



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 Year-End Report, Woodstock Wastewater Treatment Plant (WWTP)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) # 5950-7XQKXS.

I trust this report fulfills the intent of the ECA annual reporting requirements. If there are any questions, please contact me.

Yours truly,

A handwritten signature in black ink, appearing to read "Don Ford", is written over a light blue horizontal line.

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

Background

Oxford County owns and operates nine wastewater treatment plants (WWTPs) within the County: namely, Woodstock WWTP, Ingersoll WWTP, Tillsonburg WWTP, Thamesford WWTP, Drumbo sequencing batch reactor (SBR), Norwich Lagoons, Plattsville Lagoons, Tavistock Lagoons, and Mount Elgin recirculating sand filter (RSF).

Oxford County is centrally located in Southwestern Ontario (Figure 1) and in 1975 was restructured from 18 municipalities to its current 8. The County was given ownership of all municipal water and wastewater systems as part of the restructuring; however, from 1975 to 2000 the operations were subcontracted to the area municipalities and local Public Utility Commissions (PUCs). In 2000, Oxford County took over direct management and operation of all of the water and wastewater systems. Currently, Woodstock and Tillsonburg water distribution and wastewater collection systems are operated under Service Agreements with the respective municipality.

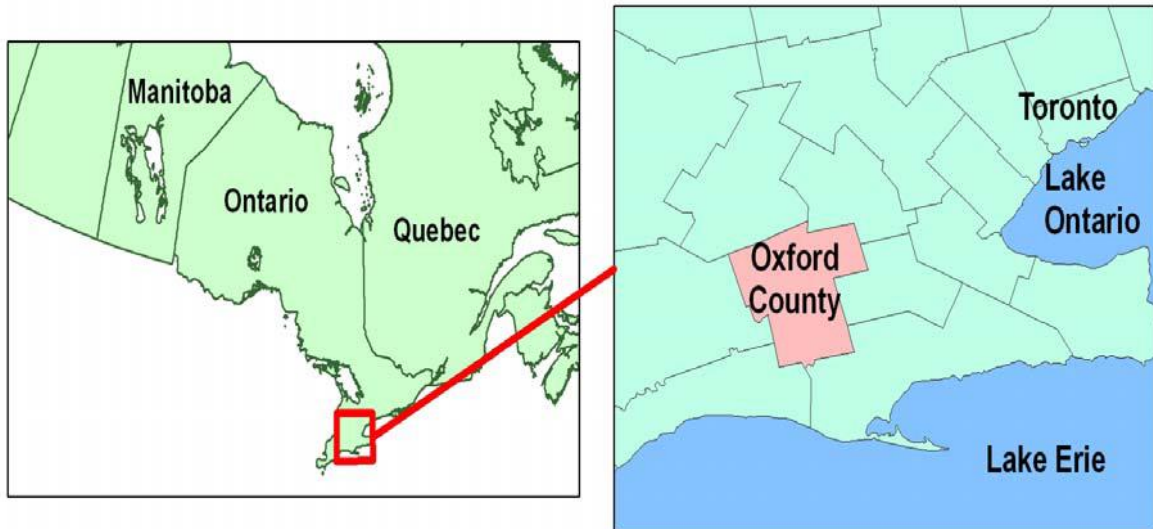


Figure 1 – Location of Oxford County

Treatment Plant Description

The Woodstock WWTP provides wastewater treatment for residential, commercial and industrial users in the City of Woodstock and for the communities of Embro and Innerkip. It also provides treatment for septic tank waste, hauled waste, holding tank waste, and landfill leachate from within Oxford County. In 2009, the plant completed a hydraulic capacity upgrade increasing the plant capacity from 25,000 m³ per day to the current approved average daily flow capacity of 33,000 m³/d, with a peak flow capacity of 66,000 m³/d.

The Woodstock WWTP (Figure 2) is a conventional activated sludge system consisting of primary and secondary treatment, with an outfall pipe to the Thames River. The facility adds ferrous chloride into the reactors for phosphorous removal; sodium hypochlorite is added seasonally for disinfection along with sodium bisulfite for de-chlorination. The facility provided effective wastewater treatment in 2014, with an average flow for the plant of 20,257 m³/day which represents 61.1% of the design capacity of 33,000 m³/day. The total flow for 2014 was 7,383,676 m³.



Figure 2 – Woodstock WWTP Aerial Photo

Plant Effluent Compliance Criteria

Facility -	Woodstock Wastewater Treatment Plant
Design Capacity -	33,000 m ³ / day
Average Daily Flow -	20,257 m ³ / day (2014)
Receiving Area -	Thames River
Classification -	WWT – IV
ECA-	#5950-7XQKXS

Table 1

Effluent Parameter	Monthly Average Concentration (milligrams per litre unless otherwise indicated)	Monthly Average Loading (kilograms per day unless otherwise indicated)
Column 1	Column 2	Column 3
<i>CBOD₅</i>		
- May 01 to November 30	15.0	495
- December 01 to April 30	20.0	660
Total Suspended Solids	15.0	495
Total Phosphorus	0.75	25.0
Total Ammonia Nitrogen (Ammonia Nitrogen + Ammonium Nitrogen)		
- May 01 to November 30	3.0	99
- December 01 to April 30	5.0	165
Total Chlorine Residual ^{Note 1}	less than 0.05	-
<i>E. Coli</i> ^{Note 1}	200 counts/100 mL (monthly <i>Geometric Mean Density</i>)	-
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times		

^{Note 1} Between May 01 to October 31.

Effluent Quality Assurance and Control Measures

Sampling Procedure

Wastewater samples are collected on a weekly basis. Raw sewage samples are collected where the sewer trunks combine before entering the sewage works. A composite sampler collects samples over a 24-hour period. Following primary treatment, a second 24-hour composite sample is collected.

Laboratory and Field Testing

A final effluent 24-hour composite sample is collected following secondary treatment, disinfection and de-chlorination but prior to the effluent discharge to the Thames River. Laboratory analysis is performed by SGS Lakefield Research Ltd. on all samples that are reported for compliance, except for pH, DO, chlorine residual and temperature, which are field collected. All in-house testing is done for process control and is not included in this report.

Summary and Interpretation of Monitoring Data

Flows

The total flow treated in 2014 was 7,383,676 m³. The daily average flow was 20,257 m³/day which represents 61.1% of the Woodstock WWTP's rated capacity of 33,000 m³/day. The daily maximum flow for 2014 was 45,419 m³/day.

Raw Sewage Quality

Table 2 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 20,257 m³/day.

Table 2

Parameter	Concentration mg/L	Loading kg/day
BOD ₅	132	2674
CBOD ₅	91	1843
TSS	196	3970
TKN	23.1	468
TP	2.7	54.7

Plant Performance & Effluent

Detailed analytical data of annual and monthly averages are summarized later in this report in Exhibit 1.

Table 3 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA limits for the parameter.

Table 3

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	*ECA Effluent Limits mg/L
CBOD ₅	2.1	2.3	97.7	15/20
TSS	3	5	98.5	15
TP	0.26	0.4	90.4	0.75
Ammonia	0.18	0.55	99	3/5
TRC	0.02	0.02	na	<0.05
E. Coli	14	27	na	200
pH	7.42	7.55	na	6-9.5

* CBOD₅, Ammonia, and E. Coli have different limits depending on the time of year please see Table 1

On a weekly basis (minimum), the operator measures pH of both the influent and effluent streams. There was no single pH result outside the discharge limits of 6-9.5 in 2014.

Staff tests Total Residual Chlorine (TRC) in the treated effluent on a daily basis; well in excess of the required weekly testing frequency. The monthly average results at all times met the Monthly Average TRC limit and were less than 0.05 mg/L and, therefore, were in compliance. The Federal Government's P2 target for TRC of 0.02 mg/L was met in 2014.

There was no reported non-compliant event for the Woodstock Wastewater Treatment Plant for any discharge parameter in 2014 as all effluent discharge criteria were met.

Effluent Objectives

Objectives are non-enforceable effluent quality values which the owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

All effluent discharge objectives listed in the plant's ECA were met at the Woodstock WWTP in 2014.

Overflows, Bypassing, Upsets, Spills, and Abnormal Conditions

There were no bypasses or overflows from the Woodstock WWTP in 2014 and there were no upset conditions noted during the year.

There was a spill of approximately 275 m³ of wastewater from the Innerkip Main Sewage Pumping Station on April 5-6, 2014. A power outage was caused by a storm event and the standby generator started automatically but the pumps failed to start properly. The high level alarm was not communicated and the overflow was discovered by Operations staff the following day. The Operator was instructed to ensure that the pumps start-up properly, and the communication error and the alarm set point were resolved.

This event was reported to the MOECC at the time it occurred.

Maintenance of Works

The operating and maintenance staff at the Woodstock WWTP conducts regularly scheduled maintenance of the plant equipment. The plant utilizes a database system known as City Works to issue work orders and maintain records for regular maintenance and repair at the treatment facility. A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

Calibration of flow meters is conducted yearly by R&R Instrumentation. The records are kept on-site at the plant.

Operations monitoring equipment calibration records are appended to this report.

Biosolids 2014

Discussion:

Biosolids are anaerobically digested and dewatered at the Woodstock WWTP using two Alfa Laval Centrifuges. The biosolids are then stored at the Oxford County Biosolids Centralized Storage Facility (BCSF) prior to land application. The sampling results and land application details are summarized in a separate Biosolids Annual report, appended.

Haulers Report

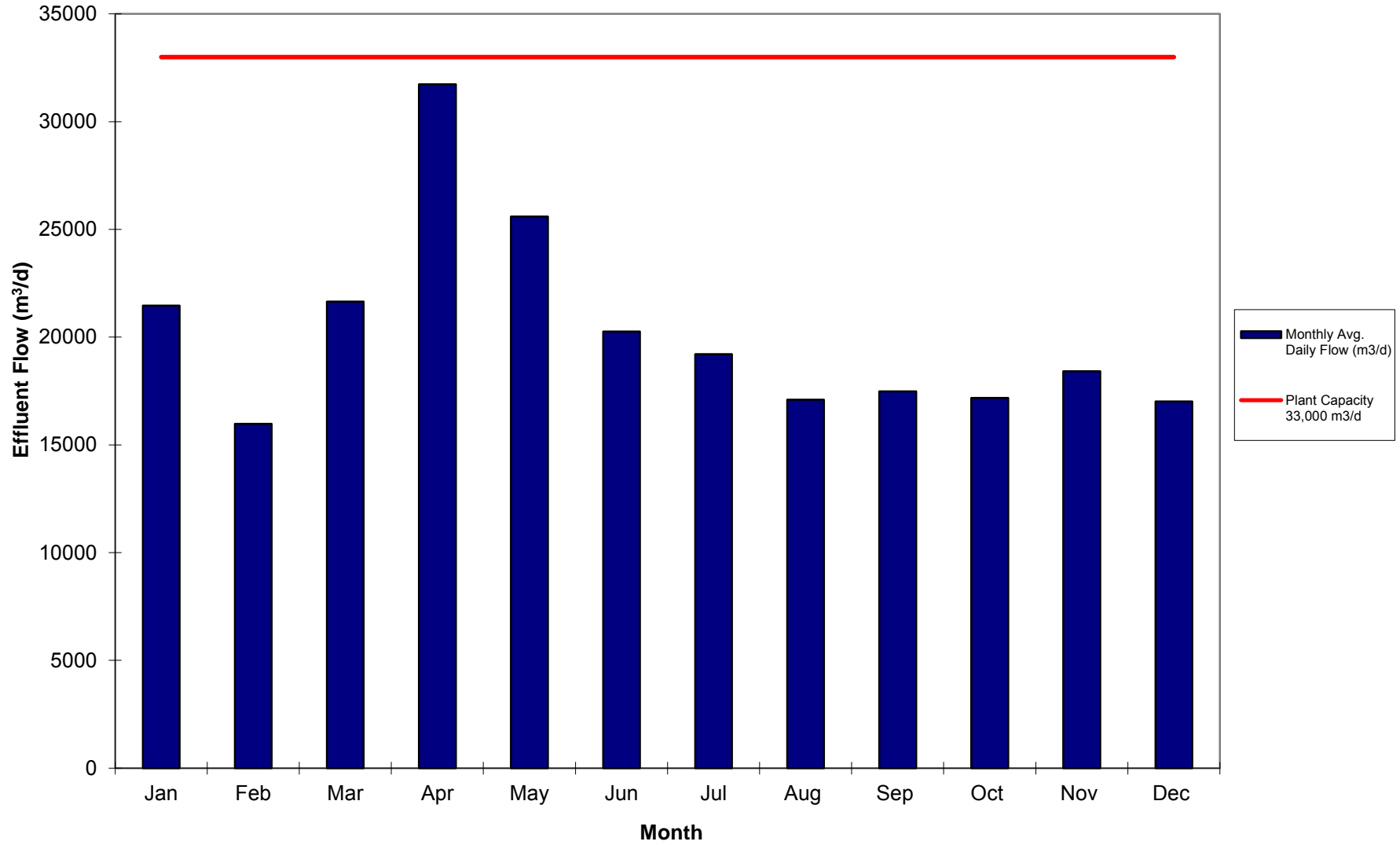
Exhibit 2 is a summary table for incoming septic haulers showing volumes of hauled waste.

Summary

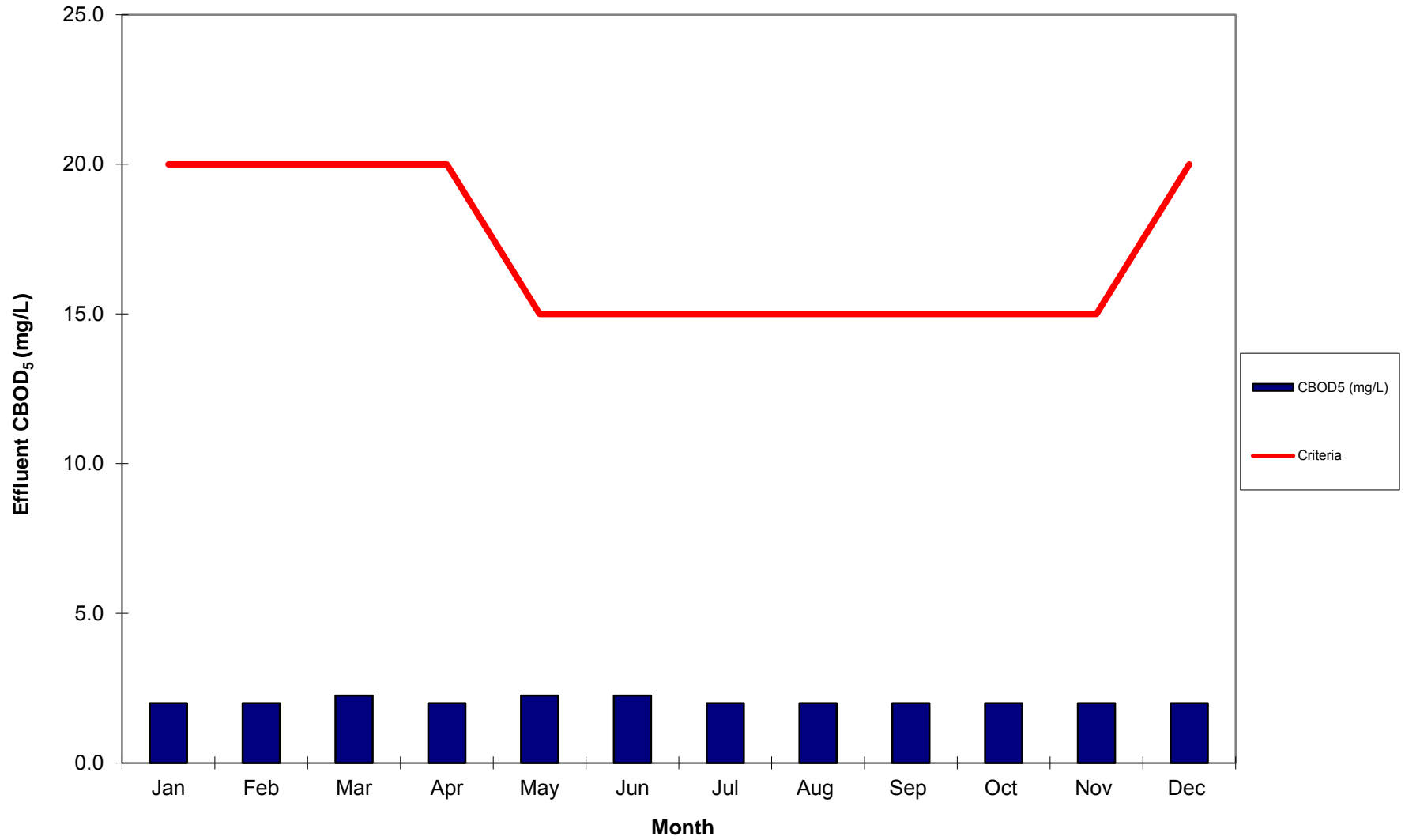
The Woodstock WWTP operated within its design flow criteria and met all effluent discharge quality limits in 2014.

Exhibit 1

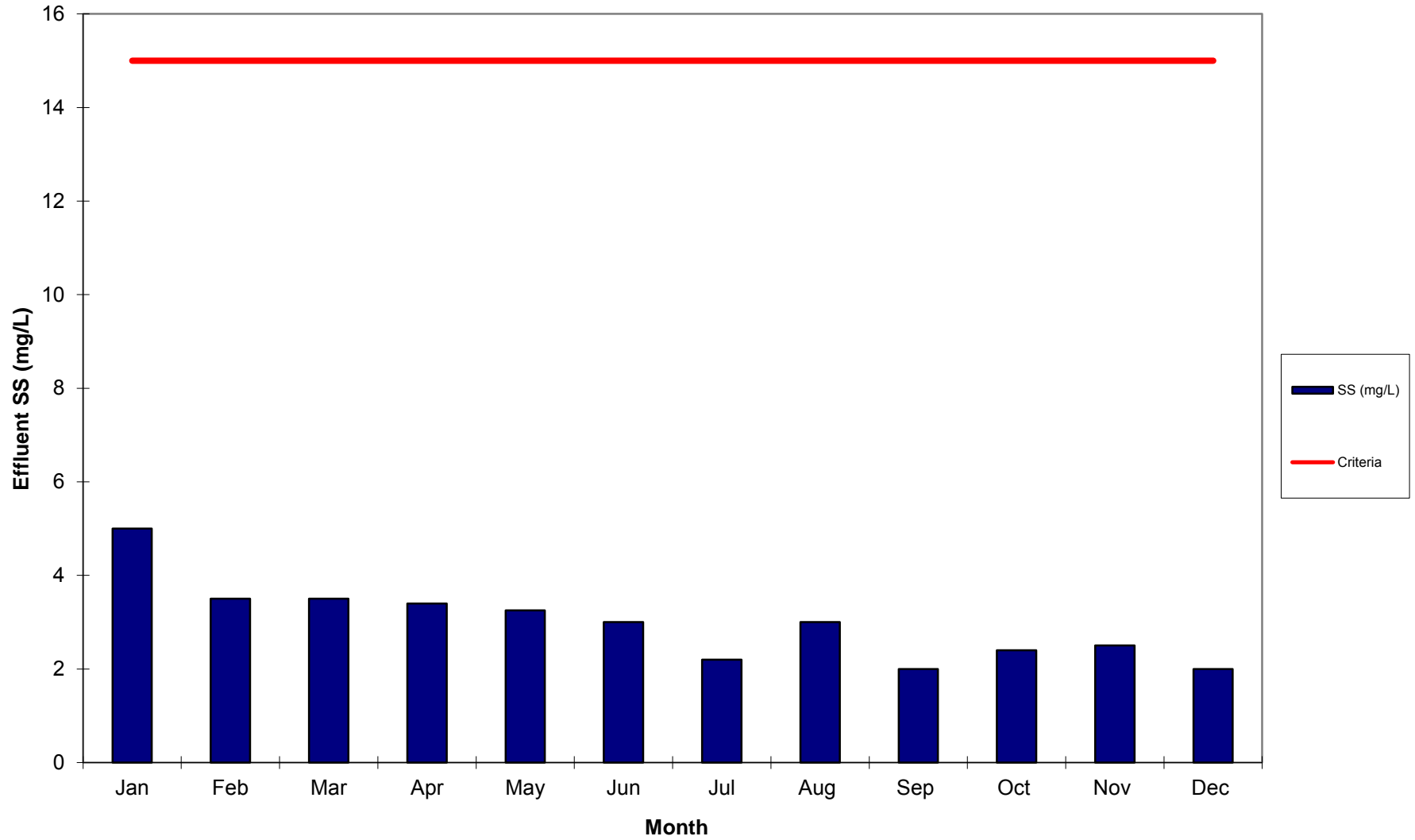
Woodstock WWTP Effluent, Monthly Average Daily Flow, 2014



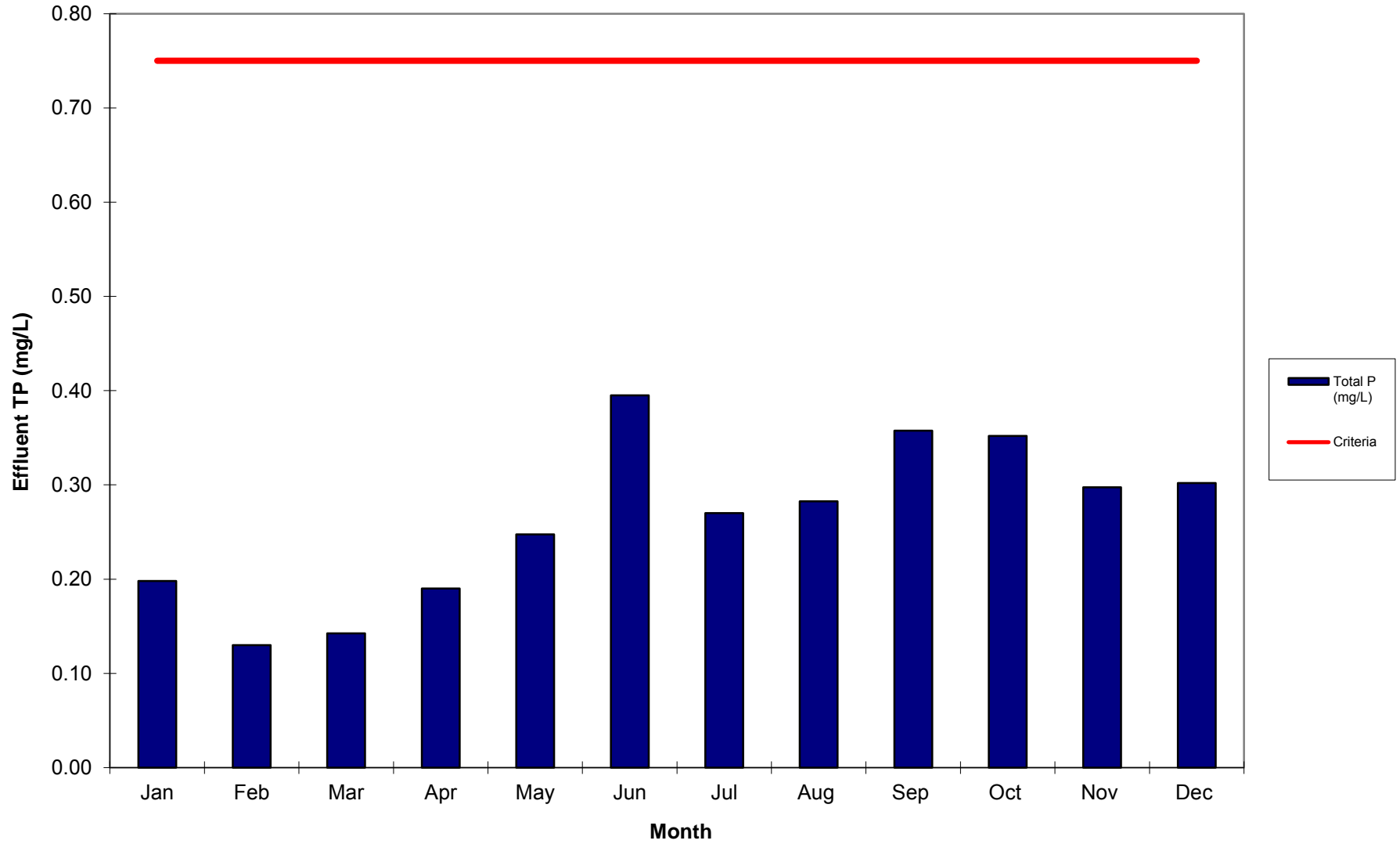
Woodstock WWTP Effluent, Monthly Average CBOD₅ (mg/L), 2014



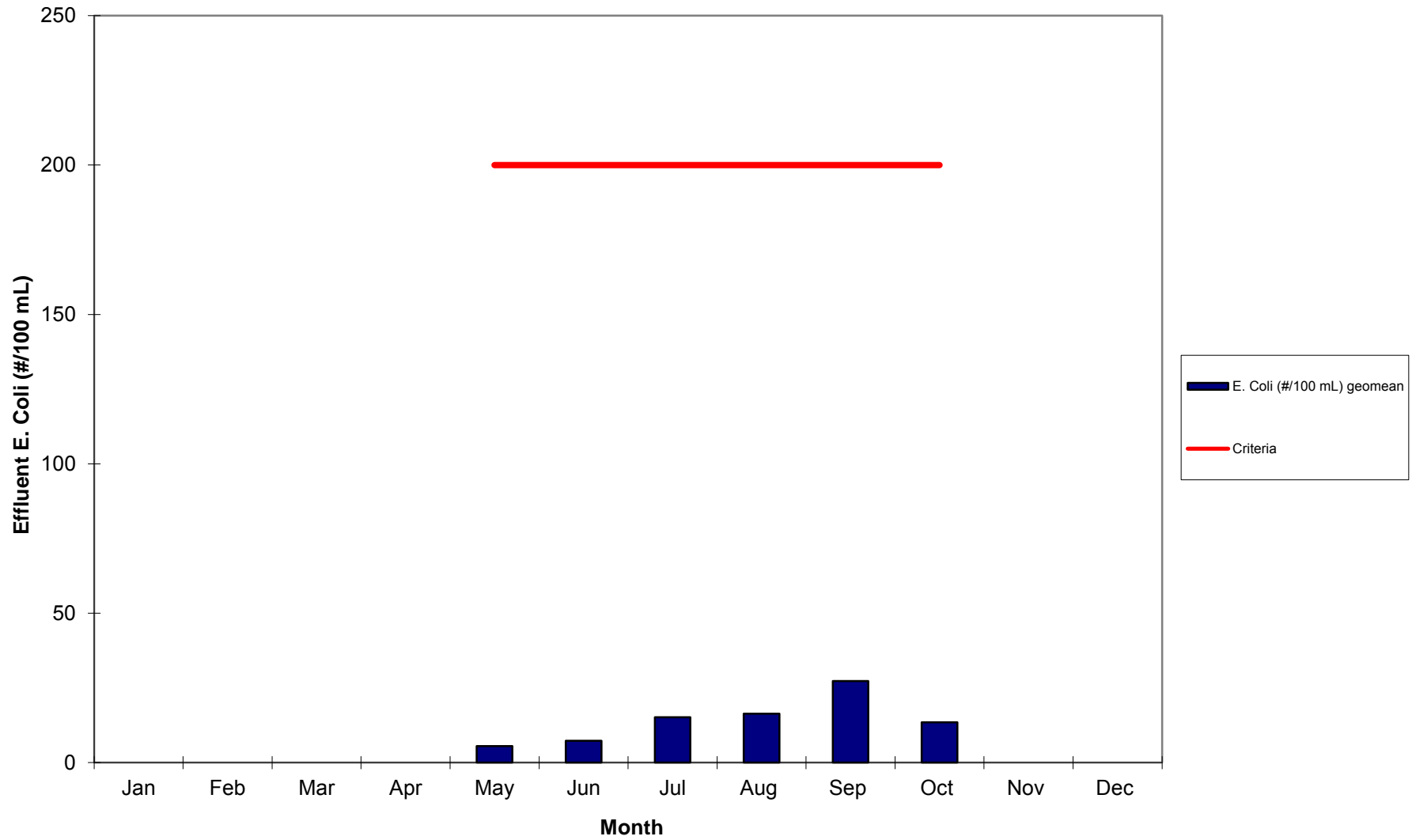
Woodstock WWTP Effluent, Monthly Average SS (mg/L), 2014



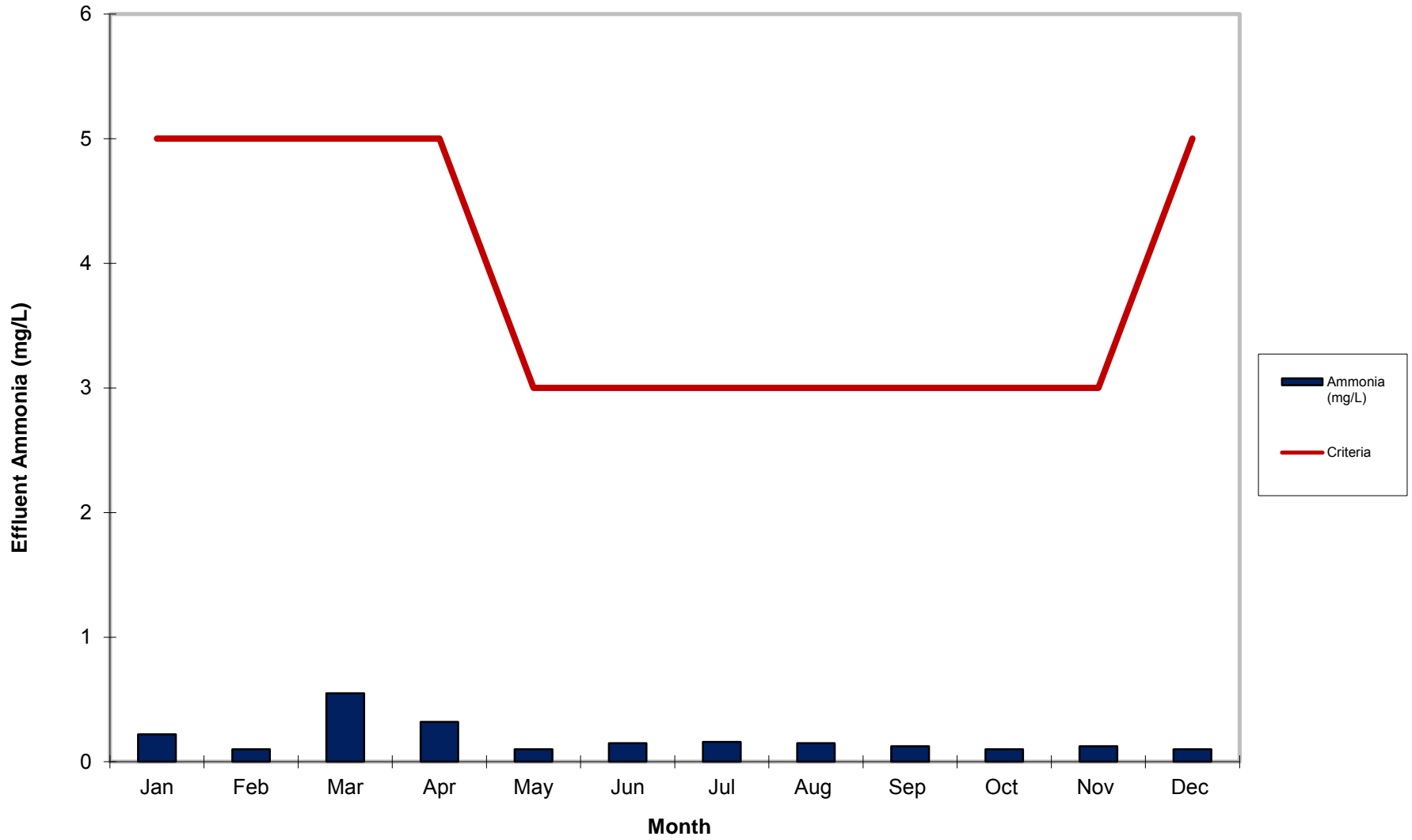
Woodstock WWTP Effluent, Monthly Average TP (mg/L), 2014



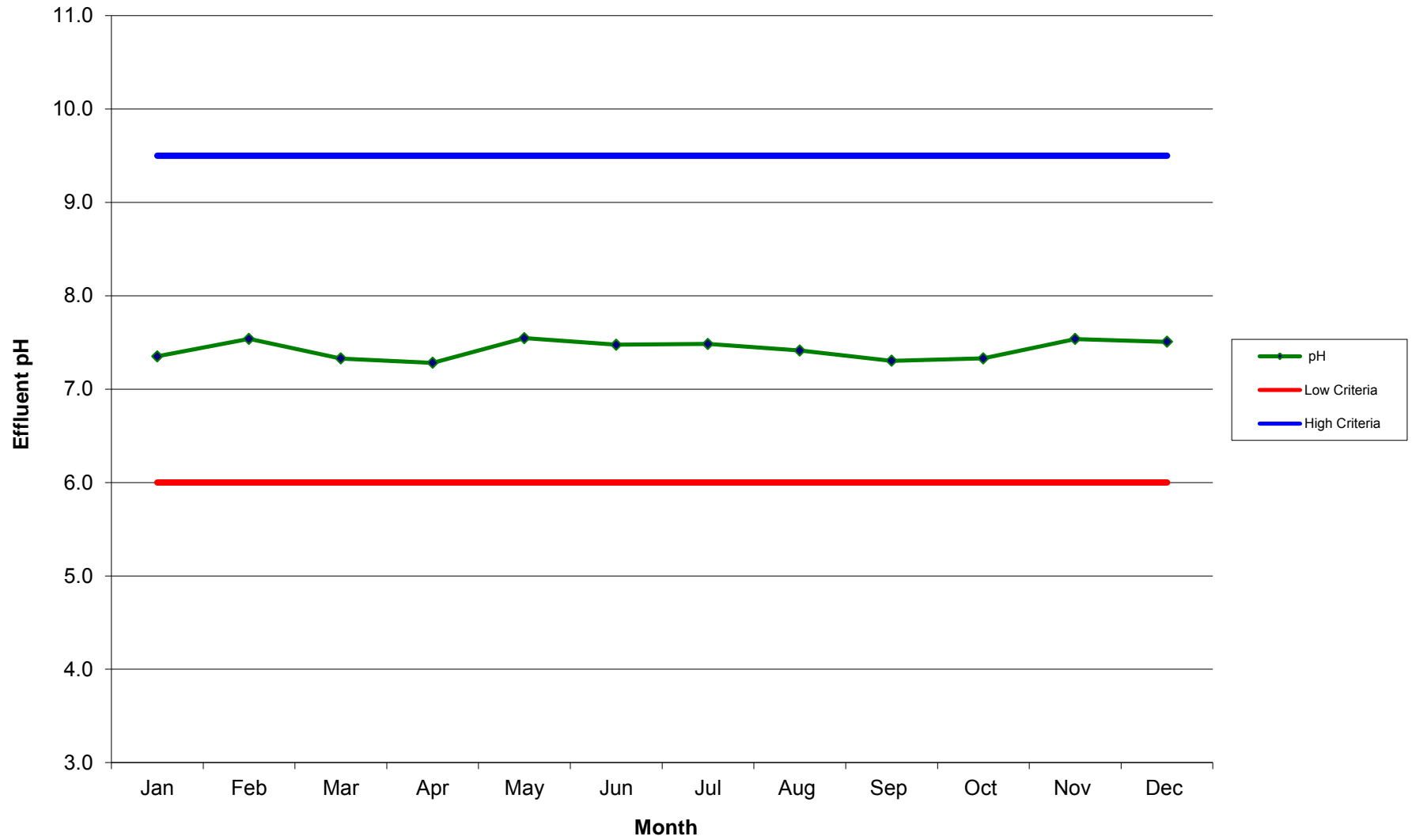
Woodstock WWTP Effluent, Monthly Geomean E. Coli, 2014



Woodstock WWTP Effluent, Monthly Average Ammonia (mg/L), 2014



Woodstock WWTP Effluent, Monthly Average pH, 2014



Municipality: Woodstock
 PROJECT: Woodstock WWTP
 Operator: Oxford County
 Works Number:
 12000685

2014

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Total	Total 1000m3	Design
Total Flow (m ³)	665288	431248	671074	952067	793340	607714	595553	530071	524654	532552	552637	527478				7383676	7384	
Monthly Avg. Daily Flow (m3/d)	21460.9	15972.1	21647.5	31736	25591.6	20257	19211.4	17099.1	17488.5	17179.1	18421.2	17015.4	20257	15972	31736			33000
Min. Daily Flow (m ³ /d)	15051	11770	13065	19945	18629	14095	12673	14083	11506	12100	9838	12527	13774	9838	19945			61.1%
Max. Daily Flow (m3/d)	45419	22738	36345	39602	33027	32053	28916	21233	29371	22095	38004	20582	30782	20582	45419			
Influent																		
BOD ₅ (mg/L)	83.2	142.3	109.0	69.8	118.0	113.5	100.0	118.0	118.5	112.6	109.0	130.0	132	69.8	142			
SS (mg/L)	111.6	162.0	129.5	108.4	213.5	191.5	150.2	166.3	169.0	173.0	138.3	148.0	196	108	214			
Total P (mg/L)	2.7	3.3	2.8	2.2	3.3	3.0	2.2	2.6	2.8	2.5	2.4	2.9	2.7	2.2	3.3			
NH ₃ +NH ₄ -N (mg/L)	19.1	19.1	18.8	13.5	14.7	23.6	15.9	18.6	17.6	18.0	16.6	18.0	17.8	13.5	23.6			
TKN (mg/L)	25.9	26.8	24.2	19.5	25.6	25.7	18.5	20.4	23.8	22.0	19.2	25.7	23.1	18.5	26.8			
NITRITE (mg/L)	0.22	0.15	0.11	0.13	0.15	0.06	0.11	0.03	0.05	0.06	0.12	0.09	0.11	0.03	0.22			
NITRATE (mg/L)	0.52	0.15	0.26	0.62	0.51	0.06	0.17	0.06	0.12	0.06	0.63	0.21	0.28	0.06	0.63			
pH	7.82	7.81	7.71	7.63	7.74	7.79	7.76	7.64	7.66	7.63	7.81	7.81	7.73	7.63	7.82			
Temp Celcius	9.0	8.8	8.4	8.6	10.1	11.8	12.9	15.0	15.1	13.3	11.2	9.7	11.2	8.4	15.1			
CBOD ₅ (mg/L)	81.2	80.0	77.5	69.4	110.5	118.0	74.4	101.5	107.5	101.8	72.3	101.0	91	69	118			
Primary Effluent																		
BOD ₅ (mg/L)	173.6	148.3	117.5	104.4	97.8	101.5	84.2	88.3	90.3	99.0	115.5	114.0	111	84	174			Criteria
SS (mg/L)	273.8	222.5	132.8	124.4	110.8	115.5	99.6	107.8	105.5	99.6	120.0	108.4	135	100	274			
Total P (mg/L)	7.2	5.5	3.1	2.4	2.0	2.3	1.8	2.3	2.2	2.3	2.4	2.4	3.0	1.8	7.2			
NH ₃ +NH ₄ -N (mg/L)	18.9	19.5	21.6	15.1	15.6	18.9	16.9	22.0	21.8	18.7	17.9	20.8	19.0	15.1	22.0			
TKN (mg/L)	32.2	27.9	27.0	17.7	19.4	25.0	18.1	23.0	24.2	22.7	23.1	25.3	23.8	17.7	32.2			
NITRITE (mg/L)	0.52	0.38	0.65	0.60	0.35	0.09	0.14	0.08	0.14	0.06	0.31	0.22	0.29	0.06	0.65			
NITRATE (mg/L)	1.25	0.57	2.11	1.29	0.26	0.06	0.17	0.10	0.47	0.09	0.58	2.10	0.75	0.06	2.11			
pH	7.42	7.51	7.34	7.55	7.73	7.68	7.72	7.55	7.60	7.54	7.75	7.72	7.59	7.34	7.75			
Temp Celcius																		
CBOD ₅ (mg/L)	89.6	69.0	52.0	43.0	54.3	55.5	41.6	55.5	57.8	58.4	50.0	67.8	58	42	90			

Exhibit 2

Hauler Summary 2014

Hauler Name	Quantity												Year to Date	Description	Waste Type	Inside out of County	
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec					m3
Company 1	196	164	196	98		31			31					716	clean up of process areas	bloody washwater	inside County
Company 2	12	7	5	9	11	9	13	14	15	15	10	6		124	portables	chemical toilet	inside County
Company 3														0	residential	septage	inside County
Company 4														0	portables	chemical toilet	inside County
Company 5														0	portables	chemical toilet	inside County
Company 6	35	33	78	115	97	113	109	117	90	114	77	59		1,036	residential	septage	inside County
Company 7	26	7	32	268	221	22	71	73	90	69	90	11		980	residential	septage	inside County
Company 8	111	133	279	547	388	352	480	490	341	370	252	154		3,896	residential	septage	inside County
Company 9				3	1	4	5	3	7	1				24	portables	chemical toilet	inside County
Company 10	45	62	69		528	343	341	234	310	442	249	221		2,843	residential	septage	inside County
Company 11	64	39	46	86	180	199	255	211	164	130	50	102		1,525	residential	septage	inside County
Company 12	156	166	257	274	313	314	319	233	282	294	294	229		3,131	residential	septage	inside County
Thamesford Wastewater Treatment Plant														0		waste activated sludge	inside County
Drumbo Sequence Batch Reactor	132	170	170	170	170	75	151	94	77	132	113	113		1,566	no digester	waste activated sludge	inside County
Ingersoll Wastewater Treatment Plant														0		waste activated sludge	inside County
Oxford County Waste Management Facility	384		594	3,719						1,779	390			6,866	landfill	leachate	inside County
Total Haulage	1,161	780	1,725	5,289	1,908	1,462	1,743	1,468	1,407	3,345	1,524	895		22,706			

Calibration Records

Instrumentation Calibrations and Checks

Date 2014	Calibrated				Checked					
	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer
Jan-06	jb	ms	ms						jb	
Jan-08						jb	ms	ms	jb	
Jan-10						jb	ms	ms	jb	
Jan-13		jb				jak		jb	jak	
Jan-15							jb	jb		
Jan-17							jb	jb		
Jan-20	ms	jak	jak	ms						
Jan-22						ms	jak	jak	ms	
Jan-24						ms	jak	jak	ms	
Jan-27	jb	ms	ms						jb	
Jan-29						jb	ms	ms	jb	
Jan-31							ms	ms		
Feb-03	jak	jb		jak						
Feb-05						jak	jb	jb	jak	
Feb-07						jak	jb	jb	jak	
Feb-10	ms	jak	jak	ms						
Feb-13						ms	jak	jak	ms	
Feb-14						ms	jak	jak	ms	
Feb-17		ms	ms							
Feb-19	jb						ms	ms		
Feb-21						jb	ms	ms	jb	
Feb-24	ms	jak	jak	ms						
Feb-26						jak	jak	jak	jak	
Feb-28						ms			ms	
Mar-03	ms	jak	jak	ms						
Mar-05						ms	jak	jak	ms	
Mar-07						ms	jak	jak	ms	
Mar-10	jb	ms	ms							
Mar-12						jb	ms	ms	jb	
Mar-14						jb	ms	ms	jb	
Mar-17	jak	jb		jak						
Mar-19										
Mar-21						jak	jb		jak	
Mar-24	ms	jak	jak	ms						
Mar-26						ms	jak	jak	ms	
Mar-28						ms	jak	jak	ms	
Mar-31	jb	ms	ms							
Apr-02						jb	ms	ms	jb	
Apr-04						jb	ms	ms	jb	

Operator should initial and date after each calibration or check.

Hach Spectrophotometer calibrated yearly or at lamp replacement.

All other meter calibrated once/week and checked twice/week.

Instrumentation Calibrations and Checks

Date 2014	Calibrated					Checked				
	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer
Apr-04	ms			ms						
Apr-07	jak			jak		ms			ms	
Apr-09		jb				jak			jak	
Apr-11							jb			
Apr-14	ms			ms						
Apr-17						ms	jak	jak	ms	
Apr-18										
Apr-21		ms	ms							
Apr-23	jb						ms	ms		
Apr-25						jb	ms	ms	jb	
Apr-28	jak	ms	ms	jak		jb			jb	
Apr-30						jak			jak	
May-02							ms	ms		
May-05	ms	jak	jak	ms			ms	ms		
May-08						ms	jak	jak	ms	
May-09						ms	jak	jak	ms	
May-12	jak	ms	ms	jak						
May-14						jak	ms	ms	jak	
May-16						jak	ms	ms	jak	
May-19	ms		ms	ms						
May-21		jb				jak			jak	
May-23						ms			ms	
May-26	ms	jmt	jmt	ms						
May-28						ms	jak	jak	ms	
May-30						ms	jak	jak	ms	
Jun-02	jb	ms	ms							
Jun-04							ms	jb		
Jun-06							ms	jb		
Jun-09	ms	jak	jak	ms						
Jun-11		jb				jak			jak	
Jun-13						ms	jak	jak	ms	
Jun-16	ms	jak	jak	ms		ms			ms	
Jun-18							jak	jak		
Jun-20						ms			ms	
Jun-23	jb	ms	ms							
Jun-25						jak	ms	ms	jak	
Jun-27		jb				jak	ms	ms	jak	
Jun-30	jak	jak	jak	jak						
Jul-03							jak	jak		
Jul-04						jak			jak	

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Instrumentation Calibrations and Checks

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Jul-07	ms	ms	ms	ms						
Jul-09		jb				ms			ms	
Jul-11						ms	jb		ms	
Jul-14	jak	ms	ms	jak						
Jul-16						jak	ms	ms	jak	
Jul-18						jak	ms	ms	jak	
Jul-21	jb	ms	ms							
Jul-23		jb					ms	ms	jb	
Jul-25							jb			
Jul-28	ms	jak	jak	ms						
Jul-30						ms	jak	jak	ms	
Aug-01						ms	jak	jak	ms	
Aug-04	jak	ms	ms	jak						
Aug-06						jak	ms	ms	jak	
Aug-08						jak	ms	ms	jak	
Aug-11	ms	ms	ms	ms						
Aug-13							ms	ms		
Aug-15		jb				ms			ms	
Aug-18	ms	jak	jak	ms						
Aug-20						ms	jak	jak	ms	
Aug-22						ms	jmt	jmt	ms	
Aug-25	jb	ms	ms						jb	
Aug-27		jb					ms	ms	jb	
Aug-29							ms	ms		
Sep-01										
Sep-03	jak			jak			ms	ms		
Sep-05	jak	ms	jb	jak	jak					
Sep-08	ms	jt	jt	ms						
Sep-10						jb	jak	jak		
Sep-11						ms			ms	
Sep-12						ms	jt	jt	ms	
Sep-15	jak	jak	ms			jak	ms	ms	jb	
Sep-17							ms	ms		
Sep-22	jb	jb	ms	jak				jb		
Sep-24						jak			jak	
Sep-25							ms	ms		
Sep-26						jak		jak		
Sep-29	ms	jak	jak	ms						
Oct-01						ms	jmt	jmt	ms	
Oct-03		jak				ms		jak	ms	

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Instrumentation Calibrations and Checks

Date 2014	Calibrated					Checked				
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Oct-06	jb	ms				jb		ms		
Oct-07			ms							
Oct-08							ms	ms		
Oct-10	jb					jb			jb	
Oct-14	jb	jb	jak	jak						
Oct-17						jak			jak	
Oct-20		jak	jak							
Oct-21	ms			ms						
Oct-22		jmt	jmt			ms			ms	
Oct-24	jb	jak	jak	jb		jb			jb	
Oct-27	jak	jb		jak		jb	jb			
Oct-29	jb	ms	ms			jb			jb	
Oct-30							ms	ms		
Oct-31	jb					hjb	ms	ms		
Nov-03	jak			jak			jmt	jmt		
Nov-04		jb				jak	jb		jak	
Nov-06			jb					jb		
Nov-10	jb					jb				
Nov-12	jmt	jmt	jmt							
Nov-14						ms	jak	jak		
Nov-17		jak	jak			ms				
Nov-18	ms	ms	ms							
Nov-24	jak	jb		jak			jb	jb		
Nov-26							jak		os	
Nov-28		jb					jb			
Dec-01	ms	ms	jmt							
Dec-03	ms					ms				
Dec-04			os				jak			
Dec-05							ms			
Dec-08	jab	jb	os	jak		jb	jb			
Dec-10						jak			jak	
Dec-15	jak			jak						
Dec-16		ms								
Dec-18		jb					jb		jb	
Dec-19	ms					ms			ms	
Dec-30	ms	ms		ms						

Operator should initial and date after each calibration or check.

Hach Spectrophotometer calibrated yearly or at lamp replacement.

All other meter calibrated once/week and checked twice/week.

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Woodstock ON
Customer PO
Our Job # B13 8622

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 600
Cal Date Dec. 16/14
Due Date Dec, 16/15
Cal Freq Yearly
Location Primary #2
Description Flow Ind. Transmitter
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A 97 7308
Accuracy 1%
Range 0 - 75.000 m³/hr
Size 100 mm or 4"
GKL 4.968
mA Output + Green

MEASURING EQUIPMENT

Manufacturer	Fluke	Krohne
Model	725	GS 8
Serial #	7903019	404860
Cal Reference	Fluke	
Traceability	NIST	
Accuracy	0.02% + 2 cnts	0.1%

INPUT Rev SIM	DISPLAY m ³ /hr	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.00	4.000	4.003	4.003	0.02	0.02
2.50	8.69	5.854	5.876	5.876	0.14	0.14
5.00	17.38	7.708	7.735	7.735	0.17	0.17
10.00	34.76	11.415	11.480	11.480	0.41	0.41
20.00	69.83	18.897	18.878	18.878	-0.12	-0.12
	69.83	18.897				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FQ 600
 Cal Date Dec. 16/14
 Due Date Dec, 16/15
 Cal Freq Yearly
 Location Primary #2
 Description Flow Integrator
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A 97 7308
 Accuracy 1%
 Range 0 - 75.000 m³/hr
 Size 100 mm or 4"
 GKL 4.9680

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
 Model 09A10 GS 8
 Serial # 6315002 404860
 Cal Reference
 Traceability NIST
 Accuracy .0001 0.1%

INPUT m ³ /hr	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
8.69		0.145	0.144	0.144	-0.08	-0.08
17.38		0.290	0.293	0.293	0.24	0.24
34.76		0.579	0.581	0.581	0.16	0.16
69.83		1.164	1.165	1.165	0.08	0.08
75.00		1.250				

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

As Left 580105.11
 As Found 580102.00
 Difference 3.11

TECHNICIAN'S NOTES

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UNIT UNDER TEST (UUT)

Tag # FE 600
Cal Date Dec. 16/14
Due Date
Cal Freq Yearly
Location Primary #2
Description Flow Element Mag
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A 97 7308
Accuracy 1%
Range 0 - 75.000 m³/hr
Size 4"
GKL 4.968
DN 100 or 4" -H-V4A
PN 150 PSI
KLE IP67

MEASURING EQUIPMENT

Manufacturer Krohne
Model GS 8
Serial # 404860
Cal Reference
Traceability
Accuracy 0.1%

INPUT	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off		0.00	0.06	0.06	0.08	0.08
P1 Run						
			<u>mA</u>			
Y 20 =	$4.00 + (16) \times 20/21.579 =$	18.829	$\frac{Q \times K \times F}{GKL \times DN \times DN}$			
Y 10 =	$4.00 + (16) \times 10/21.579 =$	11.415				
Y 5 =	$4.00 + (16) \times 5/21.579 =$	7.707	= $\frac{75 \times 2 \times 7074}{4.968 \times 100 \times 100}$			
Y 2.5 =	$4.00 + (16) \times 2.5/21.579 =$	5.854				
Y 0 =	$4.00 + (16) \times 0/21.579 =$	4.000				
				= 21.579		
*Actual Applied Value						% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	
Fail:	Fail:	

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIT 602
Cal Date Dec. 18/14
Due Date Dec. 18/15
Cal Freq Yearly
Location Transfer
Description Flow Ind. Transmitter
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A 98 24988
Accuracy 1%
Range 0 - 75.000 m³/hr
Size 150 mm or 6"
GKL 6.2470

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
Model 725 GS 8
Serial # 7903019 404860
Cal Reference Fluke
Traceability NIST
Accuracy 0.02% + 2 cnts 0.1%

INPUT SIM Y	m ³ /hr	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.00	4.0000	3.999	3.999	-0.01	-0.01
1.25	12.45	6.6560	6.662	6.662	0.04	0.04
2.50	24.84	9.2992	9.308	9.308	0.05	0.05
5.00	49.68	14.5984	14.617	14.617	0.12	0.12

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



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UNIT UNDER TEST (UUT)

Tag # FQ 602
 Cal Date Dec. 18/14
 Due Date Dec. 18/15
 Cal Freq Yearly
 Location Transfer
 Description Flow Integrator
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A 98 24988
 Accuracy 1%
 Range 0 - 75.00 m³/hr; 0 - 1.25 PPM
 Size 150 mm or 6"
 GKL 6.2470

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
 Model 09A10 GS 8
 Serial # 6315002 404860
 Cal Reference
 Traceability NIST
 Accuracy .0001 0.1%

INPUT m ³ /hr	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.0000	0.000	0.000	0.00	0.00
24.84		0.4140	0.416	0.416	0.16	0.16
49.68		0.8280	0.831	0.831	0.24	0.24
75.00		1.2500				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

As Left 1131427
 As Found 1131420
 Difference 7

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

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UNIT UNDER TEST (UUT)

Tag # FE 602
 Cal Date Dec. 18/14
 Due Date
 Cal Freq Yearly
 Location Transfer
 Description Flow Element Mag
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A95 16573
 Accuracy 1%
 Range 0 - 75.00 m³/hr
 Size 6"
 K.L.E IP67
 PN 150 PSI
 GKL 6.2470
 DN 150 or 6" -H-V4A

MEASURING EQUIPMENT

Manufacturer Krohne
 Model GS 8
 Serial # 404860
 Cal Reference
 Traceability
 Accuracy 0.1%

	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off		0.00	0.08	0.08	0.11	0.11
P1 Run		7.55	7.55	7.55	0.00	0.00
			mA			
Y 5.00 =	$4.00 + (16) \times 5/7.549 =$		14.598		$\frac{Q \times K \times F}{GKL \times DN \times DN}$	
Y 2.50 =	$4.00 + (16) \times 2.5/7.549 =$		9.299			
Y 1.25 =	$4.00 + (16) \times 1.25/7.549 =$		6.649			
Y 0.00 =	$4.00 + (16) \times 0.00/7.549 =$		4.000		$= \frac{75.00 \times 2 \times 7074}{6.2470 \times 150 \times 150}$	
					= 7.549	
*Actual Applied Value					% Error = $\frac{UUT \text{ Reading} - AAV \times 100}{\text{Span}}$	

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:  CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIT 604
Cal Date Dec. 18/14
Due Date Dec. 18/15
Cal Freq Yearly
Location South Waste
Description Flow Ind. Transmitter
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A 96 9506
Accuracy 1%
Range 0 - 150.00 m³/hr
Size 100 mm or 4"
GKL 4.945

MEASURING EQUIPMENT

Manufacturer	Fluke	Krohne
Model	725	GS 8
Serial #	7903019	404860
Cal Reference	Fluke	
Traceability	NIST	
Accuracy	0.02% + 2 cnts	0.1%

INPUT SIM Y	DISPLAY m ³ /hr	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.000	4.0000	4.003	4.003	0.02	0.02
5.00	17.475	5.8640	5.854	5.854	-0.06	-0.06
10.00	34.950	7.7280	7.745	7.745	0.11	0.11
20.00	69.900	11.4560	11.478	11.478	0.14	0.14
40.00	139.810	18.9130	18.944	18.944	0.19	0.19

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FQ 604
Cal Date Dec. 18/14
Due Date Dec. 18/15
Cal Freq Yearly
Location South Waste
Description Flow Integrator
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A 96 9506
Accuracy 1%
Range 0 - 150.00 m³/hr; 0 - 2.500 PPM
Size 100 mm or 4"
GKL 4.945
Pump Capacity 540 GPM at 28 ft of head
 or 122.6 m³/hr

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
Model 09A10 GS 8
Serial # 6315002 404860
Cal Reference
Traceability NIST
Accuracy .0001 0.1%

INPUT m ³ /hr	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000	0.00	0.0000	0.000	0.000	0.00	0.00
17.475	5.00	0.2913	0.291	0.291	-0.01	-0.01
34.950	10.00	0.5825	0.583	0.583	0.02	0.02
69.900	20.00	1.1650	1.173	1.173	0.32	0.32
139.810	40.00	2.3302	2.338	2.338	0.31	0.31
225.000		3.7500				

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

		As Left	1671567.8	
		As Found	<u>1671555.2</u>	
AS FOUND	AS LEFT	Difference	12.6	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓			
Fail:	Fail:			

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FE 604
Cal Date Dec. 18/14
Due Date
Cal Freq Yearly
Location South Waste
Description Flow Element Mag
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A 96 9506
Accuracy 1%
Range 0 - 150.00 m³/hr
Size 4"
KL.E IP67
GKL 4.9450
DN 100 or 4" -H-V4A
PN 150 PSI

MEASURING EQUIPMENT

Manufacturer Krohne
Model GS 8
Serial # 404860
Cal Reference
Traceability
Accuracy 0.1%

	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off		0.00	0.12	0.01	0.08	0.01
P1 On					0.00	0.00
			<u>mA</u>			GKL x DN x DN
Y 10.00 =	$4.00 + (16) \times 10/42.916 =$		18.913			
Y 5.00 =	$4.00 + (16) \times 5/42.916 =$		11.456			$\frac{150.00 \times 7074 \times 2}{4.945 \times 100 \times 100}$
Y 2.50 =	$4.00 + (16) \times 2.5/42.916 =$		7.728			
Y 1.25 =	$4.00 + (16) \times 1.25/42.916 =$		5.864			
Y 0.00 =	$4.00 + (16) \times 0/42.916 =$		4.000			42.916
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$	

Test Unit Results

AS FOUND	AS LEFT	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	
Fail:	Fail:	

CERTIFIED BY:

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UNIT UNDER TEST (UUT)

Tag # FIT 605
 Cal Date Dec. 16/14
 Due Date Dec. 16/15
 Cal Freq Yearly
 Location North Waste
 Description Flow Ind. Transmitter
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A 96 9551
 Accuracy 1%
 Range 0 - 150.00 m³/hr
 Size 100 mm or 4"
 GKL 4.922

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
 Model 725 GS 8
 Serial # 7903019 404860
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts 0.1%

INPUT SIM Y	DISPLAY m ³ /hr	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Rev						
0.00	0.000	4.0000	4.000	4.000	0.00	0.00
5.00	17.391	5.8550	5.848	5.848	-0.04	-0.04
10.00	34.791	7.7110	7.704	7.704	-0.04	-0.04
20.00	69.581	11.4220	11.417	11.417	-0.03	-0.03
40.00	139.153	18.8430	18.838	18.838	-0.03	-0.03

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

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UNIT UNDER TEST (UUT)

Tag # FQ 605
Cal Date Dec. 16/14
Due Date Dec. 16/15
Cal Freq Yearly
Location North Waste
Description Flow Integrator
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A 96 9551
Accuracy 1%
Range 0 - 150.00 m³/hr; 0 - 2.500 PPM
Size 100 mm or 4"
GKL 4.922

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
Model 09A10 GS 8
Serial # 6315002 404860
Cal Reference
Traceability NIST
Accuracy .0001 0.1%

INPUT m ³ /hr	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000	0.00	0.000	0.000	0.000	0.00	0.00
34.791	10.00	0.580	0.581	0.581	0.04	0.04
69.581	20.00	1.160	1.159	1.159	-0.04	-0.04
139.153	40.00	2.319	2.318	2.318	-0.04	-0.04
150.000		2.500				

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

		As Left	1278003.6	TECHNICIAN'S NOTES
		As Found	1277999.0	
AS FOUND	AS LEFT	Difference	4.6	
Pass: ✓	Pass: ✓			
Fail:	Fail:			

CERTIFIED BY:

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UNIT UNDER TEST (UUT)

Tag # FE 605
 Cal Date Dec. 16/14
 Due Date
 Cal Freq Yearly
 Location North Waste
 Description Flow Element Mag
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A 96 9551
 Accuracy 1%
 Range 0 - 150.00 m³/hr
 Size 4"
 KLE IP67
 GKL 4.9220
 DN 100 or 4" -H-V4A
 PN 150 PSI

MEASURING EQUIPMENT

Manufacturer Krohne Fluke
 Model GS 8 725
 Serial # 404860 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.1% 0.02% + 2 cnts

	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off		0.00	0.03	0.03	0.06	0.06
P1 Run		125.97	125.97	125.97	0.00	0.00
Y 10.00 =	4.00 + (16) x 10/43.117 =		18.843			GKL x DN x DN
Y 5.00 =	4.00 + (16) x 5/43.117 =		11.422			
Y 2.50 =	4.00 + (16) x 2.5/43.117 =		7.711			$\frac{150.00 \times 7074 \times 2}{4.922 \times 100 \times 100}$
Y 1.25 =	4.00 + (16) x 1.25/43.117 =		5.855			
Y 0.00 =	4.00 + (16) x 0.00/43.117 =		4.000			
					43.117	
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$	

