+Nitrate as N	0.3	0.8	49	2.1	0.8	0.3	71	2	85	4.1	24	2	1.3	0.3	29	2.8	38	110	8.8	0.7	1.2	4.3	19.9
Oil & Grease (Total)	166	15	12	10	26	16	12	12	12	80	12	14	16	12	15	12	12	12	12	24	12	24	24
As -Arsenic	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
B -Boron	1.1	1.1	0.71	0.93	1.1	1.5	0.03	1.2	0.79	1.2	0.93	0.83	1.2	1.1	1.5	1.7	1.3	1.0	1.2	1.3	0.94	1.1	1.1
Ca -Calcium	740	810	600	650	840	950	410	850	650	970	800	770	1100	840	800	900	750	660	730	870	800	830	787
Cd -Cadmium	0.03	0.03	0.03	0.03	0.005	0.011	0.005	0.008	0.009	0.005	0.006	0.006	0.007	0.006	0.010	0.017	0.005	0.005	0.009	0.008	0.005	0.007	0.012
Co -Cobalt	0.06	0.06	0.05	0.05	0.06	0.08	0.02	0.05	0.05	0.06	0.02	0.02	0.02	0.01	0.04	0.04	0.03	0.04	0.03	0.04	0.01	0.03	0.04
Cr -Chromium	1.1	1.0	0.6	0.6	0.74	0.89	0.27	0.68	0.53	0.57	0.39	0.42	0.61	0.60	0.56	0.75	0.60	0.47	0.55	0.68	0.48	0.55	0.62
Cu -Copper	8.6	9.0	6.7	6.8	9.9	11	3.5	9.6	7.7	8.5	5.9	8.4	7.4	8.0	10	8.8	7.2	7.5	8.8	7.4	7.6	7.9	8.6
Hg -Mercury	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.002	0.001	0.004	0.002	0.002	0.001
K -Potassium	140	170	120	140	160	160	73	130	120	120	90	87	100	84	100	95	88	84	89	96	100	110	112
Mg -Magnesium	130	150	120	120	150	170	85	140	110	130	120	110	160	130	140	130	140	120	110	130	120	130	128
Mo -Molybdenum	0.2	0.2	0.2	0.2	0.27	0.32	0.10	0.27	0.26	0.23	0.13	0.13	0.18	0.19	0.21	0.26	0.23	0.20	0.21	0.22	0.21	0.20	0.21
Na -Sodium	360	420	290	340	380	360	250	320	290	300	340	260	400	260	450	400	270	400	270	340	260	350	327
Ni -Nickel	0.4	0.4	0.3	0.3	0.49	0.66	0.21	0.55	0.40	0.39	0.26	0.30	0.46	0.40	0.39	0.52	0.43	0.36	0.38	0.51	0.34	0.39	0.40
P -Phosphorus	1200	1300	950	1000	1400	1500	470	1270	1100	810	820	1000	1200	1000	1400	1210	990	1000	1100	1200	1100	1100	1105
Pb -Lead	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Se -Selenium	0.3	0.3	0.3	0.3	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.3	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2
Zn -Zinc	12	13	9.3	9.4	13	15	4.7	12	10	11	7.5	8.4	12	10	11	14	12	10	13	10	11	11	11
E Coli (cfu/1gm dried wgt)	143,302	102,837	41,463	287,449	158,940	72,829	37,600	39,244	109,215	32,472	106,061	131,579	163,823	123,932	47,573	76,677	77,778	88,608	210,938	156,051	118,590	121,864	95,468
E Coli (cfu/100gm)	460,000	290,000	102,000	710,000	240,000	260,000	47,000	135,000	32,472	109,215	32,472	210,000	480,000	290,000	98,000	240,000	210,000	210,000	540,000	490,000	370,000	340,000	243,766
Results Compared to Criteria																							Criteria
As -Arsenic	9	11	12	12	7	3	8	6	4	3	5	4	3	4	5	3	4	4	4	3	3	4	6
Cd -Cadmium	0.9	1.1	1.2	1.2	0.3	0.3	0.4	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.5	0.5	0.2	0.2	0.3	0.2	0.3	0.3	0.4
Co -Cobalt	1.9	2.1	2.0	2.0	4.0	2.2	1.6	1.5	1.8	2.0	1.0	0.9	1.7	1.7	1.2	1.3	1.2	1.3	1.3	1.3	0.3	1.1	1.5
Cr -Chromium	34	35	24	24	49	25	22	20	20	19	20	18	21	26	27	24	22	20	21	22	15	20	24
Cu -Copper	268	319	272	275	656	308	280	279	284	290	283	259	316	388	293	316	388	293	316	280	237	272	309
Hg -Mercury	0.031	0.035	0.041	0.040	0.066	0.028	0.080	0.029	0.037	0.068	0.051	0.044	0.034	0.043	0.049	0.096	0.074	0.084	0.039	0.127	0.064	0.072	0.056
Mo -Molybdenum	6	7	8	8	18	9	8	8	10	8	7	6	8	8	10	8	8	8	7	7	7	7	8
Ni -Nickel	12	14	12	12	32	18	17	16	15	13	13	13	16	17	19	17	16	15	15	16	11	14	16
Pb -Lead	9	11	4	4	7	6	8	3	4	3	5	4	3	4	5	3	4	4	8	3	3	4	5
Se -Selenium	9	11	12	12	7	6	8	6	7	3	10	4	10	4	10	6	4	4	8	3	3	7	7
Zn -Zinc	374	461	378	381	861	420	376	349	349	369	375	379	368	410	427	534	444	422	391	414	321	394	422

Tillsonburg WWTP De-Water Sludge January to December, 2014

Lab Number	CA12009-JAN14	CA13301-JAN14	CA13096-FEB14	CA12495-FEB14	CA12129-MAR14	CA13444-MAR14	CA12104-APR14	CA13602-APR14	CA13285-MAY14	CA13695-MAY14	CA13195-JUN14	CA13550-JUN14	CA15031-JUL14	CA12437-JUL14	CA12119-AUG14	CA11266-AUG14	CA12109-SEP14	CA12543-SEP14	CA13075-OCT14	CA12487-OCT14	CA12240-NOV14	CA12676-NOV14	CA13139-DEC14	CA13426-DEC14			
Sample Date	02-Jan-14	15-Jan-14	05-Feb-14	19-Feb-14	05-Mar-14	19-Mar-14	02-Apr-14	16-Apr-14	07-May-14	21-May-14	04-Jun-14	18-Jun-14	02-Jul-14	16-Jul-14	06-Aug-14	20-Aug-14	03-Sep-14	17-Sep-14	01-Oct-14	15-Oct-14	05-Nov-14	19-Nov-14	03-Dec-14	17-Dec-14			
Specific Gravity	1.1	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.0	Average		
Oil & Grease (total)	4000	7100	2600	4100	2700	2100	2900	3900	10000	7800	2300	2300	4300	8400	4300	6400	3200	1800	2000	2500	3300	4900	2400	2300	4050		
pH	6.66	6.99	7.04	6.67	6.78	7.03	6.88	6.95	6.90	7.11	6.94	6.26	5.84	5.60	5.47	5.90	6.34	5.76	6.01	6.05	5.69	6.40	6.04	5.66	6.37		
Alkalinity (mg/L as CaCO3)	670	540	1070	840	610	1630	610	1000	1280	1060	1210	560	1010	480	520	310	700	260	140	92	52	190	191	95	630		
Total Solids	30.4	23.1	24.9	32.1	26.1	24.0	23.3	23.8	23.1	21.8	22.5	23.1	21.8	20.6	22.9	22.4	22.9	22.4	21.8	21.9	24.0	20.8	21.7	20.2	18.9	23.6	
Volatile Solids	29.8	16.2	17.1	22.5	18.2	17.0	17.1	16.5	19.6	14.8	15.2	16.4	14.7	13.9	15.6	14.8	14.2	12.8	15.1	14.2	13.4	14.3	13.4	12.8	16.6		
Total Nitrogen-kjeldahl (N)	13000	11000	14000	13000	14000	11000	11000	11000	12000	7400	5600	10000	6900	6500	6200	7000	10400	8700	10000	7900	7600	8500	10000	8400	9629		
Ammonia+Ammonium (N)	200	100	100.0	300	100	100	100	100	200	100	100	100	100	100	100	100	100	100	100	100	300	500	100	100	100	142	
Nitrite as N	47	3.0	200.0	150	71	61	68	50	220	30	58	3.0	59	2.4	31	25	43	39	39	3	55	17	40	55	55		
Nitrate as N	310	104	62.0	210	118	127	130	180	410	32	520	410	320	360	400	350	130	340	320	240	390	89	180	160	240		
Nitrite+Nitrate as N	360	107	262.0	360	189	188	200	230	400	90	520	470	360	400	430	380	170	340	359	280	390	140	200	200	294		
As - Arsenic	2.9	2.0	2.0	3.0	4	4	4	4	3	5	5	4	5	5	4	4	4	5	4	5	5	5	5	5	4		
B - Boron	20	20	19	28	23	24	16	19	25	27	22	31	37	27	28	32	31	34	34	53	59	56	54	42	26		
Ca - Calcium	30000	30000	35000	29000	31000	29000	34000	29000	35000	34000	32000	34000	32000	23000	27000	28000	29000	28000	25000	24000	22000	21000	25000	1	26750		
Cd - Cadmium	0.70	0.66	0.89	0.80	0.6	0.4	0.4	0.3	0.5	0.8	0.8	0.6	0.9	0.8	1.0	0.8	0.9	0.7	1.0	0.6	0.8	1.2	1	1.1	0.7		
Co - Cobalt	2.5	2.2	1.7	1.5	2.0	2.4	1.5	2.4	1.6	1.5	2.9	3	1	2	1	3	4	3	4.0	4.0	2.0	3.7	2	2	2		
Cr - Chromium	27	23	25	23	23	23	22	21	18	26	23	21	25	21	23	25	23	26	34	27	22	26	28	27	24		
Cu - Copper	640	650	680	560	580	530	450	510	430	550	540	520	580	580	640	670	620	670	630	630	630	670	740	710	600		