Test Unit Results

AS FOUND	AS LEFT	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	
Fail:	Fail:	

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

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UNIT UNDER TEST (UUT)

Tag # FIT 800
 Cal Date Dec. 19/14
 Due Date Dec. 19/15
 Cal Freq Yearly
 Location Effluent Flow
 Description Flow Ind. Transmitter
 Manufacturer Milltronics
 Model OCM III
 Serial #
 Accuracy 1%
 Range 0 - 19.372257 cm; 0 - 100,000 m³/D
 Weir x 2 7.3840 meters = 2 x 3.692
 Zero Head 162.0500
 Exp. 1.5

MEASURING EQUIPMENT

Manufacturer Fluke Gauge Bd
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts ¼"

Manufacturer Fluke
 Model 416D laser distance meter
 Traceability NIST
 Accuracy 1.5 mm

INPUT cm WC	DISPLAY meters	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0000	0.00	0.0	0.0	0.00	0.00
5.87	0.0587	16679.65	16653.0	16653.0	-0.03	-0.03
15.91	0.1591	74427.76	75990.0	75990.0	1.56	1.56
32.09	0.3209	213198.54	213232.0	213232.0	0.03	0.03
19.372257	0.193723	100000.00				

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:  CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Woodstock ON
 Customer PO
 Our Job # B13 8622

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 800
 Cal Date Dec. 19/14
 Due Date Dec. 19/15
 Cal Freq Yearly
 Location Effluent Flow
 Description Flow Totalizer
 Manufacturer Milltronics
 Model OCM III
 Serial # N/A
 Accuracy 1%
 Range 0 - 100000 m³/D; 0 - 69.444 PPM (m³)
 Size 7.3840 meters weir plate 2 x 3.692

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT m ³ /D	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.0		0.000	0.000	0.000	0.00	0.00
16653.0		11.565	11.602	11.602	0.05	0.05
78000.0		54.167	54.200	54.200	0.05	0.05
213232.0		148.078	148.000	148.000	-0.11	-0.11
100000.0		69.444				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

	As Left	81693700.0
	As Found	81693000.0
	Difference	700.0
AS FOUND	AS LEFT	
Pass: ✓	Pass: ✓	
Fail:	Fail:	

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIR 800
 Cal Date Dec. 19/14
 Due Date Dec. 19/15
 Cal Freq Yearly
 Location Effluent Flow Admin Bldg
 Description Flow Ind. Recorder Scada
 Manufacturer Allen Bradley
 Model SLC 5/02
 Serial #
 Accuracy 1%
 Range 0 - 100,000 m³/D; 4 - 20 mA

MEASURING EQUIPMENT

Manufacturer Fluke
 Model 725
 Serial # 7903019
 Cal Due Date Fluke
 Cal Reference NIST
 Traceability 0.02% + 2 cnts
 Accuracy 0.01%

INPUT mA	%	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.0	0.0	0.0	0.00	0.00
8.000		25000.0	24980.0	24980.0	-0.02	-0.02
12.000		50000.0	49970.0	49970.0	-0.03	-0.03
16.000		75000.0	74970.0	74970.0	-0.03	-0.03
20.000		100000.0	99960.0	99960.0	-0.04	-0.04

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FE 800
Cal Date Dec. 19/14
Due Date
Cal Freq Yearly
Location Final Effluent
Description Flow Element
Manufacturer
Model
Serial #
Accuracy 1%
Range 0 - 100000 m³/D; 0 - 19.372 cm
Datum 162.0099 cm

MEASURING EQUIPMENT

Manufacturer Tape
Model
Serial #
Cal Reference
Traceability
Accuracy

NO.	CHECKED	CALIBRATION CHECKS FOR WEIRS AND FLUMES
1	No	Check weir or flume with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	N/A	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check transmitter location.
8	✓	Check for turbulence.
9		Description of measuring element: 2 Weir Plates 2 x 3.692 = 7.3840 m Weir Plate Weir
		Comments:

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

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UNIT UNDER TEST (UUT)

Tag # FIT 601
 Cal Date Dec. 16/14
 Due Date Dec. 16/15
 Cal Freq Yearly
 Location Primary #1
 Description Flow Ind. Transmitter
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A95 16573
 Accuracy 1%
 Range 0 - 75.000 m³/hr
 Size 100 mm or 4"
 GKL 4.998

MEASURING EQUIPMENT

Manufacturer	Fluke	Krohne
Model	725	GS 8
Serial #	7903019	404860
Cal Reference	Fluke	
Traceability	NIST	
Accuracy	0.02% + 2 cnts	0.1%

INPUT SIM Y	DISPLAY m ³ /hr	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.00	4.000	3.997	3.997	-0.02	-0.02
2.50	8.83	5.884	5.892	5.892	0.05	0.05
5.00	17.66	7.768	7.767	7.767	-0.01	-0.01
10.00	35.33	11.537	11.527	11.527	-0.06	-0.06
20.00	70.65	19.073	19.076	19.076	0.02	0.02
	7.50	5.600				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY: *R. Thachuk*

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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UNIT UNDER TEST (UUT)

Tag # FQ 601
 Cal Date Dec. 16/14
 Due Date Dec. 16/15
 Cal Freq Yearly
 Location Primary #2
 Description Flow Integrator
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A95 16573
 Accuracy 1%
 Range 0 - 75.000 m³/hr; 0 - 1.25 PPM
 Size 100 mm or 4"
 GKL 4.9980

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
 Model 09A10 GS 8
 Serial # 6315002 404860
 Cal Reference
 Traceability NIST
 Accuracy .0001 0.1%

INPUT m ³ /hr	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
17.66		0.294	0.296	0.296	0.16	0.16
35.33		0.589	0.590	0.590	0.08	0.08
70.94		1.182	1.185	1.185	0.24	0.24
75.00		1.250				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

As Left 1094419
 As Found 1094409
 Difference 10

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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UNIT UNDER TEST (UUT)

Tag # FE 601
Cal Date Dec. 16/14
Due Date
Cal Freq Yearly
Location Primary #1
Description Flow Element Mag
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A 95 16573
Accuracy 1%
Range 0 - 75.000 m³/hr
Size 4" / 100 mm
GKL 4.998
DN 100 mm -H-V4A
PN 150 PSI
KLE IP67

MEASURING EQUIPMENT

Manufacturer Krohne
Model GS 8
Serial # 404860
Cal Reference
Traceability
Accuracy 0.1%

INPUT m ³ /hr	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off		0.00	0.01	0.01	0.01	0.01
P1 Run		22.76	22.76	22.76	0.00	0.00
Y 20 =	$4.00 + (16) \times 20/21.23 =$		19.073		$\frac{Q \times K \times F}{GKL \times DN \times DN}$	
Y 10 =	$4.00 + (16) \times 10/21.23 =$		11.537			
Y 5 =	$4.00 + (16) \times 5/21.23 =$		7.768			
Y 2.5 =	$4.00 + (16) \times 2.5/21.23 =$		5.884		$= \frac{75 \times 2 \times 7074}{4.998 \times 100 \times 100}$	
Y 0 =	$4.00 + (16) \times 0/21.23 =$		4.000			
					= 21.23	

*Actual Applied Value

% Error = $\frac{UUT\ Reading - AAV \times 100}{Span}$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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UNIT UNDER TEST (UUT)

Tag # FIT - 12
 Cal Date Dec. 18/14
 Due Date Dec. 18/15
 Cal Freq Yearly
 Location South Return
 Description Flow Ind. Transmitter
 Manufacturer Krohne Altometer
 Model IFC 010F/D/18 LAS 3/S
 Serial # A 02 1046 ISO KLE IP 65
 Accuracy 1%
 Range 0 - 1100 m³/hr
 Size 350 mm or 14"
 GKL 7.448

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
 Model 725 GS 8
 Serial # 7903019 404860
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts 0.1%

INPUT SIM Y	m ³ /hr	OUTPUT*AAV	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.000	4.0000	3.997	3.997	-0.02	-0.02
1.25	80.612	5.1725	5.163	5.163	-0.06	-0.06
2.50	161.219	6.3450	6.339	6.339	-0.04	-0.04
5.00	322.438	8.6900	8.696	8.696	0.04	0.04
10.00	646.300	13.4007	13.399	13.399	-0.01	-0.01

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Woodstock ON
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 Our Job # B13 8622

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 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 12
 Cal Date Dec. 18/14
 Due Date Dec. 18/15
 Cal Freq Yearly
 Location South Return
 Description Flow Integrator
 Manufacturer Krohne Altometer
 Model IFC 010F/D/18 LAS 3/S
 Serial # A 02 1046 ISO KLE IP 65
 Accuracy 1%
 Range 0 - 1100 m³/hr; 0 - 18.333 PPM
 Size 350 mm or 14"
 GKL 7.448

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
 Model 09A10 GS 8
 Serial # 6315002 404860
 Cal Reference
 Traceability NIST
 Accuracy .0001 0.1%

INPUT m ³ /hr	SIM Y	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000	0.00	0.000	0.000	0.000	0.00	0.00
80.644	1.25	1.344	1.338	1.338	-0.03	-0.03
161.219	2.50	2.687	2.686	2.686	-0.01	-0.01
322.438	5.00	5.374	5.357	5.357	-0.09	-0.09
646.300	10.00	10.772	10.732	10.732	-0.22	-0.22
1100.000		18.333				
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$	

Test Unit Results

AS FOUND	AS LEFT	As Left	4520987.00
Pass:	Pass: ✓	As Found	4520913.00
Fail: x	Fail:	Difference	74.00

TECHNICIAN'S NOTES	

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Woodstock ON
 Customer PO
 Our Job # B13 8622

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
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 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 12
 Cal Date Dec. 18/14
 Due Date
 Cal Freq Yearly
 Location South Return
 Description Flow Element Mag
 Manufacturer Krohne Altometer
 Model IFC 010F/D/18 LAS 3/S
 Serial # A 02 1046 ISO KLE IP 65
 Accuracy 1%
 Range 0 - 1100 m³/hr
 Size 350 mm
 GKL 7.4480
 DN 350 mm / 14"
 PN 150 PSI
 KLE IP65

MEASURING EQUIPMENT

Manufacturer Krohne
 Model GS 8
 Serial # 404860
 Cal Reference
 Traceability
 Accuracy 0.1%

INPUT	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off		0.000	0.000	0.000	0.00	0.00
P1 Run		421.0	421.0	421.0	0.00	0.00
Y 10.00 =	$4.00 + (16) \times 10.00 \div 17.057 =$		13.38		$\frac{Q \times K \times F}{GKL \times DN \times DN}$	
Y 5.00 =	$4.00 + (16) \times 5.00 \div 17.057 =$		8.690			
Y 2.50 =	$4.00 + (16) \times 2.50 \div 17.057 =$		6.345			
Y 1.25 =	$4.00 + (16) \times 1.25 \div 17.057 =$		5.173		$\frac{1100 \times 2 \times 7074}{7.448 \times 350 \times 350}$	
Y 0.00 =	$4.00 + (16) \times 0.00 \div 17.057 =$		4.000			
					17.057	

*Actual Applied Value

% Error = $\frac{UUT \text{ Reading} - AAV}{Span} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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UNIT UNDER TEST (UUT)

Tag # FIT - 11
Cal Date Dec. 18/14
Due Date Dec. 18/15
Cal Freq Yearly
Location North Return
Description Flow Ind. Transmitter
Manufacturer Krohne Altometer
Model IFC 010F/D/18 LAS 3/S
Serial # A 02 1045 ISO KL.E IP 65
Accuracy 1%
Range 0 - 1100 m³/hr output not used
Size 350 mm or 14"
GKL 7.350
GK 3.675

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
Model 725 GS 8
Serial # 7903019 404860
Cal Reference Fluke
Traceability NIST
Accuracy 0.02% + 2 cnts 0.1%

INPUT SIM Y	m ³ /hr	OUTPUT*AAV	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.000	4.0000	3.996	3.996	-0.03	-0.03
1.25	79.540	5.1569	5.077	5.077	-0.50	-0.50
2.50	159.090	6.3140	6.236	6.236	-0.49	-0.49
5.00	318.175	8.6280	8.558	8.558	-0.44	-0.44
10.00	636.419	13.2570	13.185	13.185	-0.45	-0.45
Run	125.200	5.8211	12.832			

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Woodstock ON
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Our Job # B13 8622

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UNIT UNDER TEST (UUT)

Tag # FQ 11
Cal Date Dec. 18/14
Due Date Dec. 18/15
Cal Freq Yearly
Location North Return
Description Flow Integrator
Manufacturer Krohne Altometer
Model IFC 010F/D/18 LAS 3/S
Serial # A 02 1045 ISO KL.E IP 65
Accuracy 1%
Range 0 - 1100 m³/hr; 0 - 18.333 PPM
Size 350 mm or 14"
GKL 7.350

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
Model 09A10 GS 8
Serial # 6315002 404860
Cal Reference
Traceability NIST
Accuracy .0001 0.1%

INPUT m ³ /hr	SIM Y	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000	0.00	0.000	0.000	0.000	0.00	0.00
79.540	1.25	1.326	1.376	1.376	0.27	0.27
631.900	2.50	10.532	10.550	10.550	0.10	0.10
1100.000		18.333				

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	As Left	8324623	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	As Found	8324574	
Fail:	Fail:	Difference	49	

CERTIFIED BY:

R. Thachuk

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INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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UNIT UNDER TEST (UUT)

Tag # FE 11
 Cal Date Dec. 18/14
 Due Date
 Cal Freq Yearly
 Location North Return
 Description Flow Element Mag
 Manufacturer Krohne Altometer
 Model IFC 010F/D/18 LAS 3/S
 Serial # A 02 1045 ISO KLE IP 65
 Accuracy 1%
 Range 0 - 1100 m³/hr
 Size 350 mm
 GKL 7.3500
 DN 350 mm / 14"
 PN 150 PSI
 KLE IP65

MEASURING EQUIPMENT

Manufacturer Krohne
 Model GS 8
 Serial # 404860
 Cal Reference
 Traceability
 Accuracy 0.1%

INPUT	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off		0.000	0.000	0.000	0.00	0.00
P1 Run		370.5	370.5	370.5	0.00	0.00
Y 10.00 =	$4.00 + (16) \times 10.00 \div 17.285 =$		13.257		$\frac{Q \times K \times F}{GKL \times DN \times DN}$	
Y 5.00 =	$4.00 + (16) \times 5.00 \div 17.285 =$		8.628			
Y 2.50 =	$4.00 + (16) \times 2.50 \div 17.285 =$		6.314			
Y 1.25 =	$4.00 + (16) \times 1.25 \div 17.285 =$		5.157		$\frac{1100 \times 2 \times 7074}{7.350 \times 350 \times 350}$	
Y 0.00 =	$4.00 + (16) \times 0.00 \div 17.285 =$		4.000			
					17.285	

*Actual Applied Value

% Error = $\frac{UUT \text{ Reading} - AAV}{Span} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

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UNIT UNDER TEST (UUT)

Tag # FQ 212
Cal Date Dec. 19/14
Due Date Dec. 19/15
Cal Freq Yearly
Location Centrifuge Bldg
Description Flow Integrator
Manufacturer Krohne Altometer
Model IFC 010F/D
Serial #
Accuracy 1%
Range 0 - 50.00 L/s; 0 - 3000 Litres, or 0 - 3000 m³
Size 100 mm or 4"

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
Model 09A10 GS 8
Serial # 6315002 404860
Cal Reference
Traceability NIST
Accuracy .0001 0.1%

INPUT L/s	SIM Y	OUTPUT*AAV m ³	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0	0.000	0.000	0.000	0.00	0.00
10.71	10	0.643	0.643	0.643	0.00	0.00
21.43	20	1.286	1.293	1.293	0.23	0.23
42.86	40	2.572	2.587	2.587	0.50	0.50
50.00		3.000				

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Woodstock ON
 Customer PO
 Our Job # B13 8622

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 212
 Cal Date Dec. 19/14
 Due Date
 Cal Freq Yearly
 Location Centrifuge Bldg
 Description Flow Element Mag
 Manufacturer Krohne Altometer
 Model
 Serial # C071735
 Accuracy 1%
 Range 0 - 50.00 L/s
 Size 4"
 GKL 5.4569
 DN 100 m or 4" -H-V4A
 PN 150 PSI
 KLE IP67

MEASURING EQUIPMENT

Manufacturer Krohne
 Model GS 8
 Serial # 404860
 Cal Reference
 Traceability
 Accuracy 0.1%

INPUT	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off		0.000	0.000	0.000	0.00	0.00
P1 Run						
Y 10.00 =		$4.00 + (16) \times 40.00 \div 46.664 =$	17.715		$\frac{Q \times K \times F}{GKL \times DN \times DN}$	
Y 5.00 =		$4.00 + (16) \times 20.00 \div 46.664 =$	10.858			
Y 2.50 =		$4.00 + (16) \times 10.00 \div 46.664 =$	7.429			
Y 1.25 =		$4.00 + (16) \times 5.00 \div 46.664 =$	5.714		$\frac{50 \times 25646 \times 2}{5.4569 \times 100 \times 100}$	
Y 0.00 =		$4.00 + (16) \times 0.00 \div 46.664 =$	4.000			
					46.664	

*Actual Applied Value

% Error = $\frac{UUT \text{ Reading} - AAV}{Span} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIR - 212
 Cal Date Dec. 19/14
 Due Date Dec. 19/15
 Cal Freq Yearly
 Location Centrifuge Bldg
 Description Flow Ind. Recorder Scada
 Manufacturer Allen Bradley
 Model Panel View + 1000
 Serial #
 Accuracy 1%
 Range 0 - 50.00 L/s

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
 Model 725 GS 8
 Serial # 7903019 404860
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts 0.1%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
3.996		-0.0125	-0.1	-0.1	-0.18	-0.18
7.442		10.7563	10.7	10.7	-0.11	-0.11
17.736		42.9250	42.9	42.9	-0.05	-0.05

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



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UNIT UNDER TEST (UUT)

Tag # FE 222
 Cal Date Dec. 19/14
 Due Date
 Cal Freq Yearly
 Location Centrifuge Bldg
 Description Flow Element Mag
 Manufacturer Krohne Altometer
 Model
 Serial # C072140
 Accuracy 1%
 Range 0 - 750 US GPM or 47.318 L/s
 Size 4"
 GKL 5.6483
 DN 100 m or 4" -H-V4A
 PN 150 PSI
 KLE IP67

MEASURING EQUIPMENT

Manufacturer Krohne Fluke
 Model GS 8 725
 Serial # 404860 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.1% 0.02% + 2 cnts

INPUT	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1 Off					0.00	0.00
P1 Run						
Y 10.00 =	4.00 + (16) x 40.00 ÷ 42.664 =		19.001		$\frac{Q \times K \times F}{GKL \times DN \times DN}$	
Y 5.00 =	4.00 + (16) x 20.00 ÷ 42.664 =		11.500			
Y 2.50 =	4.00 + (16) x 10.00 ÷ 42.664 =		7.750			
Y 1.25 =	4.00 + (16) x 5.00 ÷ 42.664 =		5.875		$\frac{47.318 \times 25464 \times 2}{5.6483 \times 100 \times 100}$	
Y 0.00 =	4.00 + (16) x 0.00 ÷ 42.664 =		4.000			
					42.664	

*Actual Applied Value

% Error = $\frac{UUT \text{ Reading} - AAV}{Span} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

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UNIT UNDER TEST (UUT)

Tag # FIR - 222
Cal Date Dec. 19/14
Due Date Dec. 19/15
Cal Freq Yearly
Location Centrifuge Bldg
Description Flow Ind. Recorder Scada
Manufacturer Allen Bradley
Model Panel View + 1000
Serial #
Accuracy 1%
Range 0 - 47.318 L/s; 0 - 750 US GPM

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
Model 725 GS 8
Serial # 7903019 404860
Cal Reference Fluke
Traceability NIST
Accuracy 0.02% + 2 cnts 0.1%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
3.996		0.0000	-0.1	-0.1	-0.21	-0.21
7.442		11.1256	11.1	11.1	-0.05	-0.05
17.736		44.7333	45.1	45.1	0.77	0.77

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

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UNIT UNDER TEST (UUT)

Tag # FIT - Lift Station
Cal Date Dec. 18/14
Due Date Dec. 18/15
Cal Freq Yearly
Location Lift Stn Flow Raw
Description Flow Ind. Transmitter
Manufacturer Krohne Altometer
Model UFC 300
Serial # A107 1028
Accuracy 1%
Range 0 - 700.00 L/s
Size 19.96"
Pipe Mat Cast iron
Wall Thickness 0.969"

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
Model 725 GS 8
Serial # 7903019 404860
Cal Reference Fluke
Traceability NIST
Accuracy 0.02% + 2 cnts 0.1%

INPUT SIM L/s	%	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		4.0000	3.998	3.998	-0.01	-0.01
175.00		8.0000	7.989	7.989	-0.07	-0.07
350.00		12.0000	11.998	11.998	-0.01	-0.01
123.00	run	6.8114	6.812	6.812	0.00	0.00

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



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UNIT UNDER TEST (UUT)

Tag # FQ Lift Station
 Cal Date Dec. 18/14
 Due Date Dec. 18/15
 Cal Freq Yearly
 Location Lift Stn Flow Raw
 Description Flow Integrator
 Manufacturer Krohne Altometer
 Model UFC 300
 Serial # A107 1028
 Accuracy 1%
 Range 0 - 700.00 L/s

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT L/s	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000		0.000	0.000		0.00	0.00
121.400		7.284	7.290	0.000	0.01	-17.34
175.000		10.500	10.540	7.290	0.10	-25.00
700.000		42.000		10.540		

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

	As Left	198929.10
	As Found	198904.53
	Difference	24.57
AS FOUND	AS LEFT	
Pass: ✓	Pass: ✓	
Fail:	Fail:	

TECHNICIAN'S NOTES

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UNIT UNDER TEST (UUT)

Tag # FIT - 02 RAS
 Cal Date Dec. 16/14
 Due Date Dec. 16/15
 Cal Freq Yearly
 Location Plant 2
 Description Flow Ind. Transmitter
 Manufacturer Endress + Hauser
 Model Promag 50
 Serial # A809F16000
 Accuracy 1%
 Range 0 - 600.0 m³/hr
 Size 8"
 K factor 1.020

MEASURING EQUIPMENT

Manufacturer Fluke E+H
 Model 725 SIM
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT SIM m ³ /hr	%	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		4.0000	4.001	4.001	0.01	0.01
150.00		8.0000	7.996	7.996	-0.02	-0.02
300.00		12.0000	11.998	11.998	-0.01	-0.01
450.00		16.0000	15.998	15.998	-0.01	-0.01
600.00		20.0000	19.996	19.996	-0.03	-0.03
203.00	run	9.4133	9.433	9.433	0.12	0.12

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

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UNIT UNDER TEST (UUT)

Tag # FQ 02 RAS
 Cal Date Dec. 16/14
 Due Date Dec. 16/15
 Cal Freq Yearly
 Location Plant 2
 Description Flow Integrator
 Manufacturer Endress + Hauser
 Model Promag 50
 Serial #
 Accuracy 1%
 Range 0 -600.00 L/s; 0 - 10.00 m³

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT m ³ /hr	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000		0.000	0.000	0.000	0.00	0.00
300.000		5.000	5.004	5.004	0.04	0.04
600.0		10.000				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

As Left	409428
As Found	409408
Difference	20

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

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UNIT UNDER TEST (UUT)

Tag # FIT - 01 WAS
 Cal Date Dec. 16/14
 Due Date Dec. 16/15
 Cal Freq Yearly
 Location Plant 2
 Description Flow Ind. Transmitter
 Manufacturer Endress + Hauser
 Model Promag 53
 Serial #
 Accuracy 1%
 Range 0 - 300.0 m³/hr

MEASURING EQUIPMENT

Manufacturer Fluke E+H
 Model 725 SIM
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT SIM m ³ /hr	%	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		4.0000	3.995	3.995	-0.03	-0.03
75.00		8.0000	7.995	7.995	-0.03	-0.03
150.00		12.0000	11.989	11.989	-0.07	-0.07
225.00		16.0000	15.990	15.990	-0.06	-0.06
300.00		20.0000	19.981	19.981	-0.12	-0.12

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

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UNIT UNDER TEST (UUT)

Tag # FQ 01 WAS
 Cal Date Dec. 16/14
 Due Date Dec. 16/15
 Cal Freq Yearly
 Location Plant 2
 Description Flow Integrator
 Manufacturer Endress + Hauser
 Model Promag 53
 Serial #
 Accuracy 1%
 Range 0 -300.00 L/s; 0 - 5.00 m³

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT m ³ /hr	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.0		0.000	0.000	0.000	0.00	0.00
300.0		5.000	5.004	5.004	0.08	0.08
300.0		5.000				

*Actual Applied Value

$$\% \text{ Error} = \frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$$

Test Unit Results

As Left 317769
 As Found
 Difference

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician



R & R INSTRUMENTATION SERVICES INC.

Business (519)642 7197
Fax (519) 642-1311
Email: rthAchuk@rrinstrumentation.com

MAINTENANCE SERVICE REPORT

CUSTOMER County of Oxford **DATE OF SERVICE** Dec.16, 18,19/14

LOCATION Woodstock PCP **JOB #** B13 8622

WORK DESCRIPTION Annual calibrations

Dec. 16/14 Calibrated :

FIT - 600, FQ - 600 FIT - 01, FQ - 01

FIT - 601, FQ - 601 FIT - 02, FQ - 02

FIT - 605, FQ - 605

Dec. 18/14 calibrated:

FIT - 604, FQ - 604 FIT - 11, FQ - 11

FIT - Lift Station, FQ - Lift Station FIT - 12, FQ - 12

FIT - 602, FQ - 602

Dec. 19/14 Calibrated :

FIT - 222, FQ - 222, FIR 222 FIT - 800, FQ -800, FIR 800

FIT - 212, FQ - 212, FIR 212

TRAVEL KM 102 + 102 + 101 **MEALS** _____ **MOTEL** _____

HOURS: S.T. 25 + 8.5 + 8.5

O.T. _____

REPLACEMENT PARTS USED/REPAIRS _____

AUTHORIZED BY (CUSTOMER REPRESENTATIVE) _____ **PERFORMED BY** _____

Name (IPrint) _____ **NAME** R Thachuk CET, CCST Level III

SIGNATURE _____ **SIGNATURE** R Thachuk

Plant Maintenance Records

ID	Description	Projected Start Date	Shop	Instructions
6309	Repair	02/01/2014	250100	Centrifuge building bin area heat line or heater frozen needs repair
6342	Repair	03/01/2014	250100	Drive chain longitudinal primary # 2
6343	Repair	03/01/2014	250100	Repair cntrifuge building bin door
6379	Repair	07/01/2014	250100	Methane gas line that feeds napanee boiler frozen
6381	Repair	09/01/2014	250100	Primary # 2 cross collector chain repair
6387	Replace	10/01/2014	250100	Scum pump primary #1 increase pumping capacity
6398	Repair	16/01/2014	250100	Boiler room armstrong pump # 4 leaking
6399	Repair	20/01/2014	250100	# 1 gas compressor leaking oil
6411	Lubricate	22/01/2014	250100	Change oil in plant #3 return pumps 1+2+3
6412	Lubricate	22/01/2014	250100	Grease and inspect centrifuges
6413	Lubricate	22/01/2014	250100	Grease valves throughout plant
6414	Repair	22/01/2014	250100	Overhaul centrifuge # 2 (bearings & seals etc.)
6417	Repair	23/01/2014	250100	Old ferrous birm cleaned out.
6430	Repair	28/01/2014	250100	Digester 3 sludge reciculate pump # 1 motor replaced & repaired
6433	Repair	29/01/2014	250100	Vogelsang centrifuge feed pump 1 coupler breaking down.
6434	Repair	29/01/2014	250100	Digester recirculating pump # 2 noisy pump bearings
6435	Repair	30/01/2014	250100	Chlorine basement unit heater 13 fan not working
6441	Repair	31/01/2014	250100	Centrifuge # 1 overhaul
6450	Repair	07/02/2014	250100	Primary #2 dual longitudinal drive chain needs adjustment
6451	Repair	07/02/2014	250100	Hydrastal pump # 1 primary 1 plugged
6493	Repair	24/02/2014	250100	Boiler room armstrong pump # 3 leaking
6495	Replace	25/02/2014	250100	Change air filters for Woodstock blowers
6503	Inspect	27/02/2014	250100	Check valve for primary # 2 hydrastal pump not closing properly.
6504	Repair	27/02/2014	250100	Ferrous anti syphon valve leaking (crusted up with ferrous)
6505	Repair	27/02/2014	250100	Boiler water feed system not adding water to maintain pressure.
6524	Repair	04/03/2014	250100	Return pump # 1 plant 3 seal leaking
6526	Repair	04/03/2014	250100	Fuller gas compressor coupler needs repair
6528	Repair	05/03/2014	250100	Centrifuge sludge feed pump 121 not pumping.
6529	Replace	05/03/2014	250100	Replace packing in augers for centifuges Install two metal plates in front of centrifuge bin doorway for bin wheels□
6550	Repair	11/03/2014	250100	(cement broken away)
6551	Repair	12/03/2014	250100	Rotork transfer valve for digester # 3 needs repair
6569	Repair	19/03/2014	250100	Plant #3 south cross collector drive seal leaking oil Oil change and grease motors Aerzen blowers 2 +3 + 4□
6570	Lubricate	20/03/2014	250100	Blower # 4 rubber boot leaking
6584	Lubricate	27/03/2014	250100	Methane gas valves maintenance log
6615	Replace	01/04/2014	250100	Replace latches on barscreen auger cover
6635	Repair	08/04/2014	250100	Marlow # 6 has broken stud
6640	Repair	10/04/2014	250100	Chlorine tank scum pump plugged

6656 Repair	14/04/2014	250100	Primary conveyor rear bearings making a noise Check chlorine and bisulphite tanks and pumps and lines ☐
6665 Repair	16/04/2014	250100	Clean out chlorine contact chamber and repair mud valve John Deere tractor remove snow blower and repair before storing☐ Install sweeper for yard laneway clean up☐ Install mower for summer grass cutting ☐
6666 Replace	16/04/2014	250100	
6694 Repair	29/04/2014	250100	Marlow #7 rotork transfer valve pin sheared
6695 Repair	30/04/2014	250100	Grinder # 2 open and inspect forward and reversing while in operation
6717 Repair	08/05/2014	250100	Digester 3 + 4 recirculating pump #2 bearings
6734 Repair	16/05/2014	250100	Chlorine pump # 1 running but not pumping chemical
6735 Replace	16/05/2014	250100	Replace primary # 2 drives for chain & flyt
6740 Repair	20/05/2014	250100	Rotork #2 malfunctioning draining digester.
6749 Replace	21/05/2014	250100	Replace AC Tech drive for poly system
6750 Repair	20/05/2014	250100	Repair chain and flyt primary # 2
6757 Repair	22/05/2014	250100	Repair grinder replace drive shaft etc.
6774 Repair	27/05/2014	250100	# 2 primary scum pump plugged
6784 Repair	28/05/2014	250100	Marlow # 6 has broken stud that needs repair
6804 Repair	04/06/2014	250100	Move and repair auger sensor
6805 Repair	04/06/2014	250100	Methane gas booster motor repair
6808 Replace	05/06/2014	250100	Replace liquid sampling motor and peristaltic pump head
6837 Repair	16/06/2014	250100	Repair broken stud marlow # 6
6838 Lubricate	16/06/2014	250100	grease all barscreens and check over bearings worn parts
6853 Repair	23/06/2014	250100	Take down primary # 2 & repair cross collector chain & flights
6854 Repair	23/06/2014	250100	Repair final contact chamber clarvac
6892 Repair	30/06/2014	250100	Broken stud marlow # 6
6897 Lubricate	02/07/2014	250100	Grease centrifuges
6901 Replace	03/07/2014	250100	Replace belts on centrifuges 1 + 2
6908 Repair	04/07/2014	250100	Marlow # 6 broken stud reported Friday July 4,2014
6926 Repair	14/07/2014	250100	Vogelsang pump 1 plugged (near control panel)
6927 Lubricate	14/07/2014	250100	Drip trap gas compressor room siezed
6930 Replace	14/07/2014	250100	Change inline filters for Aerzen blowers.
6936 Repair	16/07/2014	250100	
6980 Replace	29/07/2014	250100	construct railing extentions for primary 1 scum trough wheels
6983 Repair	30/07/2014	250100	Boiler recirculation pump # 3 motor burnt out
6994 Replace	01/08/2014	250100	Replace burnt out bulbs throughout plant Marlow 6 has broken stud☐
7021 Repair	11/08/2014	250100	Transfer valve 6 marlow needs repair
7022 Replace	12/08/2014	250100	Replace outer filter for blowers
7023 Lubricate	12/08/2014	250100	centrifuges require grease and check belts

7024 Replace	12/08/2014	250100	Bar screen # 2 needs pinion replaced
7025 Repair	13/08/2014	250100	New chlorine tank scum pump motor needs bearings replaced
7048 Replace	20/08/2014	250100	Change packing marlow # 6 piston pot.
7107 Replace	15/09/2014	250100	Rebuild marlow # 6 new pot etc.
7148 Repair	01/10/2014	250100	Vogelsang pump 111 plugged
7149 Lubricate	01/10/2014	250100	centrifuges require grease and inspect belts etc.
7183 Repair	07/10/2014	250100	grit bucket beam weld joint and grind smooth
7190 Repair	08/10/2014	250100	Cement repairs around tanks and posts
7198 Repair	14/10/2014	250100	Check valve for effluent water pump #2 stuck open
7203 Repair	16/10/2014	250100	Water supply actuator valve centrifuge #2
7205 Repair	17/10/2014	250100	Ferrous system not pumping
7212 Repair	20/10/2014	250100	Inspect all sump pumps throughout plant.
7217 Repair	21/10/2014	250100	Bar screen # 2 noisy
7237 Replace	31/10/2014	250100	Replace DeZURIK butterfly valves plant #3 return pumps
7238 Replace	03/11/2014	250100	Ferrous pump leaking
7247 Repair	05/11/2014	250100	Primary # 2 scum pump plugged
7259 Repair	10/11/2014	250100	Plant #2 60' secondary clarifier shear pin
7262 Repair	10/11/2014	250100	Gas mixing line digester # 4 leaking. John Deere tractor remove mower deck and make repairs
7276 Lubricate	13/11/2014	250100	install snow blower and winter cab
7290 Replace	17/11/2014	250100	Check over chlorination and dechlorination equipment for next springs startup
7291 Repair	18/11/2014	250100	Vogelsang pump 121 plugged
7308 Repair	24/11/2014	250100	Ferrous system needs to be unplugged
7309 Repair	24/11/2014	250100	Heat pump boiler room leaking
7311 Repair	25/11/2014	250100	Waste gas burner not burning off gas
7328 Lubricate	01/12/2014	250100	Methane gas line valves inspection
7329 Repair	01/12/2014	250100	Plant # 3 north dual drive motor needs bearings
7330 Repair	01/12/2014	250100	Louver for blower room exhaust fan (exterior louver)
7332 Repair	02/12/2014	250100	Barscreen # 2 roller bearings replaced
7373 Repair	16/12/2014	250100	Primary # 2 scum troughs need repair
7409 Repair	23/12/2014	250100	Ferrous system plugged
7413 Repair	30/12/2014	250100	Digester 3 + 4 rotork valve # 3 broken pin
7533 Repair	07/01/2015	250100	Bar screen # 2 very noisy
7546 Repair	12/01/2015	250100	Digester 3 +4 recirculating pump # 1 will not run.
7568 Replace	20/01/2015	250100	Heater bar screen room fan not working
7572 Lubricate	21/01/2015	250100	
7582 Repair	27/01/2015	250100	Heater fan blower basement not working



Public Works

P. O. Box 1614, 21 Reeve St., Woodstock, Ontario N4S 7Y3

Phone: 519-539-9800 Fax: 519-421-4711

Website: www.oxfordcounty.ca

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 Year-End Report, Ingersoll Wastewater Treatment Plant (WWTP)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) #6582-9QDRDH-issued November 21, 2014.

I trust this report fulfills the intent of the ECA reporting requirements. If there are any questions, please contact me.

Yours truly,

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

The Ingersoll Wastewater Treatment Plant (WWTP) is comprised of two plants; the 1947 Plant and the 1974 Plant. Both plants are conventional activated sludge treatment systems. They provided effective wastewater treatment in 2014, with an average flow of 4,655 m³/d for the 1974 Plant, and 2,480 m³/d for the 1947 Plant. The combined average flow of 7,136 m³/d represents 69.8% of the design capacity of 10,230 m³/d for both plants. The total combined volume treated in 2014 was 2,603,865 m³.



Figure 1 Aerial view of Ingersoll WWTP

Plant Description

The Ingersoll Old and New Plants are owned and operated by Oxford County and began operation in 1947 and 1974, respectively. The facilities are conventional activated sludge plants consisting of primary and secondary treatment; both plants share the same ultraviolet light disinfection system and a combined single discharge point. The facility adds Aluminum Sulphate into the reactors for total phosphorus reduction. The plant utilizes anaerobic digestion followed by dewatering of the solids to produce stabilized biosolids. The biosolids are then transported to dedicated offsite storage prior to their beneficial reuse on agricultural land.

Plant Specifications

Facility -	Ingersoll Wastewater Treatment Plant
Design Capacity -	10,230 m ³ /d
Average Daily Flow -	7,136 m ³ /d (2014)
Receiving Water -	Thames River
Classification -	WWT – III
	MOE ECA #6582-9QDRDH

ECA Effluent Requirements

Table 1

Parameter	Limits Monthly Average Concentration	Limits Monthly Average Loading	Objectives Monthly Average Concentration
CBOD ₅	25 mg/L	256 kg/d	15 mg/L
TSS	25 mg/L	256 kg/d	15 mg/L
TP	1 mg/L	10.3 kg/d	0.75 mg/L
E.Coli	NA	200 organisms/100 ml	150 organisms/100 ml

pH between 6-9.5

Seasonal Disinfection May 1 - October 31

Effluent Quality Assurance and Control Measures

Sampling Procedure

Influent and effluent samples are collected bi-weekly using a composite sampler over a 24-hour period. Raw sewage samples are collected at the main lift station located on-site; the sample is drawn after the lift station pumps and prior to the primary tanks of either plant.

Effluent is sampled directly from the combined flow after it leaves the UV disinfection system prior to discharge and constitutes the effluent sample for the entire facility.

Laboratory and Field Testing

Laboratory analysis is performed by SGS Lakefield Research Ltd. on all samples that are reported for compliance except for pH, DO, and temperature which are field collected. All in-house testing is done for process control and is not included in this report.

Summary and Interpretation of Monitoring Data

Flows

The total volume of wastewater treated in 2014 was 2,603,865 m³. The daily average flow was 7,136 m³/day which represents 69.8% of the design flow for Ingersoll WWTP of 10,230 m³/day. The daily maximum flow for 2014 was 11,160 m³/day.

Raw Sewage Quality

Table 2 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 7,136 m³/day.

Table 2

Parameter	Concentration mg/L	Loading kg/day
CBOD ₅	113	806
SS	157	1,120
TKN	26.4	188
TP	3	21

Plant Performance & Effluent

Detailed analytical data of annual and monthly averages are summarized later in this report in Exhibit 1.

Table 3 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA limits for the parameter.

Table 3

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	ECA Effluent Limits mg/L
CBOD ₅	4	8	96.5	25
TSS	9	14	94.3	25
TP	0.5	0.8	83	1
E. Coli	2	3	na	200
pH	7.4	7.6	na	6-9.5

pH of both the influent and effluent streams is measured by the operator approximately four times per week. There was no single pH result outside the discharge limits of 6-9.5 for 2014.

The Ingersoll WWTP met all effluent discharge criteria for 2014.

Effluent Objectives

Effluent objectives are non-enforceable effluent quality values which the owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

The effluent met all effluent discharge objectives listed in the Plant's ECA at the Ingersoll WWTP.

Description of Operating Problems, Bypassing, Spills, Abnormal Events, and Complaints Received

There were no bypasses, abnormal events, spills, operating problems or complaints at the Ingersoll WWTP in 2014.

On August 26, 2014, there was an overflow of approximately 0.3 m³ of wastewater from the Carnegie Street sewage pumping station that was due to a power failure. The after hours on-call Operator responded to an alarm and connected a portable generator, however, a small amount overflowed before temporary power was provided to the pumps. This station is scheduled to be re-built with the addition of a permanent generator in 2015.

On October 24, 2014, there was a leak of approximately 20 m³ of wastewater from the forcemain that connects the 401 Eastbound Service Center to the Ingersoll sewer system. The leak was due to a faulty air release valve. A vacuum truck was called in and the affected area was cleaned up immediately and the air release valve was replaced.

Both events were reported to the MOECC at the time they occurred.

Maintenance of Works

The operating and maintenance staff from the Ingersoll WWTP conducts regularly scheduled maintenance of the plant equipment. Detailed maintenance records for each piece of equipment are kept on site at the Ingersoll WWTP. A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

R&R Instrumentation Services provided meter calibration service on both effluent meters in 2014. The calibration records are appended to this report.

Operations monitoring equipment calibration records are appended to this report.

Tabulation of Biosolids Generated, and Disposed

The Ingersoll Wastewater Treatment Plant utilizes anaerobic digesters to stabilize biosolids prior to dewatering through a centrifuge.

The dewatered material was transported to and stored at the Oxford County Biosolids Centralized Storage Facility (BCSF) in Salford, Ontario before being land applied.

Biosolids 2014

Please see Biosolids 2014 Annual report, prepared and submitted separately, for more detailed information.

Summary

The Ingersoll WWTP operated within its hydraulic design criteria in 2014.

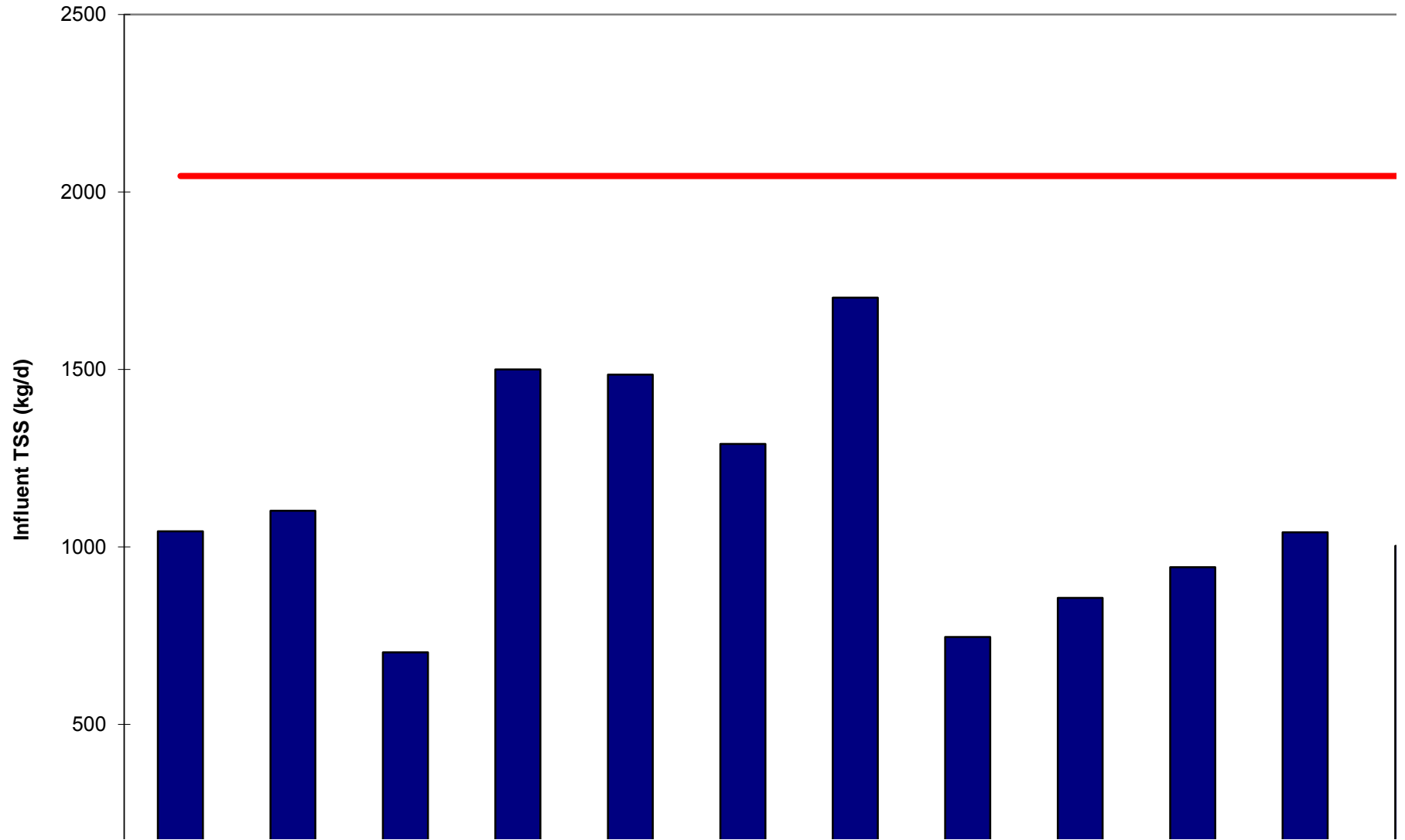
A Class Environmental Assessment was completed in October 2012 recommending upgrades to the Ingersoll WWTP, including the decommissioning of the 1947 Plant, and construction of a new Conventional Activated Sludge (CAS) Plant and upgrading the 1974 Plant. Engineering design of the recommended upgrades commenced in 2013.

Phase 1 of the recommended upgrades includes two different stages; namely, Contract A and Contract B. Contract A commenced in May 2014 and work is currently ongoing. The current Contract A includes construction of a new secondary clarifier for the 1974 Plant, along with a new plant outfall and electrical upgrades.

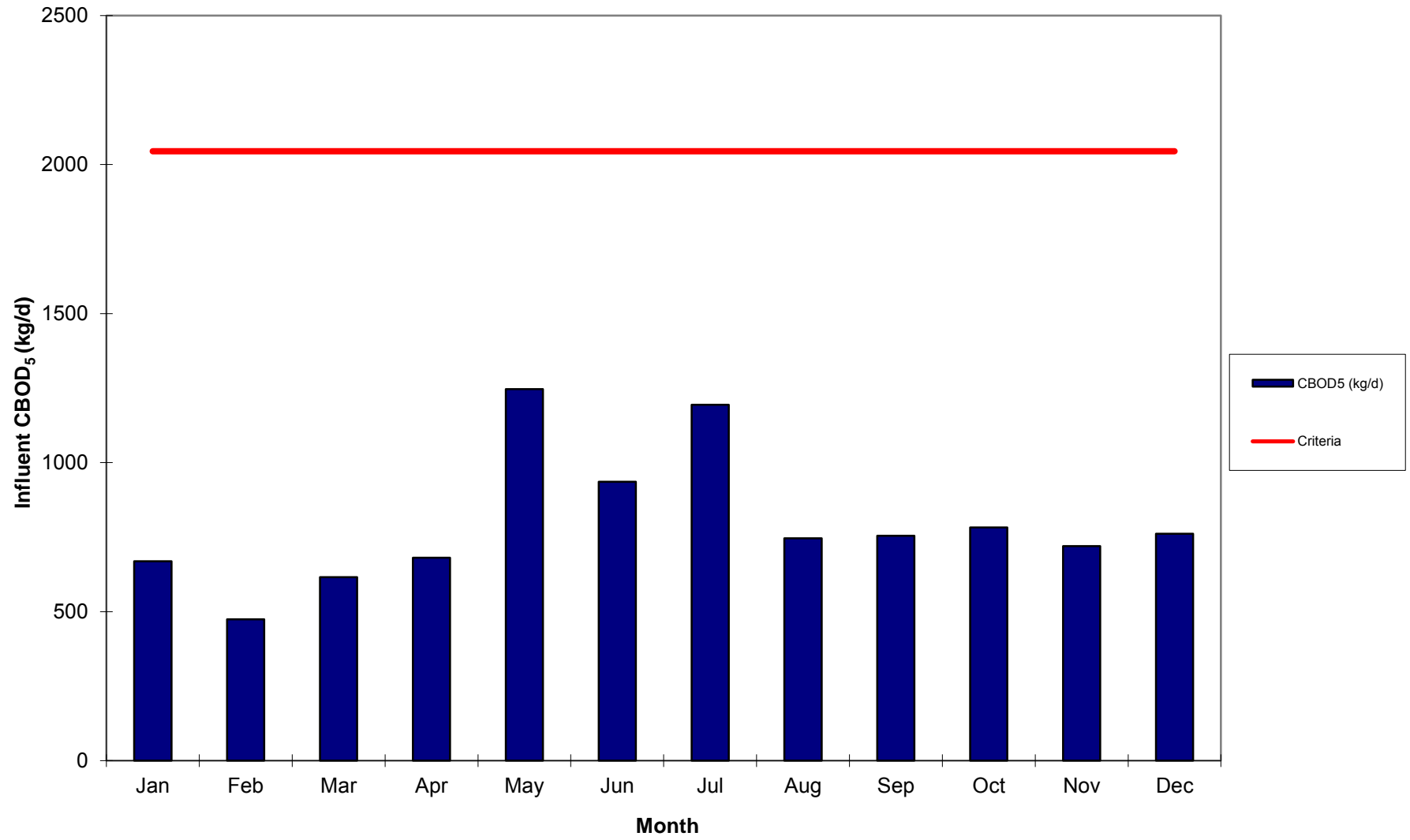
Contract B will likely commence in the summer of 2015 following completion of Contract A and will include demolishing the 1947 Plant, constructing a new CAS Plant in its place, twinning of the UV disinfection process, and constructing a new common WAS thickening facility for both the 1974 Plant and new plant. Upon completion of Phase 1 upgrades, the new plant capacity will be 12,945 m³/d and the new effluent limits will be in place.

Exhibit 1

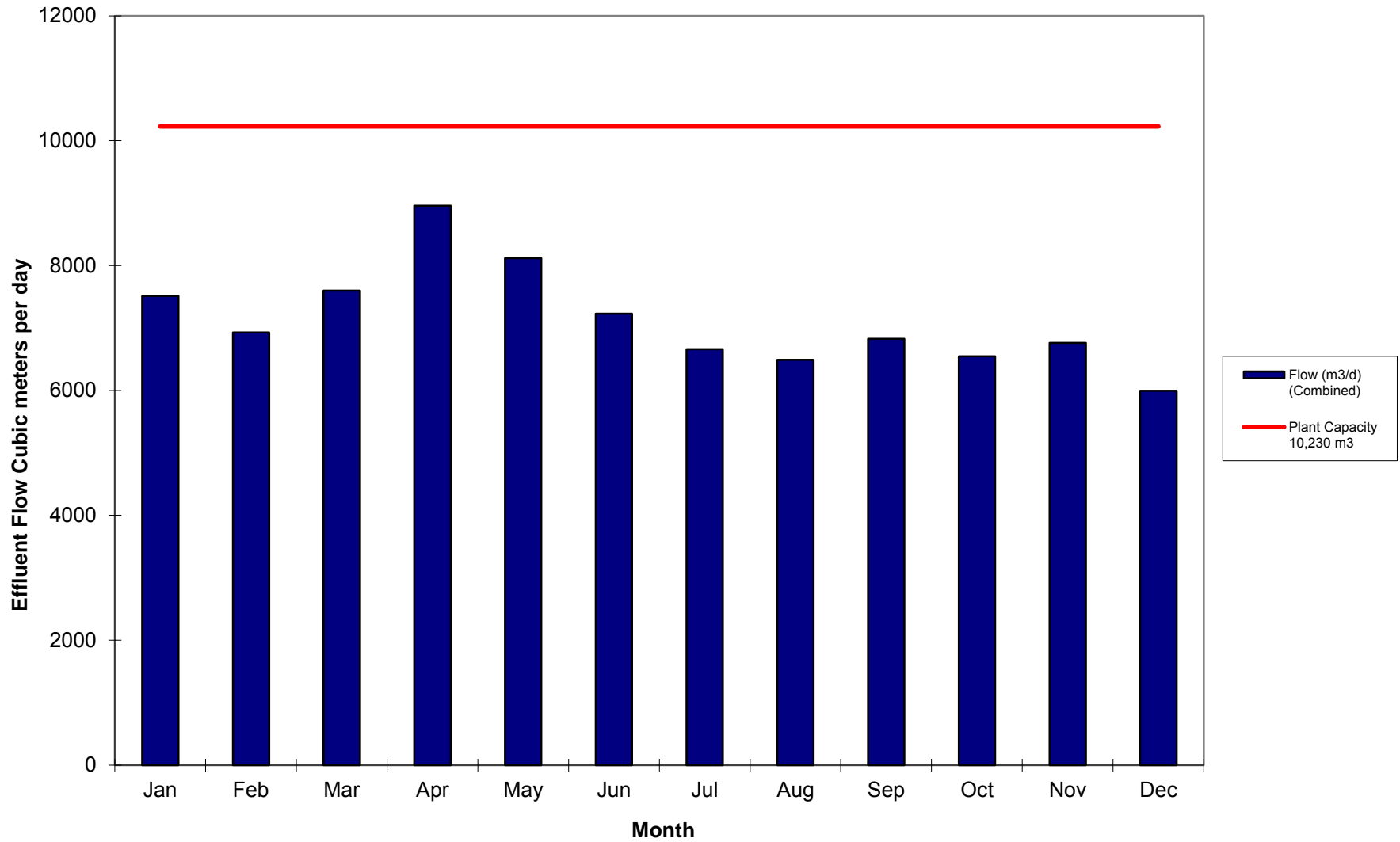
Ingersoll WWTP Influent ,TSS Loading (kg/d), 2014



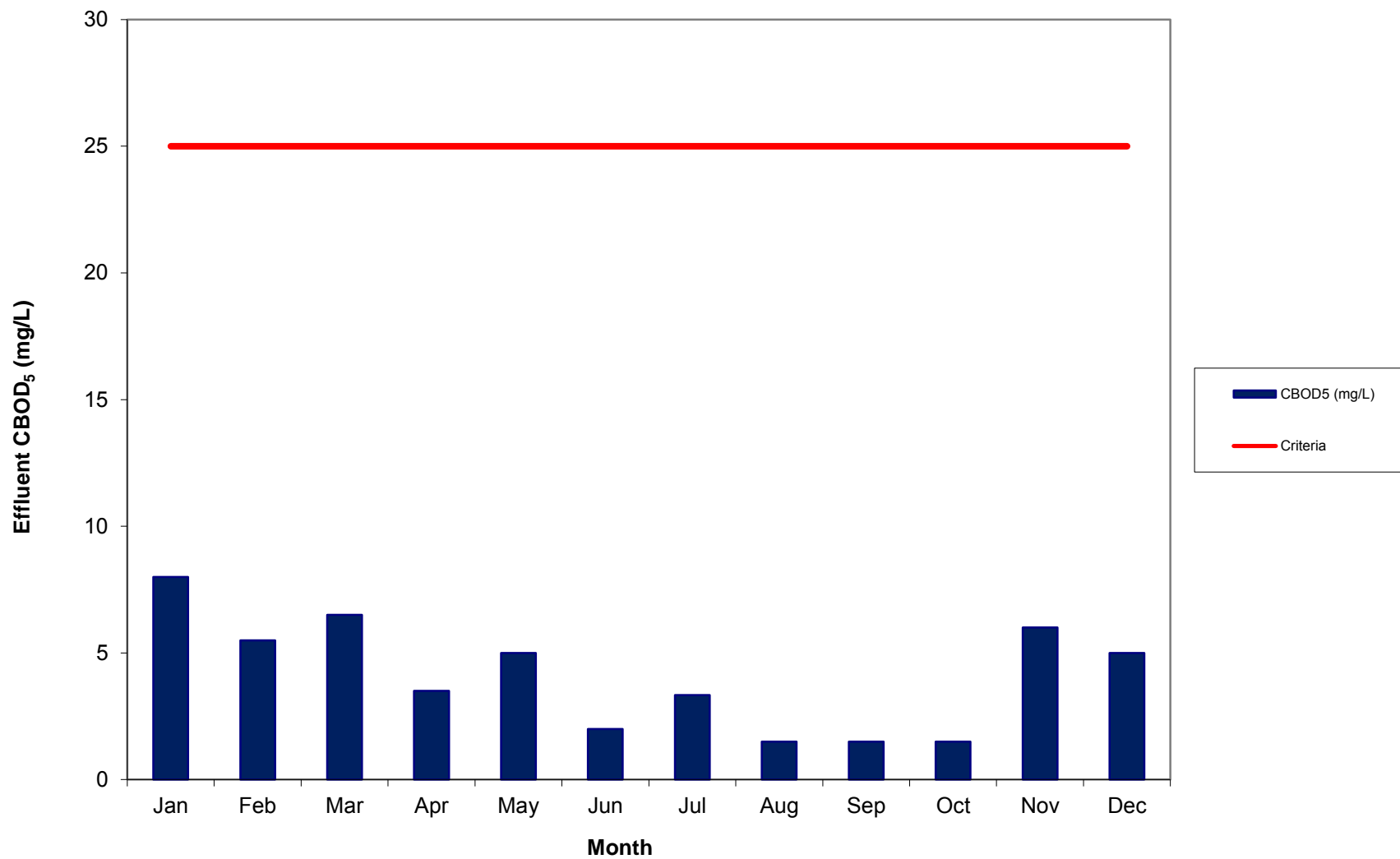
Ingersoll WWTP Influent, CBOD₅ Loading (kg/d), 2014



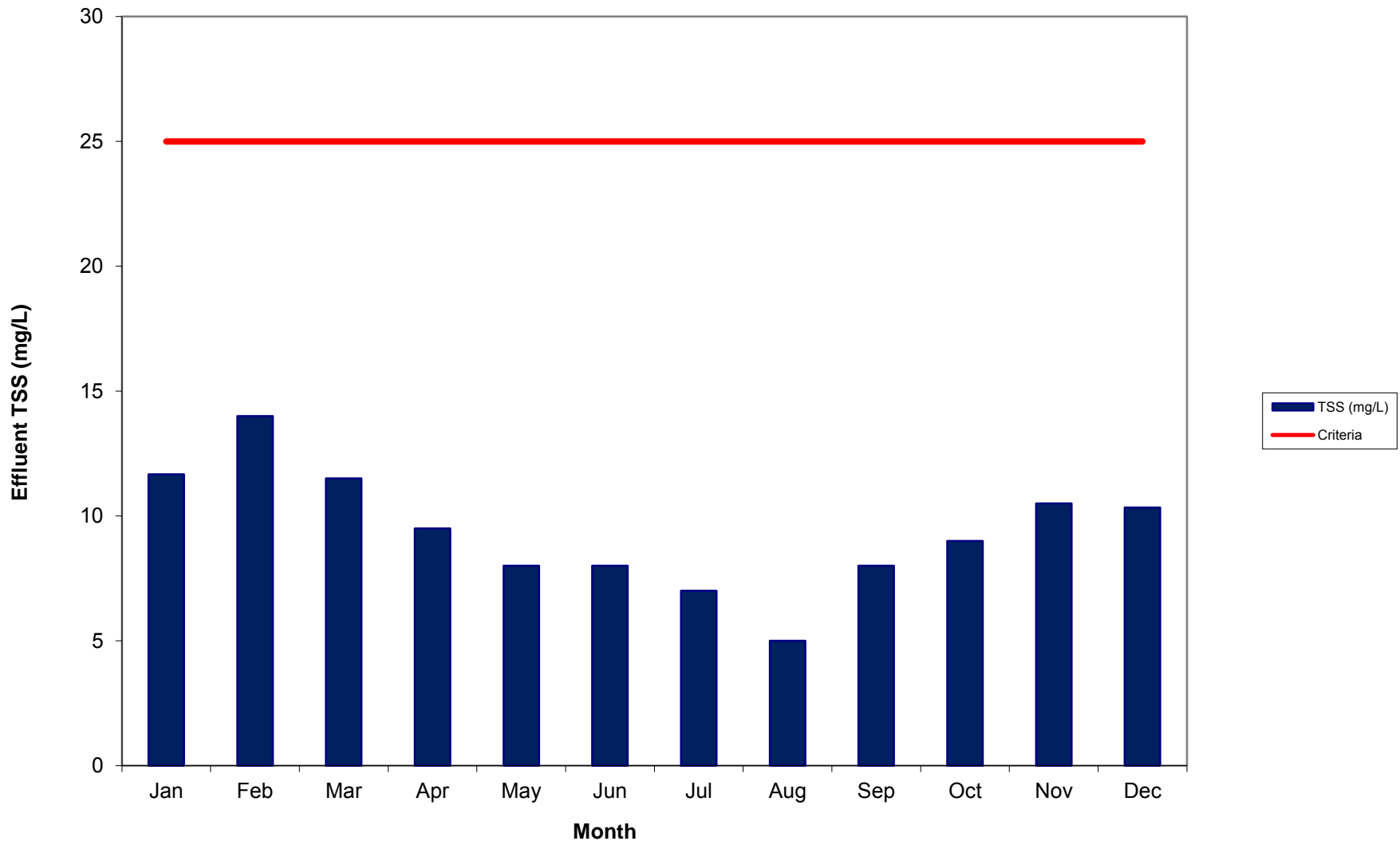
Ingersoll WWTP Effluent Flow Cubic Meters Per Day 2014