Hg - Mercury	0.41	0.37	0.79	0.46	0.35	0.45	0.30	0.30	0.43	0.38	0.39	0.42	0.36	0.48	0.62	0.64	0.69	0.48	0.78	0.41	0.39	0.56	1.50	0.63	0.52		
K - Potassium	2400	3100	2800	2700	3000	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	2363	
Mg - Magnesium	3400	3700	4100	3600	4000	4300	4000	4600	4300	3900	4300	4500	3700	2300	3000	3000	3000	3000	3000	2800	2400	2100	2700	2600	3417		
Mo - Molybdenum	8.4	6.2	8.0	7	5	6	4	6	7	7	5	4	8	7	9	7	7	10	9	8	10	10	10	9	7		
Na - Sodium	1800	2300	2000	1900	1900	2000	1700	1900	1800	1800	1800	1800	1800	1500	1700	1700	1800	1900	2100	2200	1600	1700	1900	1900	1846		
Ni - Nickel	53	46	49	41	43	38	35	40	32	38	39	38	42	38	46	38	44	47	50	47	58	47	58	58	45		
P - Phosphorus	38000	34000	42000	38000	37000	34000	29000	34000	30000	39000	37000	37000	40000	41000	42000	42000	40000	43000	39000	38000	38000	42000	46000	42000	36333		
Pb - Lead	29	21	30	19	20	24	17	18	16	19	19	25	20	18	22	22	21	22	24	24	27	28	31	24	22		
Se - Selenium	3	4	4	6	8	8	8	8	7	9	9	9	11	10	8	9	9	10	8	9	10	9	10	11	8		
Zn - Zinc	770	670	800	650	710	640	550	600	510	660	640	610	680	700	840	900	820	870	790	790	800	820	900	880	733		
E Col (cfu/1gm dried wgt)	3,846	138,768	23,265	11,534	3,063	36,250	10,265	16,842	35,932	132,723	31,598	1,602	1,057	7,274	79,101	17,452	12,075	33,840	21277	278921	187230	2396313	12401	4915	22,973		
E Col (cfu/100gm)	117,000	3,200,000	580,000	370,000	80,000	870,000	260,000	400,000	1,060,000	2,900,000	710,000	37,000	23,000	150,000	1,900,000	400,000	270,000	690,000	510000	6100000	3900000	52000000	250000	93000	537,393		
All results less than MDL taken as MDL																										Geomean	
Results Compared to Criteria																									Average	Criteria	
As - Arsenic	2.9	2.0	2.0	3.0	4.0	4.0	4.0	4.0	3.0	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	4.1	170
Cd - Cadmium	0.70	0.66	0.89	0.80	0.60	0.40	0.40	0.40	0.30	0.50	0.80	0.60	0.90	0.80	1.00	0.80	0.90	0.70	1.00	0.60	0.80	1.20	1.00	1.1	0.7	34	
Co - Cobalt	3	2	2	2	2	2	2	2	2	2	2	2	1	2	3	4	3	4	4	4	4	3	2	2	2	340	
Cr - Chromium	27	23	25	23	23	23	22	21	18	26	23	21	25	21	23	25	23	26	34	27	22	26	28	27	24	2800	
Cu - Copper	640	650	680	560	580	530	450	510	430	550	540	520	580	580	640	670	620	670	630	630	630	670	740	710	600	1700	
Hg - Mercury	0.4	0.4	0.8	0.5	0.4	0.5	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.5	0.8	0.4	0.4	0.4	0.6	1.5	0.6	0.5	11	
Mo - Molybdenum	8.4	6.2	8.0	7.0	5.0	6.0	4.0	6.0	6.0	7.0	5.0	4.0	8.0	7.0	8.0	7.0	8.0	7.0	8.0	8.0	10.0	10.0	10.0	9	7.3	94	
Ni - Nickel	53	46	49	41	43	38	35	40	32	38	39	38	42	38	46	38	44	47	50	47	58	47	58	58	45	420	
Pb - Lead	29	21	30	19	20	24	17	18	16	19	19	25	20	18	22	22	21	22	24	24	27	28	31	24	22	1100	
Se - Selenium	3	4	4	6	8	8	8	8	7	9	9	9	11	10	8	9	9	10	8	9	10	9	10	11	8	34	
Zn - Zinc	770	670	800	650	710	640	550	600	510	660	640	610	680	700	840	900	820	870	790	790	800	820	900	880	733	4200	