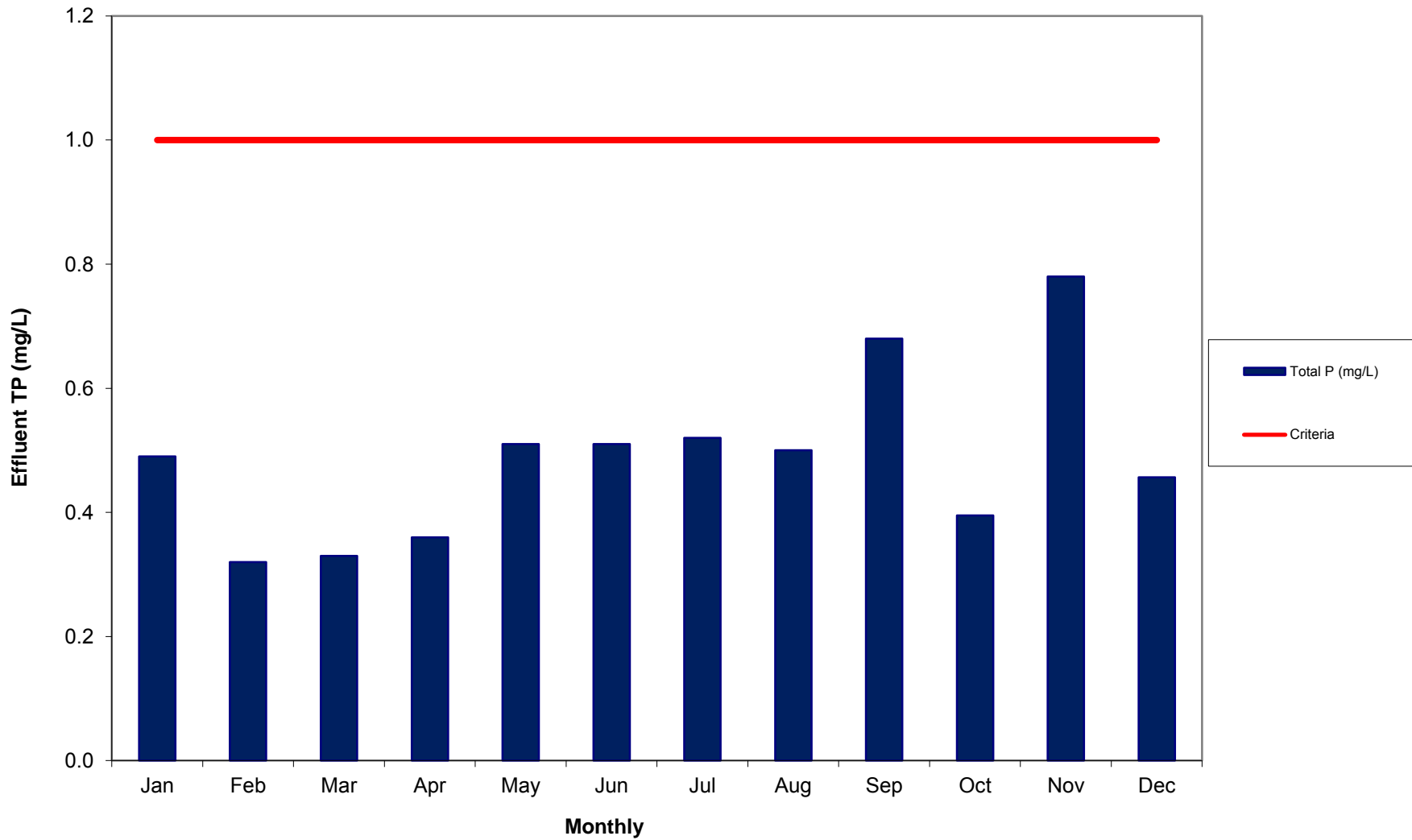
Ingersoll WWTP Effluent, Monthly Average CBOD₅ (mg/L), 2014



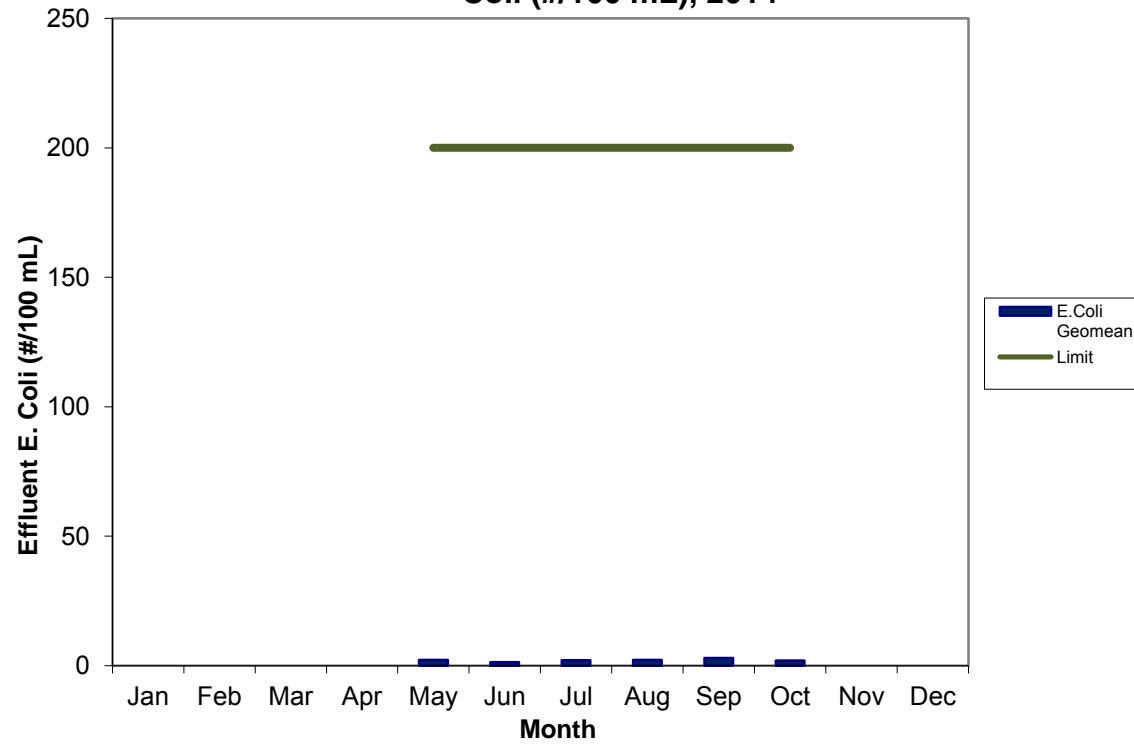
Ingersoll WWTP Effluent , Monthly Average TSS (mg/L), 2014



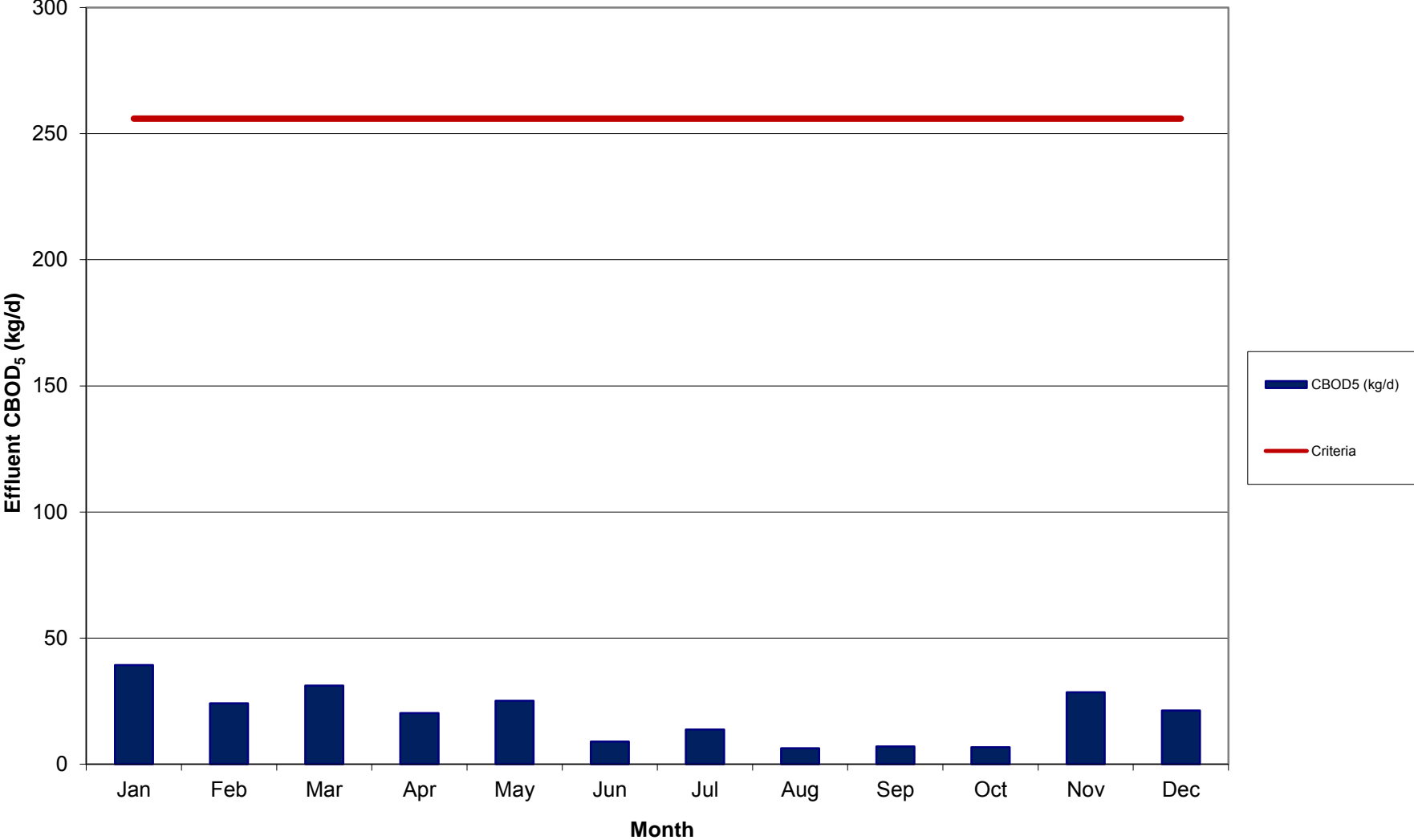
Ingersoll WWTP Effluent , Monthly AverageTP (mg/L) , 2014



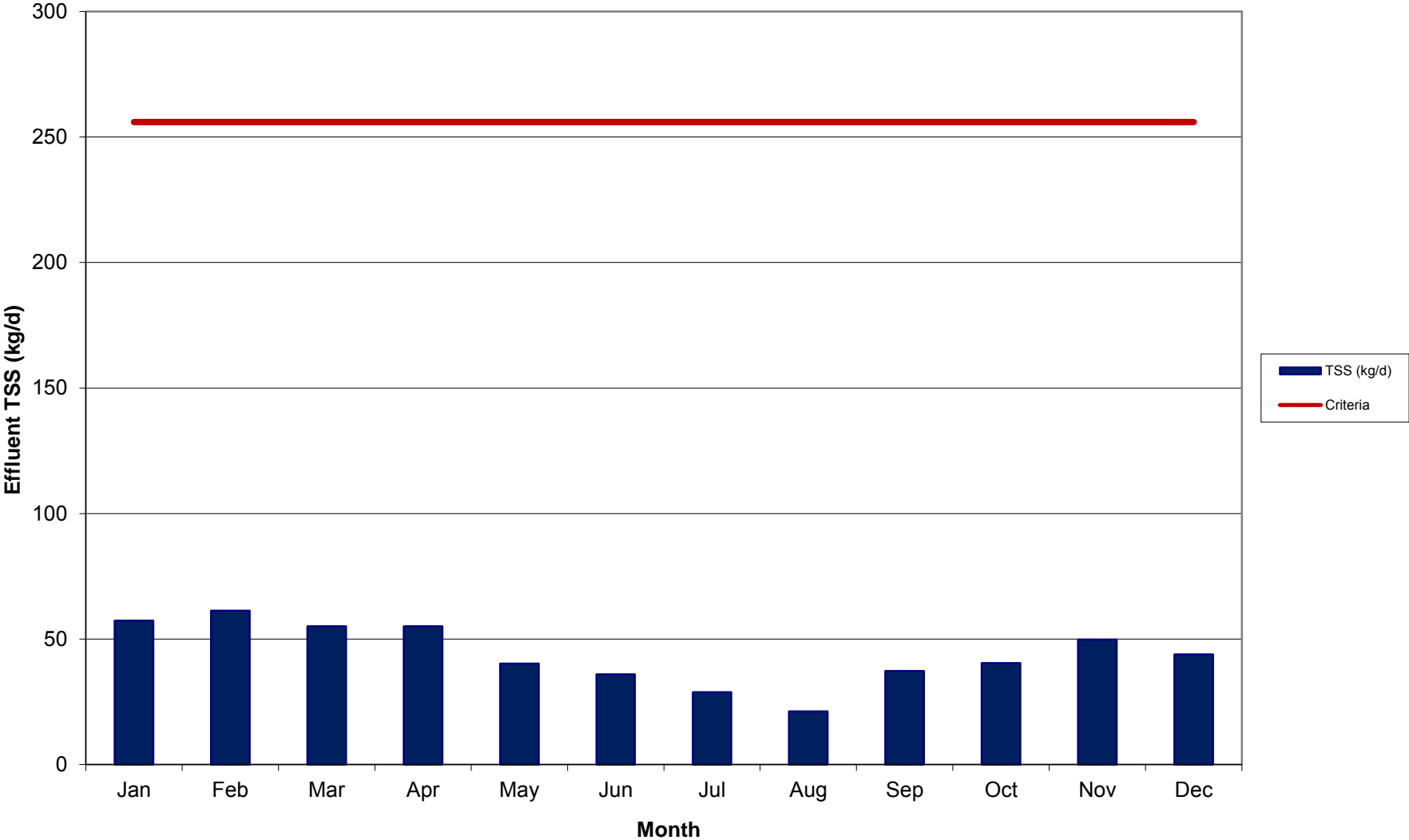
Ingersoll WWTP Effluent , Monthly Geometric Mean Density E. Coli (#/100 mL), 2014



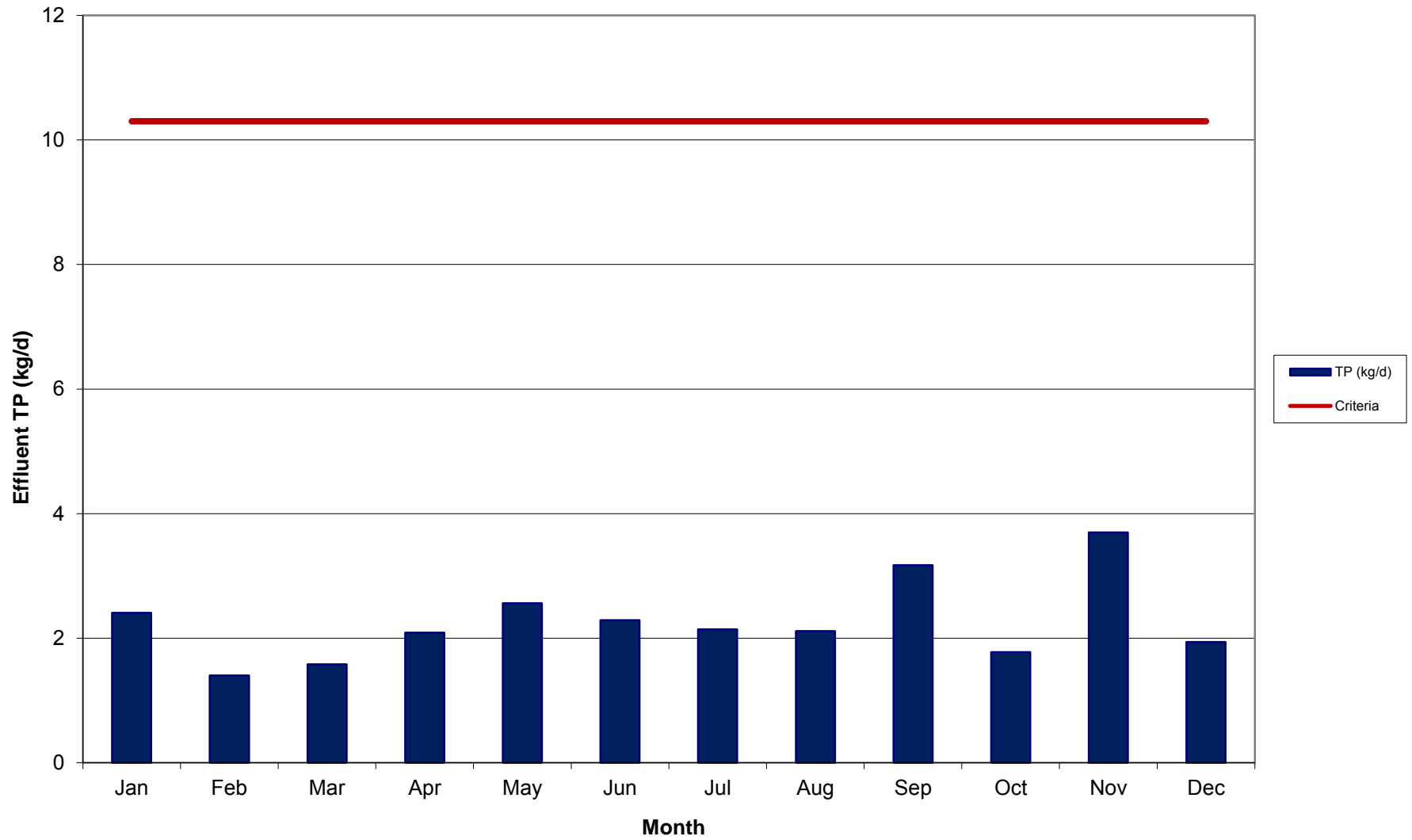
Ingersoll WWTP Effluent, CBOD₅ (kg/d) Loadings to Thames River, 2014



Ingersoll WWTP Effluent, TSS (kg/d) Loading to Thames River, 2014



Ingersoll WWTP Effluent, TP (kg/d) loading to Thames River, 2014



Municipality: Ingersoll
 PROJECT: INGERSOLL WWTP
 Operator: County of Oxford
 Works Number:
 (O) 110003978 (N) 110003969

2014

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Total	Total 1000m3
Total Flow m3	232919	194015	235565	268750	251687	216881	206416	201196	204768	202939	202881	185848				2603865	2603.865
Flow (m ³ /d) (New)	4911	4379	4788	5798	5022	4488	4117	4222	4662	4489	4742	4247	4655	4117.2	5797.7	Design	
Flow (m ³ /d) (Old)	2603	2550	2810	3161	3096	2741	2541	2268	2164	2057	2021	1748	2480	1748.3	3160.7	Criteria	
Flow (m ³ /d) (Combined)	7514	6929	7599	8958	8119	7229	6659	6490	6826	6546	6763	5995	7136	5995.1	8958.3	10230	
Max Daily Flow	11047	9150	9732	11160	9823	9894	8210	7641	8261	7426	9070	7508	9077	7426	11160		
Min Daily Flow	5483	5146	5507	6210	6472	5353	5008	4364	5042	4362	5225	4392	5214	4362	6472		
Common Influent																	
CBOD ₅ (mg/L)	89.0	68.5	81.0	76.0	153.5	129.5	179.3	115.0	110.5	119.5	106.5	127.0	113	68.5	179.33		
TSS (mg/L)	139.0	159.0	92.5	167.5	183.0	178.5	255.7	115.0	125.5	144.0	154.0	167.3	157	92.5	255.67		
Total P (mg/L)	2.3	3.0	4.2	3.8	2.4	2.3	5.8	2.2	2.0	2.2	3.1	2.7	3.0	2.005	5.7567		
NH ₃ +NH ₄ -N (mg/L)	15.3	18.5	11.5	10.9	16.5	15.9	42.8	14.6	22.7	14.9	15.4	27.7	18.9	10.9	42.833		
TKN (mg/L)	24.2	27.2	24.1	23.1	20.4	20.8	45.9	19.6	29.1	20.5	23.4	38.4	26.4	19.55	45.933		
NITRITE (mg/L)	0.41	0.29	0.30	0.48	0.02	0.02	0.34	0.02	0.02	0.02	0.02	0.02	0.16	0.015	0.475		
NITRATE (mg/L)	0.63	0.58	0.44	2.95	0.03	0.03	0.51	0.03	0.03	0.03	0.03	0.03	0.44	0.03	2.945		
pH (mg/L)	7.63	7.59	7.65	7.63	7.51	7.57	7.58	7.41	7.46	7.44	7.47	7.57	7.54	7.405	7.65		
Effluent Combined	Old and New Plant Combined Effluent after UV System Upgrade															Objectives	Limits
CBOD ₅ (mg/L)	8.0	5.5	6.5	3.5	5.0	2.0	3.3	1.5	1.5	1.5	6.0	5.0	4	2	8	15	25
TSS (mg/L)	11.7	14.0	11.5	9.5	8.0	8.0	7.0	5.0	8.0	9.0	10.5	10.3	9	5.00	14.00	15	25
Total P (mg/L)	0.5	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.7	0.4	0.8	0.5	0.5	0.3	0.8	0.75	1
NH ₃ +NH ₄ -N (mg/L)	4.0	0.4	1.9	0.8	1.1	1.2	1.0	0.2	0.8	0.2	5.0	1.9	1.5	0.2	5.0		
TKN (mg/L)	6.2	2.6	4.6	2.5	4.9	3.0	2.5	2.6	1.9	1.8	7.1	3.4	3.572	1.750	7.100		
NITRITE (mg/L)	2.77	0.65	0.68	0.26	0.39	0.28	0.22	0.05	0.24	0.02	0.36	2.08	0.66	0.02	2.77		
NITRATE (mg/L)	16.67	22.60	19.40	16.55	21.15	17.90	20.90	18.70	24.15	17.55	18.20	20.10	19.489	16.550	24.150		
pH	7.46	7.31	7.32	7.47	7.31	7.61	7.52	7.40	7.30	7.39	7.38	7.30	7.4	7.3	7.6		
E.Coli Geomean unionized ammonia (mg/L)	0.053	0.001	0.009	0.005	0.051	0.012	0.009	0.002	0.006	0.001	0.065	0.008	2	1.41	3	NA	200
Influent Loadings																	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Design	
CBOD ₅ (kg/d)	669	475	616	681	1246	936	1194	746	754	782	720	761	806	475	1246	2045	
TSS (kg/d)	1044	1102	703	1501	1486	1290	1702	746	857	943	1041	1003	1118	703	1702	2045	
Effluent Loadings to Thames River																	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Limits	
CBOD ₅ (kg/d)	39	24	31	20	25	9	14	6	7	7	28	21	19	6	39	256	
TSS (kg/d)	57	61	55	55	40	36	29	21	37	40	50	44	44	21	61	256	
TP (kg/d)	2	1	2	2	3	2	2	2	2	3	2	4	2	1	4	10.3	

Calibration Records

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Ingersoll ON
Customer PO
Our Job # B13 8565

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 03
Cal Date June 04/14
Due Date June 04/15
Cal Freq Yearly
Location New Plant Waste
Description Flow Ind. Transmitter
Manufacturer ABB Kent Taylor
Model MF/E1513618010004ER1304111
Serial # V/87122/2/2
Accuracy 1%
Range 0-15.000 L/s
Vel 15.000 L/s 0.84884

MEASURING EQUIPMENT

Manufacturer Fluke ABB
Model 725 Magmaster
Serial # 7903019 P/27260/1/1
Cal Reference Fluke ABB
Traceability NIST
Accuracy 0.02% + 2 cnts 0.25%

INPUT ABB SIM	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000		0.000	0.00	0.00	0.00	0.00
0.100		2.575	2.61	2.61	0.23	0.23
0.200		5.150	5.19	5.19	0.27	0.27
0.500		12.875	12.97	12.97	0.63	0.63
L/s		mA				
0.00		4.000	3.995	3.995	-0.03	-0.03
2.59		6.763	6.782	6.782	0.12	0.12
5.19		9.536	9.523	9.523	-0.08	-0.08
12.94		17.803	17.820	17.820	0.11	0.11
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{AAV}} \times 100$ Span	

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Ingersoll ON
 Customer PO
 Our Job # B13 8565

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 03
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location New Plant Waste Basement
 Description Flow Integrator
 Manufacturer ABB Kent Taylor
 Model M/FE 1513618010004ER1304111
 Serial # V/87122/2/2
 Accuracy 1%
 Range 0 - 0.900 PPM ; 0 - 15.000 L/s

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT L/s	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
5.20		0.312	0.313	0.313	0.11	0.11
12.93		0.776	0.779	0.779	0.33	0.33
15.00		0.900				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	As Left	13
Pass: ✓	Pass: ✓	As Found	10
		Difference	3
Fail:	Fail:		

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Ingersoll ON
 Customer PO
 Our Job # B13 8565

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 03
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location New Plant Waste
 Description Flow Ind. Transmitter
 Manufacturer ABB Kent Taylor
 Model MF/E1513618010004ER1304111
 Serial # V/87122/2/2
 Accuracy 1%
 Range 0-15.00 L/s
 Cal Factor 1.45719
 Cal Fac 2/3/4 20/6/1.35321
 P Max 250 PSI
 T Proc. 60°C
 T Amb. 60°C

MEASURING EQUIPMENT

Manufacturer
 Model
 Serial #
 Cal Reference
 Traceability
 Accuracy

INPUT P1	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Off		0.00	0.00	0.00		
On		0.62	0.62	0.62		

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	TECHNICIAN'S NOTES
Pass:	Pass:	
Fail:	Fail:	

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Ingersoll ON
Customer PO
Our Job # B13 8565

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 04
Cal Date June 04/14
Due Date June 04/15
Cal Freq Yearly
Location New Plant RAS Basement
Description Flow Ind. Transmitter
Manufacturer ABB Kent Taylor
Model Magmaster
Serial # V/84584/3/1
Accuracy 1%
Range 0 - 90.00 L/s
Velocity 90 L/s 2.86489 m/s
Size 200 mm 8"
Fac 1 1.34663
Fac 2,3,4 3/9/1.000

MEASURING EQUIPMENT

Manufacturer Fluke
Model 725
Serial # 7903019
Cal Reference Fluke
Traceability NIST
Accuracy 0.02% + 2 cnts

INPUT ABB SIM	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.00	0.00	0.00	0.00
0.10		4.230	4.26	4.26	0.03	0.03
0.20		8.461	8.50	8.50	0.04	0.04
0.50		21.152	21.21	21.21	0.06	0.06
1.00		42.305	42.49	42.49	0.21	0.21
2.00		84.609	84.77	84.77	0.18	0.18
L/s		mA				
0.00		4.000	3.995	3.995	-0.03	-0.03
4.26		4.757	4.750	4.750	-0.04	-0.04
8.50		5.511	5.509	5.509	-0.01	-0.01
21.21		7.771	7.777	7.777	0.04	0.04
42.49		11.554	11.536	11.536	-0.11	-0.11
84.77		19.070	19.038	19.038	-0.20	-0.20
90.00		20.000				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Ingersoll ON
 Customer PO
 Our Job # B13 8565

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 04
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location New Plant RAS Basement
 Description Flow Ind. Transmitter
 Manufacturer ABB Kent Taylor
 Model MF/E1513618010004ER1304111
 Serial # V/84584/3/1
 Accuracy 1%
 Range 0 - 90.00 L/s
 Cal Factor 1.34664
 Cal Fac 2/3/4 3/9/1.0000
 P Max 250 PSI
 T Proc. 60°C
 T Amb. 60°C

MEASURING EQUIPMENT

Manufacturer
 Model
 Serial #
 Cal Reference
 Traceability
 Accuracy

INPUT P1	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Off		0.00	0.00	0.00		
On		47.12	47.12	47.12		

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	TECHNICIAN'S NOTES
Pass:	Pass:	
Fail:	Fail:	

CERTIFIED BY:  CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIT 06
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location Old Plant Waste
 Description Mag Flow Ind. Transmitter
 Manufacturer ABB Kent Taylor
 Model MF/E1513618010004ER1304111
 Serial # V/87122/2/1 P/55544/2/7
 Accuracy 1%
 Range 0-50.00 L/s
 Velocity 50 L/s 2.82949
 Sensor Factor 1.4561
 Snsr Fact. 2/3/4 12/6/1.37931
 Vel 15.000 L/s 2.82949 ms

MEASURING EQUIPMENT

Manufacturer ABB
 Model Magmaster SIM
 Serial #
 Cal Reference
 Traceability
 Accuracy 0.25%

INPUT SIM	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.00	0.00	0.00	0.00
0.10		2.573	2.59	2.59	0.03	0.03
0.20		5.146	5.16	5.16	0.03	0.03
0.50		12.865	12.92	12.92	0.11	0.11
1.00		25.731	25.75	25.75	0.04	0.04
Max Vel						
2.82949		50.000				
L/s		mA				
0.00		4.000	Not used			
25.00		12.000				
50.00		20.000				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FQ 06
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location Old Plant Waste
 Description Mag Flow Integrator
 Manufacturer ABB Kent Taylor
 Model MF/E151361801004ER1304111
 Serial # V/87122/2/1
 Accuracy 1%
 Range 0 - 3.00 PPM ; 0 - 50.00 L/s
 Velocity 50 L/s 2.82949

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT L/s	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
2.19		0.131	0.131	0.131	0.00	0.00
12.92		0.775	0.772	0.772	-0.10	-0.10
25.77		1.546	1.548	1.548	0.07	0.07
50.00		0.300				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$

Test Unit Results

AS FOUND	AS LEFT	As Left	44
Pass: ✓	Pass: ✓	As Found	41
		Difference	3
Fail:	Fail:		

TECHNICIAN'S NOTES

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UNIT UNDER TEST (UUT)

Tag # FE 06
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location Old Plant Waste
 Description Mag Flow Ind. Transmitter
 Manufacturer ABB Kent Taylor
 Model MF/E1513618010004ER1304111
 Serial # V/87122/2/1 P/55544/2/7
 Accuracy 1%
 Range 0-50.00 L/s
 Cal Factor 1.5612
 Cal Fac 2/3/4 12/6/1.37934
 P Max 250 PSI
 T Proc. 60°C
 T Amb. 60°C

MEASURING EQUIPMENT

Manufacturer
 Model
 Serial #
 Cal Reference
 Traceability
 Accuracy

INPUT P1	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
On		0.00	0.00	0.00		

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	TECHNICIAN'S NOTES
Pass:	Pass:	
Fail:	Fail:	

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UNIT UNDER TEST (UUT)

Tag # FIT 01
 Cal Date June 03/14
 Due Date June 03/15
 Cal Freq Yearly
 Location Effluent Flow Old Plant
 Description Flow Transmitter
 Manufacturer Milltronics
 Model Multiranger+
 Serial #
 Accuracy 1%
 Range 0 - 6818 m³/D
 Head Span 28.61 cm
 Datum Top of angle 70.2 cm
 9" Parshall Flume pg 355 ISCO
 Exponent 1.530
 Formula m³/D 43248 H^{1.530}
 Empty Distance 59.61 60.15 cm

MEASURING EQUIPMENT

Manufacturer Fluke Gauge Board
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT cm	METERS	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0000	0.0	0	0	0.00	0.00
15.02	0.1502	2543.3	2540	2540	-0.05	-0.05
17.60	0.1760	3241.4	3250	3250	0.13	0.13
22.30	0.2230	4655.9	4655	4655	-0.01	-0.01
23.73	0.2373	5120.3	5128	5128	0.11	0.11
28.610	0.2861	6816.6				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

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UNIT UNDER TEST (UUT)

Tag # FIR 01
 Cal Date June 03/14
 Due Date June 03/15
 Cal Freq Yearly
 Location Control Room Old Plant Flow
 Description Flow Ind. Recorder
 Manufacturer Fischer & Porter
 Model 1390-12-010-00-000
 Serial # 9009B2041/1/B2
 Accuracy 1%
 Range 0 - 6818 m³/D

MEASURING EQUIPMENT

Manufacturer Fluke
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT mA	%	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.0	3	3	0.04	0.04
8.000		1704.5	1705	1705	0.01	0.01
12.000		3409.0	3409	3409	0.00	0.00
16.000		5113.5	5110	5110	-0.05	-0.05
20.000		6818.0	6811	6811	-0.10	-0.10

Chart %

4.000	0.0	0.0	0.0	0.0	0.00	0.00
8.000	25.0	25.0	25.0	25.0	0.00	0.00
12.000	50.0	50.0	50.0	50.0	0.00	0.00
16.000	75.0	74.0	74.0	74.0	-1.00	-1.00
20.000	100.0	99.0	99.0	99.0	-1.00	-1.00

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

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UNIT UNDER TEST (UUT)

Tag # FQ 01
Cal Date June 03/14
Due Date June 03/15
Cal Freq Yearly
Location Control Room
Description Flow Integrator
Manufacturer Milltronics
Model Multiranger+
Serial #
Accuracy 1%
Range 0 - 4.735 PPM; 0 - 6818 m³/D

MEASURING EQUIPMENT

Manufacturer NexXTech
Model 09A10
Serial # 6315002
Cal Reference
Traceability NIST
Accuracy .0001

INPUT m ³ /D	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0		0.000	0.000	0.000	0.00	0.00
4650		3.229	3.228	3.228	-0.02	-0.02
3250		2.257	2.276	2.276	0.40	0.40
5132		3.564	3.530	3.530	-0.72	-0.72
6818		4.735				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND

Pass: ✓

Fail:

AS LEFT

Pass: ✓

Fail:

TECHNICIAN'S NOTES

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UNIT UNDER TEST (UUT)

Tag # FE 01
Cal Date June 03/14
Due Date June 03/15
Cal Freq
Location Effluent Flow Old Plant
Description Flow Element
Manufacturer
Model
Serial #
Accuracy
Range 0 - 6818 m³/D
0 - 28.61 cm
Empty Distance 60.15 cm

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	no	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check for turbulence.
8		Description of measuring element: 9" Parshall Flume
		Comments:

CERTIFIED BY:  CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

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UNIT UNDER TEST (UUT)

Tag # FIT 02
 Cal Date June 03/14
 Due Date June 03/15
 Cal Freq Yearly
 Location Eff. Flow New Plant
 Description Flow Ind. Transmitter
 Manufacturer Milltronics
 Model Multiranger+
 Serial #
 Accuracy 1%
 Range 0 - 1387.0 m³/D x 10 or
 0 - 3,051,033.8 IGPM
 Temp Comp TS2

MEASURING EQUIPMENT

Manufacturer Fluke Gauge Board
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

 Empty Dist 67.46
 Head Span 38.33 cm
 Datum top of angle 76.18 cm
 12" Parshall Flume pg 357 ISCO

 Display x 10
 Exponent 1.522

INPUT cm	METERS	OUTPUT*AAV m ³ /D x 10	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0000	0.0	0.0	0.0	0.00	0.00
27.38	0.2738	831.1	831.0	831.0	-0.01	-0.01
31.82	0.3182	1044.7	1049.0	1049.0	0.31	0.31
34.43	0.3443	1177.9	1178.0	1178.0	0.01	0.01
36.55	0.3655	1290.0	1298.0	1298.0	0.58	0.58
38.33	0.3833	1386.9				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIR 02
 Cal Date June 03/14
 Due Date June 03/15
 Cal Freq Yearly
 Location Control Room
 Description Flow Ind. Recorder
 Manufacturer Fischer & Porter
 Model 1390-12-010-00-000
 Serial # 9009B2041/1/B1
 Accuracy 1%
 Range 0 - 13870 m³/D

MEASURING EQUIPMENT

Manufacturer Fluke
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT mA	%	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0	-6	-4	-0.04	-0.03
8.000		3468	3461	3463	-0.05	-0.04
12.000		6935	6932	6935	-0.02	0.00
16.000		10403	10398	10401	-0.04	-0.01
20.000		13870	13866	13866	-0.03	-0.03

Chart %

4.000	0.0	0.0	0.0	0.00	0.00
8.000	25.0	25.0	25.0	0.00	0.00
12.000	50.0	50.0	50.0	0.00	0.00
16.000	75.0	75.0	75.0	0.00	0.00
20.000	100.0	100.0	100.0	0.00	0.00

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

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UNIT UNDER TEST (UUT)

Tag # FQ 02
 Cal Date June 03/14
 Due Date June 03/15
 Cal Freq Yearly
 Location Control Room
 Description Flow Integrator
 Manufacturer Milltronics
 Model Multiranger+
 Serial #
 Accuracy 1%
 Range 0 - 9.632 PPM; 0 - 13870 m³/D

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT m ³ /D	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
6860		4.764	4.765	4.765	0.01	0.01
10490		7.285	7.241	7.241	-0.46	-0.46
11780		8.181	8.191	8.191	0.10	0.10
12990		9.021	9.020	9.020	-0.01	-0.01
13870		9.632				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

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UNIT UNDER TEST (UUT)

Tag # FE 02
Cal Date June 03/14
Due Date June 03/15
Cal Freq Yearly
Location Effluent Flow New Plant
Description Flow Element
Manufacturer
Model
Serial #
Accuracy
Range 0 - 13870 m³/D
0 - 38.33 cm
Empty Distance 67.46 cm

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Due Date
Cal Reference
Traceability
Accuracy
Range

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	no	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check for turbulence.
8		Description of measuring element: 12" Parshall Flume
		Comments:

CERTIFIED BY:  CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FE 05
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq
 Location RAS Old Plant
 Description Flow Element
 Manufacturer ABB Kent Taylor
 Model MF/E1513618010004ER1304111
 Serial # V/87122/2/3
 Accuracy 1%
 Range 0 - 50.00 L/s
 Cal Factor 1.4345
 Cal Fac. 2,3,4 10/6/1.40524
 P Max 250 PSI
 T Proc. 60°C
 T Amb. 60°C

MEASURING EQUIPMENT

Manufacturer
 Model
 Serial #
 Cal Reference
 Traceability
 Accuracy

INPUT Pump	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
off		0.00	0.00	0.00		
on		58.01	58.01	58.01		

*Actual Applied Value

$$\% \text{ Error} = \frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$$

Test Unit Results

AS FOUND	AS LEFT
Pass:	Pass:
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY: _____ CET, CCST Level III Technician

Plant Maintenance Records

ID	Descriptic	Projected St	Shop	Instructions
6347	Repair	01/01/2014	250300	Repair old plant water heater switch may be faulty
6349	Replace	01/01/2014	250300	Replace packing in old pump sludge pumps #1,2.
6390	Replace	03/01/2014	250300	Replace old plant alum delivery line as it was frozen .
6391	Replace	02/01/2014	250300	Replace and install new Health and S afety board in main office.
6407	Inspect	10/01/2014	250300	Work with TSSA inspectior with boiler on gas train
6425	Replace	17/01/2014	250300	Replace lowlift off float on centrate pump at the old plant
6426	Repair	22/01/2014	250300	Re work hoffman blower and install bearing
6436	Replace	24/01/2014	250300	Replace lower bearing on auger in the centrifuge building
6475	Inspect	07/02/2014	250300	Troubleshoot raw sludge pumps at old plant kicking out
6476	Repair	07/02/2014	250300	repair broken hinge on entrance gate
6520	Replace	21/02/2014	250300	Fabricate brackets install wheels on table saw
6521	Replace	21/02/2014	250300	Install and fab frame work for Health and Safety board
6540	Inspect	03/03/2014	250300	Inspect roto cut and report to Scott Cuthbert
6541	Inspect	03/03/2014	250300	Inspect digester recirc pump to see if its plugged
6542	Repair	03/03/2014	250300	Repair west final cross collector gear reducer drive .Advise Scott Cuthbert of repair
6543	Repair	03/03/2014	250300	Repair replace impeller seal and bearings as required inpect overall condition of pump
6544	Lubricate	03/03/2014	250300	Inspect and lubricate digester mixing pumps for primary digester
6561	Repair	03/03/2014	250300	New plant cross collector chain broken pump down tank and inspect cross collector
6562	Repair	03/03/2014	250300	Replace belt on HVAC unit for Centrifuge Building
6563	Repair	03/03/2014	250300	Work on boiler with Hobbs Boiler Service
6574	Inspect	14/03/2014	250300	Gather all rigging and equipment for annual safety inspections for Tradesafe Ltd.
6579	Lubricate	25/03/2014	250300	Grease blowers 1,2,3. as required 500 hrs
6580	Replace	25/03/2014	250300	Replace suction elbow on effluent pump at New plant
6606	Repair	24/03/2014	250300	Old plant sludge pump has belts burnt off . Check if pump isnt plugged with debris.
6607	Repair	24/03/2014	250300	Repair and inspect Old Plant check valve / not seating properly .
6650	Replace	04/04/2014	250300	Replace lift station low level float on float operation controls
6651	Inspect	04/04/2014	250300	Old plant low lifts floats not working for centrate operation check float for debris or replace if defective.
6652	Repair	04/04/2014	250300	Repair truck loading pipe replace broken flange
6653	Replace	04/04/2014	250300	Lifting davit inspection revielled worn cable and load hook to be replaced as per Trade Safe inspection
6676	Repair	11/04/2014	250300	Get U.V. ready for disinfecation season and install banks as required
6677	Repair	11/04/2014	250300	Repair Op low lift station floats not working
6704	Lubricate	24/04/2014	250300	Preform 1000 hr inspection grease and lubrication requirements on centrifuge
6705	Repair	23/04/2014	250300	Repair primary wast longitudinal gear reducer drive
6727	Repair	01/05/2014	250300	N.P. Primary tank inspect cross collector not working Pump down tank and repair then put back in service.
6790	Replace	23/05/2014	250300	Replace drive chain on cross collector drive and repair idler arm . Test run
6830	Lubricate	02/06/2014	250300	U.V. service grease and add acti gel to self cleaning wipers on U.V.
6831	Replace	02/06/2014	250300	Install new 500 1b hoist in wetwell for rag removal

6850	Replace	13/06/2014	250300 install guards on new plant seepex sludge pump and install guards on poly pumps in dewatering building
6912	Repair	01/07/2014	250300 Replace centrifuge bld air make up unit belt
6913	Inspect	26/06/2014	250300 Get info for chemicl pumps for temporary chlor/dechlorination as per ministry approval.
6921	Replace	04/07/2014	250300 Repair toilets at both plants
6922	Inspect	04/07/2014	250300 Clean out boiler room so floor can be painted
6959	Replace	11/07/2014	250300 Replace cieling tile in bathroom investagate why water damage leaked at roof check on roof and advise foreman
6977	Lubricate	18/07/2014	250300 Grease and clean UV disenfection system
6978	Repair	18/07/2014	250300 Repair door with contractors ALPHA DOOR on north side of sludge dewatering building .Lock plant up and arm security system when done .
7054	Replace	11/08/2014	250300 Machine sprockets for New Plant clarifer and install
7079	Inspect	01/09/2014	250300 Add water to secondary by pass overflow to actr as a buffer / gases immettting from vent pipe
7080	Repair	01/09/2014	250300 Repair and assemble parts washer
7119	Inspect	05/09/2014	250300 Inspect # 3 blower belt adjust tension as required by manufacturers specs
7195	Repair	03/10/2014	250300 Repair Do sensor and re-install into new plant aeration tank
7225	Replace	20/10/2014	250300 Replace hot water heater in old plant.
7239	Replace	20/10/2014	250300 Replace 3 inch check valve methane line from secondary digester
7260	Repair	30/10/2014	250300 Replace bearing in Hoffman blower at old old plant
7261	Repair	30/10/2014	250300 Install guarding on bolier recirculation pump . Check emergency lighting in digester basement. Lower fire extinguisher in pump house
7279	Lubricate	31/10/2014	250300 Grease blowers and repair blower guard #1
7280	Repair	31/10/2014	250300 Tighten packing glands on old plant raw sludge pumps #1 # 2
7281	Inspect	31/10/2014	250300 Unplug centrifuge sludge feed pump #2
7282	Repair	31/10/2014	250300 Unplug moyno scum pump check valve not closing check operation of check valve
7283	Replace	31/10/2014	250300 Remove and clean all U.V. banks and store U.V. componets for winter
7317	Replace	14/11/2014	250300 Instal valve to drain effluent water lines so freezing does not occur
7318	Repair	14/11/2014	250300 Remove debris in swing check valve and instal drain valve
7319	Replace	14/11/2014	250300 replace splitter valve at washing machine
7320	Replace	14/11/2014	250300 Replace DO ball sensor in aeration tank at New Plant
7321	Replace	14/11/2014	250300 Fabricate and install latch for alum hut and alum tank
7322	Repair	14/11/2014	250300 Replace cable on door @ small quonset building
7362	Repair	30/11/2014	250300 Unplug moyno pump scum pump check vgalve at New Plant
7364	Replace	01/12/2014	250300 Replace lift station pump # 2 isolation knife gate valve (suction side)
7544	Replace	02/01/2015	250300 Replace oil in bearing housing on hoffman blower at Old plant
7578	Repair	16/01/2015	250300 Check pumps backflush sludge lines if pumps dont pump staff to pump down tanks clean hoppers with vaccuum truck
7579	Operate	16/01/2015	250300 Operate New Plant suction valves on final clarifers. Old dewatering lines need to be used when the contractor are working on return hopper during contract A expansion
7580	Repair	16/01/2015	250300 Repair door handle on entrance door to sludge dewatering building



Public Works

P. O. Box 1614, 21 Reeve St., Woodstock, Ontario N4S 7Y3

Phone: 519-539-9800 Fax: 519-421-4711

Website: www.oxfordcounty.ca

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 Year-End Report, Tillsonburg Wastewater Treatment Plant (WWTP)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) #9997-82RS5A.

I trust this report fulfills the intent of the annual reporting requirements of the ECA.

If there are any questions, please contact me.

Yours truly,

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

The Tillsonburg WWTP (Figure 1) is a conventional activated sludge system that provided effective wastewater treatment in 2014. The 2014 average flow for the plant of 5,754 m³/day represents 70% of the design capacity of 8,180 m³/day. The total flow for 2014 was 2,099,743 m³.

Plant Description

The facility is a conventional activated sludge plant consisting of primary and secondary treatment, with an outfall pipe to the Big Otter Creek. The facility adds aluminum sulphate into the reactors for phosphate reduction and ultraviolet light for seasonal disinfection.

Oxford County owns and operates the facility.



Figure 1 Tillsonburg WWTP Aerial Photo

Plant Specifications

Facility -	Tillsonburg Wastewater Treatment Plant
Design Capacity -	8,180 m ³ /day
Average Daily Flow -	5,754 m ³ /day (2014)
Receiving Water -	Big Otter Creek
Classification -	WWT – III
ECA	# 9997-82RS5A

ECA Effluent Requirements

Table 1

Parameter	Limits Monthly Average Concentration	Limits Monthly Average Loading	Objectives Monthly Average Concentration
CBOD ₅	25 mg/L	203 kg/d	15 mg/L
TSS	25 mg/L	203 kg/d	15 mg/L
TP	1 mg/L	8.1 kg/d	0.75 mg/L
E.Coli*	200 organisms/100 ml*	NA	150 organisms/100 ml*
pH	6.0-9.5		6.5-8.0

*Seasonally from May 1 to Nov. 30

Effluent Quality Assurance and Control Measures

Sampling Procedure

Raw sewage samples are collected where the influent streams combine before entering the sewage works. A composite sampler collects samples over a 24-hour duration on a bi-weekly basis.

The final effluent 24-hour composite sample is collected on a weekly basis after secondary treatment and disinfection, and prior to the effluent discharge to Big Otter Creek.

Laboratory and Field Testing

Laboratory analysis is performed by SGS Lakefield Research Ltd. on all samples that are reported for compliance except for pH, DO, and temperature which are field collected. All in-house testing is done for process control and is not included in this report.

Summary and Interpretation of Monitoring Data

Flows

The total flow treated in 2014 was 2,099,743 m³. The daily average flow was 5,754 m³/day which represents 70% of the design flow for Tillsonburg WWTP of 8,180 m³/day. The daily maximum flow for 2014 was 11,170 m³/day.

Raw Sewage Quality

Table 2 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 5,754 m³/day.

Table 2

Parameter	Concentration mg/L	Loading kg/day
CBOD ₅	165	950
TSS	219	1260
TKN	27	155
TP	4.3	25

Plant Performance & Effluent

Detailed analytical data of annual and monthly averages are summarized later in this report in Exhibit 1.

Table 3 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA limits for the parameter.

Table 3

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	*ECA Effluent Limits mg/L
CBOD ₅	1.5	4	99	25
TSS	6.5	8.5	97	25
TP	0.4	0.5	90.7	1
E. Coli	10	38	na	200
pH	7.6	8.0	na	6-9.5

All effluent pH is measured by the operator at a minimum on a weekly basis. There was no single sample outside the range of 6-9.5 for 2014.

The effluent from the Tillsonburg WWTP met all discharge criteria for 2014.

Effluent Objectives

Effluent objectives are non-enforceable effluent quality values which the owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

All effluent discharge objectives listed in the Tillsonburg WWTP's ECA were met in 2014 with the exception of meeting the objective pH range of 6.5 – 8.0 with several results over the high value of 8.0, namely; on Feb 18 (8.36), Mar 4 (8.18), Mar 11 (8.22), Mar 24 (8.02),

Apr 7 (8.04), Apr 13 (8.01), Apr 19 (8.2), Jul 29 (8.05), Jul 30 (8.02), Jul 31 (8.1), and Nov 12 (8.36).

Description of Operating Problems, Bypassing, Spills, Abnormal Events, and Complaints Received

There were no upset conditions at the Tillsonburg Wastewater Treatment Plant. There were no complaints received regarding the Tillsonburg WWTP.

There was an overflow of an estimated 7800 liters to Otter Creek from the John Pound Road Lift station on September 5th, 2014 at 22:40 due to excessive rain (70 mm/1.5 hours). The excessive inflow of rain entered the sanitary system and the lift station pumps could not keep up.

This event was sampled and reported to the MOECC at the time of the occurrence.

Maintenance of Works

The operating and maintenance staff from the Ingersoll and Tillsonburg WWTP conducts regularly scheduled maintenance of the plant equipment. Detailed maintenance records for each piece of equipment are kept on site. A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

Calibrations are completed by R&R Instrumentation on an annual basis for all flow measurement devices.

Operations monitoring equipment calibration records are appended to this report.

Tabulation of Biosolids Generated, and Disposed

Biosolids are aerobically digested and dewatered, then transported to and stored at the Oxford County's Biosolids Centralized Storage Facility (BCSF) after which they are land applied.

Biosolids

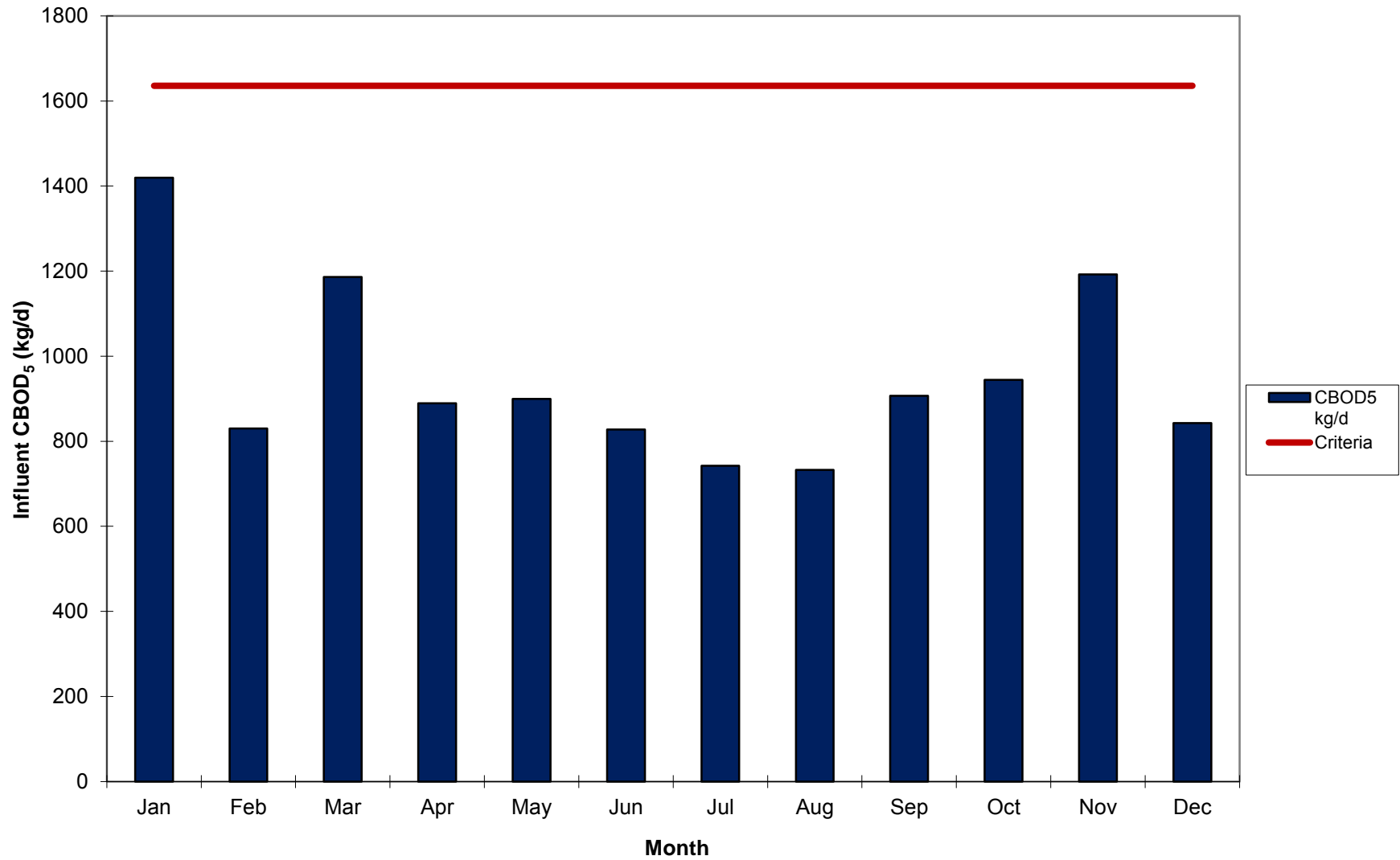
Details of the Biosolids and the land application program are contained in a separate Biosolids Annual Report.

Additional Activities

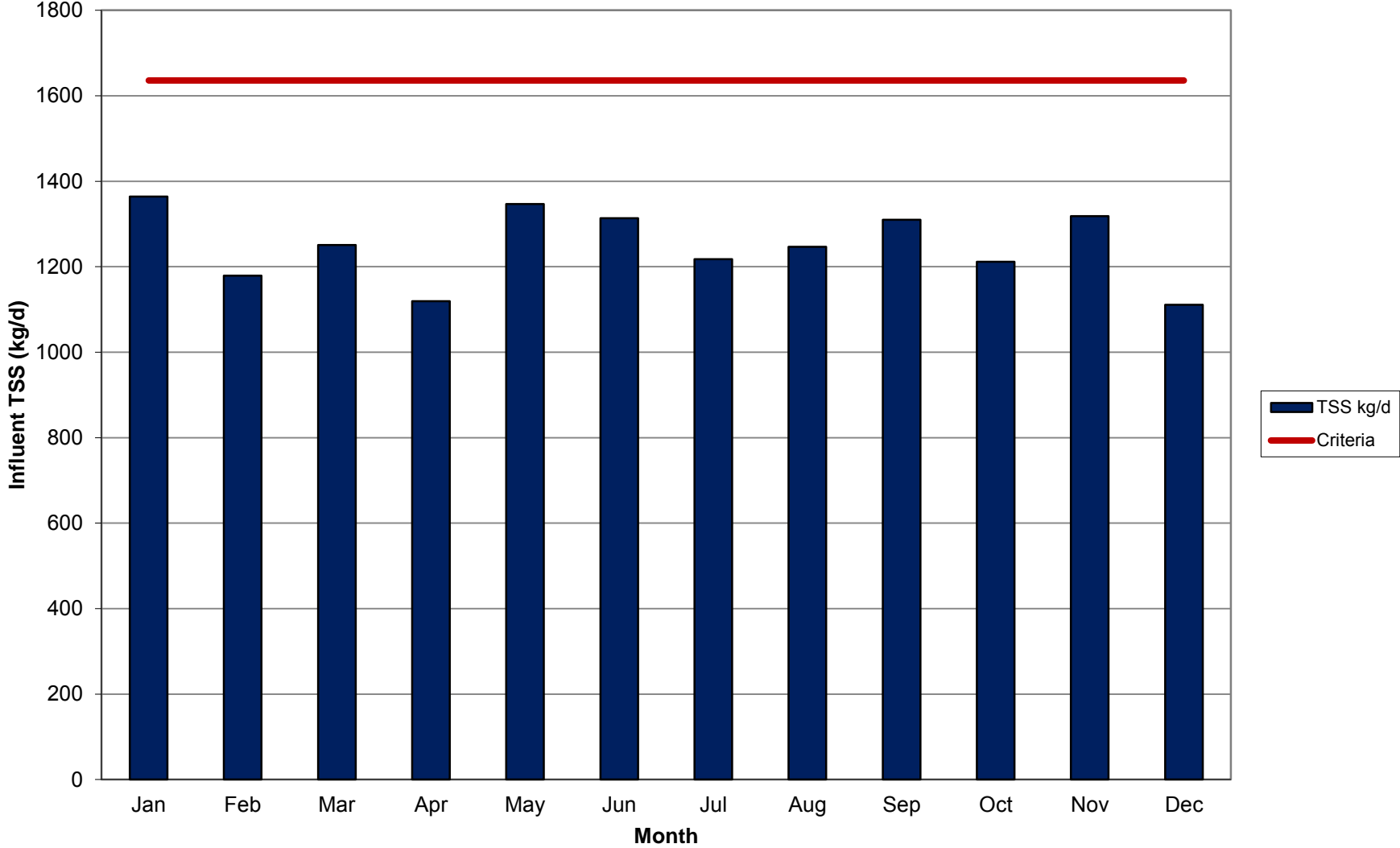
A Class Environmental Assessment was completed in July 2013 for the Tillsonburg WWTP, evaluating the future capacity needs and alternative treatment options. The recommended alternative of adding another treatment train to increase the rated capacity to 12,270 m³/d will be implemented when wastewater flows approach the current plant capacity.

Exhibit 1

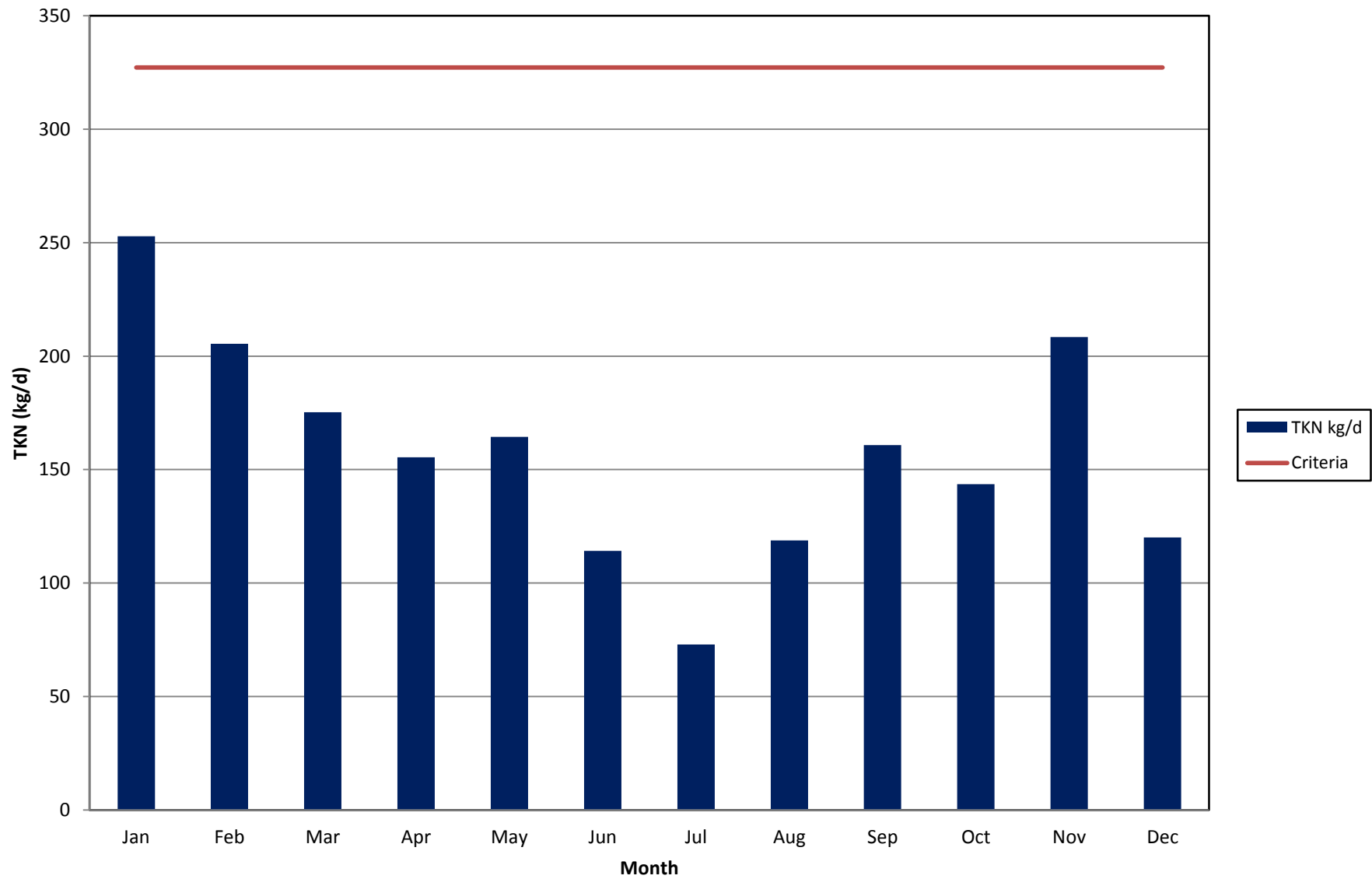
Tillsonburg WWTP Influent, Monthly Average Loading CBOD₅ (kg/d), 2014



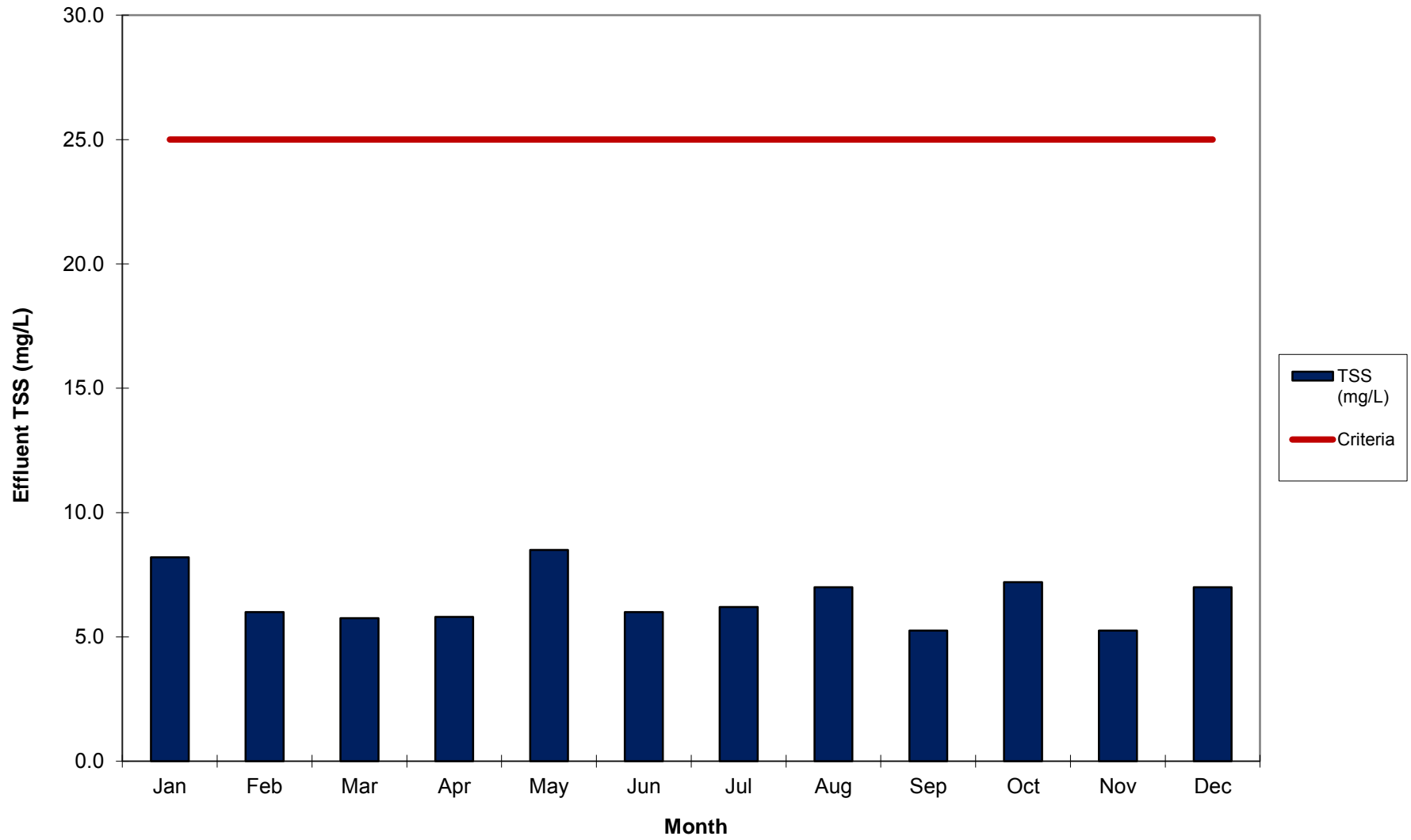
Tillsonburg WWTP Influent, Monthly Average Loading TSS (kg/d), 2014



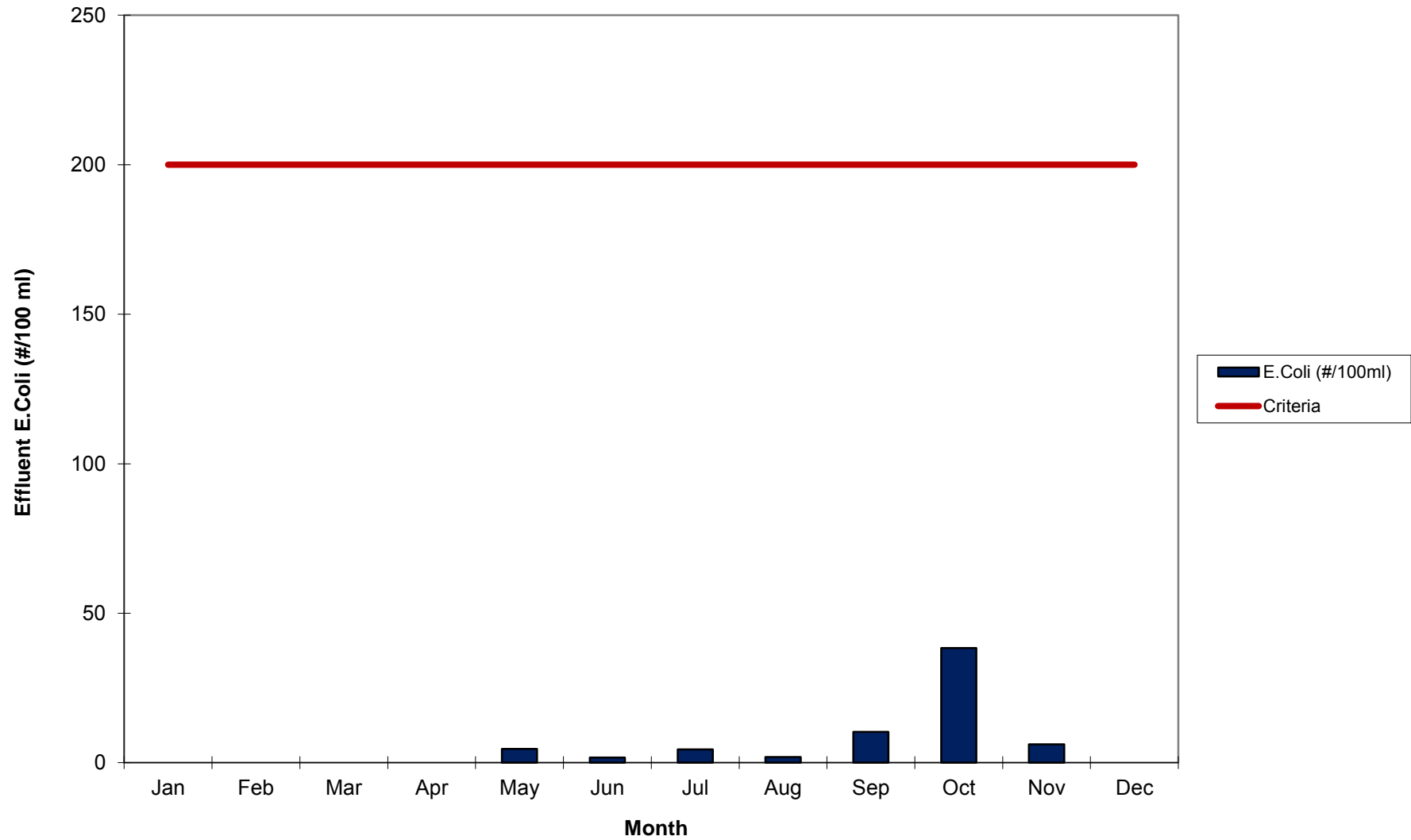
Tillsonburg WWTP Influent, Monthly Average Loading TKN (kg/d), 2014



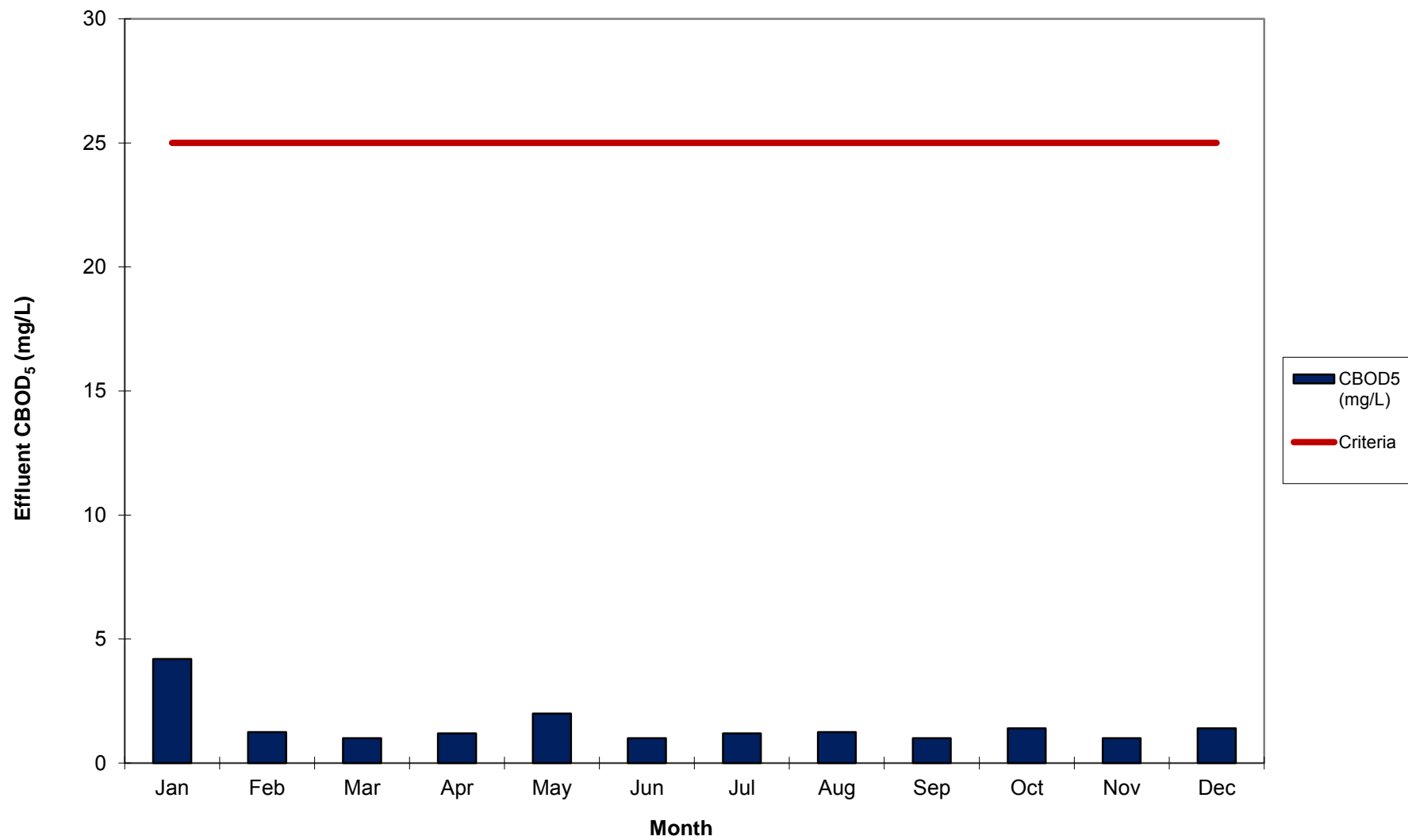
Tillsonburg WWTP Effluent, Monthly Average TSS (mg/L), 2014



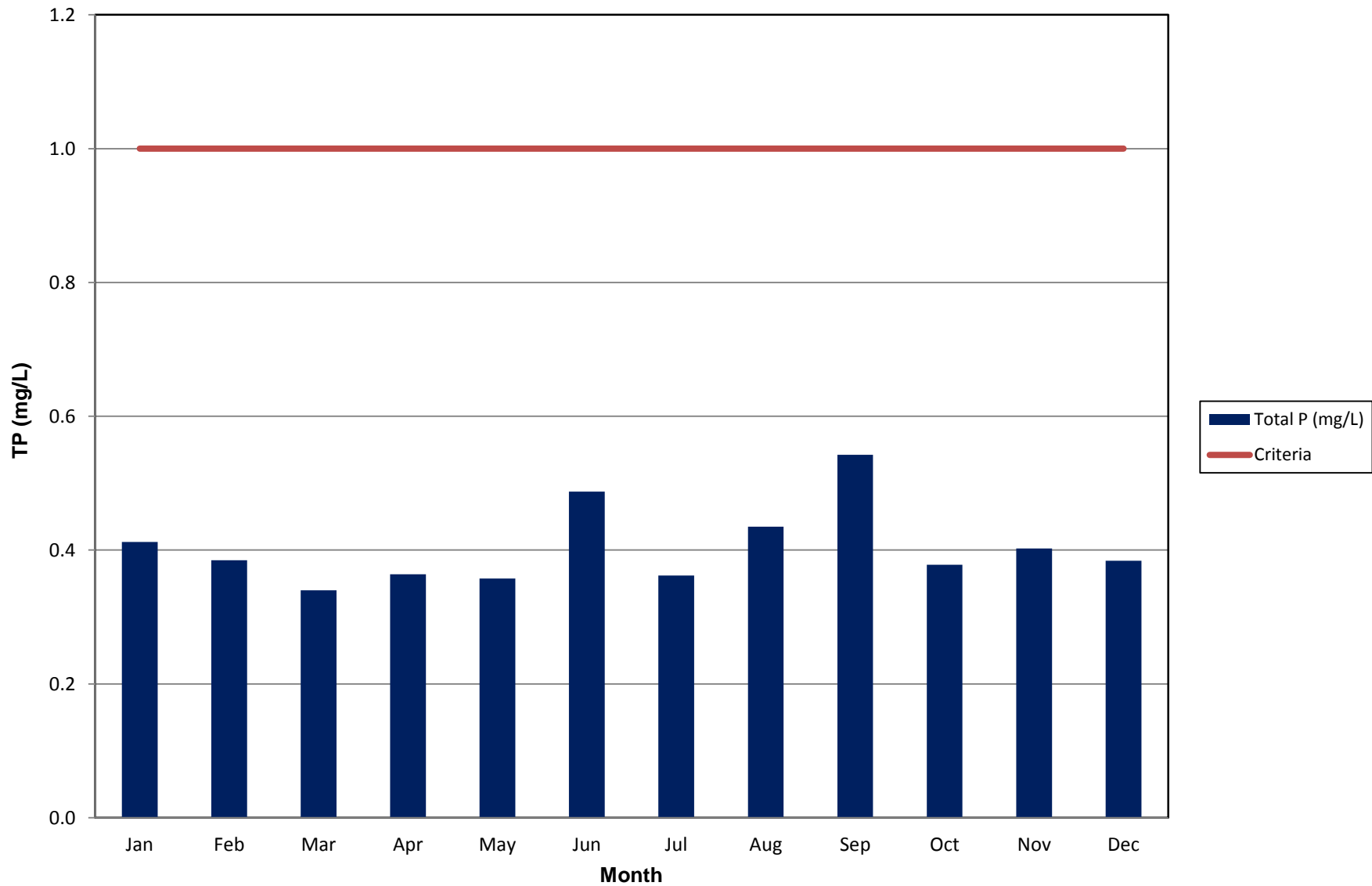
Tillsonburg WWTP Effluent, Monthly Geometric Mean Density E. Coli (#/100 ml), 2014



Tillsonburg WWTP Effluent, Monthly Average CBOD₅ (mg/L), 2014



Tillsonburg WWTP Effluent, Monthly Average TP (mg/L), 2014



Calibration Records

OXFORD COUNTY PUBLIC WORKS

Location: Tillsonburg WWTP & Norwich Lagoons

Dissolved O2 / PH Meter Calibration Reports

DATE Calibrated	Ph Meter Calibration weekly	Buffer 4.00	Buffer 7.00	Buffer 10.0	Dissolved O2 Meter	Calibration Weekly	Membrane Replaced Yes/No	Operator Signature
May 30, 2014	yes	yes	yes		yes	yes	no	BJ
June 6, 2014	yes	yes	yes		yes	yes	no	BJ
June 10, 2014	yes	yes	yes		yes	yes	no	DG
June 20, 2014	yes	yes	yes		yes	yes	no	BJ
June 24, 2014	yes	yes	yes		yes	yes	no	DG
July 4, 2014	yes	yes	yes		yes	yes	no	BJ
July 10, 2014	yes	yes	yes		yes	yes	no	DG
July 17, 2014	yes	yes	yes		yes	yes	yes	BJ
July 24, 2014	yes	yes	yes		yes	yes	no	DG
August 5, 2014	yes	yes	yes		yes	yes	no	DG
August 15, 2014	yes	yes	yes		yes	yes	no	BJ
August 22, 2014	yes	yes	yes		yes	yes	no	BJ
August 25, 2014	yes	yes	yes		yes	yes	no	DG
August 29, 2014	yes	yes	yes		yes	yes	no	BJ
September 9, 2014	yes	yes	yes		yes	yes	no	DG
September 16, 2014	yes	yes	yes		yes	yes	no	DG
September 22, 2014	yes	yes	yes		yes	yes	no	BJ
September 30, 2014	yes	yes	yes		yes	yes	no	BJ
October 2, 2014	yes	yes	yes		yes	yes	no	DG
October 16, 2014	yes	yes	yes		yes	yes	no	DG
October 24, 2014	yes	yes	yes		yes	yes	no	BJ
October 31, 2014	yes	yes	yes		yes	yes	no	DG
November 6, 2014	yes	yes	yes		yes	yes	no	BJ
November 12, 2014	yes	yes	yes		yes	yes	no	BJ
November 20, 2014	yes	yes	yes		yes	yes	no	DG
November 27, 2014	yes	yes	yes		yes	yes	no	BJ
December 9, 2014	yes	yes	yes		yes	yes	no	DG
December 17, 2014	yes	yes	yes		yes	yes	no	DG
December 22, 2014	yes	yes	yes		yes	yes	no	BJ
December 27, 2014	yes	yes	yes		yes	yes	no	BJ

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Tillsonburg ON
 Customer PO
 Our Job # B13 8567

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT Eff. Flow South
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location South Effluent Flow
 Description Flow Ind. Transmitter
 Manufacturer Milltronics
 Model OCM III
 Serial #
 Accuracy 1%
 Range 0 - 14094 m³/D = 0-45.995 cm WC
 Range Zero Head 104.0 cm
 Angle iron above sensor 130.4 cm
 Range Change 0 - 30000m³/D Custom Pg 25

MEASURING EQUIPMENT

Manufacturer Fluke Gauge Bd & Fluke
 Model 725 Dist. meter D416
 Serial # 7903017
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% 1.5 mm

INPUT cm WC	METERS	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
28.85	0.2885	6904.243	6895	6895	-0.07	-0.07
30.04	0.3004	7344.696	7424	7424	0.56	0.56
30.86	0.3086	7653.652	7616	7616	-0.27	-0.27
46.00	0.4600	14094.193	11.517			
			mA			
m³/D		mA				
6847.00		7.652	7.748	7.748	0.60	0.60
14094.00		11.517				
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$	

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES
Error in parshall flume: 8.75" should be 9" causing rdg to be higher. Head to Flow Cals using ISCO tables

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

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 City/Town Tillsonburg ON
 Customer PO
 Our Job # B13 8567

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 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ Effluent Flow South
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location Effluent Flow South
 Description Flow Totalizer
 Manufacturer Milltronics
 Model OCM III
 Serial #
 Accuracy 1%
 Range 0 - 9.788 PPM; 0-14094 m³/D
 Range Change 0 - 30000 m³/D

MEASURING EQUIPMENT

Manufacturer	Fluke	NexXTech
Model	725	09A10
Serial #	7903017	6315002
Cal Reference	Fluke	
Traceability	NIST	NIST
Accuracy	0.02%	.0001

INPUT m ³ /D	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000		0.000	0.000	0.000	0.00	0.00
7731.000		5.369	5.345	5.345	-0.25	-0.25
30000.000		20.833				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

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 City/Town Tillsonburg ON
 Customer PO
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 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIR Eff. Flow South
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location South Effluent Flow
 Description Flow Ind. Recorder Scada
 Manufacturer Allen Bradley
 Model SLC 5/04
 Serial #
 Accuracy 1%
 Range (Old) 0 - 14094 m³/D
 New Range 0 - 30000 m³/D
 0-300000 = 4 - 20 mA

MEASURING EQUIPMENT

Manufacturer Fluke
 Model 725
 Serial # 7903017
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02%

INPUT mA	%	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0	0	0	0.00	0.00
8.000		7500	7565	7565	0.21	0.21
12.000		15000	15135	15135	0.44	0.44
16.000		22500	22705	22705	0.67	0.67
20.000		30000	30000	30000	0.00	0.00

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer Ontario Clean Water Agency
City/Town Tillsonburg ON
Customer PO
Our Job # B13 8567

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE Effluent South
Cal Date June 05/14
Due Date June 05/15
Cal Freq
Location Effluent Flow South
Description Flow Element
Manufacturer
Flow Element Parshall Flume

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	no	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check transmitter location.
8	✓	Check for turbulence.
9		Description of measuring element: 9" Parshall Flume deformed diameter 8.75"
		Comments:

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

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 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT -S Return
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location S Return Flow
 Description Flow Ind. Transmitter
 Manufacturer Milltronics
 Model Multiranger+
 Serial #
 Accuracy 1%
 Range 0 - 52.27 L/s
 Head 0-27.00 cm WC
 mA Output Not used. No Scada Input
 Primary Element 90° VNotch Weir

MEASURING EQUIPMENT

Manufacturer Fluke Gauge Bd & Fluke
 Model 725 Dist. meter D416
 Serial # 7903017
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% 1.5 mm

INPUT cmWC	Meters	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0000	0.000	0.00	0.00	0.00	0.00
17.02	0.1702	16.492	16.80	16.80	0.59	0.59
24.09	0.2409	39.307	39.01	39.01	-0.57	-0.57
26.18	0.2618	48.395	48.84	48.84	0.85	0.85
27.000	0.2700	52.274				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Tillsonburg ON PCP
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 Our Job # B13 8567

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 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ - S Return
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location S. Return Flow
 Description Flow Totalizer
 Manufacturer Milltronics
 Model Multiranger+
 Serial #
 Accuracy 1%
 Range 0 - 52.276 L/s; 0 - 3.1366 PPM

MEASURING EQUIPMENT

Manufacturer Fluke NexXTech
 Model 725 09A10
 Serial # 7903017 6315002
 Cal Reference Fluke
 Traceability NIST NIST
 Accuracy 0.02% .0001

INPUT L/s	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
16.80		1.008	1.000	1.000	-0.26	-0.26
39.01		2.341	2.315	2.315	-0.83	-0.83
48.39		2.903	2.900	2.900	-0.10	-0.10
52.276		3.1366				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	As Left	940433.24	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	As Found	940416.54	
		Difference	16.70	
Fail:	Fail:			

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer Ontario Clean Water Agency
City/Town Tillsonburg ON
Customer PO
Our Job # B13 8567

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE South Return
Cal Date June 05/14
Due Date June 05/15
Cal Freq
Location Return Flow South
Description Flow Element
Manufacturer
Flow Element 90° V Notch Weir

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	no	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check transmitter location.
8	✓	Check for turbulence.
9		Description of measuring element: 90° V Notch Weir
		Comments:

CERTIFIED BY:



CET, CCST Level III Technician

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CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Tillsonburg ON PCP
 Customer PO
 Our Job # B13 8567

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 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT -N Return
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location N Return Flow
 Description Flow Ind. Transmitter
 Manufacturer Milltronics
 Model Multiranger+
 Serial #
 Accuracy 1%
 Range 0 - 52.27 L/s
 Head 0-27.00 cm WC
 mA Output Not used. No Scada Input
 Empty Dist. 105.1 mm
 Steel Plate -10.6

MEASURING EQUIPMENT

Manufacturer Fluke Gauge Bd & Fluke
 Model 725 Dist. meter D416
 Serial # 7903017
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% 1.5 mm

INPUT cmWC	Meters	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0000	0.000	0.00	0.00	0.00	0.00
18.28	0.1828	19.716	19.30	19.30	-0.80	-0.80
24.28	0.2428	40.087	40.50	40.50	0.79	0.79
28.15	0.2815	58.020	58.19	58.19	0.33	0.33
27.000	0.2700	52.274				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FQ - N Return
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location N. Return Flow
 Description Flow Totalizer
 Manufacturer Milltronics
 Model Multiranger+
 Serial #
 Accuracy 1%
 Range 0 - 52.276 L/s; 0 - 3.1362 PPM

MEASURING EQUIPMENT

Manufacturer Fluke NexXTech
 Model 725 09A10
 Serial # 7903017 6315002
 Cal Reference Fluke
 Traceability NIST NIST
 Accuracy 0.02% .0001

INPUT L/s	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
19.30		1.158	1.160	1.160	0.06	0.06
40.50		2.430	2.440	2.440	0.32	0.32
57.98		3.479	3.480	3.480	0.03	0.03
52.27		3.1362				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	As Left	16194.54	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	As Found	16184.57	
		Difference	9.97	
Fail:	Fail:			

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

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Customer PO
Our Job # B13 8567

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Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE North Return
Cal Date June 05/14
Due Date June 05/15
Cal Freq
Location Return Flow North
Description Flow Element
Manufacturer

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	no	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check transmitter location.
8	✓	Check for turbulence.
9		Description of measuring element: 90° V Notch Weir
		Comments:

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FT N-WAS
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location North Waste Activated Sludge
 Description Flow Tranmitter
 Manufacturer Fischer & Porter
 Model 50SF2121/11
 Serial # 7303B2055T2
 Accuracy 1%
 Range 0 - 253.94 GPM US; 0 - 16.00 L/s

MEASURING EQUIPMENT

Manufacturer Fluke Fischer & Porter
 Model 725 55MC1018B
 Serial # 7903017 8907B5770/1/B1
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% 0.1%

INPUT Ft/s	L/s	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.00	4.0000	3.991	3.991	-0.06	-0.06
5.93	4.00	8.0000	8.022	8.022	0.14	0.14
11.86	6.00	12.0000	12.061	12.061	0.38	0.38
17.79	12.00	16.0000	16.076	16.076	0.48	0.48
23.72	16.00	20.0000	20.095	20.095	0.59	0.59

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

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 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FI/FQ N-WAS
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location North Waste Activated Sludge
 Description Flow Indicator
 Manufacturer Pribusin
 Model IUC 28 RIT
 Serial #
 Accuracy 1%
 Range 0 - 253.94 GPM US; 0 - 16.00 L/s

MEASURING EQUIPMENT

Manufacturer Fluke
 Model 725
 Serial # 7903017
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.000	0.0	0.0	0.00	0.00
8.000		4.000	4.0	4.0	0.00	0.00
12.000		8.000	8.0	8.0	0.00	0.00
16.000		12.000	12.0	12.0	0.00	0.00
20.000		16.000	16.0	16.0	0.00	0.00

F & P mag L/s	m ³	FQ Pribusin
0.00	0.0000	
8.00	0.4800	defective
16.00	0.9600	

Overview Waste Setup (totalizer) instantaneous Pribusi display

F & P mag L/s	m ³ scada WAS			% Error	% Error
0.00	0.000	0.000	0.000	0.00	0.00
16.000	0.960	0.971	0.971	1.15	1.15

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	Difference
Pass: ✓	Pass: ✓	
Fail:	Fail:	

As Left 15

As Found 9

Difference 6

TECHNICIAN'S NOTES

Totalizer defective. Needs to be replaced. Operations use Scada Totalizer. County of Osford to advise.

CERTIFIED BY:



CET, CCST Level III Technician

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 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE N-WAS
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location North Waste Activated Sludge
 Description Flow Element
 Manufacturer Fischer & Porter
 Model 10D1418A
 Serial # 7303B2055T1
 Accuracy
 Range 0 - 16.00 L/s
 Vel. Constant 0.02470
 Liner Teflon
 Probe Mat. Hasaloy C
 Int. Eff. dia. 2.090

MEASURING EQUIPMENT

Manufacturer Fluke Fischer & Porter
 Model 725 55MC1018B
 Serial # 7903017 8907B5770/1/B1
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% 0.1%

INPUT Pumps	L/s	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Off					0.00	0.00
On					0.00	0.00
V Max = 23.72 FT/s			V Max = $\frac{Q \text{ Max} \times 0.408}{D \times D}$			
Dia. = 2.0290"			= $\frac{253.94 \times 0.408}{2.0290 \times 2.0290}$			
Q = 253.91 US GPM			= 23.72 Ft/s			
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$	

Test Unit Results

AS FOUND	AS LEFT	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	
Fail:	Fail:	

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FE/FT S-WAS
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location South WAS
 Description Flow Element Mag
 Manufacturer Brooks
 Model 7401-1-W1A6AA
 Serial # 1403
 Accuracy
 Range 0 - 16.00 L/s
 Vel. Constant S1 = 8
 Q 253.91 US GPM S2 = 5
 K Factor 1945.176 PPG S3 = 6
 S4 = 5

MEASURING EQUIPMENT

Manufacturer Fluke
 Model 725
 Serial # 7903017
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02%

INPUT Pumps	L/s	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Off	0.0	4.000	4.000			
On	34.375	5.500	9.500			

*Actual Applied Value

$$\% \text{ Error} = \frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$$

Test Unit Results

AS FOUND	AS LEFT
Pass:	Pass:
Fail:	Fail:

TECHNICIAN'S NOTES

Not calibrated. No Brook SIM. Recorded output

CERTIFIED BY:



CET, CCST Level III Technician

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 City/Town Tillsonburg ON
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 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FI/FQ S-WAS
 Cal Date June 05/14
 Due Date June 05/15
 Cal Freq Yearly
 Location South Waste Activated Sludge
 Description Flow Indicator/Totalizer
 Manufacturer Pribusin
 Model IUC 28 RIT
 Serial #
 Accuracy 1%
 Range 0 - 253.94 GPM US; 0 - 16.00 L/s

MEASURING EQUIPMENT

Manufacturer Fluke
 Model 725
 Serial # 7903017
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.00	0.0	0.0	0.00	0.00
8.000		4.00	4.0	4.0	0.00	0.00
12.000		8.00	8.0	8.0	0.00	0.00
16.000		12.00	12.0	12.0	0.00	0.00
20.000		16.00	16.0	16.0	0.00	0.00
L/s		m³				
16.000		0.960		defective		

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES
Totalizer defective. Needs to be replaced.

CERTIFIED BY:



CET, CCST Level III Technician

Plant Maintenance Records

ID	Description	Projected St	Shop	Instructions
6408	Replace	15/09/2014	250200	Replace lobes ,wearplates,gear oil etc on Voglesang sludge delivery pumps to centrifuge . Do maintenance on Pumps #1 & 2
6427	Repair	17/01/2014	250200	Replace lobes on centrifuge sludge pumps (VX- 100)
6477	Repair	07/02/2014	250200	Repair boiler heating system
6478	Repair	07/02/2014	250200	Make guards on blowers as per health and safety inspections
6479	Repair	07/02/2014	250200	Repair seal on gearbox centrifuge
6522	Replace	21/02/2014	250200	Replace seals and cutter blades on in line grinder on sludge feed for Centrifuge
6675	Repair	11/04/2014	250200	Assist Alpha Laval technician remove centrifuge gearbox and sent out for repair
6911	Replace	25/06/2014	250200	Fix safety chain on dump truck
6951	Repair	11/07/2014	250200	Replace 4 inch valves in main control building
6952	Repair	11/07/2014	250200	Remove mag meter and check for blockage in the magmeter
6954	Replace	11/07/2014	250200	Replace T for degritter and piping
7075	Repair	01/09/2014	250200	Mount Hose Reels and build brackets to remove hoses from walkways
7076	Repair	01/09/2014	250200	Inspect poly system for air leaks and repair
7077	Replace	01/09/2014	250200	Replace valve ball eccentric discharge on return pump R.A.S.
7078	Repair	01/09/2014	250200	Replace valve stem on primary tanks 1 & 2 stem is rounded off and burred.
7113	Repair	05/09/2014	250200	
7140	Repair	19/09/2014	250200	Repair primary clarifer adjust chasin and inspect chain advise foreman of condition of tank
7141	Replace	15/09/2014	250200	Clean centrate pumps and check for plugging or debris
7210	Inspect	10/10/2014	250200	Inspect final clarifer vac out sump pit for grit and put back in service
7211	Repair	13/10/2014	250200	Install clean outs and clean centrate lines on dewatering system . Use a snake to remove scale on inside off line.
7242	Replace	20/10/2014	250200	Install and fabricate new laddere rack in storeage shed
7243	Replace	20/10/2014	250200	Replace 8 inch butterfly valve on aeration air supply line 125 hp
7284	Replace	31/10/2014	250200	Replace motor on ventallation system for blower bassement
7539	Replace	01/01/2015	250200	Replace lobes on centrifuge sludge feed pump and wear plates
7540	Repair	01/01/2015	250200	Fabricate wooden box over centrate line to protect from ambient air temp during freezing periods
7541	Repair	02/01/2015	250200	Inspect heater in centrifuge building repair and advise foreman.



Public Works

P. O. Box 1614, 21 Reeve St., Woodstock, Ontario N4S 7Y3

Phone: 519-539-9800 Fax: 519-421-4711

Website: www.oxfordcounty.ca

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 Year-End Monitoring Report, Thamesford Wastewater Treatment Plant (WWTP)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) #6974-6FKKAY.

I trust this report fulfills the intent of the annual reporting requirements of the ECA.

If there are any questions, please contact me.

Yours truly,

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

The Thamesford WWTP (Figure 1) provided effective wastewater treatment in 2014. The average daily flow for 2014 was 1,507 m³/d. This represents 60% of the rated capacity of 2,500 m³/d. The total annual flow was 550,033 m³ with an average monthly flow of 45,836 m³. The daily maximum flow for 2014 was 2,233 m³/day.



Figure 1 Thamesford WWTP Aerial Photo

Plant Description

The Thamesford WWTP is one of Oxford County's nine wastewater treatment facilities.

The Plant receives significant wastewater flows from a local major poultry processing plant; however, the treatment plant also receives domestic wastewater from the Community of Thamesford. The wastewater from the poultry processing plant is collected from various on-site business units and pumped to a pretreatment system comprised of an equalization silo and a Dissolved Air Flotation (DAF) unit. The company's effluent enters the lift station dedicated to their wastewater flow at the Wastewater Treatment Plant where it is pumped to the complete mix aeration basin prior to a plug flow reactor. The extended aeration system is comprised of two tanks: the complete mix basin and the plug flow reactor. After the plug flow reactor, the wastewater flows into one of two clarifiers where the settled activated sludge is either returned or wasted and the supernatant flows to either the old or the new sand filter, prior to disinfection and direct discharge to the Middle Thames River. Wasted biosolids are processed/stabilized in two aerobic digesters, and held on-site in a storage tank for eventual removal. Biosolids are applied to agricultural land application sites possessing the appropriate Nutrient Management Plan for a Non-Agricultural Source Material (NASM).

The treated effluent flow for purposes of calculating loading to the River is from the Parshall flume located after the stilling well just before discharge to the re-aeration chamber and the Middle Thames River. The flow used to apportion the loading to the

plant is from two meters, one on each lift station. The influent meters and all other meters are calibrated annually.

Effluent Criteria

Table 1

Effluent Parameter	Monthly Average Concentration (milligrams per litre unless otherwise indicated)	Monthly Average Loading (kilograms per day unless otherwise indicated)
Column 1	Column 2	Column 3
<i>BOD₅</i>		
- non-freezing (see Note 1)	10.0	25.0
- freezing (see Note 2)	15.0	37.5
Suspended Solids		
- non-freezing	10.0	25.0
- freezing	15.0	37.5
Total Phosphorus		
- non-freezing	0.2	0.5
- freezing	0.5	1.25
Total Ammonia Nitrogen		
- non-freezing	2.0	5.0
- freezing	5.0	12.5
Dissolved Oxygen	5.0	-
Total Chlorine Residual	0.01	-
<i>E. Coli</i>	200 organisms/100 mL (Monthly <i>Geometric Mean Density</i>)	-
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times		

Note 1: Non-freezing refers to conditions when the water temperature of the Middle Branch of Thames River is greater than 5 °C.

Note 2: Freezing refers to conditions when the water temperature of the Middle Branch of Thames River is equal to or less than 5 °C.

Effluent Quality Assurance and Control Measures

Sampling Procedure

Influent samples were taken from sampling ports located in-line after the influent pumps. Two 24-hour composite samplers take a sample every 15 minutes for a 24-hour period concurrent with effluent sampling. A sampler is installed on the municipal and the food processing company's influent lines. The two influent streams are separately tested, and then the results are mathematically combined, based on flow ratios.

Effluent samples were taken using a 24-hour composite sampler set to take a sample every 15 minutes for 24 hours. Samples were drawn from a stilling well prior to the parshall flume immediately before the discharge. Total residual chlorine (TRC) samples are taken daily from the stilling well prior to the parshall flume. The stilling well follows the chlorination and de-chlorination chambers. The pH of the final effluent composite sample is also measured.

Following the parshall flume, effluent flows through a discharge pipe and drops approximately 0.75 m into a discharge well, where dissolved oxygen samples are taken. This discharge well aerates the effluent prior to discharge to the River, as reflected in the DO sample results.

Laboratory and Field Testing

Laboratory analysis is performed by SGS Lakefield Research Ltd. on all samples, except for TRC, DO, and pH which are tested in the field. These results are used for determination of compliance. Any information generated in-house is used in process control but is not included in this report.

Summary and Interpretation of Monitoring Data

Exhibit 1 is a summary Table with the average, maximum, and minimum values for all influent and effluent parameters. The table is based on all external test results.

Raw Sewage Quality

Table 2 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 1,507 m³/day.

Table 2

Parameter	Concentration mg/L	Loading kg/day
BOD ₅	300	452
SS	161	243
TKN	64	97
TP	8.3	12
O&G	25	37

Plant Performance & Effluent

Table 3 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA limits for the parameter.

Table 3

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	*ECA Effluent Limits mg/L
BOD ₅	1.4	2.4	99.5	10/15
SS	1.5	2.6	99.1	10/15

TP	0.1	0.16	98.8	0.2/0.5
Ammonia	0.2	1.4	98.8	2/5
TRC	0.003	0.01	na	0.01
E. Coli	1	2	na	200
pH	6.9	7.1	na	6-9.5

* BOD₅, SS, Ammonia, and TP have different limits depending on the Middle Thames River temperature please see Table 1

Effluent pH is measured by the operator on a weekly basis (minimum) and there was no sample pH outside the criteria of 6-9.5 in 2014. All dissolved oxygen readings in the effluent were measured at least weekly by the operator and no monthly average DO was below the required minimum of 5 mg/L.

River temperatures for the Middle Thames River are summarized monthly in the table included with this report.

There was no reported non-compliance for the Thamesford Wastewater Treatment Plant for any discharge parameter in 2014 as all effluent discharge criteria were met.

Effluent Objectives

Objectives are non-enforceable effluent quality values which the owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

All effluent discharge objectives listed in the plant's ECA were met at the Thamesford WWTP in 2014, with the exception of TP results in July, and August, and an Ammonia result in November.

Description of Operating Problems, Bypassing, Spills, Abnormal Events, and Complaints Received

There were no bypasses, overflows, spills, or upset events at the Thamesford WWTP in 2014. There were no complaints received regarding the Thamesford WWTP.

Maintenance of Works

The operating and maintenance staff from the Ingersoll WWTP conducts regular scheduled maintenance of the Thamesford WWTP equipment. A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

All flow meters were checked and calibrated by R&R instrumentation.

Operations monitoring equipment calibration records are appended to this report.

Biosolids 2014

Discussion:

Biosolids removal was contracted out for agricultural land application. The details of the quantity and quality of the biosolids for 2014 can be found in a separate Biosolids Annual Report.

DAF Biosolids Activity

January to December 2014

The major poultry processing plant operates its own wastewater pretreatment system which includes a Dissolved Air Flotation (DAF) treatment unit that generates a residual sludge stream. The material is transported to the Thamesford WWTP where it is combined with the WWTP stored Biosolids. There is an existing letter from the MOECC indicating that this practice is acceptable.

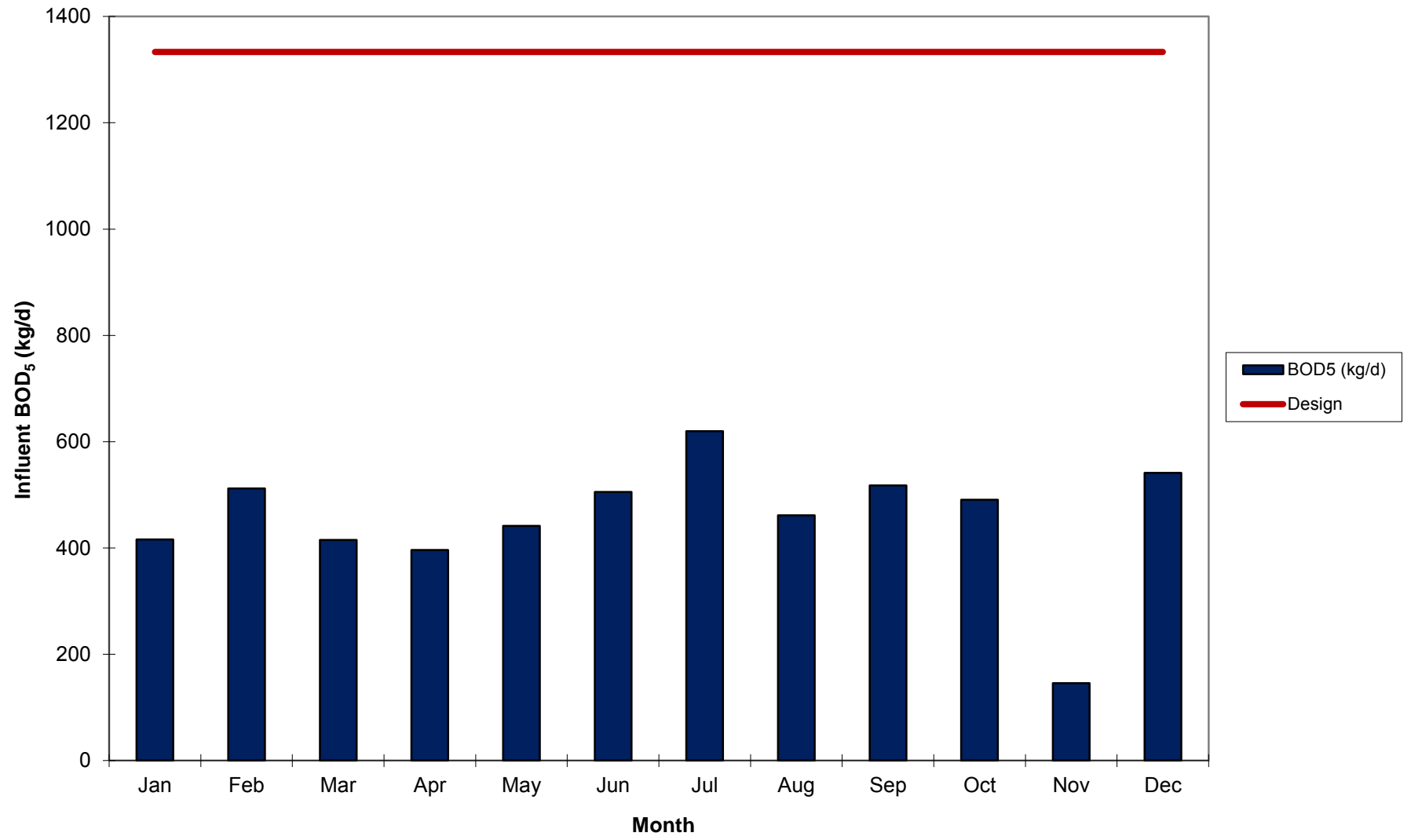
D.A.F. Sludge	
Month	Volume (m ³)
January	151
February	164
March	111
April	103
May	120
June	105
July	121
August	106
September	115
October	119
November	93
December	165
Total	1473

Summary

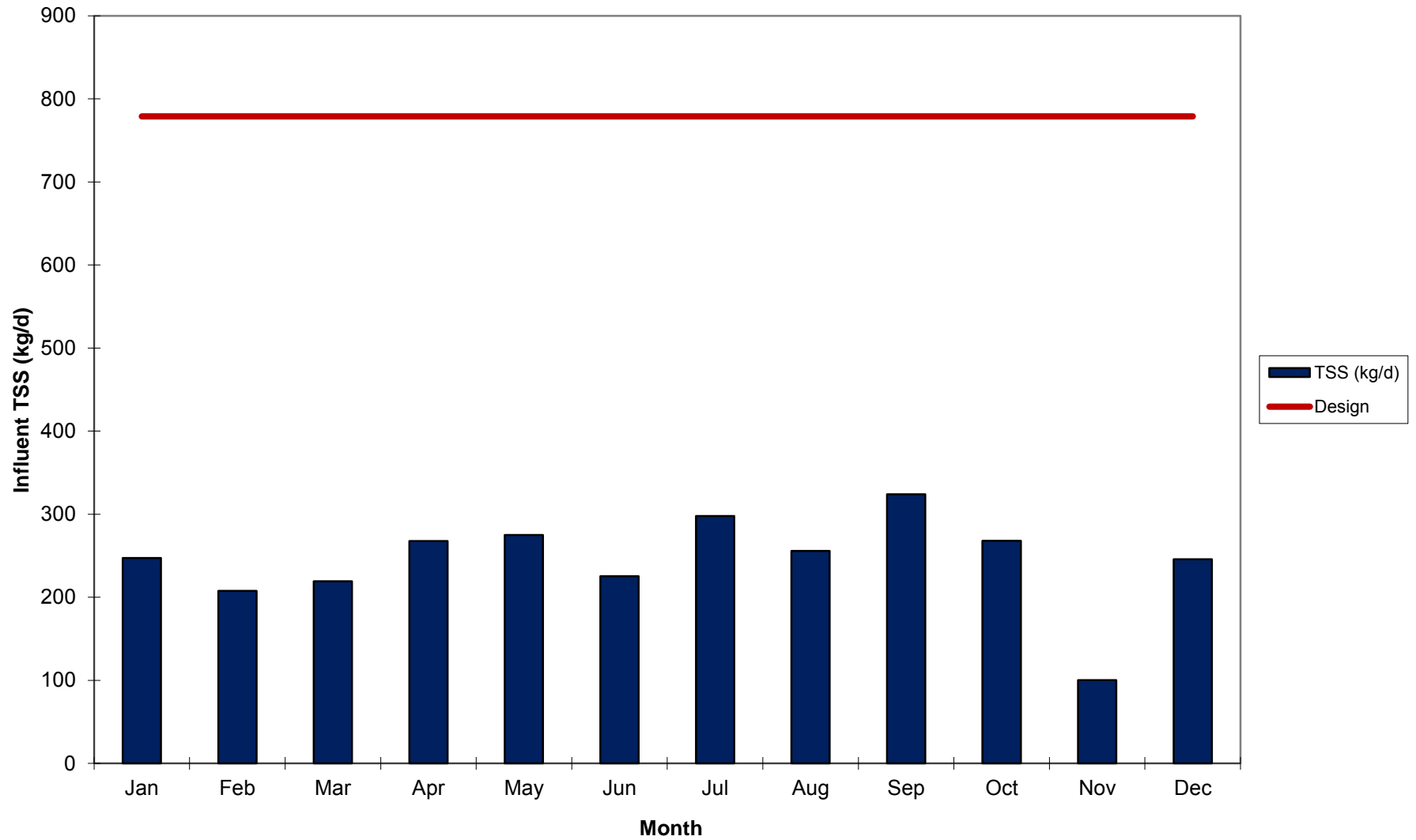
The Thamesford WWTP was operating within its design flow criteria and was within its discharge limits for 2014.

EXHIBIT 1

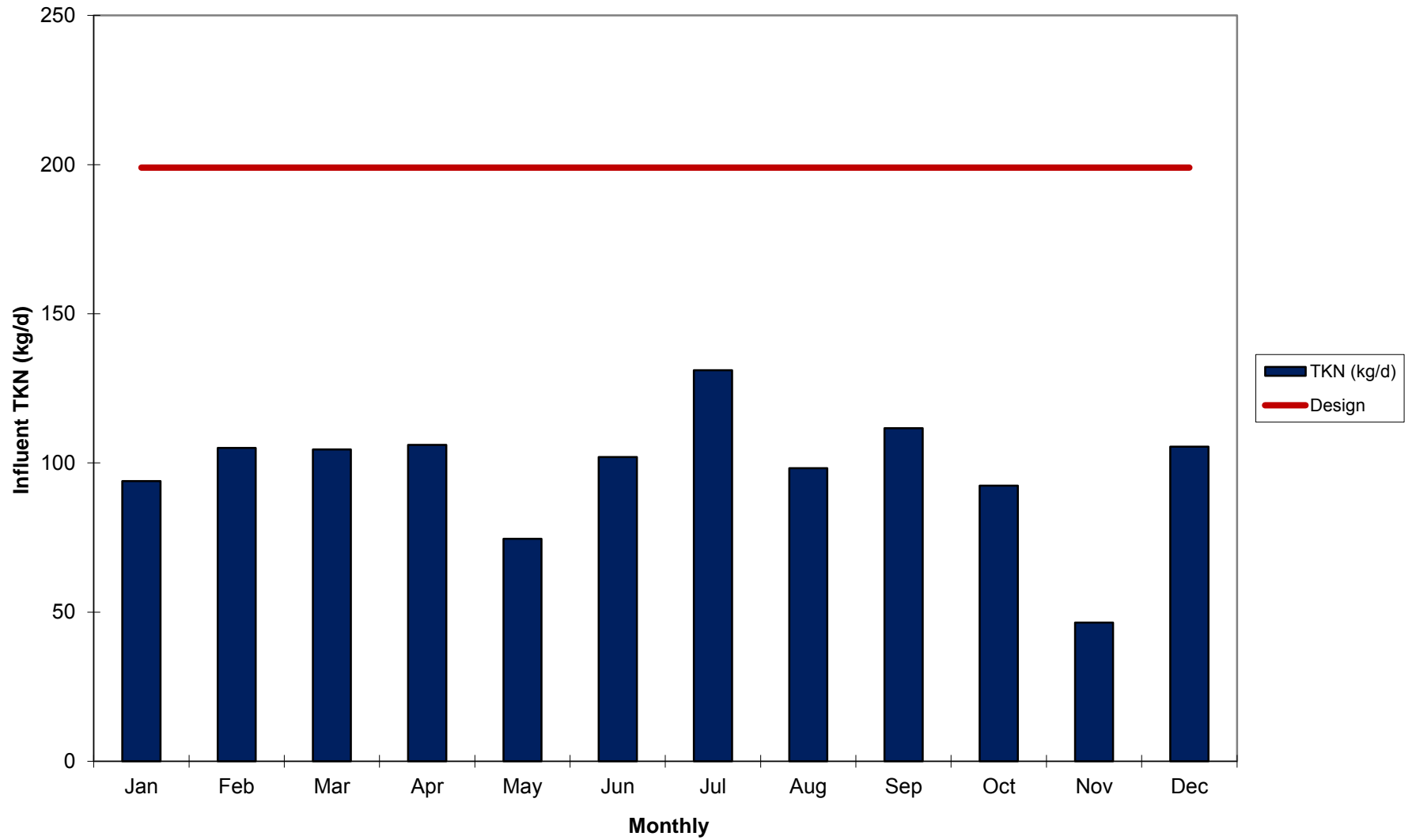
Thamesford WWTP Influent, Monthly Average BOD₅ Loading (kg/d), 2014



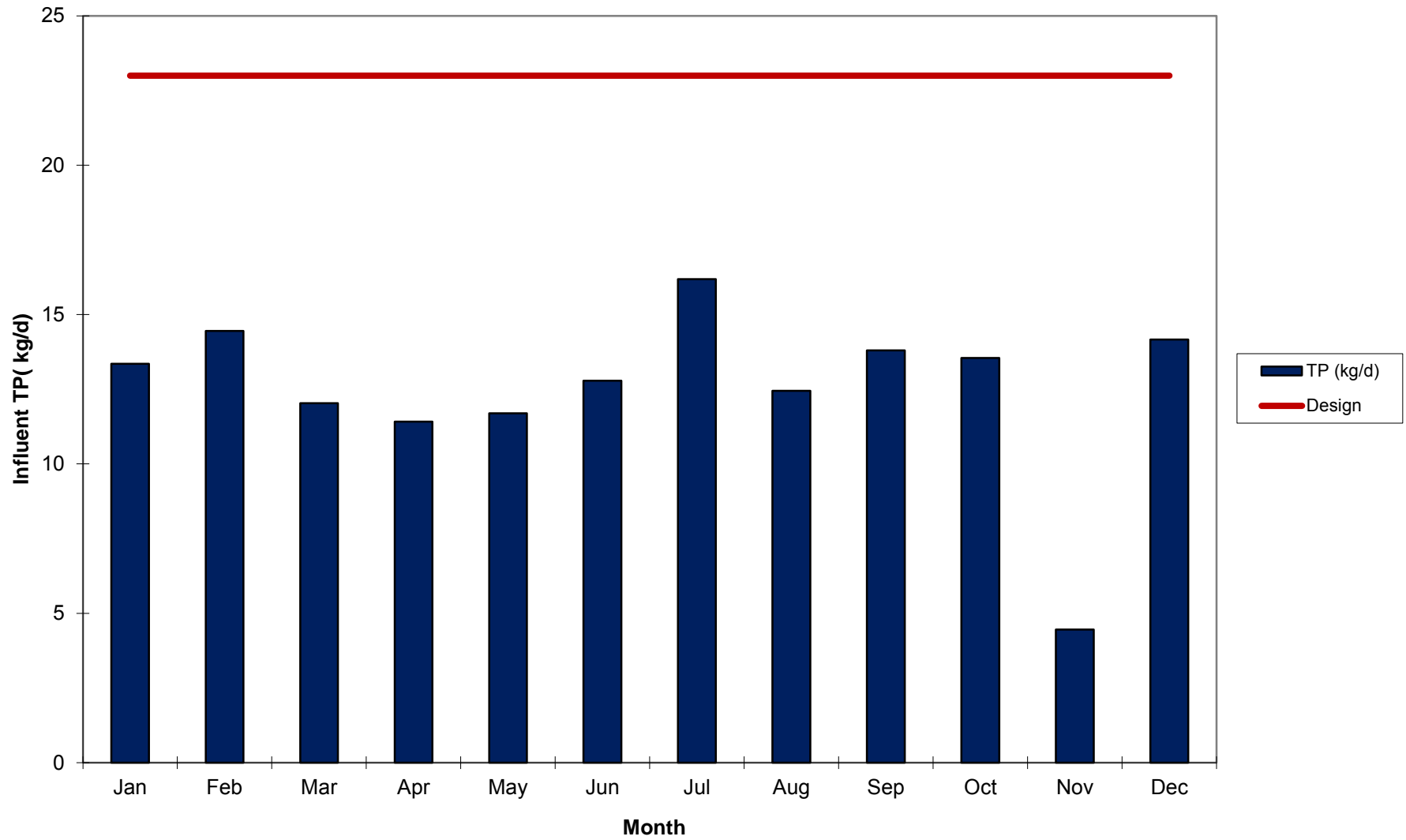
Thamesford WWTP Influent, Monthly Average TSS loading (kg/d), 2014



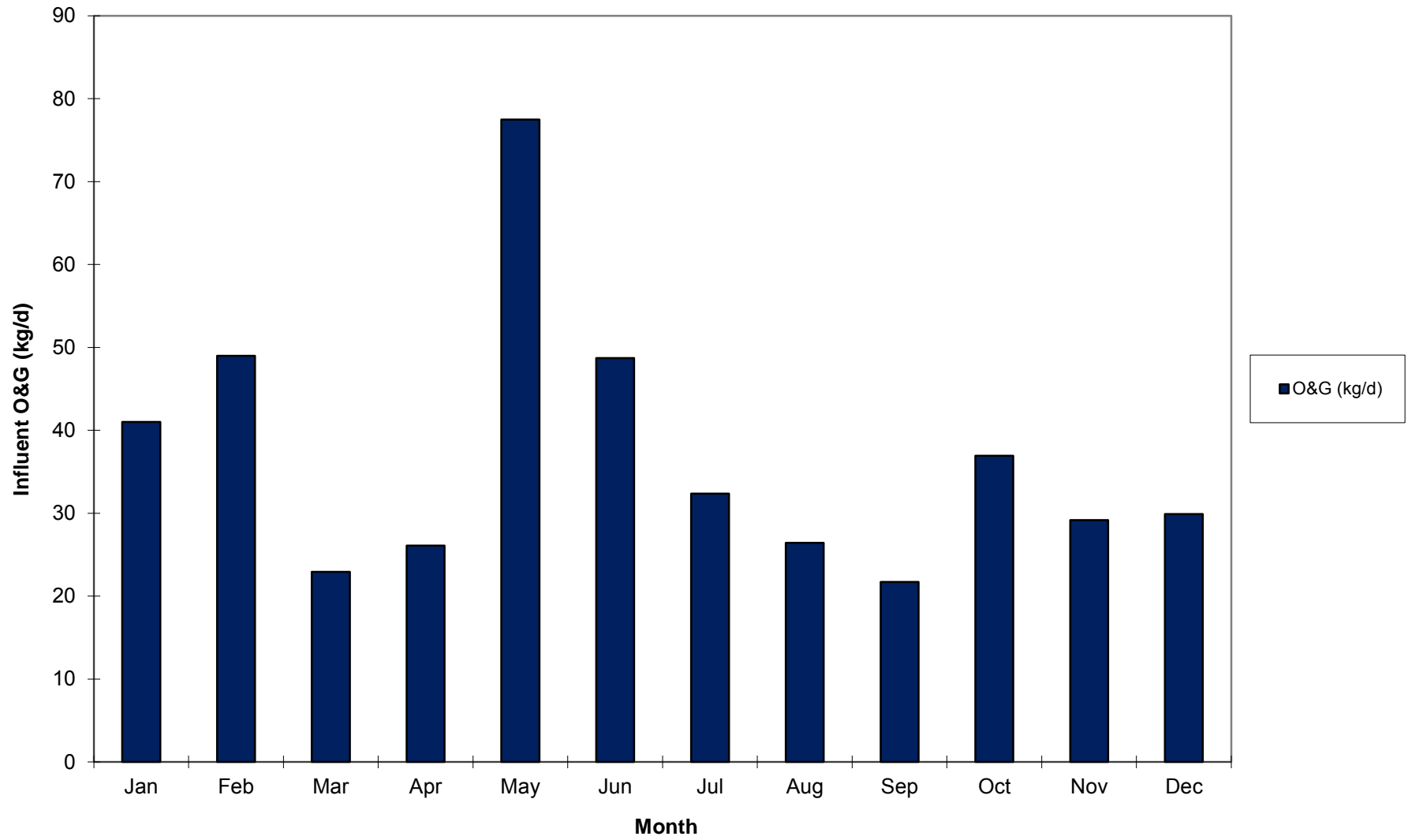
Thamesford WWTP Influent, Monthly Average TKN Loading (kg/d), 2014