EXHIBIT 2

2014 Thamesford WWTP Secondary Digester							
Lab Number		CA13846-JUL14	CA1227-AUG14	CA13289-NOV14			
Sample Date		July 25 to 26, 2014	Aug. 7, 8 & 9	Nov. 11 & 12			
		NASM 21497	NASM 21497	NASM 20247		Average	
Specific Gravity		1.0	1.0	1.0		1.0	
pH	units	7.43	7.33	7.11		7.29	
Alkalinity (mg/L as CaCO3)	mg/L	3120	3310	2200		2877	
Total Solids	mg/L	17300	39600	27600		28167	
Volatile Solids	mg/L	12200	27600	20000		19933	
Total Nitrogen-kjeldahl (N)	mg/L	1630	2440	2190		2087	
Ammonia+Ammonium (N)	mg/L	856	830	525		737	
Nitrite as N	mg/L	2.5	4.2	1.6		2.8	
Nitrate as N	mg/L	0.3	0.3	0.3		0.3	
Nitrite+Nitrate as N	mg/L	2.5	4.2	1.6		2.8	
Oil & Grease (Total)	mg/L	296	687	52		345	
As Arsenic	mg/L	0.1	0.1	0.1		0.1	
B Boron	mg/L	0.61	1.2	0.89		0.9	
Ca Calcium	mg/L	520	1400	790		903	
Cd Cadmium	mg/L	0.005	0.014	0.007		0.009	
Co Cobalt	mg/L	0.01	0.08	0.04		0.04	
Cr Chromium	mg/L	0.45	1.3	0.70		0.82	
Cu Copper	mg/L	4.4	12	7.1		7.8	
Hg Mercury	mg/L	0.001	0.002	0.001		0.001	
K Potassium	mg/L	86	110	89		95	
Mg Magnesium	mg/L	94	201	120		138	
Mo Molybdenum	mg/L	0.10	0.29	0.17		0.19	
Na Sodium	mg/L	200	220	270		230	
Ni Nickel	mg/L	0.24	0.66	0.41		0.44	
P Phosphorus	mg/L	510	1400	870		927	
Pb Lead	mg/L	0.1	0.2	0.1		0.13	
Se Selenium	mg/L	0.01	0.2	0.2		0.14	
Zn Zinc	mg/L	7.0	19	12		12.7	
E Coli (cfu/1gm dried wgt)		1,907,514	464,646	3,115,942		1,403,007	Geomean
E Coli (cfu/100gm)		3,300,000	1,840,000	8,600,000		3,737,748	Geomean
All results less than MDL taken as MDL							
Results Compared to Criteria						Average	Criteria
As Arsenic	mg/kg	6	3	4		4	170
Cd Cadmium	mg/kg	0.3	0.4	0.3		0.3	34
Co Cobalt	mg/kg	0.6	2.0	1.4		1.3	340
Cr Chromium	mg/kg	26	33	25		28	2800
Cu Copper	mg/kg	254	303	257		272	1700
Hg Mercury	mg/kg	0.058	0.051	0.036		0.048	11
Mo Molybdenum	mg/kg	6	7	6		6	94
Ni Nickel	mg/kg	14	17	15		15	420
Pb Lead	mg/kg	6	5	4		5	1100
Se Selenium	mg/kg	1	5	7		4	34
Zn Zinc	mg/kg	405	480	435		440	4200