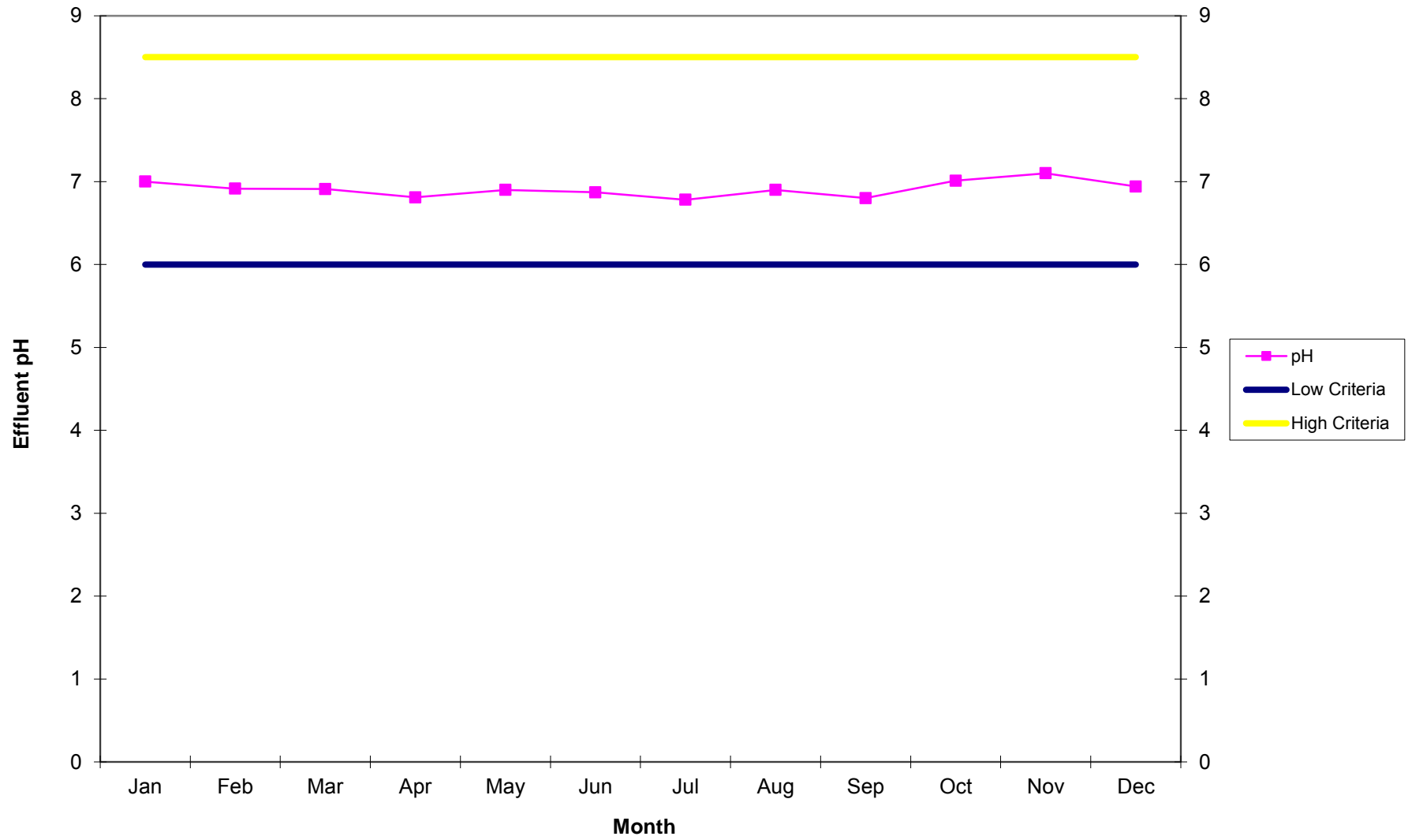
Thamesford WWTP Influent, Monthly Average TP loading (kg/d), 2014



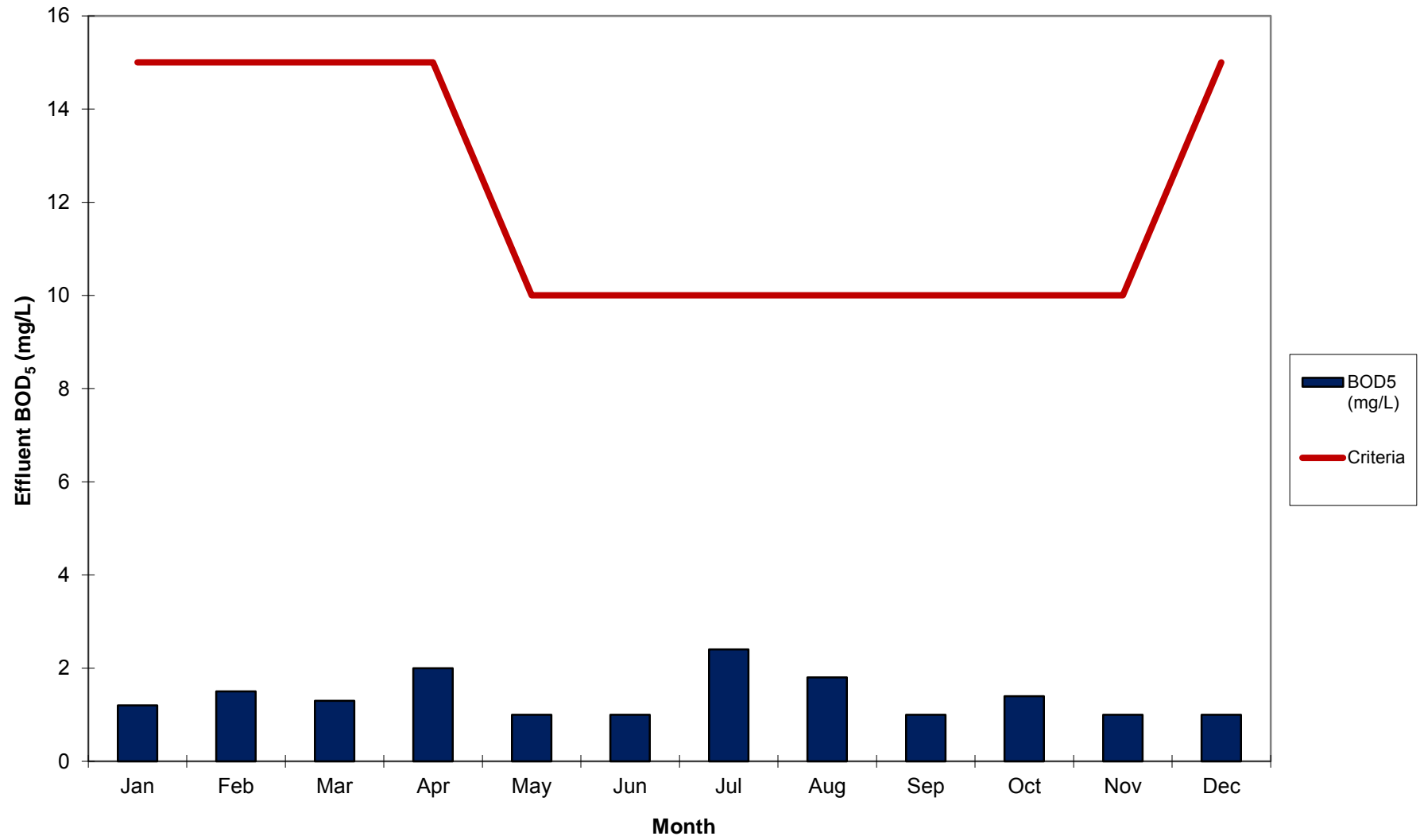
Thamesford WWTP Influent, Monthly Average O&G Loading (kg/d), 2014



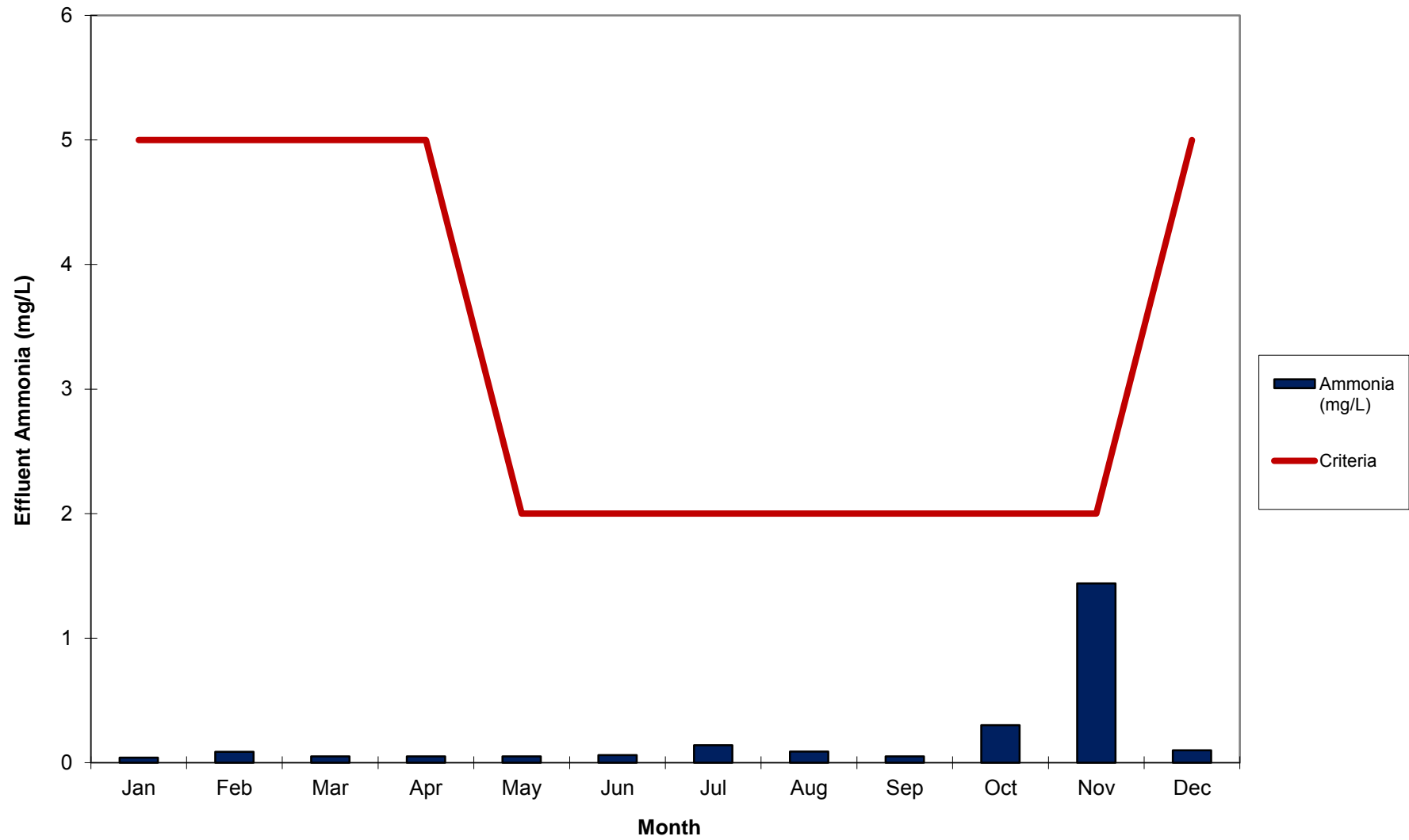
Thamesford WWTP Effluent, Monthly Average pH, 2014



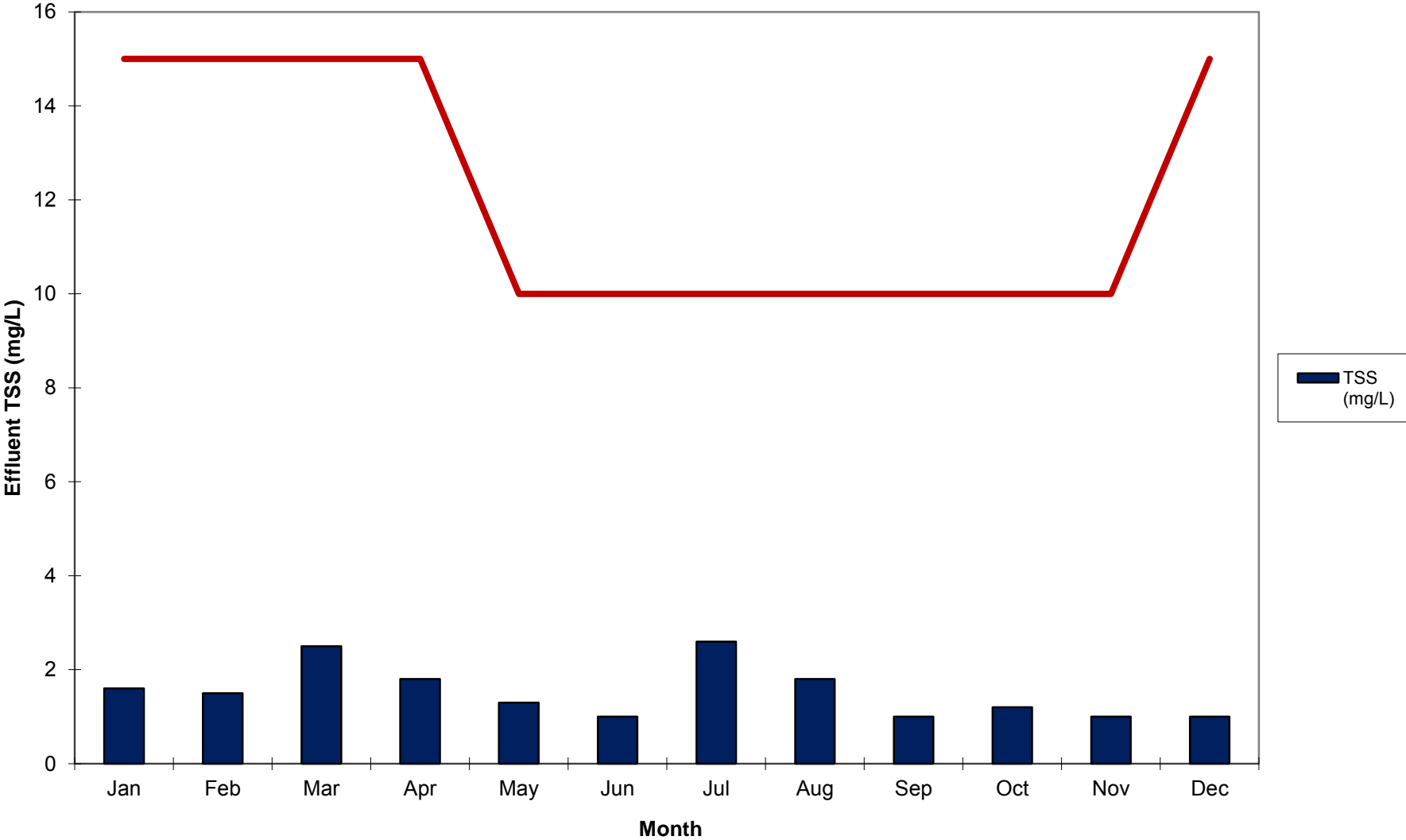
Thamesford WWTP Effluent, Monthly Average Effluent BOD₅ (mg/L), 2014



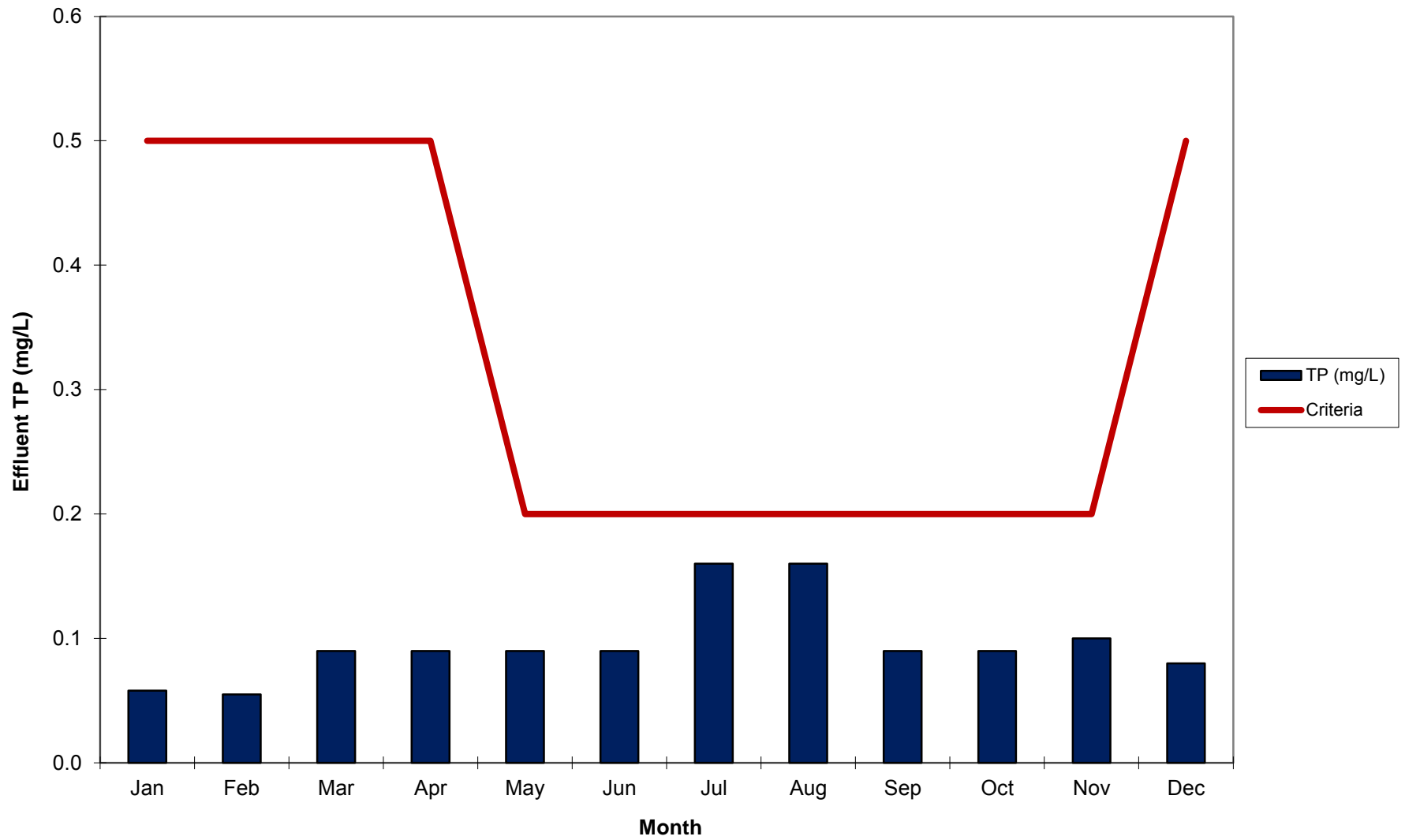
Thamesford WWTP Effluent, Monthly Average Effluent Ammonia (mg/L), 2014



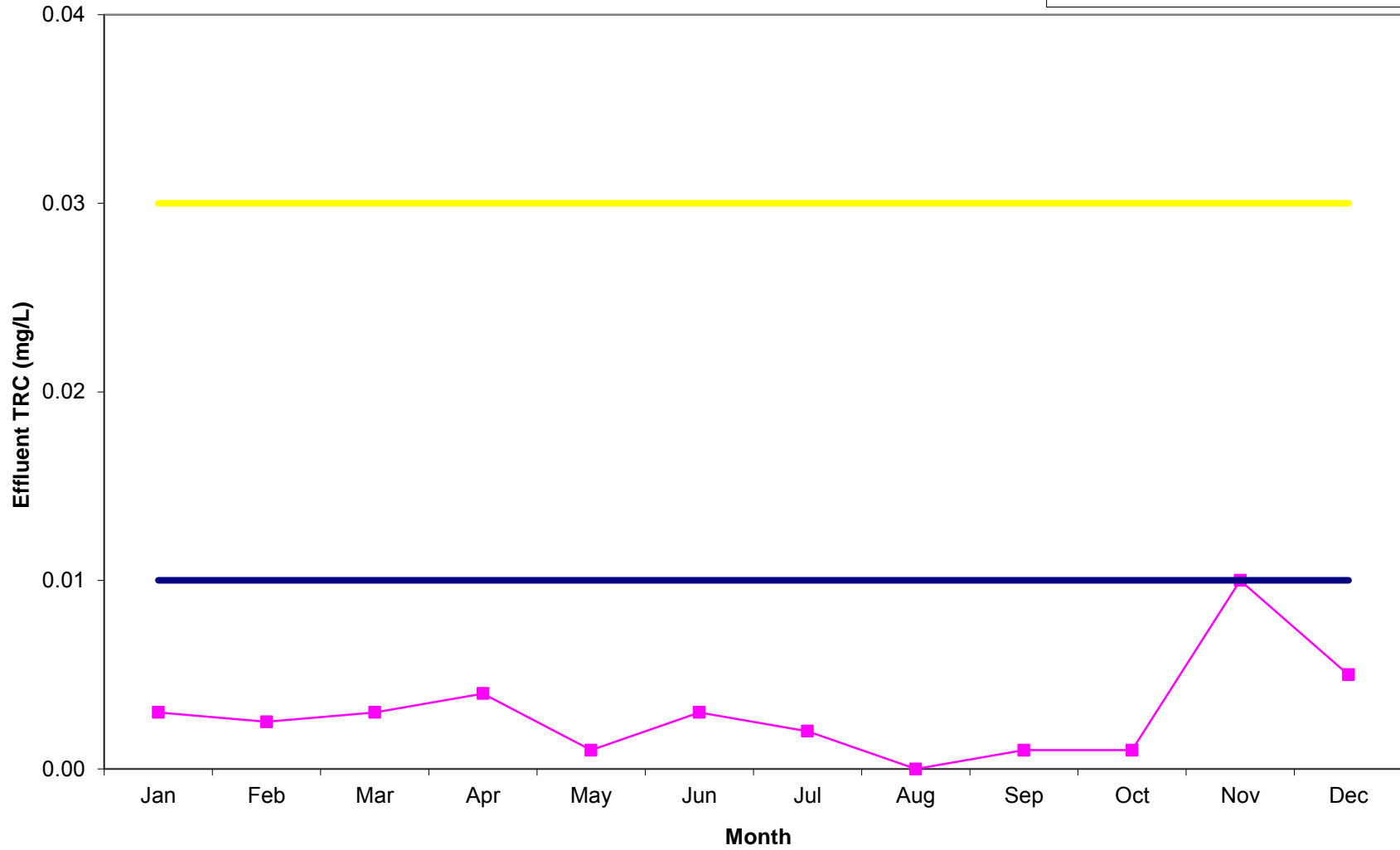
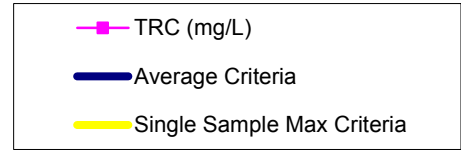
Thamesford WWTP Effluent, Monthly Average Effluent TSS (mg/L), 2014



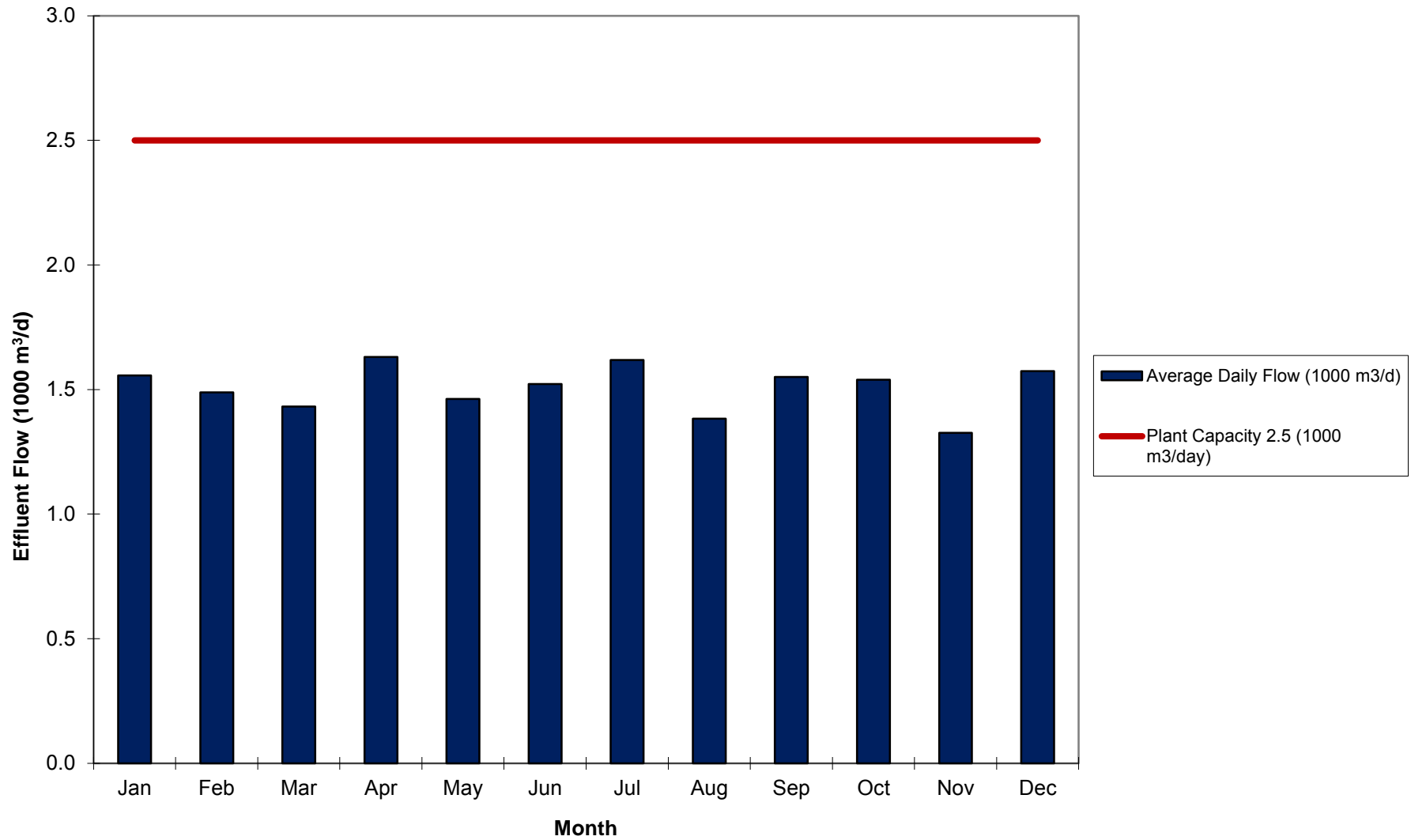
Thamesford WWTP Effluent, Monthly Average Effluent TP (mg/L), 2014



Thamesford WWTP Effluent, Monthly Average Effluent TRC (mg/L), 2014



Thamesford WWTP Effluent, Monthly Average Daily Flow (1000 m³/d), 2014



Municipality: THAMESFORD
 PROJECT:THAMESFORD WWTP
 Operator: County of Oxford
 Works Number:
 120002601

2014

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Total	Criteria
Effluent Meter																	
Total Flow (1000 m ³)	48.261	41.667	44.382	48.917	45.329	45.657	50.150	42.875	46.505	47.700	39.791	48.798	45.836	39.791	50.150	550.033	
Average Daily Flow (1000 m ³ /d)	1.557	1.488	1.432	1.631	1.462	1.522	1.618	1.383	1.550	1.539	1.326	1.574	1.507	1.326	1.631		2.500
Maximum Daily Flow (1000 m ³ /d)	2.032	2.233	1.985	2.158	1.991	2.120	2.062	1.989	2.138	2.098	2.072	2.133	2.084	1.985	2.233		
Daily Average Influent (m3/d)																	
MLF Flow (m3/d)	1117	1070	1091	1220	1057	1133	1184	997	1139	1129	960	1156	1104	960	1220		
Municipal (m3/d)	440	418	380	411	405	389	434	387	411	410	367	418	406	367	440		
Combined Flow (m3/d)	1557	1488	1471	1631	1462	1522	1618	1383	1550	1539	1326	1574	1510	1326	1631		
Production Average Influent																	
MLF Flow (m3/d)	1368	1437	1427	1524	1415	1471	1668	1545	1627	1694	1440	1706	1527	1368	1706		
Municipal (m3/d)	440	408	384	403	455	379	612	600	587	615	551	617	504	379	617		
Combined Flow (m3/d)	1808	1845	1811	1927	1870	1850	2280	2144	2214	2309	1989	2324	2031	1808	2324		
Combined Influent																	
pH	7.53	7.6	7.5	7.5	7.5	7.5	7.4	7.3	7.4	7.4	7.6	7.6	7.5	7.3	7.6		
BOD ₅ (mg/L)	267	344	290	243	302	332	383	334	334	319	110	344	300	110	383		
TSS (mg/L)	159	139	153	164	188	148	184	185	209	174	76	156	161	76	209		
TKN (mg/L)	60.3	70.6	73	65	51	67	81	71	72	60	35.1	67	64.4	35.1	81.0		
TP (mg/L)	8.6	9.7	8.4	7	8	8.4	10	9	8.9	8.8	3.4	9	8.3	3.4	10.0		
O&G (mg/L)	26.3	32.9	16	16	53	32	20	19.1	14	24	22	19	25	14	53		
Effluent																	
pH	7.0	6.9	6.9	6.8	6.9	6.9	6.8	6.9	6.8	7.0	7.1	6.9	6.9	6.8	7.1		6.0-9.5
BOD ₅ (mg/L)	1.2	1.5	1.3	2	1	1	2.4	1.8	1	1.4	1	1	1.4	1	2.4		10/15
TSS (mg/L)	1.6	1.5	2.5	1.8	1.3	1.0	2.6	1.8	1	1.2	1	1	1.5	1	2.6		10/15
Ammonia (mg/L)	0.04	0.09	0.05	0.05	0.05	0.06	0.14	0.09	0.05	0.30	1.44	0.10	0.20	0.04	1.4		2/5
TP (mg/L)	0.06	0.06	0.09	0.09	0.09	0.09	0.16	0.16	0.09	0.09	0.1	0.08	0.1	0.06	0.16		0.2/0.5
TRC (mg/L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.003	0.00	0.01		0.01
Temp	10.9	10.7	11.2	13.6	16.8	20	21.2	21.6	21	19.2	15.3	14.7	16.3	10.7	21.6		
DO (mg/L)	8.8	8.5	7.8	6.9	5.9	5.6	5.4	5.5	5.8	5.9	6.3	6.1	6.54	5.39	9		5
E. Coli (#/100mL)	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2		200
Unionized Ammonia (mg/L)					0.0005		0.0005	0.0006	0.0050	0.0010	0.0270	0.0005	0.0050	0.0005	0.0270		
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max		Design Criteria
BOD ₅ (kg/d)	416	512	415	396	442	505	620	461	518	491	146	541	452	146	620		1333
TSS (kg/d)	247	207	219	267	275	225	298	256	324	268	100	246	243	100	324		779
TKN (kg/d)	94	105	105	106	75	102	131	98	112	92	47	105	97	47	131		199
TP (kg/d)	13	14	12	11	12	13	16	12	14	14	4	14	12	4	16		23
O&G (kg/d)	41	49	23	26	77	49	32	26	22	37	29	30	37	22	77		250

OXFORD COUNTY PUBLIC WORKS

Thamesford WWTP - Middle Branch Thames River

Year 2014	Average Temperature Celsius		
January	N/A -River Frozen		
February	N/A -River Frozen		
March	N/A -River Flooding		
April	8.75		
May	15.1		
June	20.3		
July	19.7		
August	24.2		
September	18		
October	10.4		
November	4.4		
December	2.3		

Calibration Records

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Thamesford ON
 Customer PO
 Our Job # B13 8527

R&R Instrumentation Services Inc

24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 300
 Cal Date May 07/14
 Due Date May 07/15
 Cal Freq Yearly
 Location Backwash
 Description Flow Indicating Transmitter
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A00 44928
 Accuracy 1%
 Range 0 - 250.0 GPM (US)
 Size 80 mm or 3"
 GKL 5.1960
 DN 80
 X 24.1627

MEASURING EQUIPMENT

Manufacturer Krohne
 Model GS 8A
 Serial #
 Cal Reference
 Traceability
 Accuracy .10%

INPUT SIM Y	%	OUTPUT*AAV USGPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.00	0.00	0.00	0.00	0.00
2.50		25.86	25.96	25.96	0.04	0.04
5.00		51.74	51.66	51.66	-0.03	-0.03
10.00		103.47	103.50	103.50	0.01	0.01
20.00		206.94	206.99	206.99	0.02	0.02

$$x = \frac{Q \times K \times F}{GKL \times DN \times DN} \quad Y_{20} = 4.00 + (16) \times 20/24.1627 = \frac{mA}{17.244}$$

$$= \frac{250 \times 1607 \times 2}{250 \times 80 \times 80} \quad Y_{10} = 4.00 + (16) \times 10/24.1627 = 10.622$$

$$= 24.1627 \quad Y_{5} = 4.00 + (16) \times 5/24.1627 = 77.311$$

$$Y_{2.5} = 4.00 + (16) \times 2.5/24.1627 = 5.655$$

$$Y_{0} = 4.00 + (16) \times 0/24.1627 = 4.000$$

*Actual Applied Value

% Error = $\frac{UUT \text{ Reading} - AAV \times 100}{\text{Span}}$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FQ 300
 Cal Date May 07/14
 Due Date May 07/15
 Cal Freq Yearly
 Location Thamesford Backwash
 Description Flow Integrator
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A00 44928
 Accuracy 1%
 Range 0 - 250.0 GPM (US); 0 - 250.0 PPM
 Size 80 mm or 3"
 GKL 2.0000

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT US GPM	INPUT SIM Y	OUTPUT*AAV Gallons	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0	0.00	0.0	0.00	0.00	0.00	0.00
103.47	10.00	103.47	103.25	103.25	-0.09	-0.09
206.94	20.00	206.94	206.51	206.51	-0.17	-0.17

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	As Found	577825814	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	As Left	<u>577825447</u>	
		Difference	367	
Fail:	Fail:			

CERTIFIED BY:  CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIT 04
 Cal Date May 07/14
 Due Date May 07/15
 Cal Freq Yearly
 Location Effluent Flow
 Description Flow Indicating Transmitter
 Manufacturer Milltronics
 Model Multiranger+
 Serial #
 Accuracy 1%
 Range 0 - 1700 GPM (US)
 Head Span 0 - 17.65" WC
 ISCO Tables Pg 316
 6" Parshall Flume
 Empty Dist. 25.25"

MEASURING EQUIPMENT

Manufacturer Additel Gauge Bd
 Model ADT 222A
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01%

INPUT " WC	Ft WC	OUTPUT*AAV US GPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.000000	0.00	0.0	0.0	0.00	0.00
7.50	0.625000	439.94	438.1	438.1	-0.11	-0.11
8.85	0.737500	571.44	570.9	570.9	-0.03	-0.03
10.40	0.866667	737.42	735.4	735.4	-0.12	-0.12
12.80	1.066667	1023.75	1023.0	1023.0	-0.04	-0.04
17.6450	1.470417	1700.05				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FQ 04
Cal Date May 07/14
Due Date May 07/15
Cal Freq Yearly
Location Effluent Flow
Description Flow Integrator
Manufacturer Milltronics
Model Multiranger+
Serial #
Accuracy 1%
Range 0 - 1700 GPM (US)
Head Span 0 - 17.65" WC

MEASURING EQUIPMENT

Manufacturer NexXTech
Model 09A10
Serial # 6315002
Cal Reference
Traceability NIST
Accuracy .0001

INPUT US GPM	%	OUTPUT*AAV USGPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.0		0.0	0.0	0.0	0.00	0.00
241.0		241.0	243.0	243.0	0.12	0.12
570.9		570.9	575.9	575.9	0.29	0.29
735.4		735.4	736.8	736.8	0.08	0.08
1023.0		1023.0	1024.0	1024.0	0.06	0.06
1700.0		1700.0				
		As Found	81899229			
		As Left	<u>81890000</u>			
		Difference	9229			

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	
Fail:	Fail:	

CERTIFIED BY:



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UNIT UNDER TEST (UUT)

Tag # FI 04 Scada
 Cal Date May 07/14
 Due Date May 07/15
 Cal Freq Yearly
 Location Effluent Flow
 Description Flow Indicator
 Manufacturer Allen Bradley
 Model 5/11
 Serial #
 Accuracy 1%
 Range 0 - 1700 US GPM

MEASURING EQUIPMENT

Manufacturer Additel
 Model ADT 222A
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01%

INPUT mA	%	OUTPUT*AAV US GPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.0	0	0	0.00	0.00
12.000		850.0	860	860	0.59	0.59
16.000		1275.0	1280	1280	0.29	0.29
20.000		1700.0	1700	1700	0.00	0.00

*Actual Applied Value

$$\% \text{ Error} = \frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

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City/Town Thamesford ON
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Our Job # B13 8527

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E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 04
Cal Date May 07/14
Due Date May 07/15
Cal Freq Yearly
Location Effluent Flow
Description Flow Element
Manufacturer
Model
Serial #
Accuracy 3%
Range 0 - 1700 GPM (US)
0 - 17.65" WC

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Due Date
Cal Reference
Traceability
Accuracy
Range

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	No	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7		Check transmitter location
8	✓	Check for turbulence.
9		Description of measuring element: 6" Parshall Flume
		Comments:

CERTIFIED BY: _____

R Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIT/FQ 122 CSF
 Cal Date Apr. 25/14
 Due Date Apr. 25/15
 Cal Freq Yearly
 Location
 Description Flow Indicating Transmitter
 Manufacturer Fuji
 Model FLVS 1213-OYYY
 Serial # Q4M8867T
 Accuracy 2%
 Range 0 - 110.0 L/s; 0 - 6.00 PPM

MEASURING EQUIPMENT

Manufacturer Additel E + H
 Model ADT 222A Prosonic 93
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01%

Prosonic Parameters

Pipe Dia 281.9 mm
 Pipe Mat Ductile Iron
 Pipe Thickness 12 mm
 Traverse # 2X
 Sen Dist. H42
 Mortar Liner 10 mm

INPUT L/s	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.00	0.0	0.0	0.00	0.00
26.960		26.960	25.440	25.440	-1.38	-1.38

Totalizer L/s	FQ 122	m ³				
24.30		1.4580	1.467	1.467	0.15	0.15
100.00		6.0000				
		Fuji	Prosonic			
		As Found	2681184	As Found	1288	
		As Left	<u>2680860</u>	As Left	<u>978</u>	
		Difference	324	Difference	310	

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{AAV}} \times 100$
 Span

Test Unit Results		Fuji	04/28/14
AS FOUND	AS LEFT	As Found	2680860
Pass: ✓	Pass: ✓	As Left	2673466
		Difference	7394
		Prosonic	
Fail:	Fail:	As Found	978
		As Left	0
		Difference	978

TECHNICIAN'S NOTES
 Large error. Left Prosonic for weekend then check.
 Checked Mon. Failed. Ran all day. Rechecked. Output
 ok. Fuji & Prosonic test 2:00 PM

CERTIFIED BY:  CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Thamesford ON
 Customer PO
 Our Job # B13 8527

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 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT/FQ 122 CSF
 Cal Date Apr. 28/14
 Due Date Apr. 28/15
 Cal Freq Yearly
 Location
 Description Flow Indicating Transmitter
 Manufacturer Fuji
 Model FLVS 1213-OYYY
 Serial # Q4M8867T
 Accuracy 2%
 Range 0 - 110.0 L/s; 0 - 6.00 PPM

MEASURING EQUIPMENT

Manufacturer Additel E + H
 Model ADT 222A Prosonic 93
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01%

Prosonic Parameters

Pipe Dia 281.9 mm
 Pipe Mat Ductile Iron
 Pipe Thickness 12 mm
 Traverse # 2X
 Sen Dist. H42
 Mortar Liner 10 mm?

INPUT L/s	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
--------------	---	-------------------	-------------------------	------------------------	---------------------	--------------------

0.00		0.00	0.0	0.0	0.00	0.00
26.960		26.960	25.440	25.440	-1.38	-1.38

Totalizer L/s	FQ 122	m ³				
21.00		1.2600	1.262	1.262	0.03	0.03

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

<u>Test Unit Results</u>		Fuji	04/28/14
AS FOUND	AS LEFT	As Found	2680860
Pass: ✓	Pass: ✓	As Left	2673466
		Difference	7394
		Prosonic	
		As Found	978
Fail:	Fail:	As Left	0
		Difference	978

TECHNICIAN'S NOTES

CERTIFIED BY: _____

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Thamesford ON
Customer PO
Our Job # B13 8527

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rriinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT/FQ 112 Municipal
Cal Date Apr. 28/14
Due Date Apr. 28/15
Cal Freq Yearly
Location Raw Water Flow
Description Flow Indicating Transmitter
Manufacturer Fuji
Model FLVS 1213-OYYY
Serial # Q4M8867T
Accuracy 2%
Range 0 - 110.0 L/s

MEASURING EQUIPMENT

Manufacturer Additel E + H
Model ADT 222A Prosonic 93
Serial # 317A11010009
Cal Reference Lakeside
Traceability NIST
Accuracy 0.01% .10%

Prosonic Parameters

Pipe Dia 281.9 mm
Pipe Mat Ductile Iron
Pipe Thickness 12 mm
Traverse # 2X
Sen Dist. H 42
Mortar Liner 10 mm

INPUT L/s	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.00	0.0	0.0	0.00	0.00
12.850		12.850	12.860	12.860	0.01	0.01
		mA				
0.00		4.0000	3.9970	3.9970	-0.02	-0.02
12.86		5.8705	5.9010	5.9010	0.19	0.19
		Totalizer				
		m³				
10.75		0.6450	0.651	0.651	0.10	0.10
110.00		6.6000				

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:  CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FI 112 Municipal Scada
Cal Date Apr. 28/14
Due Date Apr. 28/15
Cal Freq Yearly
Location Raw Water Flow Municipal
Description Flow Indicator
Manufacturer Allen Bradley & computer
Model 5/11
Serial #
Accuracy 1%
Range 0 - 110.0 L/s

MEASURING EQUIPMENT

Manufacturer Additel
Model ADT 222A
Serial # 317A11010009
Cal Reference Lakeside
Traceability NIST
Accuracy 0.01%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.0	0.0	0.0	0.00	0.00
8.000		27.5	27.5	27.5	0.00	0.00
12.000		55.0	55.0	55.0	0.00	0.00
16.000		82.5	82.4	82.4	-0.09	-0.09
20.000		110.0	109.9	109.9	-0.09	-0.09

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY: _____

R. Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FIT/FQ 202 Clarifier Influent
 Cal Date May 07/14
 Due Date May 07/15
 Cal Freq Yearly
 Location Influent Flow sand Filter #2
 Description Flow Indicating Transmitter
 Manufacturer Fuji
 Model FLVS 1213-OYYY
 Serial # Q4M8864T
 Accuracy 2%
 Range 0 - 200.00 L/s

MEASURING EQUIPMENT

Manufacturer Additel E + H
 Model ADT 222A Prosonic 93
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01% .10%

Prosonic Parameters

Pipe Dia 334.00 mm
 Pipe Mat Ductile Iron
 Pipe Thickness 6.5 mm
 Traverse # 2X
 Sen Dist. E 43
 Mortar Liner 6 mm

INPUT L/s	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Prosonic 93						
0.000		0.000	0.000	0.000	0.00	0.00
15.780		15.780	15.800	15.800	0.01	0.01
mA						
0.00		4.000	4.000	4.000	0.00	0.00
15.78		5.262	5.230	5.230	-0.20	-0.20
Totalizer L/s FQ 202 m³						
14.23		0.8538	0.869	0.869	0.13	0.13
200.00		12.0000				
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$	

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FI 202 Scada
 Cal Date May 07/14
 Due Date May 07/15
 Cal Freq Yearly
 Location Influent Flow sand Filter #2
 Description Flow Indicator
 Manufacturer Allen Bradley & computer
 Model 5/11
 Serial #
 Accuracy 1%
 Range 0 - 200.00 L/s

MEASURING EQUIPMENT

Manufacturer Additel
 Model ADT 222A
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.0	0.1	0.1	0.05	0.05
8.000		50.0	50.1	50.1	0.05	0.05
12.000		100.0	100.0	100.0	0.00	0.00
16.000		150.0	149.9	149.9	-0.05	-0.05
20.000		200.0	199.9	199.9	-0.05	-0.05

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

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UNIT UNDER TEST (UUT)

Tag # FIT 413 WAS
 Cal Date Apr. 28/14
 Due Date Apr. 28/15
 Cal Freq Yearly
 Location
 Description Flow Indicating Transmitter
 Manufacturer Fuji
 Model FLVS 1213-OYYY
 Serial # Q6C2985T
 Accuracy 2%
 Range 0 - 100.0 L/s

MEASURING EQUIPMENT

Manufacturer Additel E + H
 Model ADT 222A Prosonic 93
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01% .10%

Prosonic Parameters

Pipe Dia 122.682 mm
 Pipe Mat Ductile Iron
 Pipe Thickness 18.5 mm
 Traverse # 2X
 Sen Dist. H 30
 Mortar Liner 10 mm

INPUT L/s	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Prosonic 93						
0.000		0.000	0.000	0.000	0.00	0.00
7.080		7.080	7.099	7.099	0.02	0.02
mA						
0.00		4.0000	3.9990	3.9990	-0.01	-0.01
7.08		5.1328	5.1260	5.1260	-0.04	-0.04

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

L/s	m ³	Meter Acc	Meter Acc
8.6630	0.520	0.525	0.525
*Actual Applied Value		Meter Accuracy =	$\frac{\text{Meter Registration}}{\text{Test Meter Registration}} \times 100$
		(%)	

Test Unit Results

As Found 125131
 As Left 125131
 Difference 0

AS FOUND	AS LEFT
Pass:	Pass:
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FI 413 WAS Scada
 Cal Date Apr. 28/14
 Due Date Apr. 28/15
 Cal Freq Yearly
 Location WAS new building
 Description Flow Indicator
 Manufacturer Allen Bradley & computer
 Model 5/11
 Serial #
 Accuracy 1%
 Range 0 - 100.0 L/s

MEASURING EQUIPMENT

Manufacturer Additel
 Model ADT 222A
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.0	0.0	0.0	0.00	0.00
8.000		25.0	25.0	25.0	0.00	0.00
12.000		50.0	50.0	50.0	0.00	0.00
16.000		75.0	74.9	74.9	-0.09	-0.09
20.000		100.0	99.9	99.9	-0.09	-0.09

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

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UNIT UNDER TEST (UUT)

Tag # FIT/FQ 412 RAS
 Cal Date Apr. 28/14
 Due Date Apr. 28/15
 Cal Freq Yearly
 Location RAS
 Description Flow Indicating Transmitter
 Manufacturer Fuji
 Model FLVS 1213-OYYY
 Serial # Q4M8867T
 Accuracy 2%
 Range 0 - 100.0 L/s; 0 - 6.00 PPM

MEASURING EQUIPMENT

Manufacturer Additel E + H
 Model ADT 222A Prosonic 93
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01% .10%

Prosonic Parameters

Pipe Dia 281.9 mm
 Pipe Mat Ductile Iron
 Pipe Thickness 12 mm = 22 mm
 Traverse # 2X
 Sen Dist. H 42
 Mortar Liner 10 mm

INPUT L/s	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Prosonic 93						
0.00		0.00	0.000	0.000	0.00	0.00
25.97		25.97	25.590	25.590	-0.38	-0.38
100.00		100.00				
mA						
0.00		4.0000	3.9950	3.9950	-0.03	-0.03
18.17		6.9067	6.9090	6.9090	0.01	0.01
Totalizer L/s		m³				
19.00		1.1400	1.132	1.132	-0.13	-0.13
100.00		6.0000				
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{AAV}} \times 100$	
					Span	

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY: R Thachuk CET, CCST Level III Technician

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 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FI 412 RAS Scada
 Cal Date May 07/14
 Due Date May 07/15
 Cal Freq Yearly
 Location New building
 Description Flow Indicator
 Manufacturer Allen Bradley & computer
 Model 5/11
 Serial #
 Accuracy 1%
 Range 0 - 100.0 L/s

MEASURING EQUIPMENT

Manufacturer Additel
 Model ADT 222A
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.0	0.0	0.0	0.00	0.00
8.000		25.0	25.0	25.0	0.00	0.00
12.000		50.0	50.0	50.0	0.00	0.00
16.000		75.0	74.9	74.9	-0.10	-0.10
20.000		100.0	99.9	99.9	-0.10	-0.10

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

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E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 204 RAS
Cal Date May 07/14
Due Date
Cal Freq Yearly
Location RAS Flow
Description Flow Indicating Transmitter
Manufacturer Fuji
Model FLVS 1213-OYYY
Serial #
Accuracy 2%
Range 0 - 100.0 L/s

MEASURING EQUIPMENT

Manufacturer Additel E + H
Model ADT 222A Prosonic 93
Serial # 317A11010009
Cal Reference Lakeside
Traceability NIST
Accuracy 0.01% .10%

Prosonic Parameters

Pipe Dia 115.57 mm
Pipe Mat Ductile Iron
Pipe Thickness 8.59 mm
Traverse # 2X
Sen Dist. F 27
Mortar Liner no

INPUT L/s	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
Prosonic 93						
0.000		0.000	0.000	0.000	0.00	0.00
100.00		100.00				
mA						
0.00		4.000	4.000	4.000	0.00	0.00
100.00		20.000				
Totalizer						
m³						
0.00		0.0000			0.00	0.00
100.00		6.0000				
*Actual Applied Value					% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$	

Test Unit Results

AS FOUND	AS LEFT
Pass:	Pass:
Fail: x	Fail: x

TECHNICIAN'S NOTES
Failed calibrators

CERTIFIED BY:



CET, CCST Level III Technician

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UNIT UNDER TEST (UUT)

Tag # FI 204 Scada
 Cal Date May 07/14
 Due Date May 07/15
 Cal Freq Yearly
 Location RAS Flow Old Plant
 Description Flow Indicator
 Manufacturer Allen Bradley & computer
 Model 5/11
 Serial #
 Accuracy 1%
 Range 0 - 100.0 L/s

MEASURING EQUIPMENT

Manufacturer Additel
 Model ADT 222A
 Serial # 317A11010009
 Cal Reference Lakeside
 Traceability NIST
 Accuracy 0.01%

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.0	0.0	0.0	0.00	0.00
8.000		25.0	25.0	25.0	0.00	0.00
12.000		50.0	50.0	50.0	0.00	0.00
16.000		75.0	74.9	74.9	-0.10	-0.10
20.000		100.0	99.9	99.9	-0.10	-0.10

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

Plant Maintenance Records

ID	Descriptic	Projected Start	Shop	Instructions
6049	Replace	05/02/2014	250700	Replace section of air line to complete mix . Line has rotted and air is leaking profusly.
6403	Inspect	10/01/2014	250700	Operate return pumps at old plant backflush lines and check for blockage and why pumps are airlocking
6404	Repair	10/01/2014	250700	Blower Amperage is low check intake filter on blower and clean if needed
6405	Replace	10/01/2014	250700	Replace CSF wetwell pump #104 remove and replace with new pump.
6406	Repair	10/01/2014	250700	Pump down final clarifer #2 cross collector Investagate why shear pin broke on drive
6428	Repair	17/01/2014	250700	Repair old plant clarifer arm
6491	Replace	14/02/2014	250700	Change diaphram on alum pump flash mixer
6492	Repair	17/02/2014	250700	Work on clogged drain for trailer with contractor
6517	Replace	21/02/2014	250700	Fabricate and install new Cl2 injuectors manifold
6518	Replace	21/02/2014	250700	
6519	Repair	21/02/2014	250700	Install new filter on 200 hp Blower (north) and change oil
6539	Repair	02/03/2014	250700	Inspect CL2 injectors and Clean injectors test pumps for chemical delivery
6559	Repair	06/03/2014	250700	Inspect and align coupling 200 hp blower
6560	Inspect	03/03/2014	250700	Inspect Ras pumps why they are not pumping ordered new kits impeller and seals
6581	Replace	25/03/2014	250700	Remove Return pump for total rebuild for old plant clarifer new impeller and bearings
6582	Replace	24/03/2014	250700	Replace motor on bi sulphite carrier water pump
6608	Repair	24/03/2014	250700	Install 2 inch valve at clarifer valve froze and broke
6625	Repair	31/03/2014	250700	Repair davit and replace pendant and install new 1/4 in cable with proper load hook as rated by inpection report from Tradesafe
6626	Replace	31/03/2014	250700	Replace defective whel on hand pallet cart as per lifting inpection requirements by tradesafe LTD.
6627	Repair	04/04/2014	250700	Take heater apart for spare parts
6690	Lubricate	21/04/2014	250700	add oil to new plant clarifer
6691	Repair	21/04/2014	250700	Clean old plant sandfilter infra- red eye controls.
6703	Replace	21/04/2014	250700	Fabricate and install new bar screen
6767	Repair	16/05/2014	250700	Remove rags from pump 403 and inspect 404 for electrical problems
6768	Repair	16/05/2014	250700	Remove Return Activated Pump and electrical problems
6787	Replace	23/05/2014	250700	install new brushes replace springs and broke n brackets on inner weir ring
6788	Repair	23/05/2014	250700	Replace rotten valve stem snd support in new plant valve chamber
6789	Replace	23/05/2014	250700	Replace grating in scum room at WWTP
6832	Repair	02/06/2014	250700	Clean CL2 injector
6923	Repair	04/07/2014	250700	Inspect puimp 104 CSF motor out on overload check for obstruction in impeller Advise foreman and put back in service
6955	Replace	18/07/2014	250700	Install new latch on entrance gate
6956	Replace	07/07/2014	250700	Install new grating on complete mix walkway
6957	Repair	11/07/2014	250700	Replace seal shaft on North 200 hp blower inlet side
6976	Replace	18/07/2014	250700	Install new fill valves for SBS and CL2 line delivery system
7055	Replace	15/08/2014	250700	Tighten leaky cl2 fill valve
7056	Repair	11/08/2014	250700	Repair alum pump at old plant investagate why pump failure occured.
7057	Repair	11/08/2014	250700	Investagate Ras pump # 2 check for possible suction blockage
7114	Repair	05/09/2014	250700	CL2 injector plugged on Cl2 pump clean and put back in service
7115	Repair	05/09/2014	250700	200 hp blower inspect discharge and bearing lubricator change lubricator if needed
7116	Repair	05/09/2014	250700	Repair scum room piping at diaghrram pump
7117	Repair	05/09/2014	250700	CSF wet well 103,104 pumps assist contractor to make connections in new electrical panel
7118	Replace	05/09/2014	250700	Repair old plant sandfilter vacuum hood leaking air
7240	Repair	20/10/2014	250700	Replace 3 inch hose on primary transfer pump
7323	Replace	14/11/2014	250700	Replace motor on barscreen and re-install test operation
7324	Repair	14/11/2014	250700	Repair New plant sandfilter door latches lubricate as needed
7326	Repair	21/11/2014	250700	Replace oil seal and housing on 200 hp blower replair shaft and test run once work is complete
7327	Replace	21/11/2014	250700	Replace SBS south pump with new prominent series

7365 Repair	01/12/2014	250700 Repair Cl2 pyump leak at top of vent pipe
7366 Repair	01/12/2014	250700 Inspect / repair sonar on scum system at new clarifer. Advise Foreman if floats are operational as back up
7367 Lubricate	01/12/2014	250700 lubricate door locks at new plant sandfilter building
7368 Replace	01/12/2014	250700 Replace defective aluim pump
7473 Repair	15/12/2014	250700 Remove motor from crane for barscreen and reinstall once motor is repaired
7542 Repair	02/01/2015	250700 repair primary 3 inch digester transfer line repair 1 inch ball valve inspection port
7543 Replace	02/01/2015	250700 Install new blower 125 hp Aerezen Remove existing 40 hp blower and all work that pertains to the installation use this work order as per Scott Cuthbert.
7565 Repair	09/01/2015	250700 Repair air leak on vaccuun hood on old plant sandfilter



Public Works

P. O. Box 1614, 21 Reeve St., Woodstock, Ontario N4S 7Y3

Phone: 519-539-9800 Fax: 519-421-4711

Website: www.oxfordcounty.ca

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 Year-End Report, Tavistock Wastewater Treatment Plant (WWTP)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) # 7789-8AKJL5.

I trust this report fulfills the intent of the ECA reporting requirements. If there are any questions, please contact me.

Yours truly,

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

The Tavistock WWTP provided effective wastewater treatment in 2014 and all effluent concentration limits, as specified by the ECA, were met.

The annual average daily flow in 2014 was 1,621 m³/d, which represents 64.2% of the rated capacity of 2,525 m³/d.

Plant Description

The Tavistock WWTP (Figure 1) consists of 3 aerated lagoon cells, 1 polishing pond and an Intermittent Sand Filter (ISF). The first three cells are equipped with Mat Aerators, and there are an additional six 15 hp aspirating surface aerators in Cell 1 to provide the necessary dissolved oxygen for the lagoons.

There is also the provision for continuous aluminum sulphate addition for phosphorus removal. The wastewater is dosed with aluminum sulphate as it enters Cell 1 and as the flow enters Cell 2.

Effluent from Cell 1 overflows to Cell 2, then into Cell 3 and/or Cell 4 where it is pumped through the filter beds and/or stored prior to discharge.

Oxford County operates the facility, utilizing the staff located at the Woodstock WWTP.



Figure 1 Aerial view of Tavistock WWTP

Plant Specifications

Facilities - Four Lagoon Cells and an Intermittent Sand Filter
Design Capacity - 2,525 m³/day
Average Daily Flow - 1621 m³/day (2014)
Receiving Stream - Hohner Drain (eventually to Thames River)
Plant Classification - WWT – I
ECA #7789-8AKJL5

Effluent requirements:

CBOD₅ 15.0 mg/L
Suspended Solids 15.0 mg/L
Total Phosphorous Summer (May-Nov.) 0.5 mg/L
Winter (Dec.-Apr.) 0.8 mg/L
Dissolved Oxygen >4.0

Free Ammonia

(Jan.)	7.0 mg/L	(Feb)	10.0 mg/L
(Mar.)	8.5 mg/L	(Apr.)	8.0 mg/L
(May -Nov.)	1.0 mg/L	(Dec.)	3.0 mg/L

Effluent Quality Assurance and Control Measures

Sampling Procedures

Raw sewage is sampled a minimum of once monthly for CBOD₅, suspended solids, TKN, total phosphorous, pH and temperature.

Automatic composite samplers are used to collect raw sewage samples from Chamber 3 as the flow enters Cell 1. Automated composite samples are also taken at the same time from a major cheese processor in Tavistock. The cheese company can discharge significant loadings to the Tavistock Lagoon system and is under a surcharge agreement with Oxford County.

Laboratory and Field Testing

Grab samples of final effluent are taken weekly during effluent discharge and tested for CBOD₅, suspended solids, total phosphorous, pH, temperature, dissolved oxygen, nitrate nitrogen, nitrite nitrogen and ammonia nitrogen. Un-ionized ammonia, BOD₅ and E.Coli were also included under the ECA amendment. SGS Lakefield Research Ltd. performs all sample analyses with the exception of pH, temperature, and dissolved oxygen which are measured in the field. A detailed summary of monthly raw sewage and final effluent analysis is provided in this report in Exhibit 1.

Summary and Interpretation of Monitoring Data

Flows

The annual average daily influent flow was 1,621 m³/d. This represents 64.2% of the rated capacity of 2,525 m³/d included in ECA #7789-8AKJL5. The daily maximum flow for 2014 was 4,879 m³/day.

Plant treated effluent volume of 591,258 m³ was released in 2014.

Raw Sewage Quality

Table 1 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 1,621 m³/day.

Table 1

Parameter	Concentration mg/L	Loading kg/day
CBOD ₅	280	454
SS	326	528
TKN	36	58
TP	11	17.8

Plant Performance & Effluent Quality

Detailed analytical data of annual and monthly averages are summarized later in the report under Exhibit 1.

Table 2 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA limits for the parameter.

Table 2

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	*ECA Effluent Limits mg/L
CBOD ₅	2.3	3.8	99.2	15
SS	3	8.3	99.1	15
TP	0.09	0.2	99.2	0.5/0.8
Ammonia	0.64	2.9	97	1-10
pH	7.57	7.9	na	6-9.5

* Ammonia, and TP have different limits depending on the time of refer to effluent requirements in the Plant Specifications section of this report

All pH is measured in the effluent by the operator on a minimum weekly basis during discharge. There was no single sample with pH outside of the required range of 6-9.5 in 2014.

The Tavistock WWTP met all the discharge criteria within its ECA in 2014.

Effluent Objectives

Objectives are non-enforceable effluent quality values which the owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

All effluent discharge objectives listed in the ECA were met.

Description of Operating Problems, Bypassing, Spills, Abnormal Events, and Complaints Received

Oxford County requested additional discharge in 2014 for the following reason;

Oxford County entered into a two year agreement with a contractor to remove biosolids from a lagoon (Cell #2) at the Tavistock Lagoons on July 23, 2012. Due to agricultural land availability issues, the Contractor requested an extension until November 30 to remove the remaining biosolids.

In order to accommodate this request, and effectively manage the inventory of wastewater, Oxford County needed relief from the allowable flow rate provided in the ECA for the months of July, August, and September (400 m³/d, 115 m³/d, and 350 m³/d, respectively), to a flow rate matching the daily influent flow of the lagoons (approximately 1,600 m³/d) since Cell #2 was offline, and therefore, its capacity was unavailable for storage.

Effluent quality was extremely good and well below the ECA discharge limits.

On July 28, 2014, Oxford County received the authorization from MOECC to discharge additional volumes. Attached is the letter of permission and the subsequent discharger's report related to this report.

In May, there was a complaint from a neighbour of the lagoon regarding presence of excessive small midge flies. Oxford County Public Health and members of Public Works met and discussed this with the individual at his home and could find no health issue or relationship between the lagoon and the flies at the residence.

There were no bypasses, spills, overflows or abnormal events at the wastewater lagoons in 2014.

There was an overflow of approximately 9 m³ of wastewater from the William Street sewage pumping station on November 19, 2014. The station was being tested to operate on standby generator power and it failed to provide power to the pumps. The Operator in charge was instructed to ensure that the pumps operate during the testing sequence and to investigate subsequent alarms.

This event was reported to the MOECC at the time it occurred.

Maintenance of Works

The operating and maintenance staff from the Woodstock WWTP conducts regularly scheduled maintenance of the plant equipment. Detailed maintenance records for each piece of equipment are kept on-site at the Woodstock Plant. A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

R & R Instrumentation calibrated all flow measuring equipment.

Operations monitoring equipment calibration records are appended to this report.

Tabulation of Biosolids Generated, and Land Applied

The lagoons act as storage for the accumulation of biosolids over time which then must be removed and utilized for their beneficial reuse on agricultural land, usually in a 10-20 year cycle although it may be longer depending on the loadings to the lagoons.

Biosolids were removed from Cell #2 by a contractor, with beneficial reuse on agricultural land used as its method of disposal.

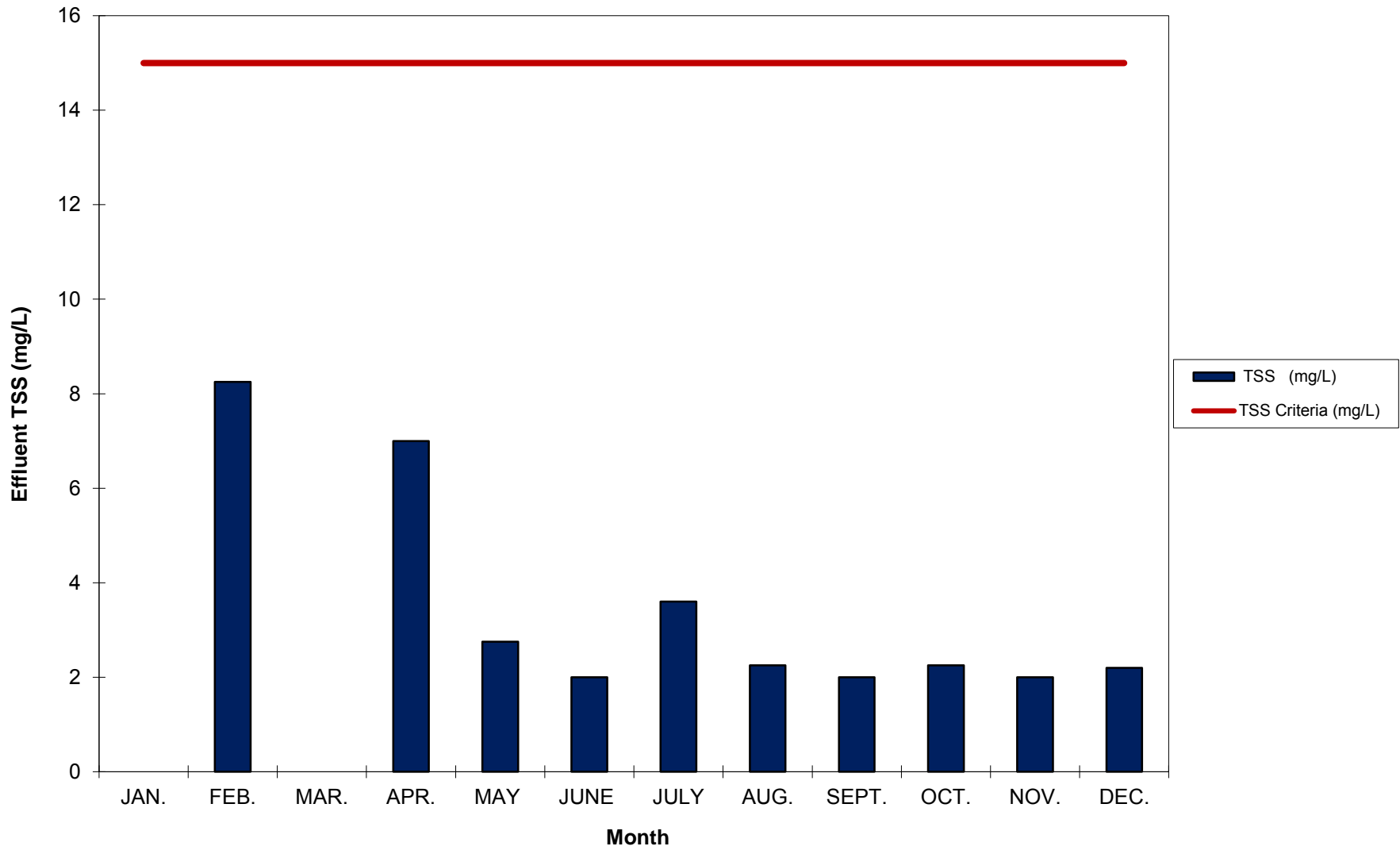
Details of the Biosolids and the land application program are contained in a separate Biosolids Annual Report.

Summary

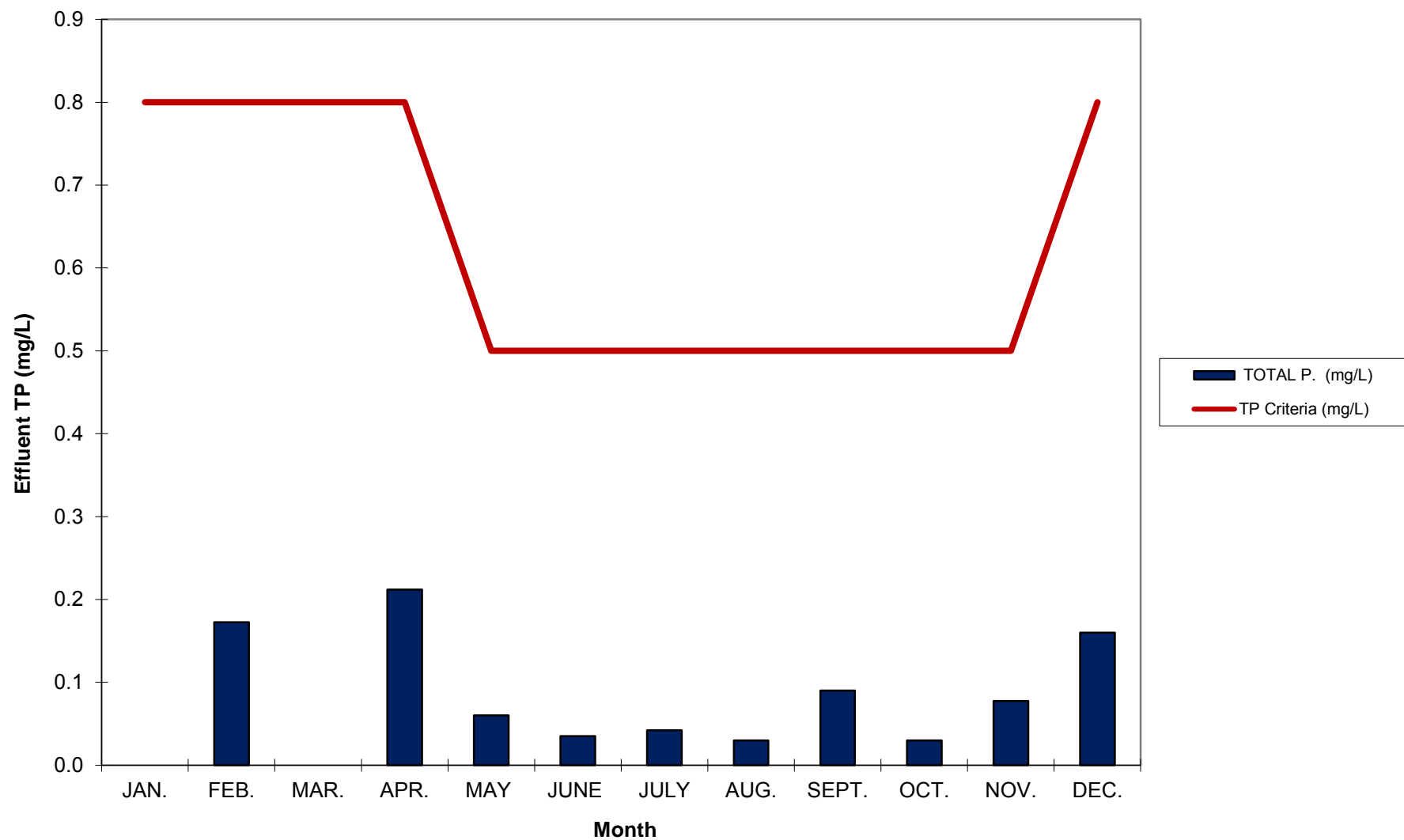
The Tavistock WWTP met all the discharge criteria within its ECA in 2014.

EXHIBIT 1

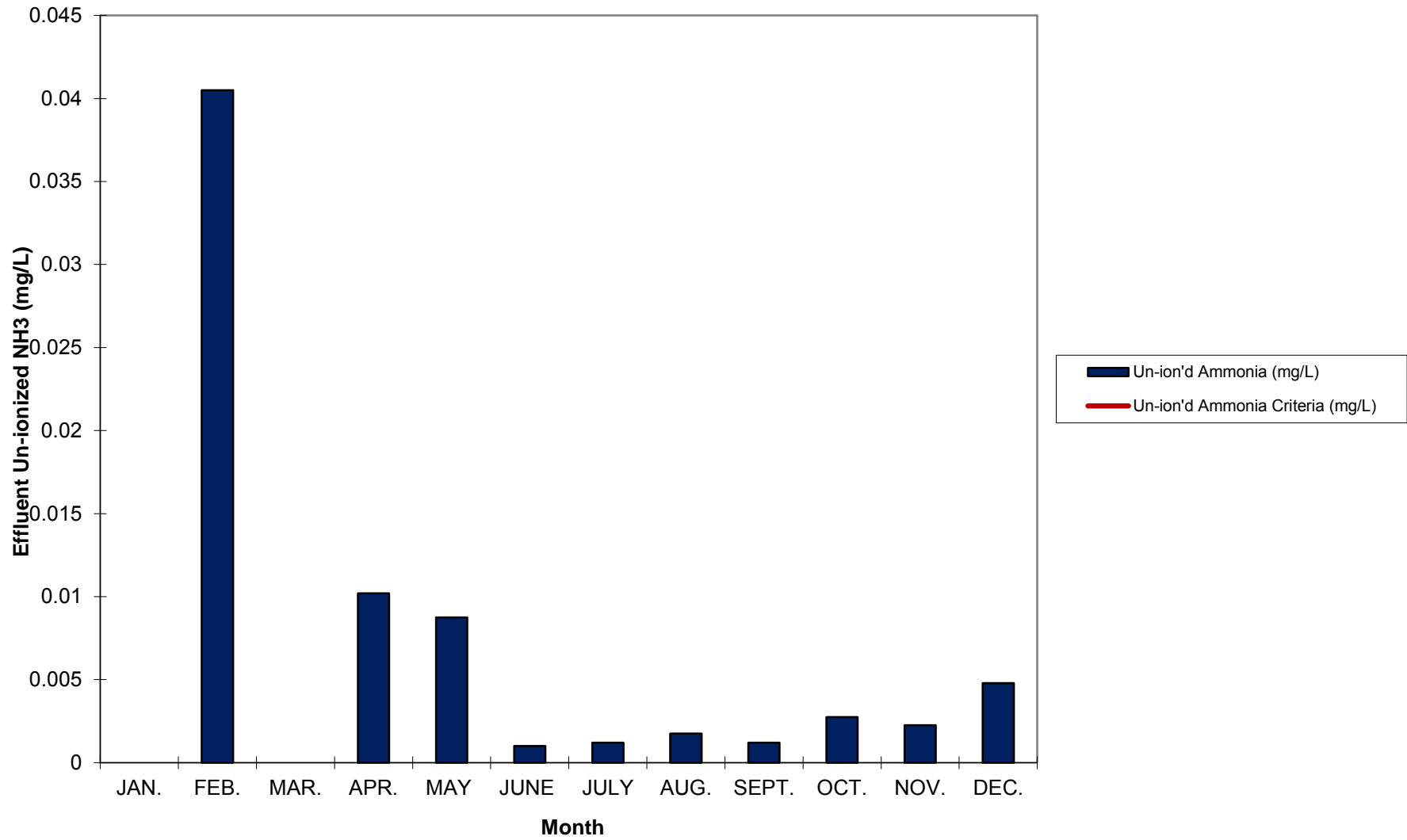
Tavistock WWTP Effluent, Monthly Average TSS (mg/L), 2014



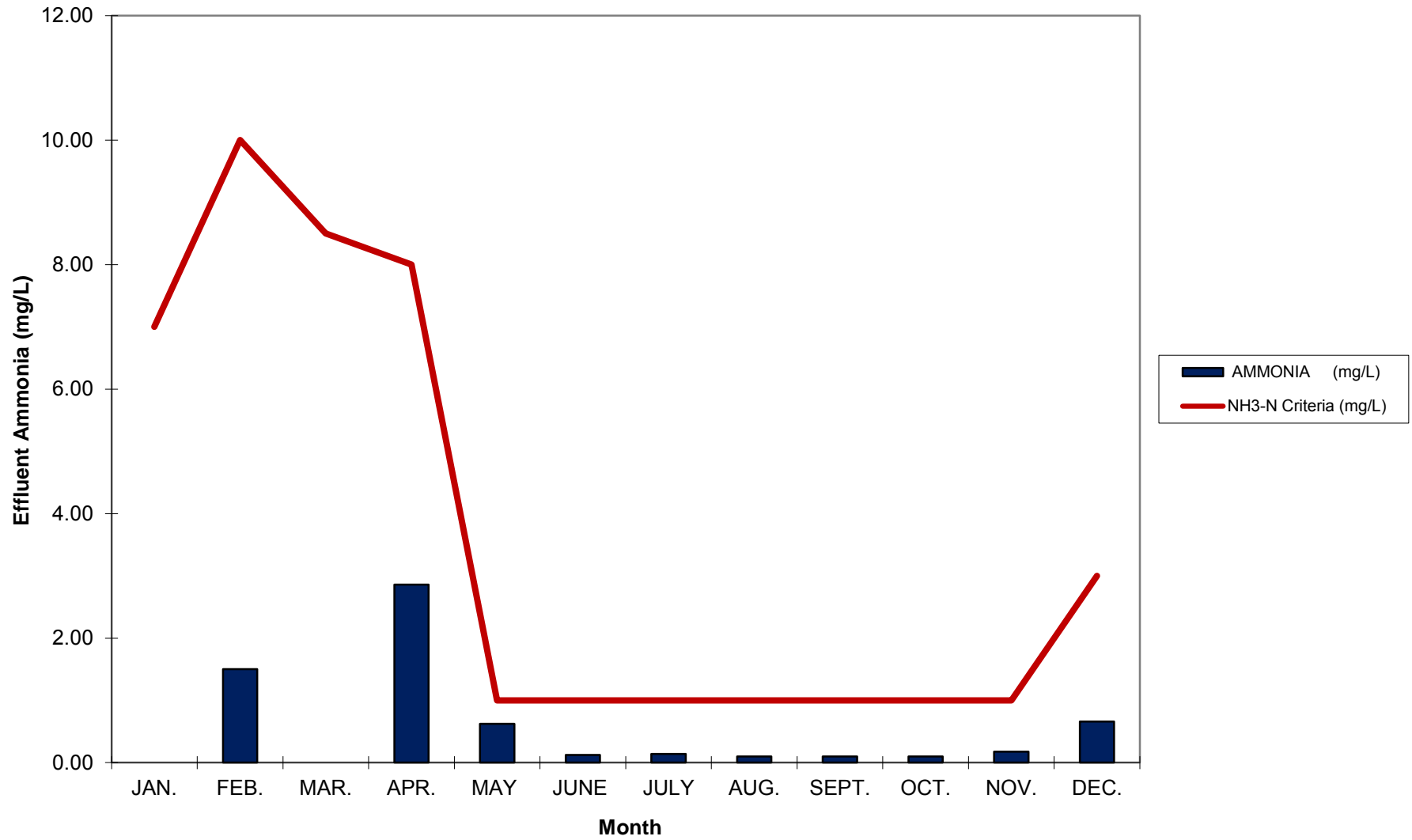
Tavistock WWTP Effluent, Monthly Average TP (mg/L), 2014



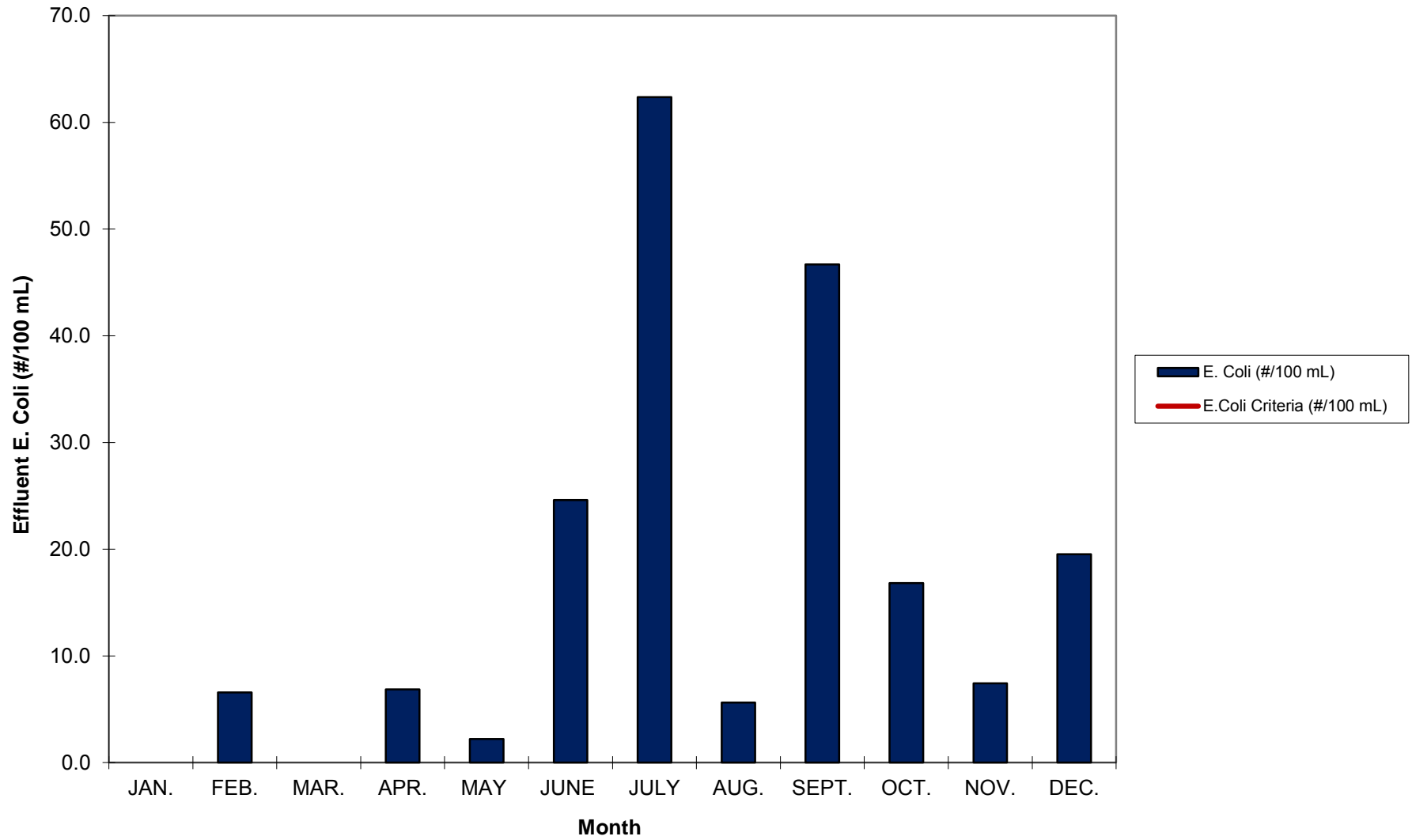
Tavistock WWTP Effluent, Monthly Average Un-ionized Ammonia (mg/L), 2014



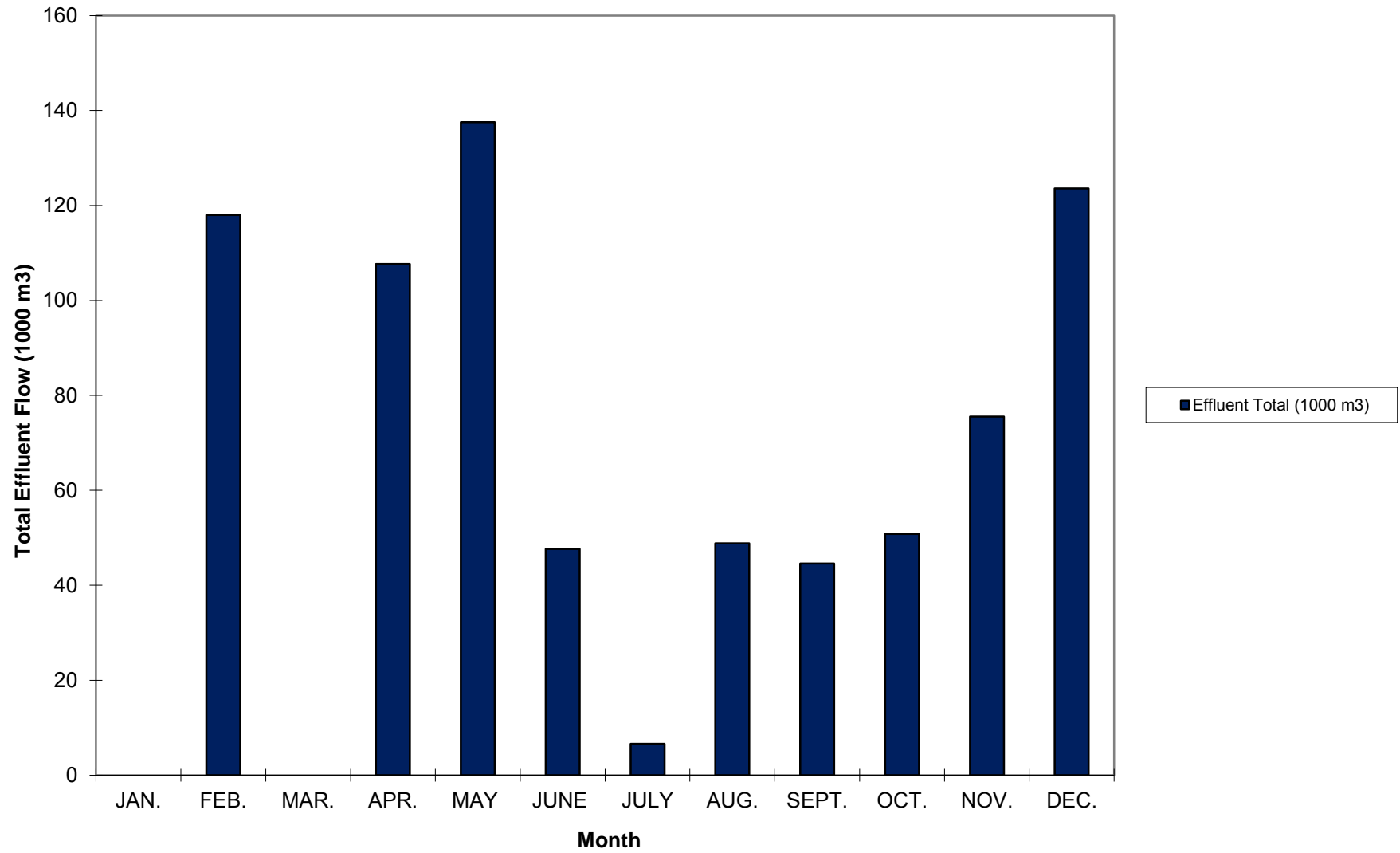
Tavistock WWTP Effluent, Monthly Average Ammonia (mg/L), 2014



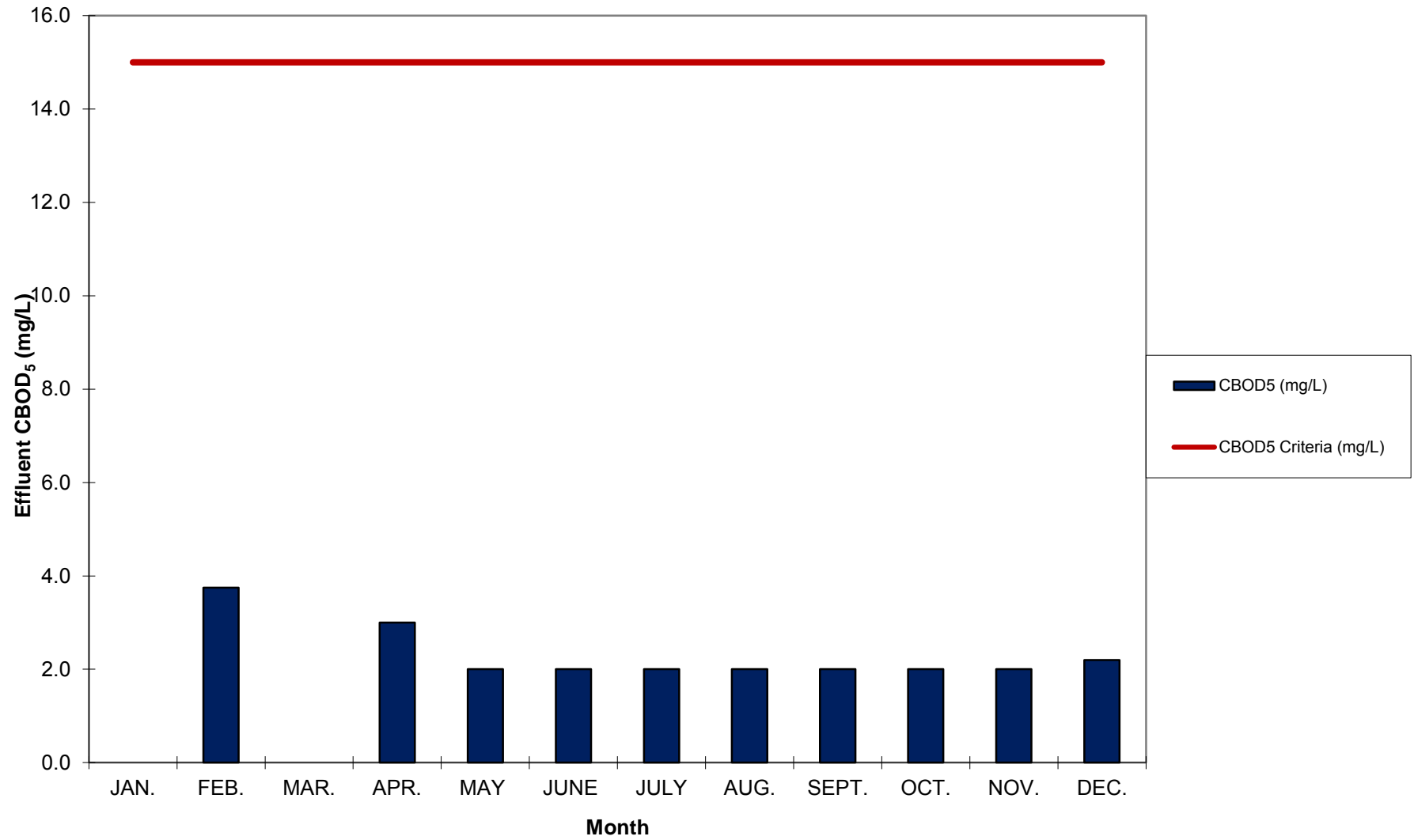
Tavistock WWTP Effluent, Monthly Geometric Mean E.Coli (#/100 mL), 2014



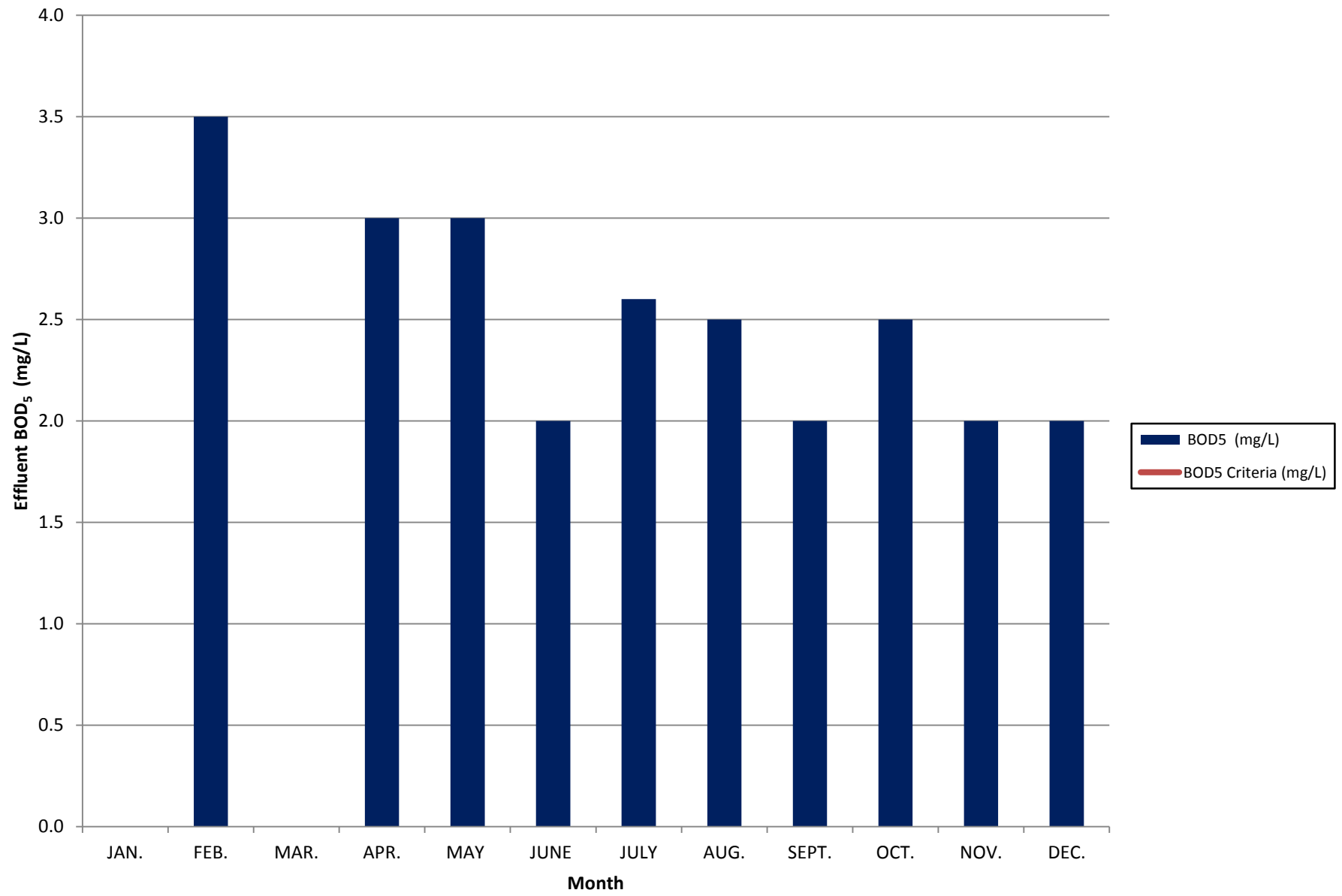
Tavistock WWTP Effluent, Monthly Flow (1000 m³), 2014



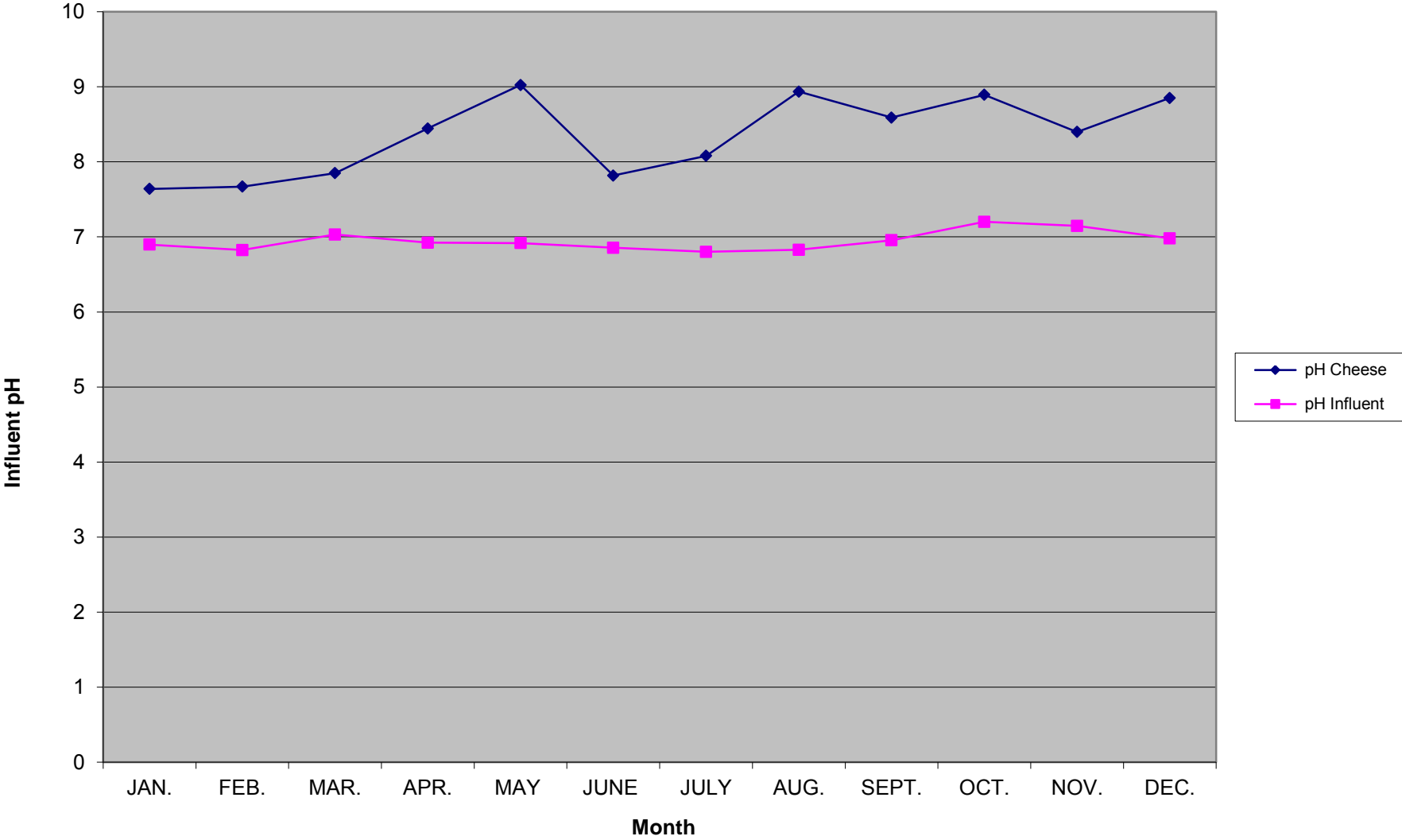
Tavistock Wastewater Effluent, Monthly Average CBOD₅ (mg/L), 2014



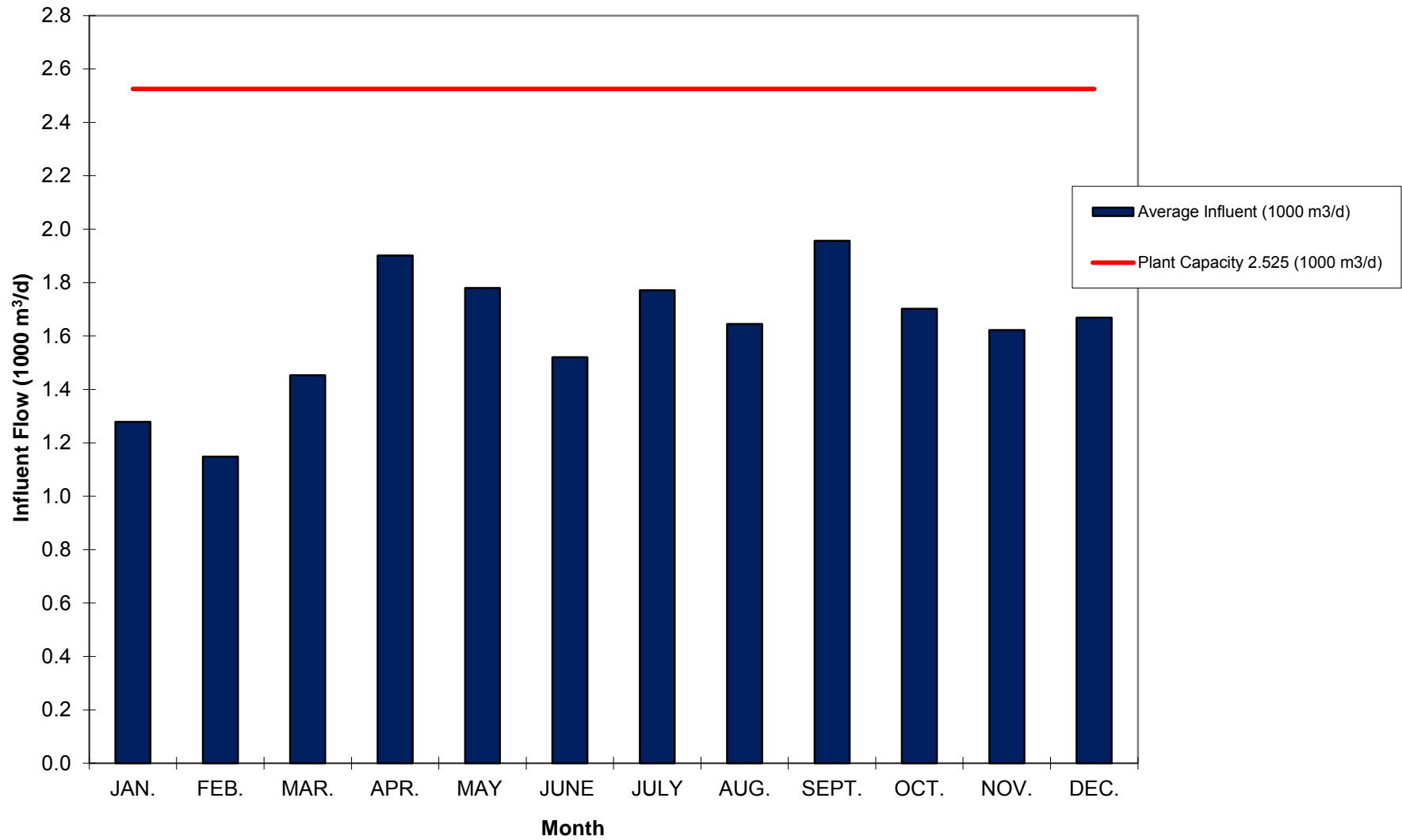
Tavistock WWTP Effluent, Monthly Average BOD₅ (mg/L), 2014



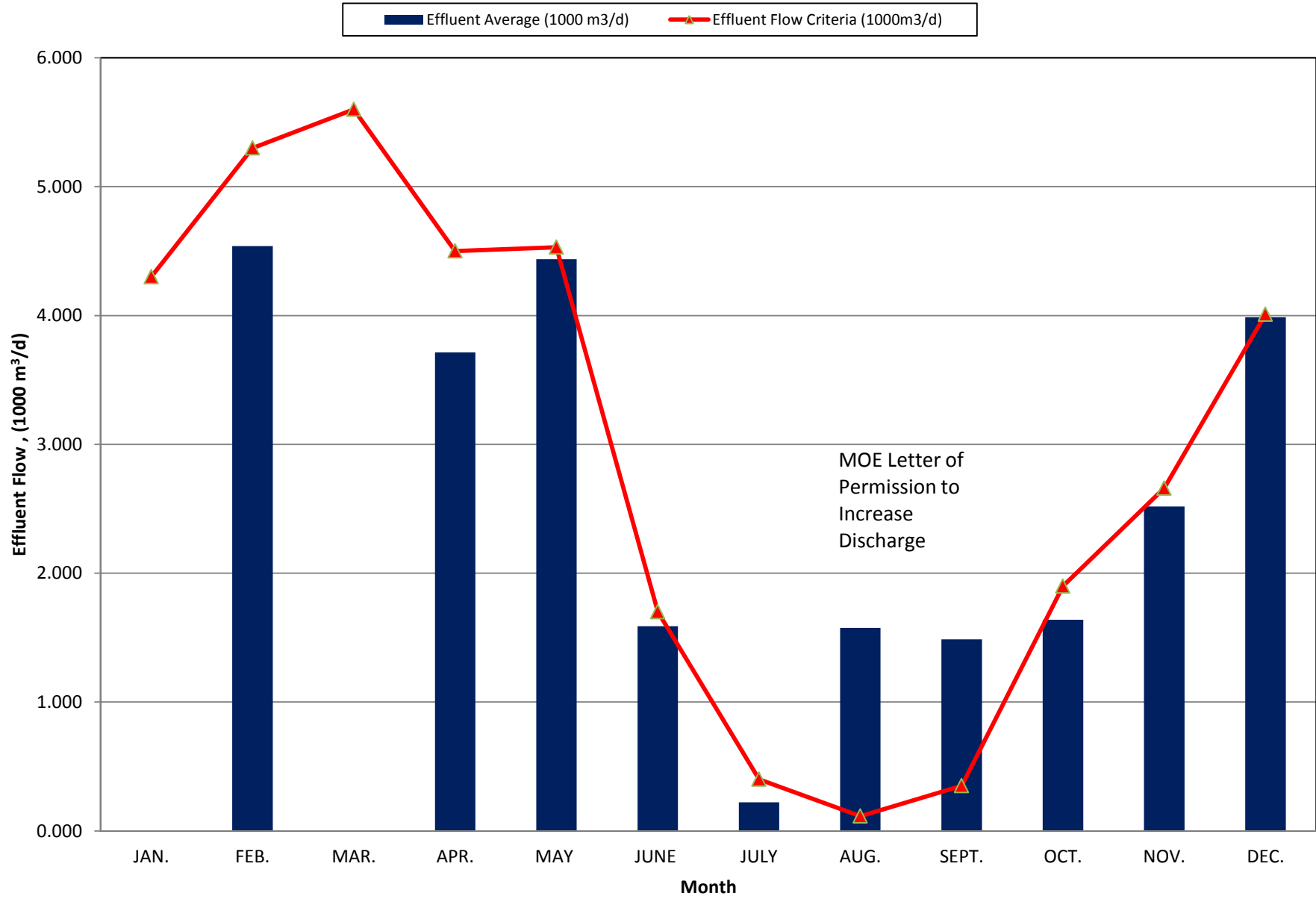
Cheese Plant pH vs Lagoon Influent pH 2014



Tavistock WWTP Influent, Monthly Average Daily Flow (1000 m³/d), 2014



Tavistock WWTP Effluent, Monthly Average Day Flow (1000 m³/d), 2014



Tavistock Influent Data 2014

#8316-6JSJJF
Special Permit
Aug. 1-Sept.

Month		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	AVE.	Criteria
Total Influent	(1000 m ³)	39.640	31.015	45.044	57.052	55.166	45.609	54.917	50.982	58.686	52.746	48.661	51.741	591.258	49.271	
Average Influent	(1000 m ³ /d)	1.279	1.149	1.453	1.902	1.780	1.520	1.772	1.645	1.956	1.701	1.622	1.669		1.621	2.525
Max Raw	(1000 m ³ /d)	2.599	1.540	2.255	2.729	2.724	1.866	2.537	2.028	3.854	2.276	4.879	2.138		2.619	
Min Raw	(1000 m ³ /d)	0.936	0.798	0.822	1.146	1.155	1.178	1.279	1.335	1.326	1.205	1.015	1.298		1.125	
Cheese Total	(1000 m ³)	12.667	15.170	15.225	13.747	18.023	19.086	18.545	18.593	20.720	15.903	13.113	14.784	195.576	16.298	
Cheese Average	(1000 m ³ /d)	0.409	0.542	0.491	0.458	0.581	0.636	0.598	0.600	0.691	0.513	0.437	0.477		0.536	
Cheese Max	(1000 m ³ /d)	0.667	0.775	0.706	0.801	0.914	1.098	0.894	0.840	1.625	1.673	0.709	0.835		0.961	
Cheese Min	(1000 m ³ /d)	0.143	0.209	0.148	0.159	0.214	0.303	0.261	0.316	0.199	0.155	0.170	0.127		0.200	
Effluent Total	(1000 m ³)		118.006		107.691	137.539	47.653	6.626	48.853	44.582	50.823	75.532	123.597	760.902	76.090	
Effluent Average	(1000 m ³ /d)		4.539		3.713	4.437	1.588	0.221	1.576	1.486	1.639	2.518	3.987		2.570	1600 m ³ /d
Effluent Max	(1000 m ³ /d)		5.300		6.549	12.725	1.740	0.400	1.719	1.678	1.901	2.660	4.010		3.868	
Effluent Min	(1000 m ³ /d)		0.387		0.527	0.111	0.363	0.082	0.947	0.713	0.652	2.173	3.297		0.925	

Tavistock Cheese Influent

BOD ₅	(mg/L)	2547.8	1190.3	861.8	928.6	965.7	760.3	885.8	1007.5	1197.8	957.8	1374.3	803.5		1123
SS	(mg/L)	381.8	291.3	276.0	359.6	430.7	259.5	218.6	232.8	371.6	388.8	621.0	318.8		346
AMMONIA	(mg/L)	9.38	9.58	6.33	7.12	7.77	8.20	8.28	12.85	11.64	11.90	10.55	10.30		9
TKN	(mg/L)	66.0	74.9	49.9	71.0	55.7	44.5	57.8	68.3	70.3	61.0	79.7	61.4		63
NITRITE	(mg/L)	3.18	8.13	14.08	6.83	11.23	7.65	8.92	6.38	18.36	2.62	0.30	4.17		8
NITRATE	(mg/L)	21.90	13.41	8.40	27.43	13.51	10.90	6.57	0.60	0.60	3.84	17.92	28.70		13
TOTAL P.	(mg/L)	43.4	35.3	27.3	31.3	28.5	23.5	30.3	34.7	37.2	28.2	40.2	29.3		32
pH	Cheese	7.64	7.67	7.85	8.44	9.02	7.82	8.08	8.94	8.59	8.89	8.40	8.85		8.35

Tavistock Lagoon Influent

CBOD ₅	(mg/L)	231.0	365.5	243.7	219.0	278.0	319.0	424.3	328.0	227.5	349.5	213.0	159.0		279.79
BOD ₅	(mg/L)	274.0	359.5	261.0	227.0	308.5	427.0	402.0	484.5	289.5	331.5	246.0	534.0		345.38
SS	(mg/L)	196.0	338.0	229.0	229.5	235.5	364.0	582.7	454.0	319.5	384.0	293.0	290.3		326.3
AMMONIA	(mg/L)	21.0	16.7	17.6	14.8	14.5	21.5	22.9	21.1	19.8	18.3	23.6	21.5		19
TKN	(mg/L)	37.7	36.2	25.6	24.5	24.3	35.3	60.7	60.6	35.0	29.1	30.9	32.9		36.0
NITRITE	(mg/L)	0.03	0.03	0.03	0.04	0.04	0.09	0.05	0.16	0.11	0.04	0.04	0.06		0
NITRATE	(mg/L)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		0
TOTAL P.	(mg/L)	8.6	11.7	7.2	5.7	5.4	11.3	24.6	16.8	11.0	10.4	7.0	8.6		11
pH	Influent	6.90	6.83	7.03	6.92	6.92	6.86	6.80	6.83	6.95	7.20	7.15	6.98		6.95
Temperature (celcius)		9.8	11.8	11.5	13.2	14.0	20.7	21.3	21.7	19.6	15.9	14.2	14.8		15.7

Tavistock Lagoon Effluent

														TOTAL	AVE.	Criteria
CBOD ₅	(mg/L)		3.8		3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2		2.30	15
BOD ₅	(mg/L)		3.5		3.0	3.0	2.0	2.6	2.5	2.0	2.5	2.0	2.0		2.51	
TSS	(mg/L)		8.3		7.0	2.8	2.0	3.6	2.3	2.0	2.3	2.0	2.2		3	15
AMMONIA	(mg/L)		1.5		2.9	0.6	0.1	0.1	0.1	0.1	0.1	0.2	0.7		0.64	1 - 10
TKN	(mg/L)		2.5		4.3	4.7	0.6	0.6	0.5	0.5	0.5	1.1	1.6		1.68	
NITRITE	(mg/L)		0.03		0.04	0.12	0.03	0.03	0.03	0.03	0.03	0.03	0.05		0.0	
NITRATE	(mg/L)		0.79		1.41	2.43	0.74	4.19	0.26	0.29	0.83	0.56	0.91		1.2	
TOTAL P.	(mg/L)		0.2		0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.2		0.09	0.5 - 0.8
pH			7.27		7.56	7.59	7.47	7.39	7.53	7.50	7.91	7.77	7.68		7.57	6.0-9.5
E. Coli	(#/100 mL)		6.6		6.9	2.2	24.6	62.4	5.6	46.7	16.8	7.4	19.5		20	
Temp.	Celcius		2.5		6.8	14.6	21.1	19.4	21.3	18.0	12.6	5.0	2.5		12.38	
D.O.	(mg/L)		6.2		8.2	6.0	6.0	8.6	6.4	5.8	8.6	11.1	10.7		7.8	
Un-ion'd Ammonia	(mg/L)		0.041		0.010	0.009	0.001	0.001	0.002	0.001	0.003	0.002	0.005		0.007	

Criteria per Month

		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
CBOD ₅ Criteria	(mg/L)	15	15	15	15	15	15	15	15	15	15	15	15
TSS Criteria	(mg/L)	15	15	15	15	15	15	15	15	15	15	15	15
TP Criteria	(mg/L)	0.8	0.8	0.8	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
NH3-N Criteria	(mg/L)	7	10	8.5	8	1	1	1	1	1	1	1	3
DO	(mg/L)												
Influent Flow Design	(1000m3/d)	2.525	2.525	2.525	2.525	2.525	2.525	2.525	2.525	2.525	2.525	2.525	2.525
Un-ion'd Ammonia Criteria	(mg/L)												
E.Coli Criteria	(#/100 mL)												
Effluent Flow Criteria	(1000m3/d)	4.3	5.3	5.6	4.5	4.53	1.7	0.4	0.115	0.35	1.9	2.66	4.01
BOD ₅ Criteria	(mg/L)												

Tavistock Influent Loading kg/d 2014

		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVE.
BOD ₅ Loading	(kg/d)	251	388	379	432	549	553	712	539	566	564	399	891	560
TSS Loading	(kg/d)	27	19	333	436	419	33	1032	747	625	653	475	485	529
Cheese BOD Loading	(kg/d)	3258	645	423	426	561	232	530	604	827	491	601	383	748
Cheese TS Loading	(kg/d)	488	158	136	165	250	14	131	140	257	199	271	152	197
Cheese TKN Loading	(kg/d)	84	41	24	33	32	0	35	41	49	31	35	29	36
Cheese TP Loading	(kg/d)	55	19	13	14	17	15	18	21	26	14	18	14	20

Calibration Records

Instrumentation Calibrations and Checks

Date 2014	Calibrated					Checked				
	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer
Oct-06	jb	ms				jb		ms		
Oct-07			ms							
Oct-08							ms	ms		
Oct-10	jb					jb			jb	
Oct-14	jb	jb	jak	jak						
Oct-17						jak			jak	
Oct-20		jak	jak							
Oct-21	ms			ms						
Oct-22		jmt	jmt			ms			ms	
Oct-24	jb	jak	jak	jb		jb			jb	
Oct-27	jak	jb		jak		jb	jb			
Oct-29	jb	ms	ms			jb			jb	
Oct-30							ms	ms		
Oct-31	jb					hjb	ms	ms		
Nov-03	jak			jak			jmt	jmt		
Nov-04		jb				jak	jb		jak	
Nov-06			jb					jb		
Nov-10	jb					jb				
Nov-12	jmt	jmt	jmt							
Nov-14						ms	jak	jak		
Nov-17		jak	jak			ms				
Nov-18	ms	ms	ms							
Nov-24	jak	jb		jak			jb	jb		
Nov-26							jak		os	
Nov-28		jb					jb			
Dec-01	ms	ms	jmt							
Dec-03	ms					ms				
Dec-04			os				jak			
Dec-05							ms			
Dec-08	jab	jb	os	jak		jb	jb			
Dec-10						jak			jak	
Dec-15	jak			jak						
Dec-16		ms								
Dec-18		jb					jb		jb	
Dec-19	ms					ms			ms	
Dec-30	ms	ms		ms						

Please initial and date after each calibration or check.
 Hach Spectrophotometer calibrated yearly or at lamp replacement.
 All other meter calibrated once/week and checked twice/week.

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Tavistock ON
 Customer PO
 Our Job # B13 8572

R&R Instrumentation Services Inc

24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 03
 Cal Date June 09/14
 Due Date June 09/15
 Cal Freq Yearly
 Location Cheese Factory
 Description Flow Ind. Transmitter
 Manufacturer Milltronics
 Model OCM II
 Serial # 078714478-2
 Accuracy 1%
 Range 0 - 30.00 L/s; 0 - 33.641 cm
 3" Parshall Flume pg. 353 ISCO

MEASURING EQUIPMENT

Manufacturer Fluke Gauge board
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy .02% + 2 cnts

Q L/s = 176.5 ^{1.547}

INPUT cm	Meters	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.00000	0.000	0.000	0.000	0.00	0.00
20.65	0.20650	14.438	14.490	14.490	0.17	0.17
21.48	0.21480	15.317	15.501	15.501	0.61	0.61
33.64	0.33640	30.000				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Tavistock ON
 Customer PO
 Our Job # B13 8572

R&R Instrumentation Services Inc

24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 03
 Cal Date June 09/14
 Due Date June 09/15
 Cal Freq Yearly
 Location Cheese Factory
 Description Flow Transmitter
 Manufacturer Milltronics
 Model OCM II
 Serial # 078714478-2
 Accuracy 1%
 Range 0 - 30.00 L/s; 0 - 1.800 PPM

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT L/s	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
14.49		0.869	0.859	0.859	-0.56	-0.56
15.50		0.930	0.925	0.925	-0.28	-0.28
30.00		1.800				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

	As Found	2699.14
	As Left	<u>2695.42</u>
AS FOUND	AS LEFT	Difference
Pass: ✓	Pass: ✓	3.72
Fail:	Fail:	

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Tavistock ON
Customer PO
Our Job # B13 8572

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 03
Cal Date June 09/14
Due Date June 09/15
Cal Freq Yearly
Location Cheese Factory
Description Flow Element
Manufacturer
Model
Serial #
Accuracy
Range 0 - 20.00 L/s; 0 - 24.473 cm

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy
Range

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	✓	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check for turbulence.
8		Description of measuring element: 3" Parshall Flume
		Comments:

CERTIFIED BY:  CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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City/Town Tavistock ON
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Our Job # B13 8572

R&R Instrumentation Services Inc

24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FR 03
Cal Date June 09/14
Due Date June 09/15
Cal Freq Yearly
Location Cheese Factory
Description Flow Recorder
Manufacturer Honeywell
Model AR 15 BDN2020
Serial #
Accuracy 1%
Range 0-100%; 4 - 20 mA

MEASURING EQUIPMENT

Manufacturer Fluke
Model 725
Serial # 7903019
Cal Reference Fluke
Traceability NIST
Accuracy .02% + 2 cnts

INPUT mA	%	OUTPUT*AAV %	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000		0.00	0.00	0.00	0.00	0.00
8.000		25.00	25.00	25.00	0.00	0.00
12.000		50.00	50.00	50.00	0.00	0.00
16.000		75.00	75.00	75.00	0.00	0.00
20.000		100.00	100.00	100.00	0.00	0.00

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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 City/Town Tavistock ON
 Customer PO
 Our Job # B13 8572

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 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 02
 Cal Date June 09/14
 Due Date June 09/15
 Cal Freq Yearly
 Location Lagoon Entrance
 Description Flow Indicating Transmitter
 Manufacturer Milltronics
 Model OCM III
 Serial #
 Accuracy 1%
 Range 0 - 21600 m³/D
 Range zero head 81.42 cm
 Max Head 33.7215

MEASURING EQUIPMENT

Manufacturer Fluke Gauge Bd
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT cm WC	Meters	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0000	0.00	0.0	0.0	0.00	0.00
11.92	0.1192	4400.09	4375.0	4375.0	-0.12	-0.12
33.7215	0.3372	21600.12				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass:	Pass:
Fail: x	Fail: x

TECHNICIAN'S NOTES
Reading low, 3.8 cm Temp. comp. reading
5831°C

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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 Customer PO
 Our Job # B13 8572

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 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 02
 Cal Date June 09/14
 Due Date June 09/15
 Cal Freq Yearly
 Location Lagoon Entrance
 Description Flow Integrator
 Manufacturer Milltronics
 Model OCM III
 Serial # 06871442-16
 Accuracy 1%
 Range 0 - 15 PPM; 0 - 250 L/s
 0 - 21600 m³/D

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT m ³ /D	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.0		0.000	0.000	0.000	0.00	0.00
5064.0		3.517	3.509	3.509	-0.05	-0.05
11640.0		8.083	8.090	8.090	0.05	0.05
14454.0		10.038	10.041	10.041	0.02	0.02
21600.00		15.000				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$

Test Unit Results

AS FOUND	AS LEFT	As Found	3106365	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓	As Left	3106321	
		Difference	44	
Fail:	Fail:			

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Tavistock ON
 Customer PO
 Our Job # B13 8572

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 01
 Cal Date June 09/14
 Due Date June 09/15
 Cal Freq Yearly
 Location Effluent Flow, Lagoon Blower Bldg
 Description Flow Indicating Transmitter
 Manufacturer Milltronics
 Model OCM II
 Serial # 06871441-36
 Accuracy 1%
 Range 0 - 250 L/s; 0 - 36.494 cm
 Primary .61 M Cipolletti Weir
 Datum 172" to top of platform or 436.88 cm
 Head 152.3 cm
 $Q = 1133.99 H^{1.5} = 250.06 \text{ L/s}$

MEASURING EQUIPMENT

Manufacturer Fluke Gauge board
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT cm WC	Meters	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.04	0.000	0.00	0.00	0.00	0.00	0.00
20.85	0.209	107.96	105.53	105.53	-0.97	-0.97
35.31	0.353	237.93	238.22	238.22	0.12	0.12
42.40	0.424	313.08	310.90	310.90	-0.87	-0.87
91.35	0.914	990.08	990.48	990.48	0.16	0.16

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:  CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

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 City/Town Tavistock ON
 Customer PO
 Our Job # B13 8572

R&R Instrumentation Services Inc

24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 01
 Cal Date June 09/14
 Due Date June 09/15
 Cal Freq Yearly
 Location Lagoon Blower Building
 Description Flow Integrator
 Manufacturer Milltronics
 Model OCM II
 Serial # 06871441-36
 Accuracy 2%
 Range 0 - 15 PPM

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT L/s	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.0		0.000	0.000	0.000	0.00	0.00
238.4		14.304	14.450	14.450	0.97	0.97
105.5		6.332	6.418	6.418	0.57	0.57
310.9		18.654	18.662	18.662	0.05	0.05

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

	As Left	191417.00
	As Found	191199.00
AS FOUND	AS LEFT	
Pass: ✓	Pass: ✓	
Fail:	Fail:	

Difference 218.00

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Tavistock ON
 Customer PO
 Our Job # B13 8572

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 04
 Cal Date June 09/14
 Due Date June 09/15
 Cal Freq Yearly
 Location Lagoon Blower Bldg
 Description Flow Indicating Transmitter
 Manufacturer Milltronics
 Model OCM III
 Serial #
 Accuracy no info on modified flume
 Range 0 - 21709 m³/D; 0 - 61 cm or 24"
 9" Parshall Flume Pg 355 ISCO
 Q = 46248 H^{1.530} = 21709

MEASURING EQUIPMENT

Manufacturer Fluke Gauge board
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT cm WC	Meters	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0000	0.000	0	0	0.00	0.00
2.82	0.0282	196.777	196	196	-0.00	-0.00
11.14	0.1114	1610.005	1610	1610	-0.00	-0.00
18.25	0.1825	3426.298	3420	3420	-0.03	-0.03
61.0000	0.6100	21709.389				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Tavistock ON
 Customer PO
 Our Job # B13 8572

R&R Instrumentation Services Inc

24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 04
 Cal Date June 09/14
 Due Date June 09/15
 Cal Freq Yearly
 Location Lagoon Blower Building
 Description Flow Integrator
 Manufacturer Milltronics
 Model OCM III
 Serial #
 Accuracy 1%
 Range 0 - 21709 m³/D; 0 - 15.076 PPM
 0 - 61 cm or 24"
 9" Parshall Flume Pg 355 ISCO

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT m ³ D	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0		0.000	0.000	0.000	0.00	0.00
196		0.136	0.135	0.135	-0.01	-0.01
1610		1.118	1.122	1.122	0.03	0.03
3420		2.375	2.340	2.340	-0.23	-0.23
21709		15.076				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT	As Left As Found Difference	653994 653982 12	TECHNICIAN'S NOTES
Pass: ✓	Pass: ✓			
Fail:	Fail:			

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Tavistock ON
Customer PO
Our Job # B13 8572

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 01
Cal Date June 09/14
Due Date June 09/15
Cal Freq
Location Lagoon near Blower Bldg
Description Flow Element
Manufacturer
Model
Serial #
Accuracy
Range 0 - 250 L/s; 0 - 36.494 cm

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy
Range

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	✓	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check for turbulence.
8		Description of measuring element: 0.61 Meters Cipolletti Weir
		Comments:

CERTIFIED BY: *R Thachuk* CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Tavistock ON
Customer PO
Our Job # B13 8572

R&R Instrumentation Services Inc

24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 02
Cal Date June 09/14
Due Date June 09/15
Cal Freq
Location Lagoon Entrance
Description Flow Element
Manufacturer
Model
Serial #
Accuracy
Range 0 - 250 L/s; 0 - 32.981 cm
ISCO Table pg 264

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy
Range

$$Q \text{ L/s} = 1319.89 \text{ H}^{1.53} = 1319.89 \times 0.18935 = 249.93 \text{ m}^3/\text{D}$$

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	✓	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check for turbulence.
8		Description of measuring element: 0.61 Meters Cipolletti Weir
		Comments:

CERTIFIED BY:  CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Tavistock ON
Customer PO
Our Job # B13 8572

R&R Instrumentation Services Inc

24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 04
Cal Date June 09/14
Due Date June 09/15
Cal Freq
Location Lagoon
Description Flow Element
Manufacturer
Model
Serial #
Accuracy
Range 0 - 21749 m³/D; 0 - 61.0 cm
 $Q \text{ m}^3/\text{D} = 32928 H^{1.53}$

Parshall Flume Dimensions:

	<u>Designed</u>	<u>Actual</u>
W	9"	9"
A	34.625	34
2/3A	23	23
D	22.625	22

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy
Range

NO.	CHECKED	CALIBRATION CHECKS FOR WIERS AND FLUMES
1	✓	Check weir with no flow to see if level transmitter output 4mA
2	✓	Check span using gauge board at 5 different levels.
3	✓	Check cleanliness of weir or flume.
4	✓	Check for hydrostatic head.
5	✓	Check for free flow for Parshall flume.
6	✓	Check for size of flume or weir.
7	✓	Check for turbulence.
8		Description of measuring element: 9" Parshall Flume
		Comments:
		No info on modified parshall Flume

CERTIFIED BY: R Thachuk CET, CCST Level III Technician

Plant Maintenance Records

ID	Descriptio	Projected Star Shop	Instructions
6447	Lubricate	05/02/2014	250500 Tavistock blowers require oil and grease (check belts & filters
6549	Repair	11/03/2014	250500 Oil & grease other blowers
6619	Repair	02/04/2014	250500 Repair effluent sample lid Tavistock filter area
6692	Repair	28/04/2014	250500 Sand filter rotorks remove for repair
6697	Lubricate	30/04/2014	250500 Tavistock blowers require oil and grease
6713	Repair	07/05/2014	250500 Two surface aerators in Tavistock require repair plus they need greasing.
6754	Repair	22/05/2014	250500 Repair oil leak blower # 2
6835	Repair	12/06/2014	250500 Install sump pump in valve chamber for filters
6899	Lubricate	02/07/2014	250500 Blowers oil and grease
6943	Repair	17/07/2014	250500 Remove MV1 gate actuator cell # 4 for repair
6950	Repair	21/07/2014	250500 Coupler gone on # 4 surface aerator
7026	Repair	13/08/2014	250500 Tavistock blower room rubber roof patch up
7041	Lubricate	19/08/2014	250500 Blowers require oil and grease
7067	Repair	04/09/2014	250500 exhaust fan blower building roof Tavistock Lagoon
7147	Lubricate	01/10/2014	250500 Blowers require oil and grease
7289	Replace	17/11/2014	250500 remove Tavistock sand filter caps for winter
7348	Lubricate	10/12/2014	250500 Tavistock blowers require oil and grease
7545	Repair	12/01/2015	250500 Blower #1 vibrating shut down for repair
7554	Repair	15/01/2015	250500 Filter building Tavistock heater blowing cold air

Additional Discharge

Ministry of the Environment and
Climate Change

Safe Drinking Water Branch
3232 White Oak Road, 3rd Floor
London ON N6E 1L8
Tel (519) 873-5094
Fax (519) 873-5096

Ministère de l'Environnement et de
l'Action en matière de changement
climatique

Direction du contrôle de la qualité de l'eau
potable
Bureau du district de London
3^e étage
3232, chemin White Oak
London (Ontario) N6E 1L8
Tel (519) 873-5094
Fax (519) 873-5096



July 28, 2014

County of Oxford
21 Reeve Street
P.O. Box No. 1614
Woodstock, Ontario
N4S 7Y3

Attention: Mr. Shahad Shafai (Manager of Environmental Services)
Mr. Don Ford (Wastewater Supervisor)

Reference: Tavistock Wastewater Treatment Lagoon - Additional Discharge Request 2014

Dear Mr. Shafai and Mr. Ford.