2014 Tavistock Lagoon Biosolids Sample Results

Sample Date		17-Sep-14	Sept. 15 & 16	Oct. 24, 25 & 26		
Lab Number		CA19211-SEP14	CA19177-SEP14	CA12739-OCT14		
		NASM 21588	NASM 21582	NASM 21586	Average	
Specific Gravity		1.7	1.7	1.8	1.7	
Oil & Grease	mg/L	3100	4800	900	2933	
pH	units	7.65	7.35	7.61	7.54	
Alkalinity (mg/L as CaCO3)		1600	1760	390	1250	
Total Solids	%	69.6	62.2	72.8	68.2	
Volatile Solids	%	4.3	4.6	5.4	4.8	
Ammonia (NH3/NH4-N)	mg/kg	1400	1100	3200	1900	
Nitrogen (Total)	mg/L	100	100	100	100	
Nitrite as N	mg/L	0.3	0.8	0.2	0.4	
Nitrate as N	mg/L	2.6	4.2	16	8	
Nitrite+Nitrate as N	mg/kg	2.9	5.0	16	8	
As Arsenic	mg/kg	2.0	2.0	1.0	1.7	
B Boron	mg/kg	8	9	10	9	
Ca	mg/kg	44000	41000	63000	49333	
Cd Cadmium	mg/kg	0.2	0.3	0.2	0.2	
Co Cobalt	mg/kg	8.0	7.3	6.4	7.2	
Cr Chromium	mg/kg	20	24	16	20	
Cu Copper	mg/kg	18	20	17	18	
Hg Mercury	mg/kg	0.07	0.08	0.07	0.07	
Potassium	mg/kg	1800	1400	1500	1567	
Mn Magnesium	mg/kg	9400	9000	9600	9333	
Mo Molybdenum	mg/kg	3	3	4	3	
Na Sodium	mg/kg	420	590	280	430	
Ni Nickel	mg/kg	17	14	13	15	
Phosphorus	mg/kg	2100	5000	2200	3100	
Pb Lead	mg/kg	11	10	10	10	
Se Selenium	mg/kg	3	4	3	3	
Zn Zinc	mg/kg	61	62	55	59	
E.Coli (cfu/1g dried wgt)	mg/kg	374	161	14	94	Geomean
E.Coli (cfu/100g)	mg/kg	26000	10000	1000	6383	Geomean
Results Compared to Criteria					Average	Criteria
As Arsenic	mg/kg	2.0	2.0	1.0	1.7	170
Cd Cadmium	mg/kg	0.2	0.3	0.2	0.23	34
Co Cobalt	mg/kg	8.0	7.3	6.4	7.2	340
Cr Chromium	mg/kg	20	24	16	20	2800
Cu Copper	mg/kg	18	20	17	18	1700
Hg Mercury	mg/kg	0.07	0.08	0.07	0.07	11
Mo Molybdenum	mg/kg	3	3	4	3	94
Ni Nickel	mg/kg	17	14	13	15	420
Pb Lead	mg/kg	11	10	10	10	1100
Se Selenium	mg/kg	3	4	3	3	34
Zn Zinc	mg/kg	61	62	55	59	4200