I have reviewed your letter dated July 11, 2014 which indicates that there will be ongoing maintenance involving the removal of biosolids from Lagoon Cell #2 at the Tavistock Wastewater Treatment Lagoons. I understand that as a result of the removal of the biosolids, you are requesting relief from the permitted effluent flow rates for the months of July, August and September 2014 (400 m³/d, 115 m³/d, and 350 m³/d, respectively), to a flow rate matching the daily influent flow of the lagoons (approximately 1600 m³/d) since Cell #2 is currently offline, and therefore, its capacity is unavailable for storage. I further understand that the quality of the effluent, as per recent lab results (June, 2014), is below the limits presented within Environmental Compliance Approval #7789-8AKJL5 dated November 24, 2010.

The consent is for the periods of July, August and September 2014, in accordance with the following conditions:

1. The Owner shall provide notification of the work commencement to Water Supervisor Craig Seabrook (705-739-6392; Craig.Seabrook@ontario.ca) verbally or via email, a minimum of twenty-four (24) hours prior to the bypass commencing.
2. The effluent discharged from the Works to Horner Creek / Drain meets the Ministry's effluent quality requirements thus minimizing environmental impact on the receiver and to protect water quality, fish and other aquatic life in the receiving water body.
3. The Owner shall, in the event of any adverse effects resulting from the work, report those adverse effects to the ministry's Spills Action Centre (1-800-268-6060) immediately and in writing to the undersigned within five (5) days of the completion of the work. The term "adverse effects" as referenced in this condition has the same meaning as in subsection 1(1) of the EPA.
4. Horner Creek / Drain water quality shall be monitored once per month for the parameters listed in Table 5 of the ECA. The creek / drain shall be sampled upstream and downstream of the sewage discharge point where the creek / drain crosses William Street South.
5. Within 45 days of the conclusion of the discharge acknowledged under this letter, a report shall be submitted to the MOECC London Office (Craig.Seabrook@ontario.ca) summarizing results of the creek and effluent monitoring program carried out during the discharge period.

Regards,



Craig Seabrook
Water Compliance Supervisor
Ministry of the Environment and Climate Change
Barrie District Office
Phone: 705-739-6392
Fax: 705-739-6350
Email: Craig.Seabrook@ontario.ca

cc. Mr. Tom Clubb, Water Compliance Supervisor, London District Office, MOECC
Mr. Scott Abernathy, Surface Water Group Leader, Technical Support Section, MOECC
Mr. Neville Rising, Water Inspector, London District Office, MOECC
Mr. Peter Heywood, Program Supervisor, Oxford County Public Health



Public Works

P. O. Box 1614, 21 Reeve Street
Woodstock, Ontario N4S 7Y3
Tel: 519-539-9800 ♦ 800-755-0394
Fax: 519-421-4711
www.oxfordcounty.ca

November 5th, 2014

Mr. Craig Seabrook,
Water Compliance Supervisor
C/O
Ministry of the Environment and Climate Change
3232 White Oak Road, 3rd Floor
London, ON
N6E 1L8

**RE: Report Summarizing Results of the Tavistock Lagoons Additional Discharge
July to September 2014
Certificate of Approval ECA #7789-8AKJL5.**

Dear Mr. Seabrook:

As per your letter dated July 28th, 2014, this is a report summarizing the results of the Hohner Drain and lagoon effluent monitoring program required by Condition #5:

“Within 45 days of the conclusion of the discharge acknowledged under this letter, a report shall be submitted to the MOECC London Office (Craig.Seabrook@ontario.ca) summarizing results of the creek and effluent monitoring program carries out during the discharge period.”

Tavistock Lagoon effluent quality was extremely good during the period covered by the permission to discharge July through September 2014, and well below ECA discharge limits and objectives. A table summarizing the results is enclosed. August and September was when the increased discharge was fully utilized as most of July had passed before operations received permission to release.

Hohner Drain results for both upstream and downstream are enclosed. They show there was no degradation in quality of the receiving drain.

I hope this report satisfies the intent of Condition #5 regarding reporting. Please feel free to contact the undersigned with any questions

Yours Truly,



Don Ford
Wastewater Operations Supervisor
Oxford County Public Works
Phone: 519-539-9800 ext. 3191

c.c. Mr. Tom Clubb, Water Compliance Supervisor, London District Office, MOECC
Mr. Scott Abernathy, Surface Water Group Leader, Technical Support Section,
MOECC
Mr. Neville Rising, Water Inspector, London District Office, MOECC
Mr. Peter Heywood, Program Supervisor, Oxford County Public Health
Mr. Shahab Shafai, Oxford County Public Works

Encl. Letter of Permission July 28th, 2014
Tavistock Year-end Summary 2014 Exhibit 1
Hohner Drain Sampling Summary 2014

2014 Hohner Drain UP Stream

														July-Sept	Aug.-Sept.	
		January	February	March	April	May	June	July	August	Sept. 9	Sept. 30	Oct.	Nov.	Dec.	Average	Average
Temp Upon Receipt at Lab	°C							12.0	14.0	16.0	12.0				54.0	14.0
CBOD5								< 4	< 4	< 4	< 4				<4	<4
TSS								4	5	16	95				30.0	38.7
pH								8.25	8.20	8.24	7.74				8.1	8.1
NH3+NH4								0.2	0.1	0.1	0.3				0.2	0.2
NO2								0.05	0.11	0.07	0.03				0.1	0.1
NO3								4.09	4.13	4.03	1.92				3.5	3.4
NO2+NO3			Not Sampled					4.14	4.24	4.10	1.95				3.6	3.4
Total P								0.033	0.042	0.055	0.294				0.11	0.13
Field Sampling Information																
pH	units							7.81	8.23	7.95	7.8				7.9	8.0
Temperature	°C							16.6	18.4	15.3	14.9				16.3	16.2
DO	mg/L							8.85	6.56	5.63	6.36				6.9	6.2

2014 Hohner Drain Down Stream

														July-Sept	Aug.-Sept.	
		January	February	March	April	May	June	July	August	Sept. 9	Sept. 30	Oct.	Nov.	Dec.	Average	Average
Temp Upon Receipt at Lab	°C							12.0	14.0	16.0	12.0				13.5	14.0
CBOD5								< 4	< 4	< 4	< 4				<4	<4
TSS								6	3.0	3	64.0				19.0	23.3
pH								8.27	8.3	8.31	8.1				8.2	8.2
NH3+NH4								0.9	< 0.1	< 0.1	0				0.6	0.2
NO2								0.56	< 0.03	0.04	< 0.03				0.3	0.0
NO3								1.62	1.02	1.22	1.57				1.4	1.3
NO2+NO3			Not Sampled					2.18	1.02	1.26	1.57				1.5	1.3
Total P								0.354	0.064	0.108	0.2				0.19	0.13
Field Sampling Information																
pH	units							8.08	8.17	8.15	8.0				8.1	8.1
Temperature	°C							18.4	14.2	19.1	15.7				16.9	16.3
DO	mg/L							5.75	5.67	5.79	6.19				5.9	5.9



Public Works

P. O. Box 1614, 21 Reeve St., Woodstock, Ontario N4S 7Y3

Phone: 519-539-9800 Fax: 519-421-4711

Website: www.oxfordcounty.ca

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 Year-End Report, Plattsville Wastewater Treatment Plant (WWTP)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) # 3133-7QWH4N.

I trust this report fulfills the intent of the ECA annual reporting requirements. If there are any questions, please contact me.

Yours truly,

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

The Plattsville WWTP provided effective wastewater treatment in 2014 and all effluent concentration limits as specified by MOE ECA # 3133-7QWH4N were met on a monthly basis. The annual average daily flow rate was 577 m³/d; this represents 72% of the WWTP rated capacity of 800 m³/d.



Figure 1 Plattsville WWTP Aerial Photo

Plant Description

Wastewater is treated at the Plattsville WWTP (Figure 1), which includes two aerated lagoon cells and two conventional wastewater stabilization ponds. Phosphorus removal is accomplished through the flow paced continuous dosing of Aluminum Sulphate into the splitter box prior to the wastewater entering the stabilization ponds and/or when required by batch dosing via a return pump pond mixing system which can dose either cell and recirculate the contents. Treated wastewater is pumped to an intermittent sand filter designed for ammonia removal prior to discharge to the Nith River.

Oxford County operates the facility, utilizing the staff located at the Woodstock WWTP.

Plant Specifications

Facilities - Lagoons
Rated Capacity (ADF) - 800 m³/day
Average Daily Flow - 577 m³/day (2014)
Receiving Stream - Nith River
Plant Classification - WWT – I
Works Number - 110003022
MOE ECA # 3133 7QWH4N
Effluent Limits:
Monthly Average CBOD₅ 10 mg/L
Monthly Average Suspended Solids 10 mg/L
Monthly Average Total Phosphorous 0.5 mg/L

Monthly Average Ammonia when Nith > 12 degrees Celsius 2 mg/L
Monthly Average Ammonia when Nith < 12 degrees Celsius 5 mg/L
E.Coli geometric mean 200 CFU per 100 mL
Effluent is discharged according to a discharge table (Table 3) within the ECA.

Effluent Quality Assurance and Control Measures

Sampling Procedures

Raw influent wastewater is sampled on a monthly basis and is analyzed for BOD₅, TSS, TKN, TP and pH. Effluent discharge samples are collected bi-weekly or monthly and at an interval to meet the percentage of drawdown of the lagoon cell as stipulated in the ECA during discharge periods and analyzed for CBOD₅, TSS, Total Ammonia Nitrogen, TP, E. Coli, temperature and pH.

Laboratory and Field Testing

Laboratory analyses are performed by SGS Lakefield Research Ltd. on all samples that are reported for compliance except for pH, DO, and temperature which are field collected. All in-house laboratory testing is done for process control and is not included in this report.

Groundwater Testing

Groundwater monitoring requires that an annual sample be collected and tested for Total Organic Carbon, Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite and Nitrate. Two samples were collected in 2014 and are referred to as the shallow well sample and deep well sample. The results are included in an attached Table under Exhibit 2.

Summary and Interpretation of Monitoring Data

Flows

The total flow treated in 2014 was 210,574 m³. The average daily flow of 577 m³/day was 72% of the design capacity of 800 m³/day. The daily maximum flow for 2014 was 1,207 m³/day.

Plant effluent can be discharged in accordance with Table 3 - Monthly Discharge Regime contained in the ECA. The total annual discharge for 2014 was 210,574 m³.

Raw Sewage Quality

Table 1 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 577 m³/day.

Table 1

Parameter	Concentration mg/L	Loading kg/day
BOD ₅	156	90
SS	192	111
TKN	46.8	27
TP	5.8	3.3

Plant Performance & Effluent Quality

Detailed analytical data of annual and monthly averages are summarized later in the report under Exhibit 1.

Table 2 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA limits for the parameter.

Table 2

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	*ECA Effluent Limits mg/L
CBOD ₅	2.3	3	98.5	10
TSS	2.7	3.3	98.6	10
TP	0.04	0.05	99.3	0.5
Ammonia	0.3	1.2	99.3	2/5
E. Coli	5	72	na	200
pH	7.4	7.6	na	6-9.5

* Ammonia has different limits depending on the temperature of the Nith River, refer to effluent limits under Plant Specifications section of this report

The plant met all effluent discharge limits contained in the ECA for 2014. The pH was within the required range for all effluent samples in 2014.

Over the reporting period, the annual average effluent CBOD₅ concentration was 2.3 mg/L. The annual average suspended solids concentration was 2.7 mg/L with a removal efficiency of 98.6%. The annual average ammonia nitrogen concentration was 0.3 mg/L with a removal efficiency of 99.3%. The annual total phosphorous level was 0.04 mg/L, which represents a removal efficiency of 99.3%.

Effluent Objectives

The objectives are non-enforceable effluent quality values which the owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

All monthly average effluent objectives were met for 2014.

The plant met all effluent discharge limits contained in the ECA for 2014.

Description of Operating Problems, Bypassing, Spills, Abnormal Events, and Complaints Received

There were no bypasses, spills, or overflow events to the Nith River at the Plattsville Lagoons in 2014. There were no complaints received regarding the Plattsville lagoons in 2014.

Maintenance of Works

Regularly scheduled maintenance of the plant equipment including surface aerators is conducted by the operating and maintenance staff of the Woodstock WWTP. Detailed maintenance records are kept on file at the Woodstock WWTP. A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

Calibrations are completed by R&R Instrumentation on an annual basis for all flow measurement devices.

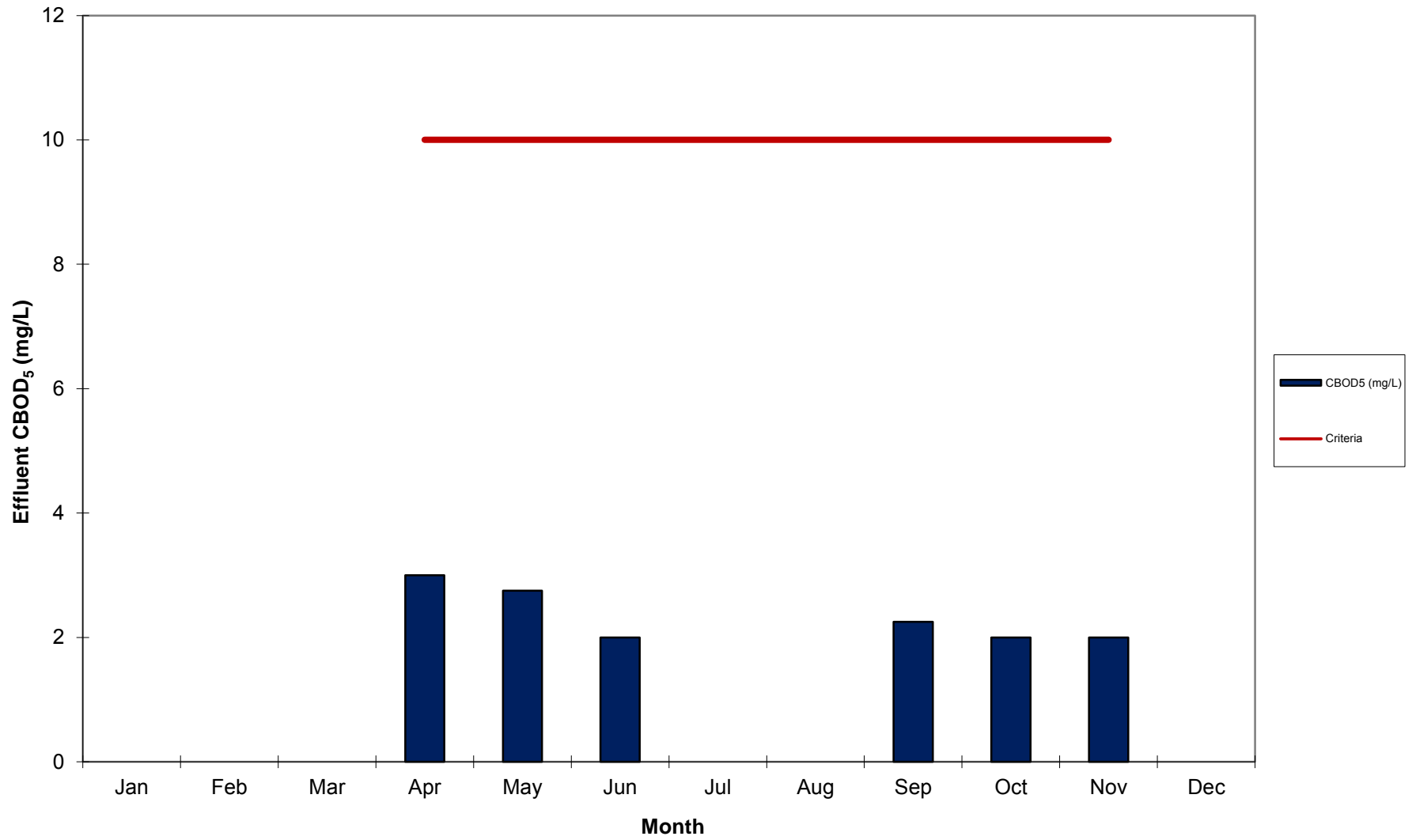
Monitoring equipment calibration records are appended to this report.

Summary and Recommendations

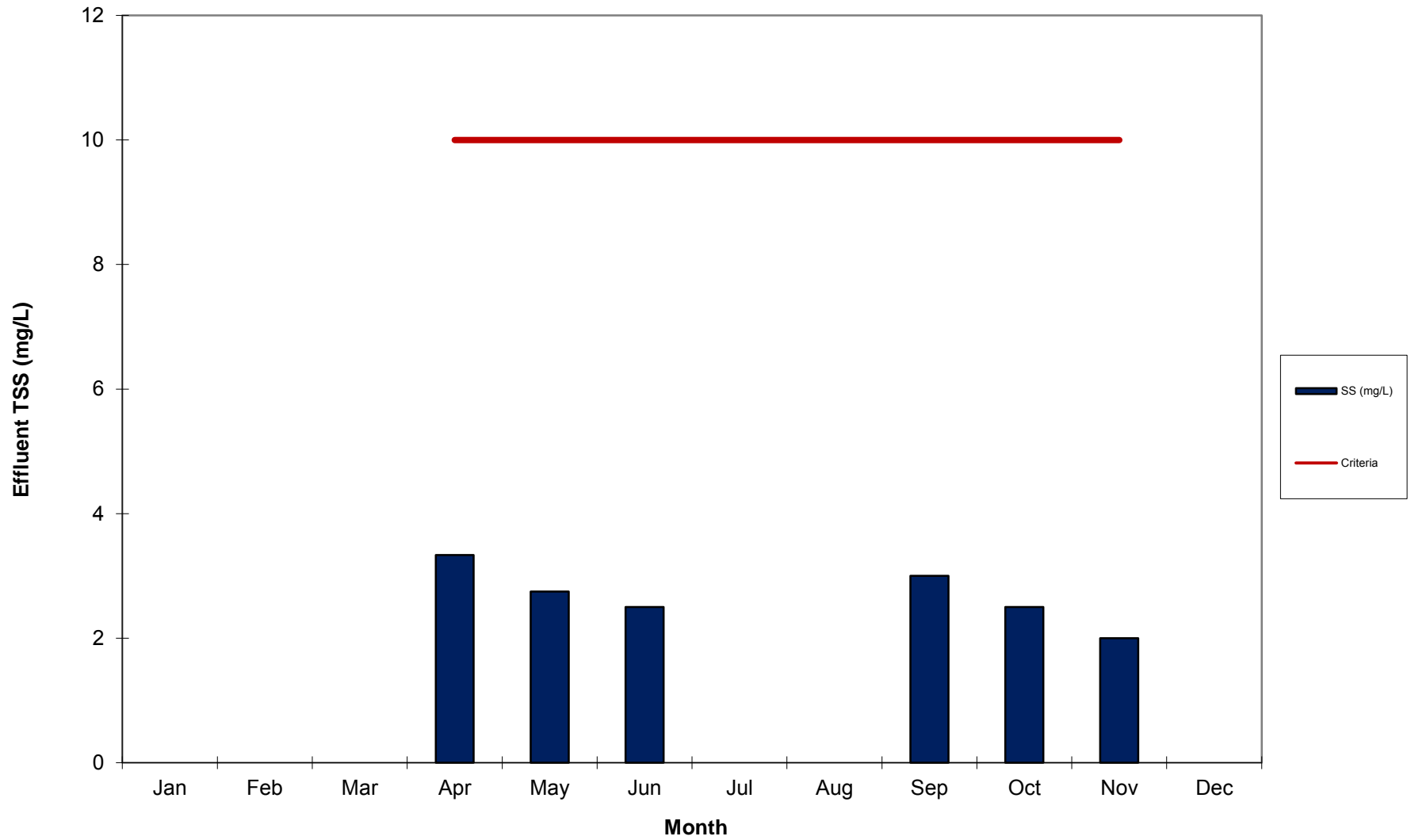
The wastewater treatment plant performed well during 2014 and met all discharge requirements.

EXHIBIT 1

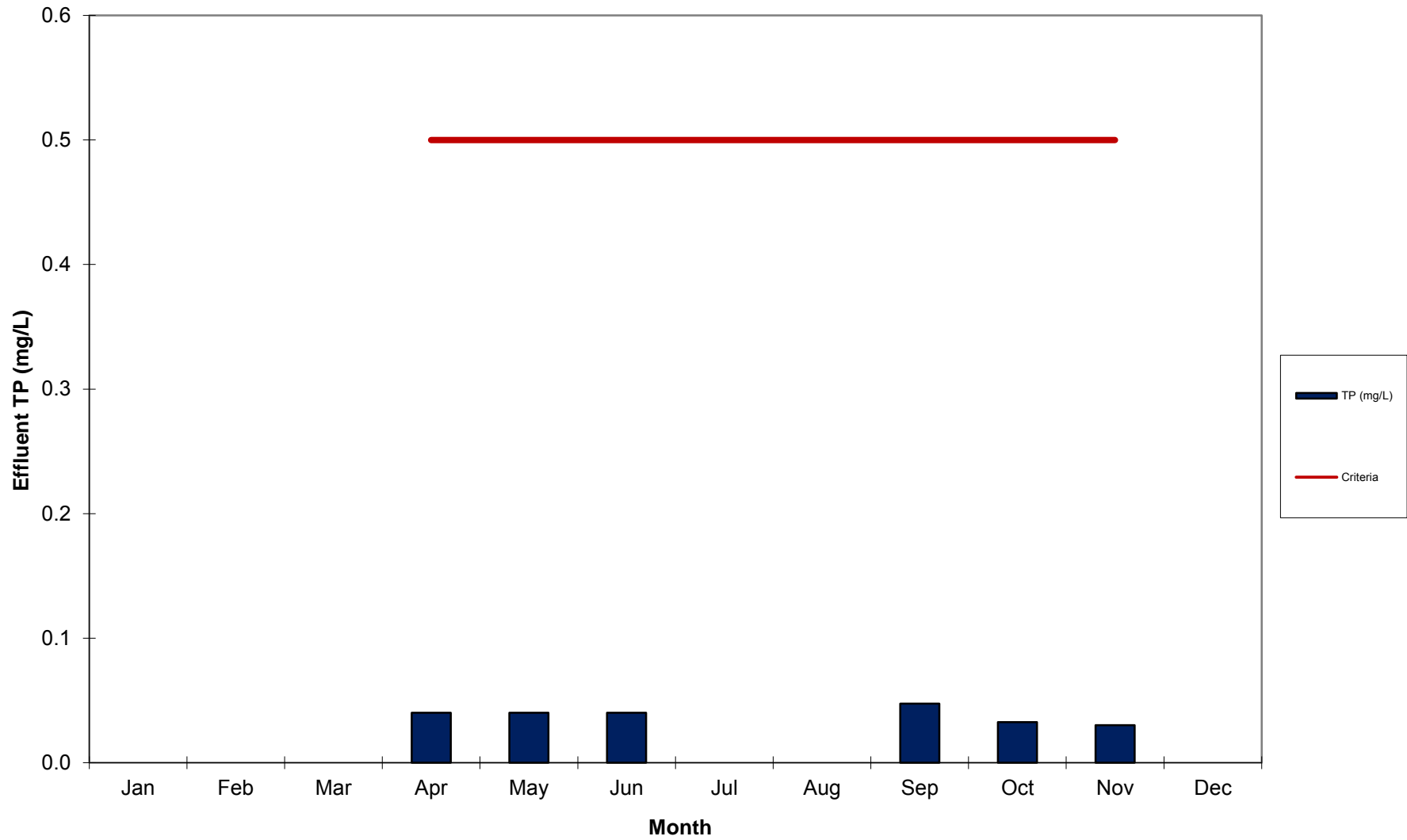
Plattsville WWTP Effluent, Monthly Average CBOD₅ (mg/L), 2014



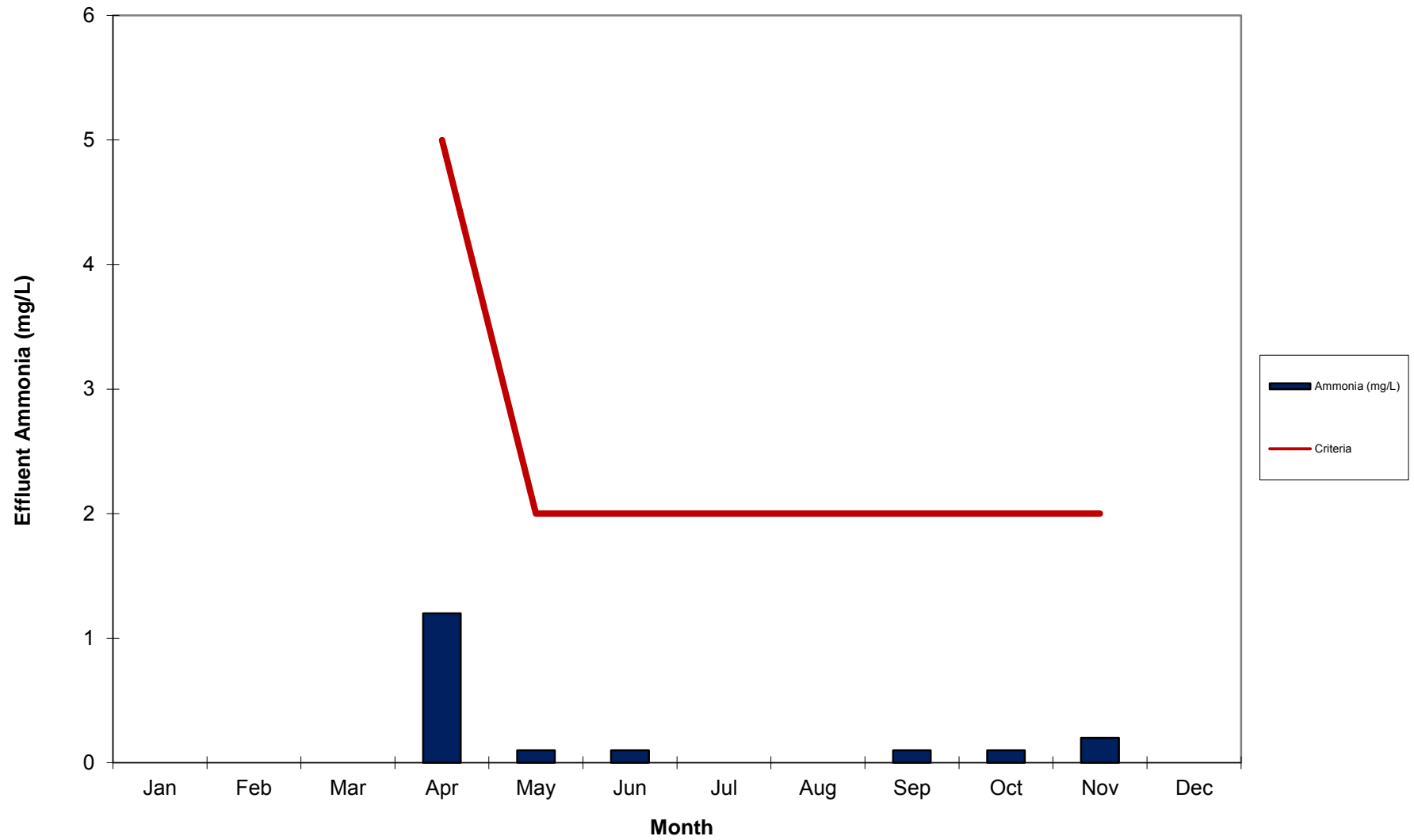
Plattsville WWTP Effluent, Monthly Average TSS (mg/L), 2014



Plattsville WWTP Effluent, Monthly Average TP (mg/L), 2014



Plattsville WWTP Effluent, Monthly Average Ammonia Discharge (mg/L), 2014



Municipality: Plattsville
 PROJECT: Plattsville Lagoons
 Operator: County of Oxford
 Works Number:
 110003022

2014

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average	Min	Max	Total	Criteria
Influent																	
Total Flow (1000m ³)	17.722	14.711	16.354	19.683	19.055	15.087	17.215	16.280	17.279	17.735	20.153	19.300				210.574	
Flow (1000m ³ /d)	0.572	0.525	0.528	0.6561	0.615	0.503	0.555	0.525	0.57597	0.5721	0.672	0.623	0.577	0.503	0.672		0.8
Max Flow (1000m ³ /d)	0.750	0.640	0.717	0.833	0.795	0.788	0.728	0.608	0.765	0.714	1.207	0.786	0.778	0.608	1.207		2.98
Min Flow (1000m ³ /d)	0.446	0.387	0.438	0.305	0.434	0.392	0.434	0.411	0.461	0.471	0.473	0.428	0.423	0.305	0.473		
Influent																	
BOD ₅ (mg/L)	81.0	162.0	169.0	150.0	162.0	138.0	162.0	46.0	216.0	206.0	233.0	149.0	156	46	233		
SS (mg/L)	134.0	202.0	286.0	157.0	209.0	174.0	189.0	73.0	252.0	212.0	216.0	194.0	192	73	286		
AMMONIA (mg/L)	30.8	40.6	37.6	24.3	49.2	47.3	39.1	19.8	61.8	54.7	48.8	53.5	42.3	19.8	61.8		
TKN (mg/L)	41.3	41.2	36.2	47.1	50.1	47.9	48.9	20.1	65.5	52.8	48.4	62.0	46.8	20.1	65.5		
NITRITE (mg/L)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.30	0.03	0.05	0.04	0.03	0.06	0.03	0.30		
NITRATE (mg/L)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.60	0.06	0.06	0.06	0.06	0.06	0.11	0.06		
TP (mg/L)	3.2	5.1	4.9	4.8	6.5	5.1	5.1	11.6	6.5	5.1	5.8	5.9	5.8	3.2	11.6		
Temp	8.9	7.3	8.1	9.5	13.7	16.6	18.3	18.2	19.0	16.3	13.1	11.3	13.35	7.28	19.05		
pH	8.23	7.77	8.37	8.24	8.27	8.17	8.11	7.84	8.16	8.34	8.39	8.05	8.16	7.77	8.39		
Effluent																	
Total Flow (1000m ³)				53.158	65.819	11.369			15.238	28.571	14.286					188.441	
Flow (1000m ³ /d)				2.7978	2.123	1.137			0.726	0.95237	1.299		1.506	0.726	2.798		
Criteria (1000m ³ /d)																	
Plant Effluent													Annual Average	Min.	Max.		Compliance Criteria
CBOD ₅ (mg/L)				3.0	2.8	2.0			2.3	2.0	2.0		2.3	2.0	3.0		Average* ≤ 10
SS (mg/L)				3.3	2.8	2.5			3.0	2.5	2.0		2.7	2.0	3.3		Average** ≤ 10
Ammonia (mg/L)				1.2	0.1	0.1			0.1	0.10	0.20		0.30	0.10	1.20		Average ¹ 2 / 5
TKN (mg/L)				1.7	0.6	0.5			0.6	0.50	1.40		0.88	0.50	1.73		
NITRITE (mg/L)				0.09	0.07	0.03			0.03	0.03	0.17		0.07	0.03	0.17		
NITRATE (mg/L)				4.39	2.40	2.17			2.13	0.21	1.08		2.06	0.21	4.39		
TP (mg/L)				0.04	0.04	0.04			0.05	0.03	0.03		0.04	0.03	0.05		Average*** ≤ 0.5
pH				7.63	7.41	7.30			7.39	7.46	7.40		7.43	7.30	7.63		
E. Coli (#/100ml)				1.3	1.5	3.0			71.9	10.4	4.5		5	1	72		Geomean 200
Temp. Celcius				8.1	16.3	19.7			16.8	11.8	6.6		13.2	6.57	19.7		
D.O. (mg/L)				10.4	9.0	8.7			9.4	9.7	11.4		9.8	8.73	11.4		

Influent Loadings	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average	Min	Max	Criteria
Month																
BOD5 kg/d	46	85	89	98	100	69	90	24	124	118	157	93	90	24	157	
TSS kg/d	77	106	151	103	128	88	105	38	145	121	145	121	110	38	151	
Effluent Loadings																
CBOD5 kg/d				8	6	2			2	2	3		4	2	8	
TSS kg/d				9	6	3			2	2	3		4	2	9	
TP kg/d				0.11	0.08	0.05			0.03	0.03	0.04		0.058	0.031	0.112	
Total Ammonia kg/d				3.36	0.21	0.11			0.07	0.10	0.26		0.685	0.073	3.357	
Criteria																
CBOD5 Criteria kg/d	0	0	0	0	0	0	0	0	0	0	0	0	0			
TSS Criteria kg/d	0	0	0	29	22	14	7	7	7	10	15	0				
TP Criteria kg/d	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0				
Total Ammonia Criteria kg/d	0	0	0	0	0	0	0	0	0	0	0	0				

* MOE Criteria: CBOD5 Monthly Average not to exceed 10 mg/L
 ** MOE Criteria: TSS Monthly Average not to exceed 10 mg/L
¹ MOE Criteria: Ammonia Monthly Average changes when stream is > 12 or < 12 degrees celcius respectively
 *** MOE Criteria: TP Monthly Average not to exceed 0.50 mg/L

Calibration Records

Instrumentation Calibrations and Checks

Date 2014	Calibrated					Checked				
	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer
Oct-06	jb	ms				jb		ms		
Oct-07			ms							
Oct-08							ms	ms		
Oct-10	jb					jb			jb	
Oct-14	jb	jb	jak	jak						
Oct-17						jak			jak	
Oct-20		jak	jak							
Oct-21	ms			ms						
Oct-22		jmt	jmt			ms			ms	
Oct-24	jb	jak	jak	jb		jb			jb	
Oct-27	jak	jb		jak		jb	jb			
Oct-29	jb	ms	ms			jb			jb	
Oct-30							ms	ms		
Oct-31	jb					hjb	ms	ms		
Nov-03	jak			jak			jmt	jmt		
Nov-04		jb				jak	jb		jak	
Nov-06			jb					jb		
Nov-10	jb					jb				
Nov-12	jmt	jmt	jmt							
Nov-14						ms	jak	jak		
Nov-17		jak	jak			ms				
Nov-18	ms	ms	ms							
Nov-24	jak	jb		jak			jb	jb		
Nov-26							jak		os	
Nov-28		jb					jb			
Dec-01	ms	ms	jmt							
Dec-03	ms					ms				
Dec-04			os				jak			
Dec-05							ms			
Dec-08	jab	jb	os	jak		jb	jb			
Dec-10						jak			jak	
Dec-15	jak			jak						
Dec-16		ms								
Dec-18		jb					jb		jb	
Dec-19	ms					ms			ms	
Dec-30	ms	ms		ms						

Please initial and date after each calibration or check.
 Hach Spectrophotometer calibrated yearly or at lamp replacement.
 All other meter calibrated once/week and checked twice/week.

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Plattsville ON
Customer PO
Our Job # B13 8575

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 311
Cal Date June 12/14
Due Date June 12/15
Cal Freq Yearly
Location Pumphouse
Description Flow Ind. Transmitter
Manufacturer Endress + Hauser
Model Promag 53
Serial #
Accuracy 1%
Range 0 - 16.00 m³/min

MEASURING EQUIPMENT

Manufacturer Fluke E + H SIM
Model 725
Serial # 7903019
Cal Reference Fluke
Traceability NIST
Accuracy 0.02% + 2 cnts

INPUT m ³ /min	%	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0	4.000	3.997	3.997	-0.02	-0.02
4.00	25.0	8.000	7.996	7.996	-0.02	-0.02
8.00	50.0	12.000	11.994	11.994	-0.04	-0.04
12.00	75.0	16.000	15.993	15.993	-0.04	-0.04
16.00	100.0	20.000	19.992	19.992	-0.05	-0.05

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Plattsville ON
Customer PO
Our Job # B13 8575

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 311
Cal Date June 12/14
Due Date June 12/15
Cal Freq Yearly
Location
Description Flow Element
Manufacturer Endress + Hauser
Model Promag W
Serial # CA 113A19000
Accuracy 1%
Range 0 - 16.00 m³/min
K Factor 0.9492/-6
DN 14"

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy

Test Unit Results

AS FOUND	AS LEFT
Pass:	Pass:
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
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Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT Bypass
Cal Date June 12/14
Due Date June 12/15
Cal Freq Yearly
Location Influent Flow
Description Flow Ind. Transmitter
Manufacturer Milltronics
Model OCM III
Serial #
Accuracy 1%
Range FS 0 - 9324 m³/D
Primary Element 6" Parshall Flume
Head 45.00 cm

MEASURING EQUIPMENT

Manufacturer Gauge Bd & Tape
Model
Serial #
Cal Reference
Traceability
Accuracy 1/4"

INPUT cm WC	Meters WC	OUTPUT*AAV m ³ /D	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0000	0.00	0.00	0.00	0.00	0.00
19.37	0.1937	2461.67	2463.00	2463.00	0.01	0.01
44.150	0.44150	9048.068				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Plattsville ON
 Customer PO
 Our Job # B13 8575

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ Bypass
 Cal Date June 12/14
 Due Date June 12/15
 Cal Freq Yearly
 Location Influent Flow
 Description Flow Integrator
 Manufacturer Milltronics
 Model OCM III
 Serial #
 Accuracy 1%
 Range fs 0 - 9324 m³/D
 Range 0 - 6.475 PPM (m³)

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT m ³ /D	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
1717.00		1.192	1.184	1.184	-0.12	-0.12
3633.00		2.523	2.505	2.505	-0.28	-0.28
5107.00		3.547	3.529	3.529	-0.28	-0.28
9324.00		6.4750				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

As Left 0
 As Found 35
 Difference -35

TECHNICIAN'S NOTES

Reset total to zero

CERTIFIED BY:

R. Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Plattsville ON
 Customer PO
 Our Job # B13 8575

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 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 311
 Cal Date June 12/14
 Due Date June 12/15
 Cal Freq Yearly
 Location
 Description Flow Integrator
 Manufacturer Endress + Hauser
 Model Promag 53
 Serial #
 Accuracy 1%
 Range 0 - 16.00 m³/min

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001

INPUT m ³ /min	%	OUTPUT*AAV PPM	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.0	0.000	0.000	0.000	0.00	0.00
4.00	25.0	4.000	4.004	4.004	0.02	0.02
8.00	50.0	8.001	7.983	7.983	-0.11	-0.11
12.00	72.0	12.000	11.982	11.982	-0.11	-0.11
16.00	100.0	16.000	16.002	16.002	0.01	0.01

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$

Test Unit Results

	As Left	834420.2
	As Found	834381.0
AS FOUND	AS LEFT	Difference
Pass: ✓	Pass: ✓	39.2
Fail:	Fail:	

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

Plant Maintenance Records

ID	Descriptio	Projected Start	I Shop	Instructions
6380	Repair	08/01/2014	250600	Plattsville blower # 3 not starting
6456	Repair	10/02/2014	250600	Plattsville blower # 2 lost its oil
6634	Replace	07/04/2014	250600	Install sand filter caps
6756	Lubricate	22/05/2014	250600	Change oil Plattsville blowers Make two sampling lids for flow splitting chamber from aerated ponds□
6942	Replace	17/07/2014	250600	Make grating and install to replace fiberglass cover
7188	Lubricate	08/10/2014	250600	Pull all pumps for inspection of fluids and add cables on pumps
7230	Repair	29/10/2014	250600	Kaeser blower # 3 lost oil
7231	Repair	29/10/2014	250600	Plattssville alum pump not pumping
7244	Repair	03/11/2014	250600	Plattsville filter building heater not working
7292	Repair	18/11/2014	250600	Plattsville sand filter #2 rotork valve faulting (siezed)
7408	Repair	23/12/2014	250600	Blower # 1 has lost oil shut down for repair
7555	Repair	15/01/2015	250600	Plattsville blower # 3 not starting



Public Works

P. O. Box 1614, 21 Reeve St., Woodstock, Ontario N4S 7Y3

Phone: 519-539-9800 Fax: 519-421-4711

Website: www.oxfordcounty.ca

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 Year-End Monitoring Report, Norwich Wastewater Treatment Plant (WWTP)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) #1680-6F6QR5.

I trust this report fulfills the intent of the ECA annual reporting requirements.

If there are any questions, please contact me.

Yours truly,

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 Norwich Wastewater Treatment Plant

The Norwich WWTP (Figure 1) provided effective wastewater treatment in 2014. The average daily flow for 2014 was 1,044 m³/d. This represents 68.2% of the rated capacity of 1,530 m³/d.



Figure 1 Aerial view of Norwich WWTP

Plant Description

The Norwich WWTP is a lagoon treatment system serving the community of Norwich, Ontario. The wastewater is pumped from two pump stations to a splitter box; then to either of two lagoon cells as determined by the operator. Typically the wastewater is directed to the North Cell which is operated in series with the South Cell, followed by filtering of the effluent through the sand filter beds performed for a period each day, as required. The lagoons may discharge year-round; however, the freezing period prevents discharge through the filter beds (normally December to April).

Plant Specifications

Facilities -	Lagoons (2 cells) and an intermittent sand filter
Design Capacity -	1,530 m ³ /day
Average Daily Flow -	1,044 m ³ /day (2014)
Receiving Stream -	Otter Creek
Plant Classification -	WWT – I
Works Number -	110001480
MOECC ECA	#1680-6F6QR5

Effluent Limits:

<u>Effluent Parameters</u>	<u>Concentration in Effluent</u>	
Escherichia Coli	200 organisms / 100 mL (monthly geometric mean density)	
	<u>Monthly</u>	
<u>Effluent Parameters</u>	<u>Concentration</u>	<u>Loading⁽³⁾</u>
BOD ₅	10mg/L	23.7kg/d
Suspended Solids	10mg/L	23.7kg/d
<u>Total Phosphorus Non-freezing period:</u>		
	0.5mg/L	1.2kg/d
<u>Freezing period:</u>	1.0mg/L	2.4kg/d
<u>(Ammonia + Ammonium) Nitrogen⁽²⁾ Non-freezing period:</u>		
	3.0mg/L (5.0mg/L) ⁽¹⁾	11.8kg/d
<u>Freezing period</u>	5.0mg/L (8.0 mg/L) ⁽¹⁾	18.9kg/d
Total Chlorine Residual (when chlorine is in use)	0.002mg/L(0.01mg/L) ⁽¹⁾	0.005kg/d
Dissolved Oxygen	> 4.0 mg/L	

Notes: (1) Values in brackets indicate daily concentration limits.

(2) In addition to the (Ammonia + Ammonium) Nitrogen concentrations noted above, the un-ionized ammonia concentration in the effluent shall not exceed 0.1 mg/L for monthly average values and 0.2 mg/L for any individual sample.

(3) The loading are based on an average daily flow of 2,366 m³/d over a 236-day discharge period.

The Owner shall maintain the pH of the effluent from the sewage treatment plant within the range of 6.0 to 9.5, inclusive, at all times.

Freezing period means the period of time during which the water temperature of the receiving stream is equal to or below 5 degrees Celsius. Normally this period is from December 1st to April 30th.

Non-freezing period means the period of time during which the water temperature of the receiving stream is above 5 degrees Celsius.

Effluent Quality Assurance and Control Measures

Sampling Description

Influent samples were taken from the Lagoon influent splitter box. The sampling frequency is once per week and samples are tested for Biochemical Oxygen Demand (BOD₅), Suspended Solids (SS) monthly, Total Phosphorus (TP), and Total Kjeldahl Nitrogen (TKN) weekly.

Effluent samples are taken using a 24-hour composite sampler set to take a sample every 15 minutes for the duration of the discharge period. BOD₅ and SS are sampled at least

monthly. TP, ammonia, TKN, pH, and temperature samples are taken three times per week; E.Coli and dissolved oxygen are tested at least weekly.

Laboratory and Field Testing

Laboratory analysis is performed by SGS Lakefield Research Ltd. on all samples for all parameters except for pH, temperature, and dissolved oxygen which are tested in the field during collection. These results are used for determination of compliance. Any information generated in-house is used in process control but is not included in this report.

Summary and Interpretation of Monitoring Data

Presented in Table A that follows are the average, maximum, and minimum values for all influent and effluent parameters. The calculation is based on all external test results and both flow meters.

Flows

The average flow was 1,044 m³/d representing 68.2% of the design criteria of 1,530 m³/d. The daily maximum flow for 2014 was 3,419 m³/day.

Raw Sewage Quality

Table 1 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 1,044 m³/day.

Table 1

Parameter	Concentration mg/L	Loading kg/day
BOD ₅	204	213
SS	183	191
TKN	42	44
TP	4.8	5

Plant Performance & Effluent

Table 2 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA limits for the parameter.

Table 2

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	*ECA Effluent Limits mg/L
BOD ₅	2	3	99	10
SS	2	3	98.9	10
TP	0.21	0.23	95.6	0.5/1
Ammonia	1.8	4.1	na	3/5
E. Coli	8	26	na	200

pH	7.6	7.8	na	6-9.5
----	-----	-----	----	-------

* Ammonia, and TP have different limits depending on the temperature of Big Otter Creek, refer to effluent limits under Plant Specifications section of this report

All pH is measured in the effluent by the operator a minimum of three times per week during discharge. There were no samples outside the pH range of 6-9.5 for 2014. All dissolved oxygen readings in the effluent were measured at least weekly by the operator during discharge and no sample was below the minimum of 4 mg/L.

The average, maximum, and minimum influent and effluent results were calculated and are shown in Table A of Exhibit 1.

Effluent Objectives

Effluent objectives are non-enforceable effluent quality values which the owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

All effluent discharge objectives listed in the Plant's ECA were met with the exception of the ammonia objective in April which was exceeded during the non-compliance to the effluent limit for Ammonia described below.

Description of Operating Problems, Bypassing, Spills, Abnormal Events, and Complaints Received

The Norwich WWTP was operating within its discharge limits for 2014 with exceptions in April and in May 2014. In April, the ammonia exceeded the monthly average effluent discharge limit, with four samples over the single sample maximum during the month. Monthly effluent concentration of ammonia was 4.05 mg/L; the criteria limit is 3.0 mg/L. In May, there was a single sample which exceeded the single sample maximum for ammonia of 5 mg/L during that discharge period; the result was 6.3 mg/L.

Lagoons levels were extremely high with the potential for berm damage. There was extreme cold winter temperature with ice cover until mid-April 2014. The four single sample maximum exceedances occurred during filter bed break-in period during the first few weeks of discharge. These samples were over the single sample limit of 5 mg/L.

Adding to the difficulties, two of the filter bed automatic valves were taken out for repair and operational staff could only use two filter beds instead of the existing four filter beds. Staff monitored ammonia levels and sampled in-house daily. Ammonia levels began to drop as discharge period continued.

These non-compliances were reported to the MOECC at the time they occurred.

There was no bypass or overflow or spill events during the year from the lagoon system.

There were no complaints received for the Norwich WWTP.

On September 6, 2014, there was an overflow of approximately 0.6 m³ from the Lossing Drive sewage pumping station that was due to a power failure. The after hours on-call Operator responded to an alarm and noticed the overflow. The main power was restored shortly after the Operator arrived and before a portable generator could be connected.

This event was reported to the MOECC at the time it occurred.

Maintenance of Works

Maintenance was completed as needed on the Wastewater Treatment Plant and was initiated by the operator during routine inspection of the system. The system is owned and operated by Oxford County and is supervised as one of a total of nine plants. The maintenance is completed by the southern area staff. A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

R&R Instrumentation Services performed meter calibration on the lagoon effluent meter.

Operations monitoring equipment calibration records are appended to this report.

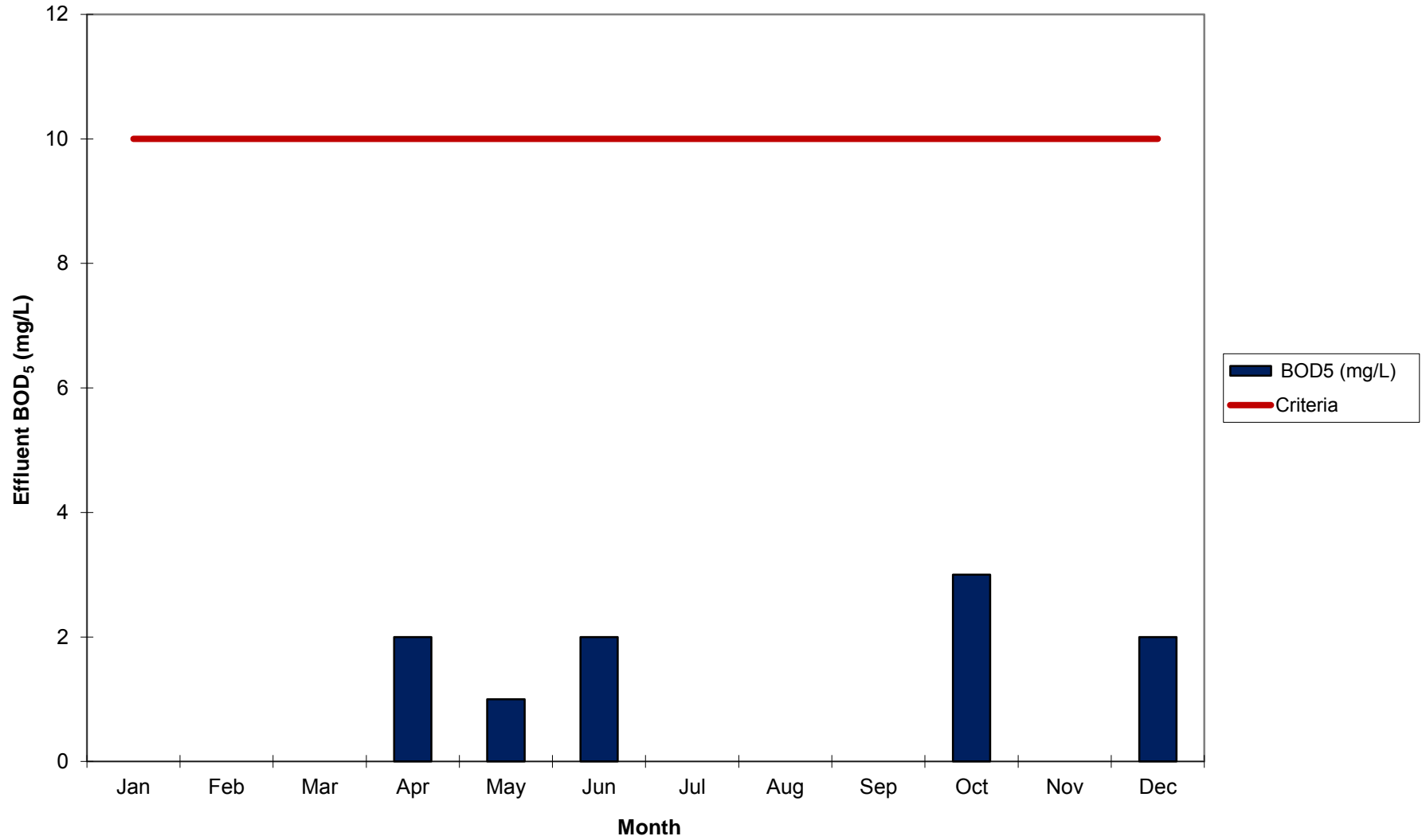
Summary

The Norwich WWTP was operating within its design flow criteria and was operating within its discharge limits for 2014 with exceptions in April and in May 2014.

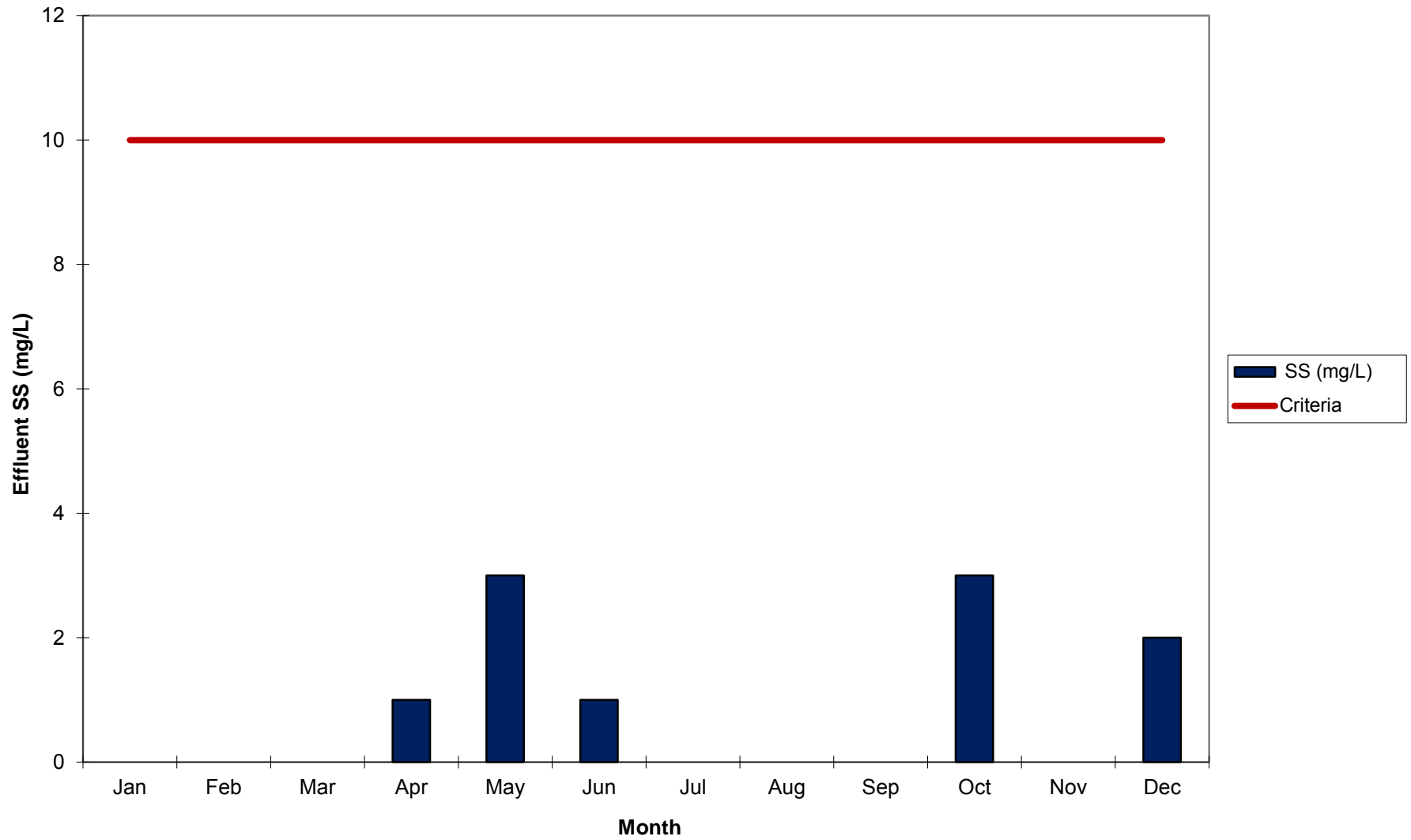
There is a Class Environmental Assessment study underway for the Norwich WWTP to determine the preferred alternative to upgrade the plant to meet the future wastewater treatment needs of the community.