Woodstock WWTP Dewatered Sludge 2014

Lab Number	CA19079-MAY14	CA19083-MAY14	CA12317-SEP14	CA12409-SEP14	CA12456-SEP14	CA12677-SEP14	CA12728-SEP14	CA12802-SEP14	CA12801-SEP14		
Sample Date	10-May-14	12-May-14	Sept. 4 to 5, 2014	09-Sep-14	10-Sep-14	Sept. 23	Sept. 23 & 24	Sept. 24 & 25	25-Sep-14		
NASM Number	21645	21645	20497	20497	20606	21497	21497	21873	21876	Average	
Specific Gravity	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.0	
Oil & Grease (total)	60000	42000	50000	50000	600	3400	72000	68000	72000	46444	
pH	units 8.07	7.59	7.39	8.10	8.09	7.96	7.77	7.75	7.77	7.83	
Alkalinity (as CaCO3)	3740	2620	4710	6480	7140	1570	2670	3490	2670	3899	
Total Solids	% 27.6	26.5	28.4	26.0	25.6	19.4	27.8	26.7	27.8	26.2	
Volatile Solids	% 15.6	14.7	14.8	14.0	13.8	12.4	14.8	14.3	14.8	14.4	
Total Nitrogen-kjeldahl (N)	mg/L 18000	9500	9800	10000	8800	8900	10000	10000	10000	10556	
Ammonia+Ammonium (N)	mg/L 1500	1500	1900	1900	1600	1800	1700	1500	1700	1678	
Nitrite as N	mg/L 0.2	0.2	0.2	3.2	0.3	0.2	0.2	0.2	0.2	0.5	
Nitrate as N	mg/L 0.3	0.3	0.3	0.3	0.6	0.3	0.3	0.3	0.3	0.3	
Nitrite+Nitrate as N	mg/L 0.3	0.3	0.3	3.2	0.9	0.3	0.3	0.3	0.3	0.7	
As Arsenic	mg/kg 4	4	8.0	8	4	5	4	4	4	5	
B Boron	mg/kg 37	33	39	44	43	31	38	37	38	38	
Ca Calcium	mg/kg 41000	39000	44000	46000	43000	31000	44000	45000	44000	41889	
Cd Cadmium	mg/kg 1.6	1.5	1.00	1	2.0	0.6	1.0	1.0	1.0	1.2	
Co Cobalt	mg/kg 4.9	4.4	4.7	4.5	4.5	3	4.3	5.0	4.3	4.4	
Cr Chromium	mg/kg 66	65	67	70	71	29	65	64	65	62	
Cu Copper	mg/kg 700	670	740	750	750	720	660	700	660	706	
Hg Mercury	mg/kg 0.95	0.48	0.6	1.1	0.8	0.42	2.2	1.5	2.2	1.1	
K Potassium	mg/kg 750	720	740	870	810	2600	710	730	710	960	
Mg Magnesium	mg/kg 5200	4900	5600	5600	5600	3300	6400	6600	6400	5511	
Mo Molybdenum	mg/kg 11	11	11	12	11	12	13	15	13	12	
Na Sodium	mg/kg 900	890	870	970	940	2000	860	890	860	1020	
Ni Nickel	mg/kg 70	67	76	71	69	47	80	83	80	71	
P Phosphorus	mg/kg 33000	31000	32000	34000	34000	47000	29000	30000	29000	33222	
Pb Lead	mg/kg 46	40	43	140	36	22	37	41	37	49	
Se Selenium	mg/kg 7	8	7	8	8	10	7	8	7	8	
Zn Zinc	mg/kg 1100	1100	1000	1100	1000	870	1000	1100	1000	1030	
E Coli (cfu/1gm dried wgt)	1,265,823		9,845	731	39	30,880	562,162	606,969	562,162	34,705	
E Coli (cfu/100gm)	35,000,000	149,000,000	280,000	19,000	1,000	600,000	15,600,000	16,200,000	15,600,000	1,591,835	
All results less than MDL taken as MDL											
Results Compared to Criteria										Average	Criteria
As Arsenic	mg/kg 4.0	4.0	8.0	8.0	4.0	5.0	4.0	4.0	4.0	5.0	170
Cd Cadmium	mg/kg 1.60	1.50	1.00	1.00	2.00	0.60	1.00	1.00	1.00	1.19	34
Co Cobalt	mg/kg 5	4	5	5	5	3	4	5	4	4	340
Cr Chromium	mg/kg 66	65	67	70	71	29	65	64	65	62	2800
Cu Copper	mg/kg 700	670	740	750	750	720	660	700	660	706	1700
Hg Mercury	mg/kg 1.0	0.5	0.6	1.1	0.8	0.4	2.2	1.5	2.2	1	11
Mo Molybdenum	mg/kg 11	11	11	12	11	12	13	15	13	12	94
Ni Nickel	mg/kg 70	67	76	71	69	47	80	83	80	71	420
Pb Lead	mg/kg 46	40	43	140	36	22	37	41	37	49	1100
Se Selenium	mg/kg 7	8	7	8	8	10	7	8	7	8	34
Zn Zinc	mg/kg 1100	1100	1000	1100	1000	870	1000	1100	1000	1030	4200

Ingersoll WWTP De-Water Sludge 2014

Lab Number	CA19078-MAY14	CA12728-SEP14		
Sample Date	09-May-14	Sept. 23 & 24		
	NASM 21616	NASM 21497	Average	
Specific Gravity	1.0	1.0	1.0	
Oil & Grease (total)	37000	4200	20600	
pH	units 8.39	8.09	8.2	
Alkalinity (mg/L as CaCO3)	6380	2450	4415	
Total Solids	% 21.8	25.6	23.7	
Volatile Solids	% 13.8	14.4	14.1	
Total Nitrogen-kjeldahl (N)	mg/kg 11000	10000	10500	
Ammonia+Ammonium (N)	mg/kg 2800	2100	2450	
Nitrite as N	mg/kg 0.3	0.4	0.4	
Nitrate as N	mg/kg 0.3	0.3	0.3	
Nitrite+Nitrate as N	mg/kg 0.3	0.4	0.4	
As Arsenic	mg/kg 5	4	4.5	
B Boron	mg/kg 44	54	49	
Ca Calcium	mg/kg 43000	48000	45500	
Cd Cadmium	mg/kg 1.2	1	1.10	
Co Cobalt	mg/kg 4.7	4.9	5	
Cr Chromium	mg/kg 85	86	86	
Cu Copper	mg/kg 670	640	655	
Hg Mercury	mg/kg 0.43	0.62	0.5	
K Potassium	mg/kg 1100	1100	1100	
Mg Magnesium	mg/kg 5500	6600	6050	
Mo Molybdenum	mg/kg 18	22	20.0	
Na Sodium	mg/kg 1500	1400	1450.0	
Ni Nickel	mg/kg 34	28	31.0	
P Phosphorus	mg/kg 38000	34000	36000.0	
Pb Lead	mg/kg 19	21	20.0	
Se Selenium	mg/kg 9	8	8.5	
Zn Zinc	1500	1200	1350.0	
E Coli (cfu/1gm dried wgt)	8,685,662	2,651,072	4,798,574	Geomean
E Coli (cfu/100gm)	189,000,000	68,000,000	113,366,662	Geomean
All results less than MDL taken as MDL				
Results Compared to Criteria				
As Arsenic	mg/kg 5.0	4.0	4.5	
Cd Cadmium	mg/kg 1.20	1.00	1.10	
Co Cobalt	mg/kg 4.7	4.9	4.8	
Cr Chromium	mg/kg 85	86	86	
Cu Copper	mg/kg 670	640	655	
Hg Mercury	mg/kg 0.43	0.62	0.53	
Mo Molybdenum	mg/kg 18	22	20	
Ni Nickel	mg/kg 34	28	31	
Pb Lead	mg/kg 19	21	20	
Se Selenium	mg/kg 9	8	9	
Zn Zinc	mg/kg 1500	1200	1350	

Tillsonburg WWTP De-Water Sludge 2014

Lab Number	CA12312-MAY14	CA12677-SEP14	CA12729-SEP14		
Sample Date	12-May-14	23-Sep-14	Sept. 23 & 24		
	NASM 21615	NASM 20567	NASM 21497	Average	
Specific Gravity	1.0	1.0	1.0	1.0	
Oil & Grease (total)	7900	3400	4000	5100	
pH	7.43	7.96	7.45	7.61	
Alkalinity (mg/L as CaCO3)	2320	5220	1400	2980	
Total Solids	19.0	19.4	18.5	19.0	
Volatile Solids	13.0	12.4	12.2	12.5	
Total Nitrogen-kjeldahl (N)	13000	8900	8600	10167	
Ammonia+Ammonium (N)	800	1800	1300	1300	
Nitrite as N	0.9	0.2	1.6	0.9	
Nitrate as N **	0.3	0.3	85	29	
Nitrite+Nitrate as N	0.9	0.3	87	29	
As Arsenic **	5	5	5	5	
B Boron	20	31	45	32	
Ca Calcium	34000	31000	29000	31333	
Cd Cadmium **	0.7	0.6	1.0	0.8	
Co Cobalt	2.3	3.0	3.0	2.8	
Cr Chromium	23	29	26	26	
Cu Copper	560	720	720	667	
Hg Mercury	0.42	0.42	0.48	0.44	
K Potassium	2700	2600	2200	2500	
Mg Magnesium	4600	3300	3100	3667	
Mo Molybdenum	8	12	13	11	
Na Sodium	2000	2000	1900	1967	
Ni Nickel	45	47	52	48	
P Phosphorus	37000	47000	44000	42667	
Pb Lead	25	22	30	26	
Se Selenium **	11	10	11	11	
Zn Zinc	720	870	880	823	
E Coli (cfu/1gm dried wgt)	310,526	30,880	560,949	175,213	Geomean
E Coli (cfu/100gm)	5,900,000	600,000	10,400,000	3,326,689	Geomean
** All results less than MDL taken as MDL					
Results Compared to Criteria					Criteria
As Arsenic	mg/kg	5.0	5.0	5.0	170
Cd Cadmium	mg/kg	0.70	0.60	1.00	34
Co Cobalt	mg/kg	2.3	3.0	3.0	340
Cr Chromium	mg/kg	23	29	26	2800
Cu Copper	mg/kg	560	720	720	1700
Hg Mercury	mg/kg	0.4	0.4	0.5	11
Mo Molybdenum	mg/kg	8	12	13	94
Ni Nickel	mg/kg	45	47	52	420
Pb Lead	mg/kg	25	22	30	1100
Se Selenium	mg/kg	11	10	11	34
Zn Zinc	mg/kg	720	870	880	4200

EXHIBIT 3



2014 SUMMARY OF SPREADING OF BIOSOLIDS FOR THE COUNTY OF OXFORD FROM TAVISTOCK WWTP LAGOON CELL # 2

NASM PLAN: 21582							
Spreading Dates	Field Number	Acres Available	Total lbs Spread	Total Tons Spread	Application Rate (tons/acre)	Total Tonnes Spread	Application Rate(tonnes/ac)
September 15 & 16, 2014	103	37.8	1290590	645.295	17.0712963	585.402473	15.48683791
September 15 & 16, 2014	106(105)	28.2	906900	453.45	16.07978723	411.3634096	14.58735495
Total tons spread on NASM 21582:		1098.745	Total tonnes spread on NASM 21582:		996.7658826		

NASM PLAN: 21588							
Spreading Dates	Field Number	Acres Available	Total lbs Spread	Total Tons Spread	Application Rate (tons/acre)	Total Tonnes Spread	Application Rate(tonnes/ac)
September 17, 2014	2	20.4	897550	448.775	21.99877451	407.1223159	19.95697627
Total tons spread on NASM 21588:		448.775	Total tonnes spread on NASM 21588:		407.1223159		

NASM PLAN: 21586							
Spreading Dates	Field Number	Acres Available	Total lbs Spread	Total Tons Spread	Application Rate (tons/acre)	Total Tonnes Spread	Application Rate(tonnes/ac)
October 24-26, 2014	whole farm	86.5	3634230	1817.115	21.00710983	1648.460959	19.05735213
Total tons spread on NASM 21586:		1817.115	Total tonnes spread on NASM 21586:		1648.460959		

Please see attached 3 corresponding field maps & post application reports as prepared by Jeff Bannerman C.C.A.-ON. All agronomic reporting is included in the post application reports for each farm and field we have spread on.

NASM Applied - Thamesford - 2014

Start Date	NASM Plan #	% Solids			GeoTownship	County	Hectares Spread	m ³
18-Jul-14	21497	2.71			Nissouri	Oxford	22.22	2888
						July Total:	22.22	2888
11-Nov-14	20247	2.61			Nissouri	Middlesex	16.8	1596
						November Total:	16.8	1596
						2014 Total:	39.02	4484

NASM Applied - Oxford Cake - 2014

Start Date	NASM Plan #	% Solids	Lot	Concession	GeoTownship	County	Hectares	Tillsonburg	Tillsonburg	Woodstock	Woodstock	Ingersoll	Ingersoll	Total WT	Total DT
							Spread	WT	DT	WT	DT	WT	DT		
09-May-14	21616	21.44			Zorra	Oxford	19.64	0	0	0	0	494.62	113.91	494.62	113.91
10-May-14	21645	25.76			Zorra	Oxford	28.17	0	0	846.47	219.73	0	0	846.47	219.73
12-May-14	21615	25.75			Zorra	Oxford	17.58	479.21	123.06	0	0	0	0	479.21	123.06
						May Total:	65.39	479.21	123.06	846.47	219.73	494.62	113.91	1820.3	456.7
05-Sep-14	20497	25.93			Dereham	Oxford	54.91	0	0	1590.79	411.83	0	0	1590.79	411.83
10-Sep-14	20606	23.32			Zorra	Oxford	34.18	0	0	357.71	235.84	0	0	357.71	235.84
22-Sep-14	20567	23.33			Zorra	Oxford	29.7	346.09	83.16	0	0	0	0	346.09	83.16
24-Sep-14	21497				Nissouri	Oxford	23.91	105.33	23.5	0	0	292.97	66.79	398.3	90.29
25-Sep-14	21873	25.86			Cayuga	Haldimand	16.57	0	0	463.15	119.3	0	0	463.15	119.3
26-Sep-15	21876	25.86			Rainham	Haldimand	4.7	0	0	86.91	22.56	0	0	86.91	22.56
						September Total:	163.97	451.42	106.66	2498.56	789.53	292.97	66.79	3242.95	962.98
						2014 Total:	229.36	930.63	229.72	3345.03	1009.26	787.59	180.7	5063.25	1419.68

EXHIBIT 4

2014 BCSF Storm Water Pond

Analysis	Units	June										Nov		Average	Max	MIN			
		Jan.	Feb.	March	April	May	June Field	June	July	Aug.	Sept.	Oct.	Nov Field				Nov	Dec.	
Temperature	C						22.5	8.0					4.5	6.0		10.3	22.5	4.5	
pH	pH units						7.65	8.19					8.06	8.12		8.01	8.19	7.65	
Alkalinity(as CaCO3	mg/L							183						186		185	186	183	
Conductivity	uS/cm						NA	564					873	NA		719	873	564	
COD	mg/L							32						23		28	32	23	
NH3+NH4 *	as N mg/L							0.01						0.4		0.21	0.40	0.01	
TKN	as N mg/L							3.7						5.2		4.5	5.2	3.7	
Tot Susp.Solids	mg/L							29						89		59	89	29	
Sulphate	mg/L							21						29		25	29	21	
Nitrite (as nitrogen)	mg/L							0.05						0.05		0.05	0.05	0.05	
Nitrate(as nitrogen)	mg/L							1.61						3.05		2.33	3.05	1.61	
Nitrate + Nitrite (as nitrogen)	mg/L							1.66						3.10		2.38	3.10	1.66	
CBOD	mg/L							9						6		8	9	6	
Chloride	mg/L							61						56		59	61	56	
4AAP-Phenolics *	mg/L							0.002						0.002		0.002	0.002	0.002	
Fe iron	mg/L							0.596						4.93		2.76	4.93	0.60	
Phosphorous	mg/L							0.198						0.53		0.362	0.526	0.198	
Disolved Oxygen	mg/L						5.24	NA					7.49	NA		6.37	7.49	5.24	

*If less than MDL, detection limit is used