EXHIBIT 1

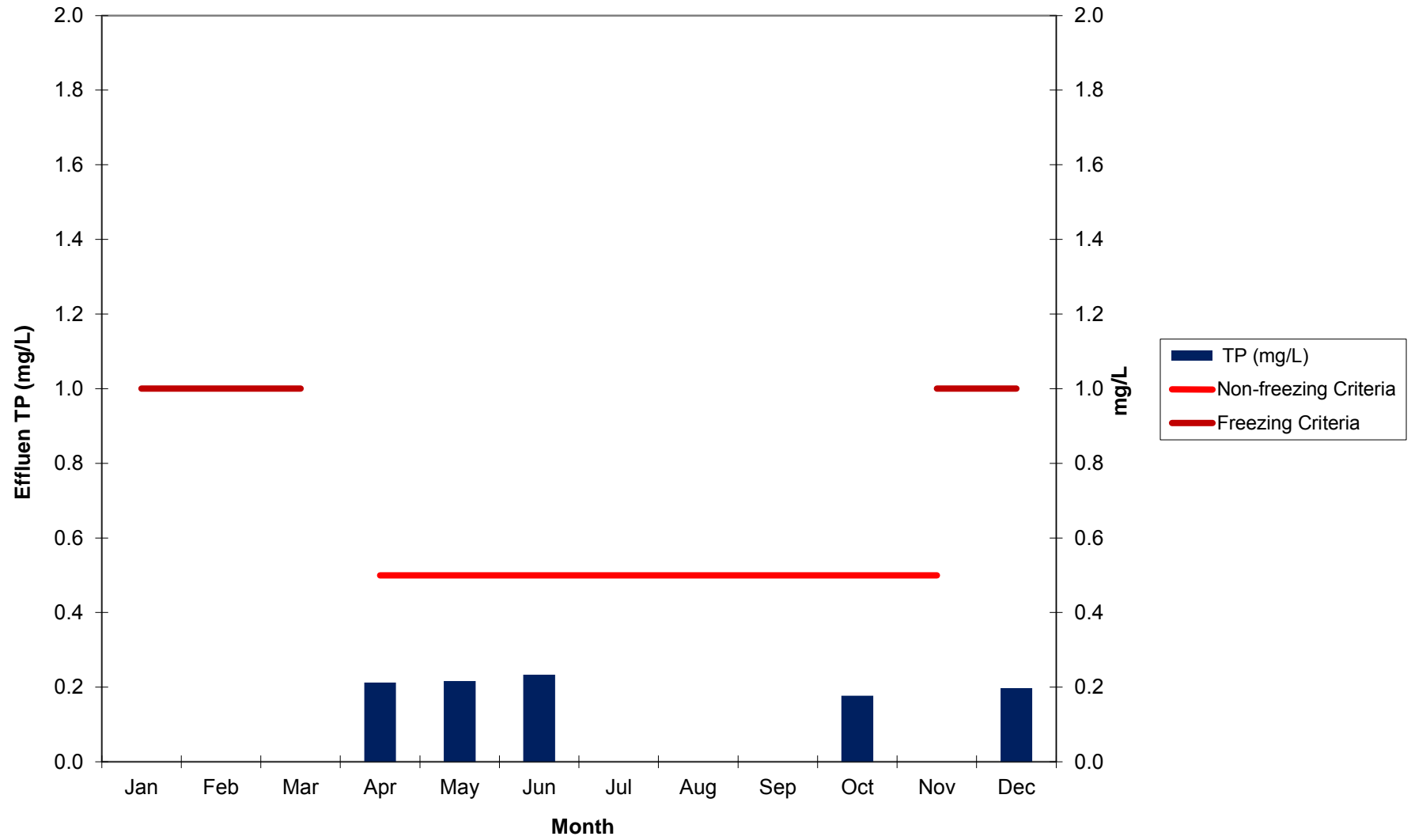
Norwich Lagoons Effluent, Monthly Average BOD₅ (mg/L), 2014



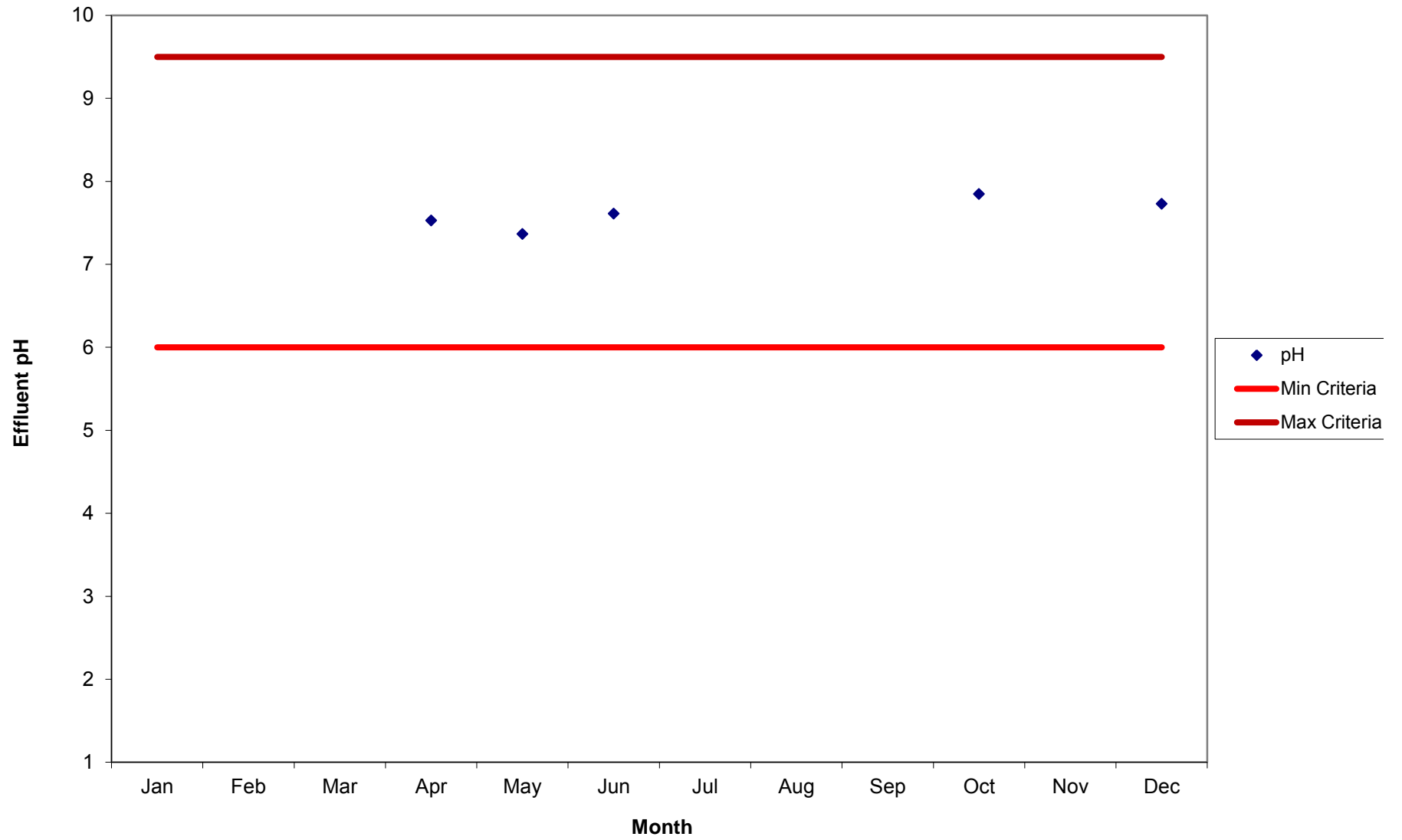
Norwich Lagoons Effluent, Monthly Average SS (mg/L), 2014



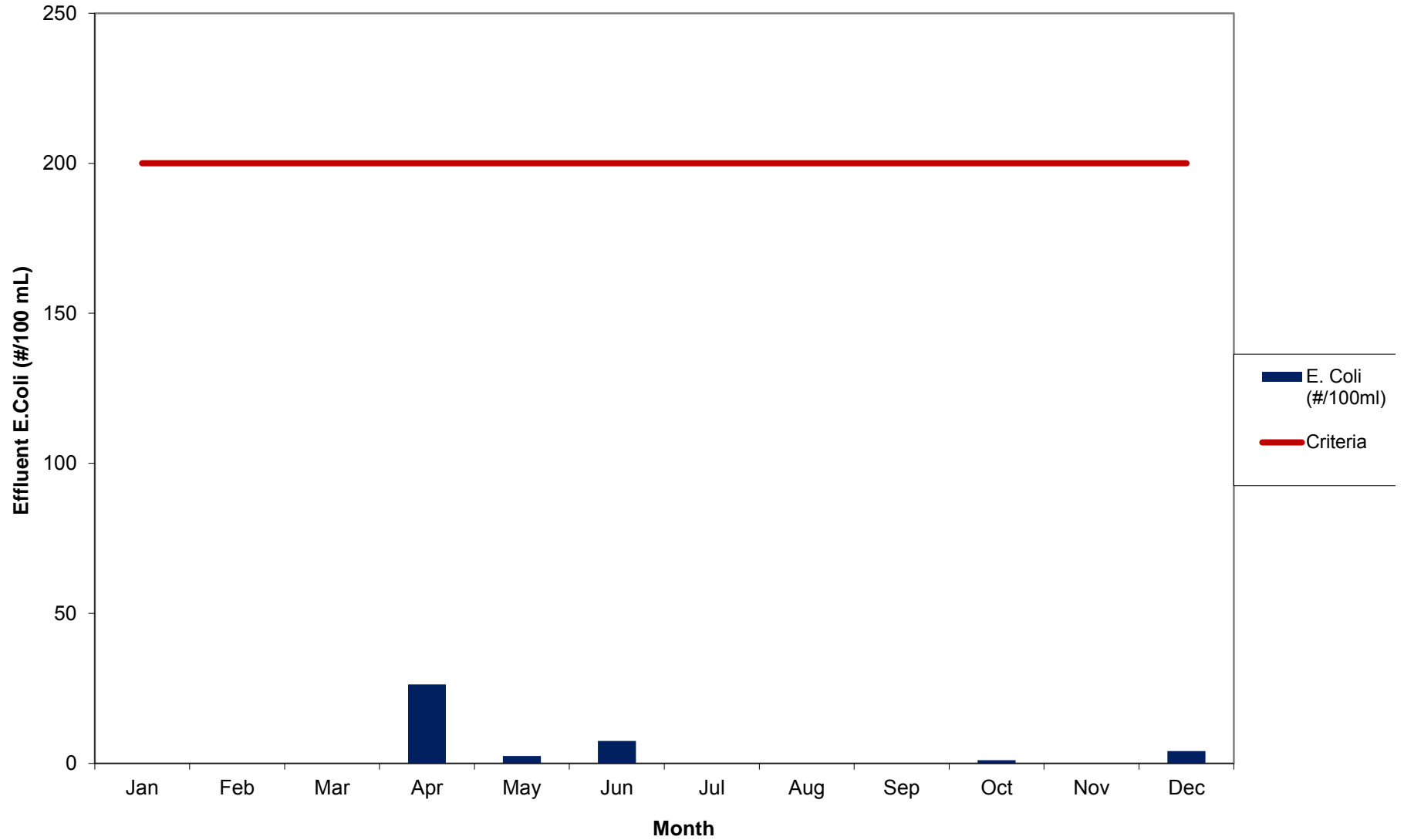
Norwich Lagoon Effluent, Monthly Average TP (mg/L), 2014



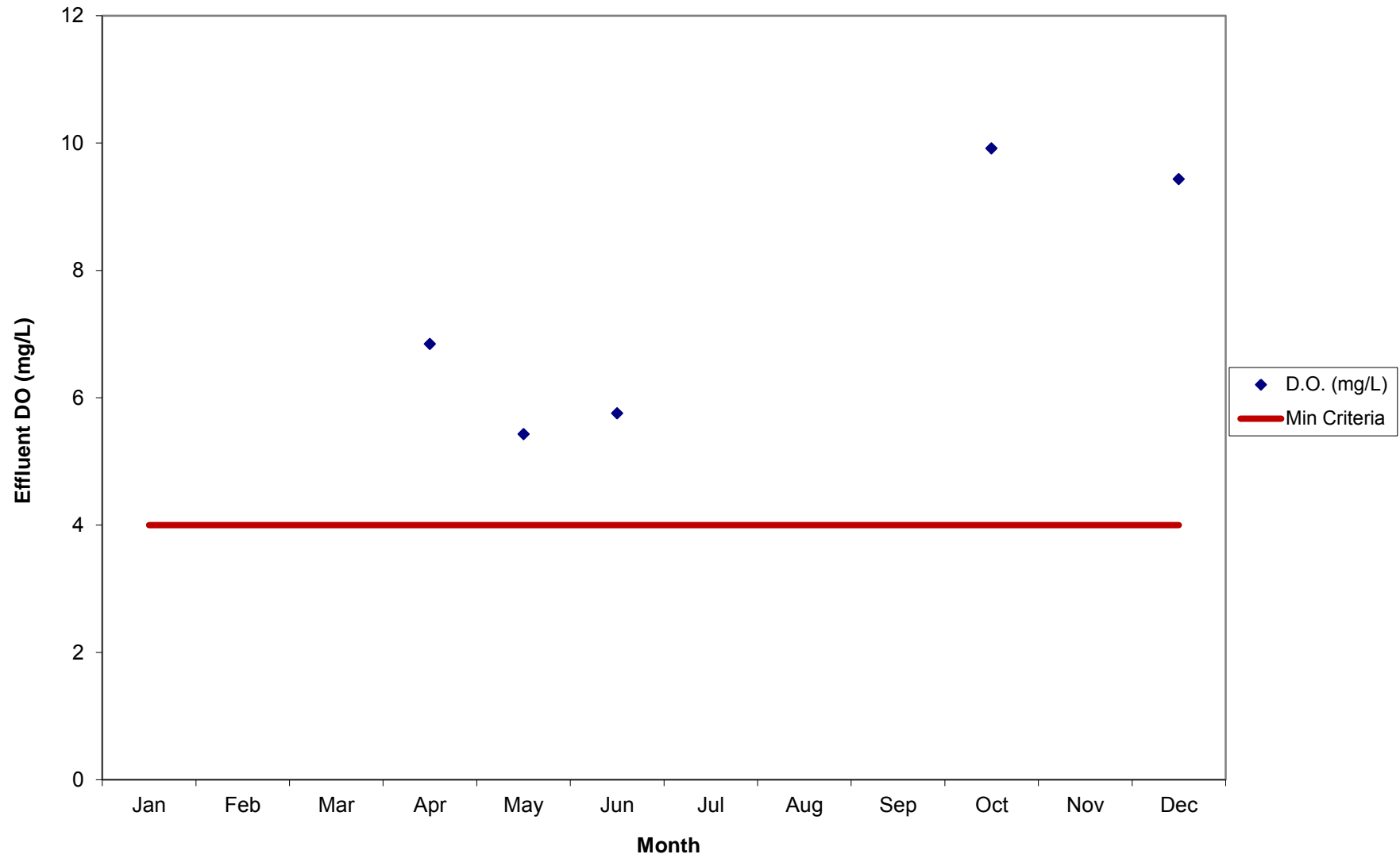
Norwich Lagoon Effluent, Monthly Average pH, 2014



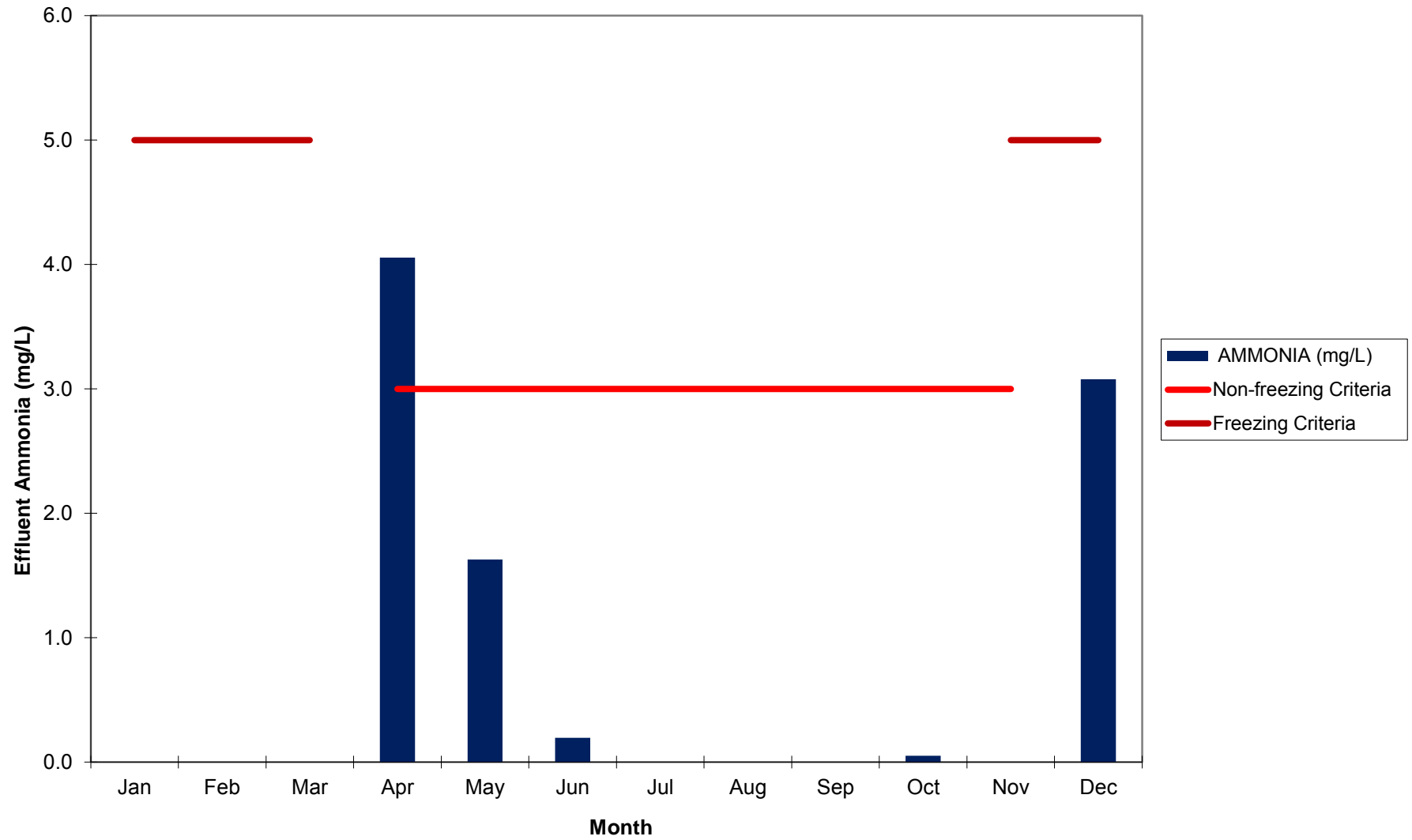
Norwich Lagoon Effluent, Monthly Geometric Mean Density E.Coli (#/100ml), 2014



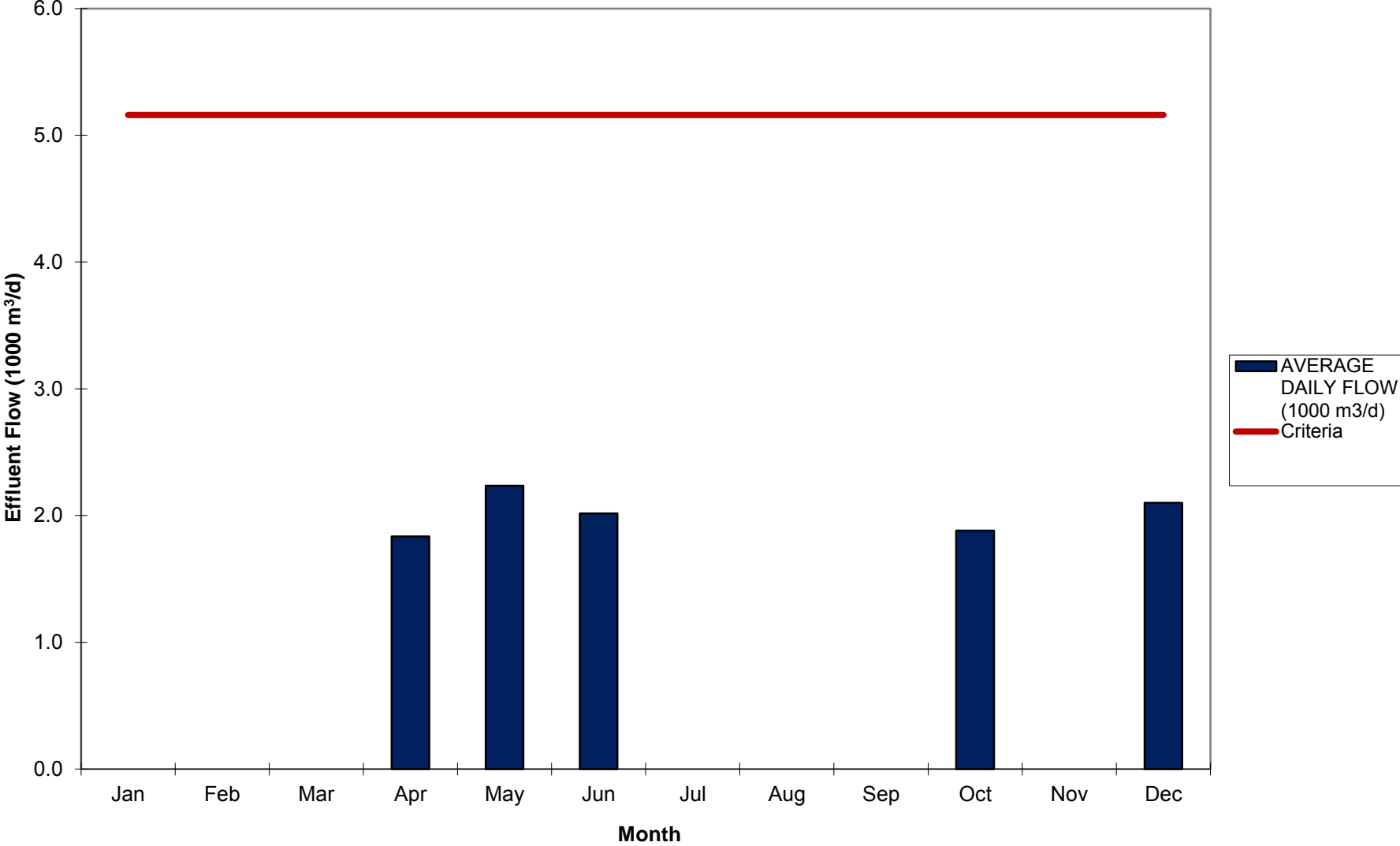
Norwich Lagoon Effluent, Monthly Average DO (mg/L), 2014



Norwich Lagoon Effluent, Monthly Average Ammonia (mg/L), 2014

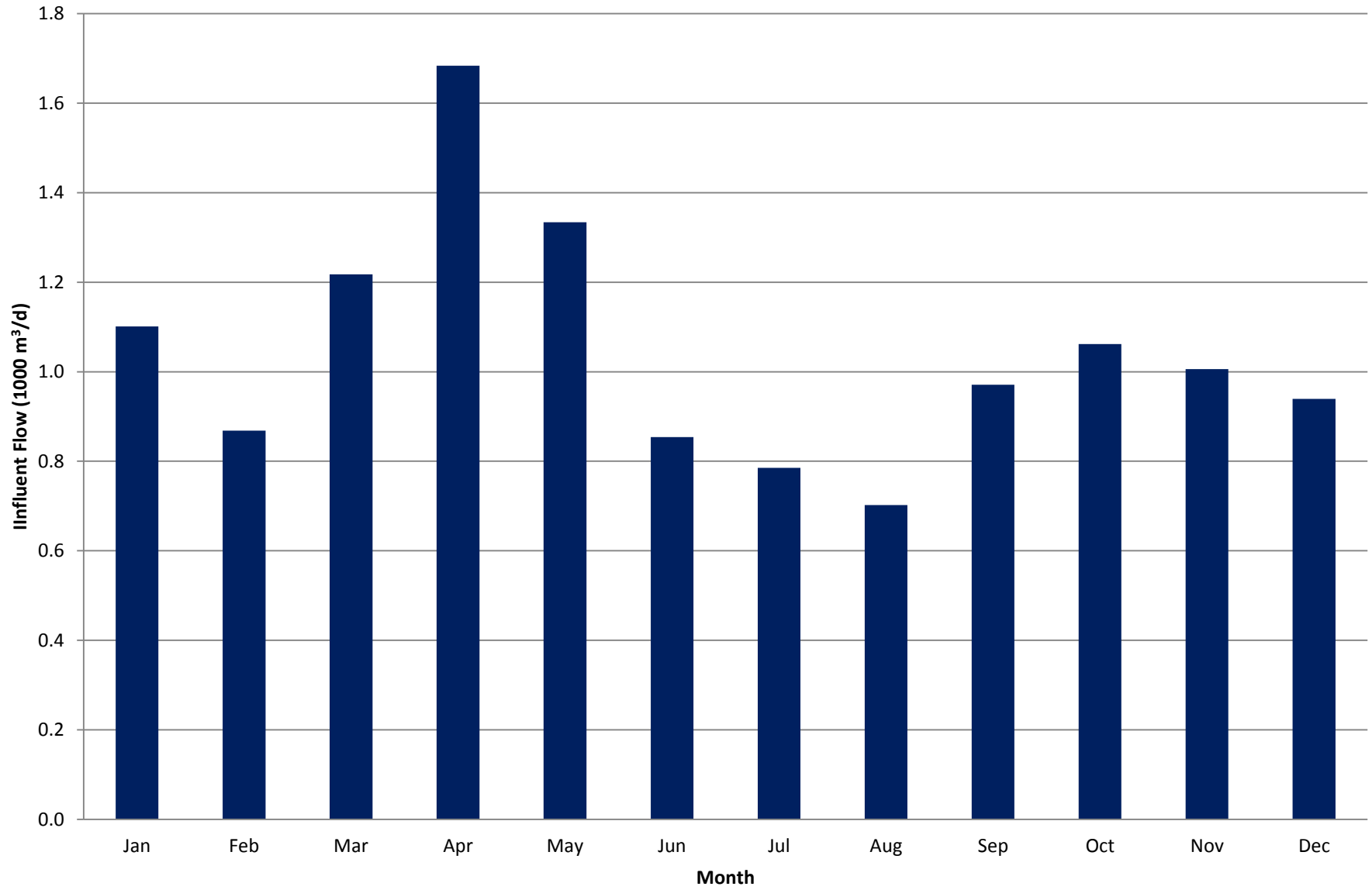


Norwich Lagoon Effluent, Monthly Average Daily Flow (1000 m³/d), 2014



Norwich Lagoon Influent, Average Daily Flow (1000 m³/d), 2014

■ AVERAGE DAILY FLOW (1000 m³/d)



Calibration Records

OXFORD COUNTY PUBLIC WORKS

Location: Tillsonburg WWTP & Norwich Lagoons

Dissolved O2 / PH Meter Calibration Reports

DATE Calibrated	Ph Meter Calibration weekly	Buffer 4.00	Buffer 7.00	Buffer 10.0	Dissolved O2 Meter	Calibration Weekly	Membrane Replaced Yes/No	Operator Signature
May 30, 2014	yes	yes	yes		yes	yes	no	BJ
June 6, 2014	yes	yes	yes		yes	yes	no	BJ
June 10, 2014	yes	yes	yes		yes	yes	no	DG
June 20, 2014	yes	yes	yes		yes	yes	no	BJ
June 24, 2014	yes	yes	yes		yes	yes	no	DG
July 4, 2014	yes	yes	yes		yes	yes	no	BJ
July 10, 2014	yes	yes	yes		yes	yes	no	DG
July 17, 2014	yes	yes	yes		yes	yes	yes	BJ
July 24, 2014	yes	yes	yes		yes	yes	no	DG
August 5, 2014	yes	yes	yes		yes	yes	no	DG
August 15, 2014	yes	yes	yes		yes	yes	no	BJ
August 22, 2014	yes	yes	yes		yes	yes	no	BJ
August 25, 2014	yes	yes	yes		yes	yes	no	DG
August 29, 2014	yes	yes	yes		yes	yes	no	BJ
September 9, 2014	yes	yes	yes		yes	yes	no	DG
September 16, 2014	yes	yes	yes		yes	yes	no	DG
September 22, 2014	yes	yes	yes		yes	yes	no	BJ
September 30, 2014	yes	yes	yes		yes	yes	no	BJ
October 2, 2014	yes	yes	yes		yes	yes	no	DG
October 16, 2014	yes	yes	yes		yes	yes	no	DG
October 24, 2014	yes	yes	yes		yes	yes	no	BJ
October 31, 2014	yes	yes	yes		yes	yes	no	DG
November 6, 2014	yes	yes	yes		yes	yes	no	BJ
November 12, 2014	yes	yes	yes		yes	yes	no	BJ
November 20, 2014	yes	yes	yes		yes	yes	no	DG
November 27, 2014	yes	yes	yes		yes	yes	no	BJ
December 9, 2014	yes	yes	yes		yes	yes	no	DG
December 17, 2014	yes	yes	yes		yes	yes	no	DG
December 22, 2014	yes	yes	yes		yes	yes	no	BJ
December 27, 2014	yes	yes	yes		yes	yes	no	BJ

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Norwich ON
 Customer PO
 Our Job # B13 8566

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 300
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location Norwich Waste Water Lagoon
 Description Flow Indicating Transmitter
 Manufacturer Krohne Altometer
 Model IFC 010F/D/6
 Serial # A96 13375
 Accuracy 1%
 Range 0 - 150.00 L/s
 Size 10" 250 mm
 GKL 4.507

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
 Model 725 GS8
 Serial # 7903019 404860 509 000
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts 0.1%

INPUT SIM Y	%	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		4.000	4.000	4.000	0.00	0.00
10.16		5.084	5.070	5.070	-0.09	-0.09
11.40		5.216	5.174	5.174	-0.26	-0.26
23.30		6.485	6.477	6.477	-0.05	-0.05
30.80		7.285	7.269	7.269	-0.10	-0.10

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES
SIM not working with transmitter. Zero check ok.

CERTIFIED BY:  CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Norwich ON
 Customer PO
 Our Job # B13 8566

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIR 300A
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location Norwich Lagoon
 Description Flow Ind. Recorder
 Manufacturer Bristol Babcock
 Model 4392
 Serial # 9409-37842
 Accuracy 1%
 Range 0 - 150.00 L/s
 Chart 0 - 100 %

MEASURING EQUIPMENT

Manufacturer Fluke
 Model 725
 Serial # 7903019
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts

INPUT mA	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.000	0.00	0.00	0.00	0.00	0.00	0.00
8.000	25.00	37.50	37.50	37.50	0.00	0.00
12.000	50.00	75.00	74.93	74.93	-0.05	-0.05
16.000	75.00	112.50	112.38	112.38	-0.08	-0.08
20.000	100.00	150.00	149.81	149.81	-0.13	-0.13

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES
Chart drive full scale. Will not read when mA changed.

CERTIFIED BY:  CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Norwich ON
Customer PO
Our Job # B13 8566

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FE 300
Cal Date June 04/14
Due Date June 04/15
Cal Freq Yearly
Location Norwich Waste Water
Description Flow Element
Manufacturer Krohne Altometer
Model IFC 010F/D/6
Serial # A96 13375
Accuracy 1%
Range 0 - 150.00 L/s
Size 10"
GKL 4.507
KLE IP67
DN 250/10" - H - V4A
PN 150 PSI

MEASURING EQUIPMENT

Manufacturer
Model
Serial #
Cal Reference
Traceability
Accuracy

$\frac{Q \times K \times F}{GKL \times DN \times DN}$	$Y_{20} = 4.00 + (16) \times 20/27.119 =$	15.799 mA
	$Y_{10} = 4.00 + (16) \times 10/27.119 =$	9.900 mA
	$Y_5 = 4.00 + (16) \times 5/27.119 =$	6.950 mA
$= \frac{150 \times 25464 \times 2}{4.507 \times 250 \times 250}$	$Y_{2.5} = 4.00 + (16) \times 2.5/27.119 =$	5.475 mA
	$Y_0 = 4.00 + (16) \times 0/27.119 =$	4.000 mA
$= 27.119$		

Test Unit Results

AS FOUND

AS LEFT

Pass:

Pass:

Fail:

Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Norwich ON
 Customer PO
 Our Job # B13 8566

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 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 300A
 Cal Date June 04/14
 Due Date June 04/15
 Cal Freq Yearly
 Location Norwich Lagoon
 Description Flow Integrator
 Manufacturer Bristol Babcock
 Model 4392
 Serial # 9409-37842-B03
 Accuracy 1%
 Range 0 - 9.000 PPM; 0 - 150.00 L/s

MEASURING EQUIPMENT

Manufacturer Fluke NexXTech
 Model 725 09A10
 Serial # 7903019 6315002
 Cal Reference Fluke
 Traceability NIST NIST
 Accuracy 0.02% + 2 cnts .0001

INPUT SIM Y	%	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00		0.000	0.000	0.000	0.00	0.00
75.00		4.500	4.530	4.530	0.33	0.33
150.00		9.000	9.005	9.005	0.06	0.06

$$\% \text{ Error} = \frac{\text{UUT Reading} - \text{AAV} \times 100}{\text{Span}}$$

Test Unit Results

	As Left	448059
	As Found	<u>448050</u>
	Difference	9

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:  CET, CCST Level III Technician

Plant Maintenance Records

ID	Descriptio	Projected St	Shop	Instructions
5527	Repair	01/04/2014	250400	Remove affected Rotorx valves advise foreman oif repair Valves 1,3.
6725	Repair	05/05/2014	250400	Repair door lock hinges and replace locks on equalization chambers and locking rods on hatches due to vandalism .
6914	Repair	26/06/2014	250400	Check all fluid levels on compressor and inspect
7064	Repair	22/08/2014	250400	Wetwell pump 104 CSF tripping out on overloads . Investagate possible pump problems
7065	Inspect	22/08/2014	250400	Check Return pump at new plant pump 402 kicking out on overloads
7066	Repair	22/08/2014	250400	Replace rubber on sweep arm check gearbox for possible bearing failure.
7134	Repair	14/09/2014	250400	Fabricate lock box and chains for assess gates at lagoons



Public Works

P. O. Box 1614, 21 Reeve St., Woodstock, Ontario N4S 7Y3

Phone: 519-539-9800 Fax: 519-421-4711

Website: www.oxfordcounty.ca

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 Year-End Report, Drumbo Sequencing Batch Reactor (SBR)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) #3-2191-90-916.

I trust this report fulfills the intent of the ECA reporting requirements. If there are any questions, please contact me.

Yours truly,

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

The Drumbo Sequencing Batch Reactor (SBR) provided effective wastewater treatment in 2014 with an average plant flow of 285 m³/d, which represents 105% of the design capacity of 272 m³/d. The total flow in 2014 was 103,970 m³. The daily maximum flow for 2014 was 384 m³/day.

Plant Description

The Drumbo SBR began operation in its present configuration in 1992. The SBR plant consists of two alternating reactors, pressure filters and ultra-violet radiation for disinfection, with an outfall pipe to the Cowan Drain. The plant adds aluminum sulphate into the reactors for phosphorus removal.

Oxford County operates the plant, utilizing the staff located at the Woodstock WWTP.

Plant Specifications

Plant -	Sequencing Batch Reactor
Design Capacity -	272 m ³ / day
Peak Capacity -	774 m ³ / day
Average Daily Flow -	285 m ³ / day (2014)
Receiving Area -	Cowan Drain
Classification -	WWT – II
ECA numbers -	3-2191-90-916 8-1158-92-006

<u>Effluent Limits:</u>	Ave. Monthly Concentration	Average Loading
BOD ₅ (Period A)	10 mg/L	2.8 kg/day
BOD ₅ (Period B)	15 mg/L	4.0 kg/day
Suspended Solids (Period A)	10 mg/L	2.8 kg/day
Suspended Solids (Period B)	15 mg/L	4.0 kg/day
Total Phosphorus (Period A)	0.5 mg/L	0.14 kg/day
Total Phosphorus (Period B)	1.0 mg/L	0.27 kg/day
Total Ammonia (Period A)	3.0 mg/L	0.8 kg/day
Total Ammonia (Period B)	5.0 mg/L	1.36 kg/day
Total Chlorine Residual	0.01 mg/L	

Note:

Period A refers to the time that the receiving stream temperature exceeds 5° C.

Period B refers to the time that the receiving stream temperature is less than or equal to 5° C.

The geometric mean density of E.Coli in the effluent shall not exceed 200 per 100 ml for any calendar month.

The average monthly concentration of dissolved oxygen in the effluent shall not be less than 5.0 mg/L.

Effluent Quality Assurance and Control Measures

Sampling Procedure

Influent samples are taken using a 24-hour composite sampler on a bi-weekly basis from the transfer tank; this tank receives flow from the trash tank, which holds most of the daily flow.

Effluent samples are taken bi-weekly using a 24-hour composite sampler installed so as to sample during periods of flow from either of two reactors. Samples are taken on site and tested for pH, chlorine residual, dissolved oxygen, and temperature.

Laboratory and Field Testing

Laboratory analysis is performed by SGS Lakefield Research Ltd. on all samples that are reported for compliance except for pH, DO, chlorine residual, and temperature.

Summary and Interpretation of Monitoring Data

Flows

The total flow treated in 2014 was 103,970 m³. The daily average flow was 285 m³/day which represents 105% of the rated capacity for Drumbo of 272 m³ /day. The daily maximum flow for 2014 was 384 m³/day.

Raw Sewage Quality

Table 1 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 285 m³/day.

Table 1

Parameter	Concentration mg/L	Loading kg/day
BOD ₅	126	36
TSS	89	25
TKN	30	8.6
TP	4	1.1

Plant Performance & Effluent

Detailed analytical data of annual and monthly averages are summarized later in this report in Exhibit 1.

Table 2 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA limits for the parameter.

Table 2

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	*ECA Effluent Limits mg/L
BOD ₅	5.5	10	95.6	10/15
TSS	5.4	7.5	93.9	10/15
TP	0.2	0.3	95	0.5/1
Ammonia	1.8	4.25	92.5	3/5
E. Coli	2	10	na	200
pH	7.52	7.81	na	6.5-9.5

* BOD₅, Ammonia, TP, and TSS have different limits depending on the temperature of the receiving Cowan Drain, refer to effluent limits under Plant Specifications above

The plant met all effluent discharge limits contained in the ECA in 2014, with the exception of Ammonia in April as detailed below. There was no single pH result outside the discharge limits of 6.5-9.5 in 2014.

Effluent Objectives

Objectives are non-enforceable effluent quality values which the owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits are exceeded.

The Drumbo SBR did not meet all effluent objectives in 2014. The objective of 5 mg/L for BOD₅ was not met in June, July, August, and November. The objective of 5 mg/L for TSS was not met during June, July, September and October. The objective of 4 mg/L was not met for Ammonia for the month of April while the objective of 2 mg/L was not met in November. The objective of 0.3 mg/L was not met for TP in October.

The Plant met all effluent discharge limits/criteria contained in the ECA in 2014 with the single exception of an ammonia non-compliance in April outlined in the following section.

Description of Operating Problems, Bypassing, Spills, Abnormal Events, and Complaints Received

There was a non-compliance with discharge limits/criteria in the ECA in the month of April for ammonia.

The average ammonia result for April 9, 2014 (Period B) was 5.1 mg/L with an average loading of 2.0 kg/day. The discharge limit for the average monthly concentration of ammonia (Period B) is 5.0 mg/L with an average loading of 1.36 kg/day.

The average ammonia result for April 25, 2014 (Period A) was 3.4 mg/L with an average loading of 1.34 kg/day. The discharge limit for the average monthly concentration of ammonia (Period A) is 3.0 mg/L with an average loading of 0.8 kg/day.

Period A refers to the period of time the receiving stream temperature exceeds 5 degrees C. Period B refers to the period of time the receiving stream temperature is less than or equal to 5 degrees C.

High hydraulic loadings for the month of April 2014, plus an upset reactor, created the non-compliance condition.

For Period B from April 1-15, 2014 the average flow was 428 m³/day.
For Period A from April 16-30, 2014 the average flow was 394 m³/day.
The design capacity of the plant is 272 m³/day.

It was discovered that the overflow check valve in the collection system between the sanitary system and the storm system was stuck open and allowed storm water to enter the sanitary system it has since been repaired.

This non-compliant event was reported to the MOECC at the time of its occurrence.

There were no bypasses, spills, or overflow events to the Nith River from the Drumbo SBR in 2014, and there were no complaints received regarding the WWTP in 2014.

Maintenance of Works

The operating and maintenance staff from the Woodstock WWTP conducts regularly scheduled maintenance of the Plant equipment. Detailed maintenance records for each piece of equipment are kept at the Woodstock Wastewater Treatment Plant (WWTP). A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

Calibrations are completed by R&R Instrumentation on an annual basis for all flow measurement devices.

Monitoring equipment calibration records are appended to this report.

During a technical review of the flow measurement equipment at the SBR by XCG Consultants Ltd. it was suggested that an additional meter be installed on the effluent to verify flow readings and that the existing influent meter readings be recorded from the net totalizer value displayed on the device instead of the + plus totalizer reading. Both these suggestions were acted upon by the operating staff during 2014.

Tabulation of Biosolids Generated, and Disposed

BIOSOLIDS ANNUAL REPORT 2014

Discussion:

Removed biosolids are a combination of waste activated sludge and primary sludge which is drawn from the Trash tank which is the first tank the raw wastewater enters before siphoning into the transfer tank that loads the reactors. The tank is designed to allow the settling and collection of solids for removal by truck.

The removal is accomplished by the Oxford County sewage vacuum truck with a useful volume of approximately 19 m³ as permitted under an MOECC Waste Management System certificate number A800939, or by a contracted certified waste hauler as needed.

The biosolids are then transported to the Woodstock WWTP for digestion.

The total volume of biosolids transported from the Drumbo WWTP in 2014 was 1,566 m³. Below are the monthly volumes of biosolids transported to the Woodstock WWTP in 2014.

SUMMARY OF ALL BISOLIDS REMOVAL

DATE	BIOSOLIDS QUANTITY(m ³)
January	132
February	170
March	170
April	170
May	170
June	75
July	151
August	94
September	77
October	132
November	113
December	113
2014 Total	1566

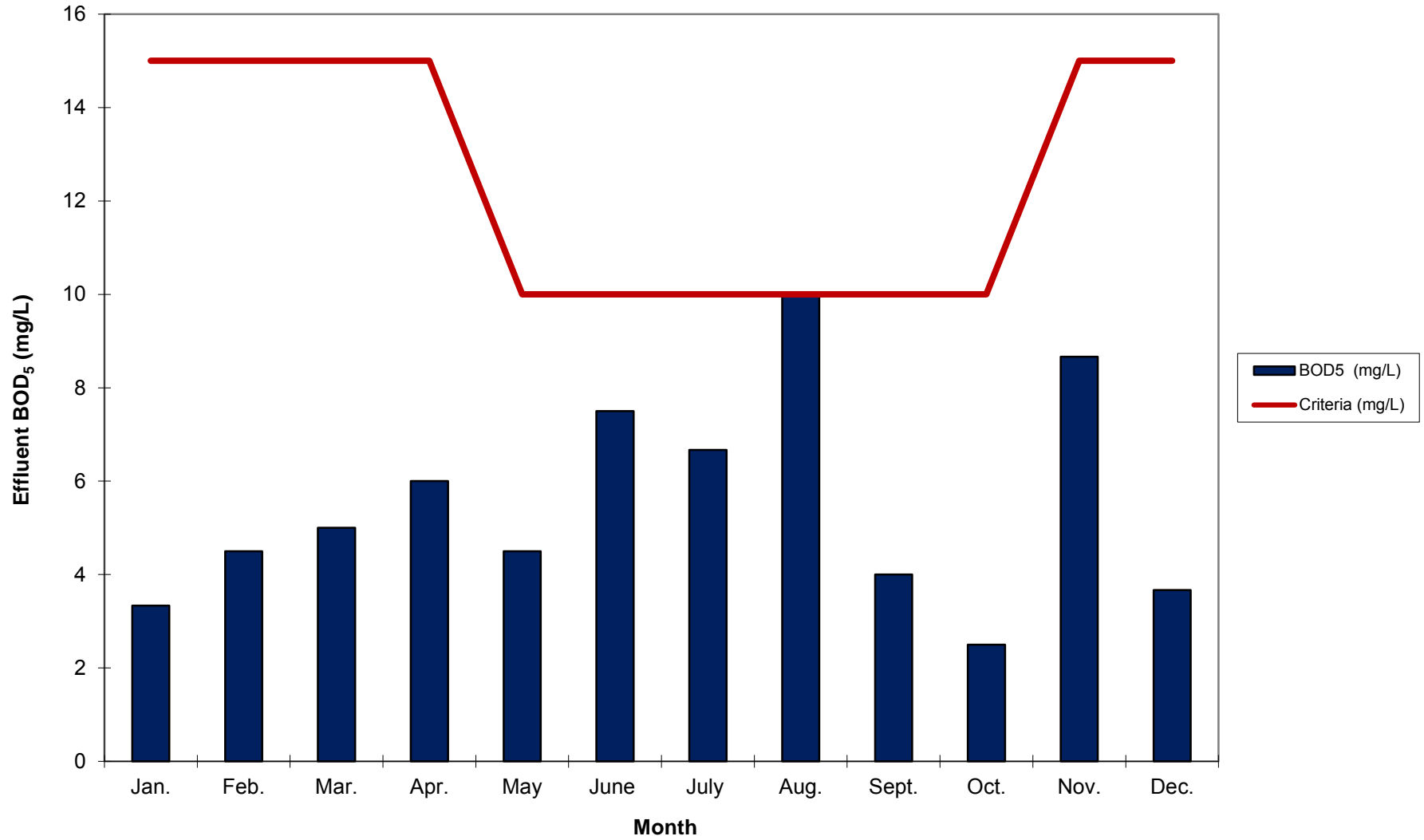
Summary

The Drumbo SBR operated within discharge criteria through 2014 with the single exception of the non-compliant event in April for ammonia listed previously. A technical evaluation was completed by XCG Consultants Ltd. in 2013/14 to evaluate the hydraulic capability of the plant.

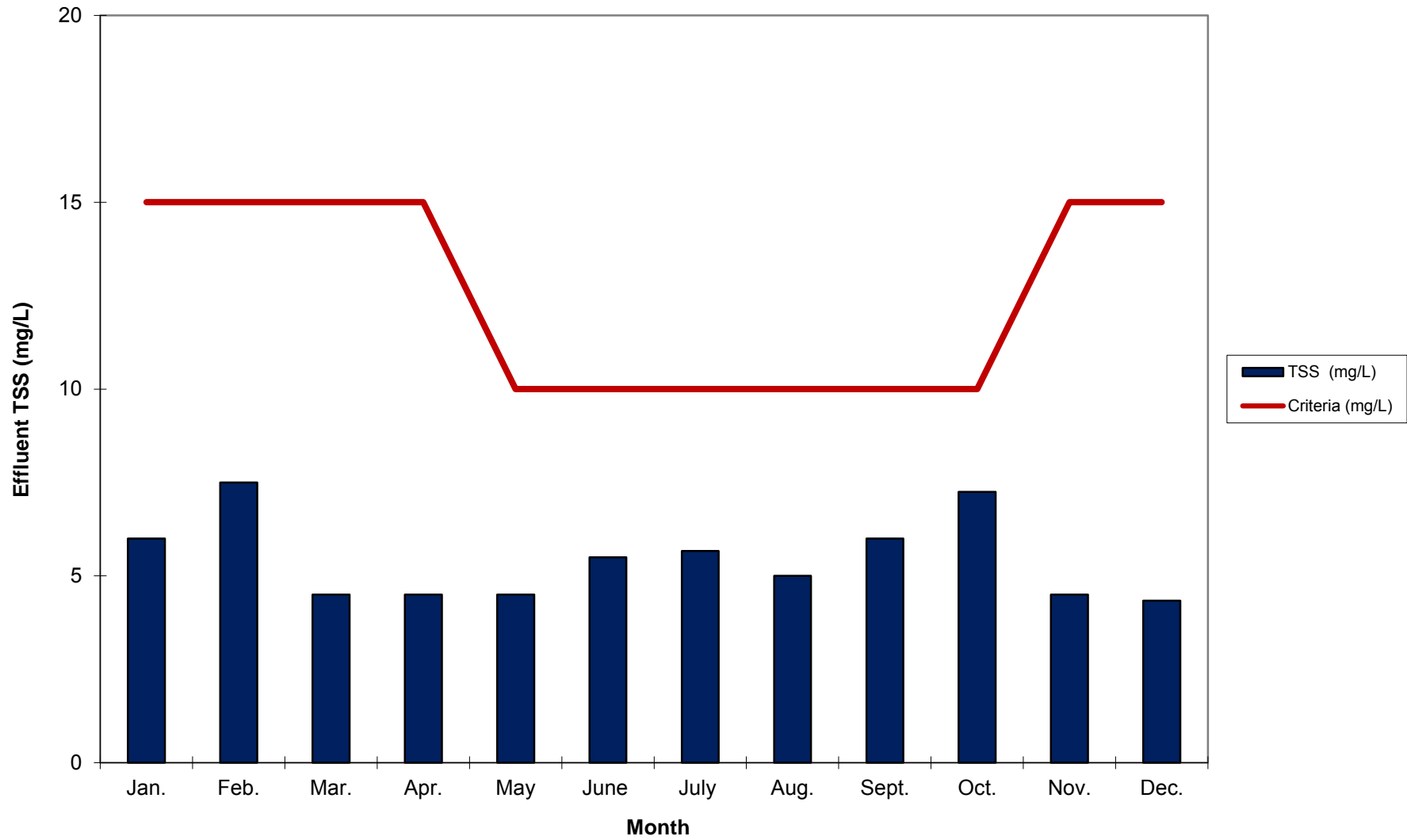
A Class Environment Assessment was initiated in 2013 to investigate practical alternatives to increase treatment capacity to meet projected future flows. In the interim, Oxford County plans to optimize the treatment process and has already submitted an application to re-rate the Plant to a higher rated capacity of approximately 300 m³/d.

Exhibit 1

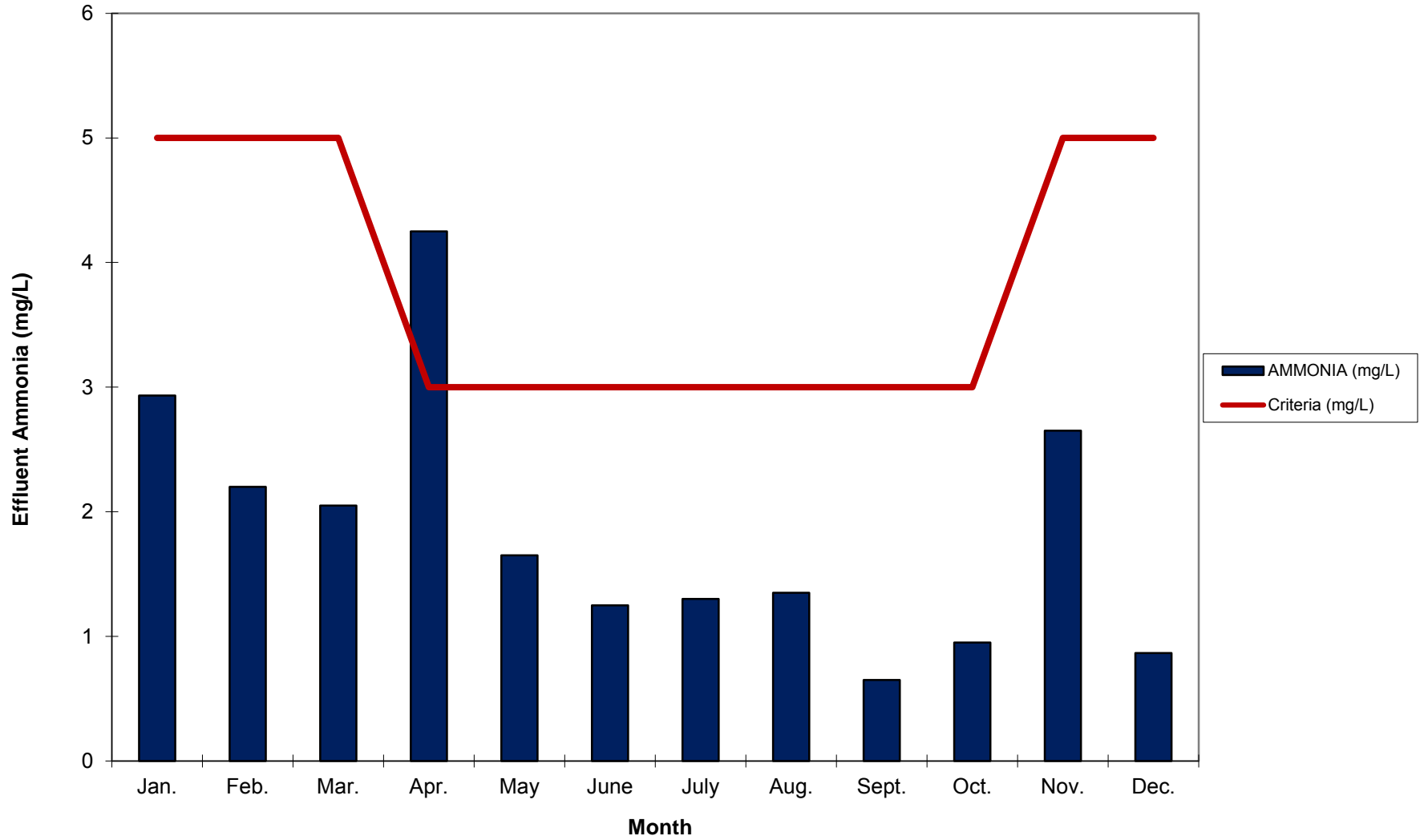
Drumbo WWTP Effluent, Monthly Average BOD₅ (mg/L), 2014



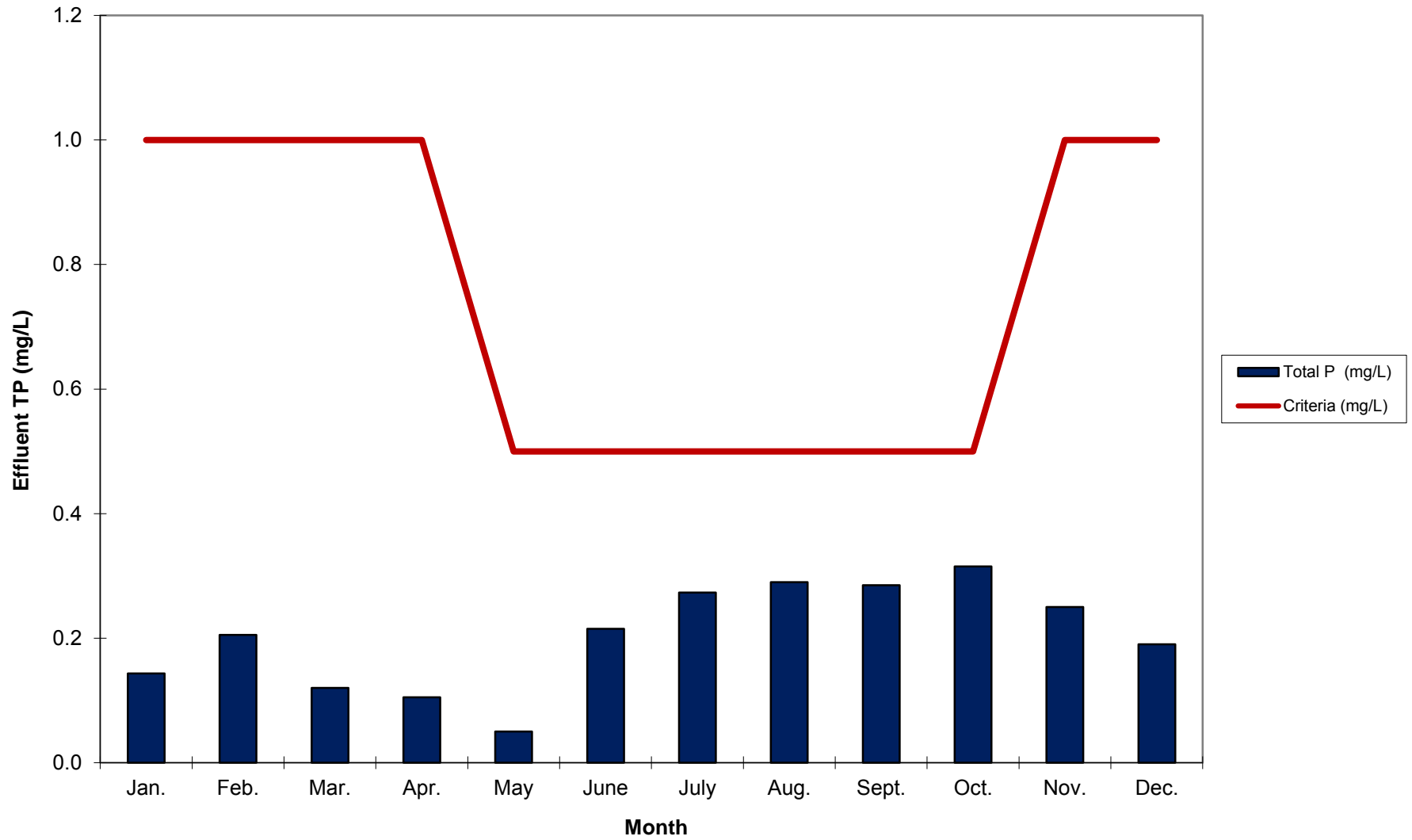
Drumbo WWTP Effluent. Monthly Average TSS (mg/L), 2014



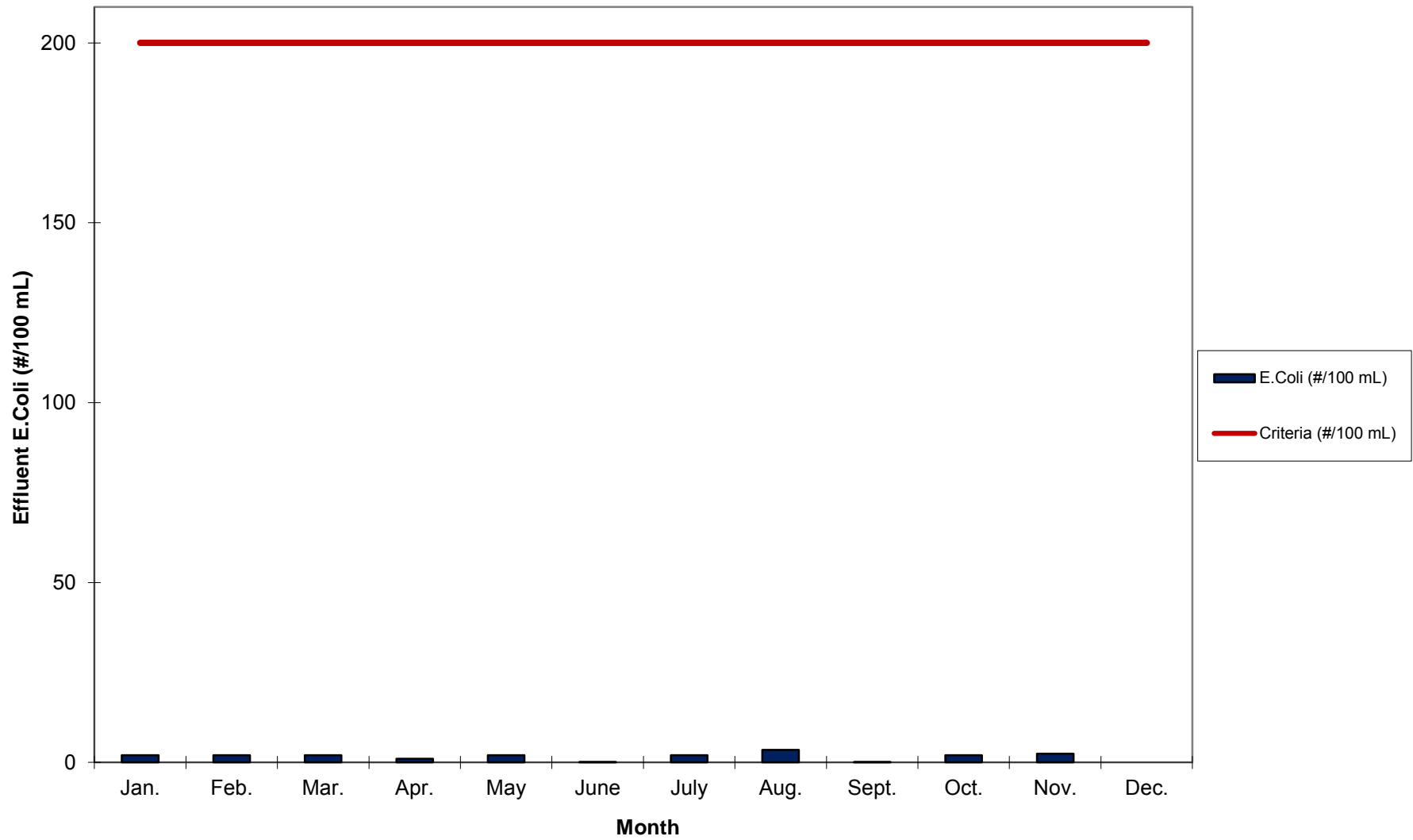
Drumbo WWTP Effluent, Monthly Average Ammonia (mg/L), 2014



Drumbo WWTP Effluent , Monthly AverageTP (mg/L), 2014

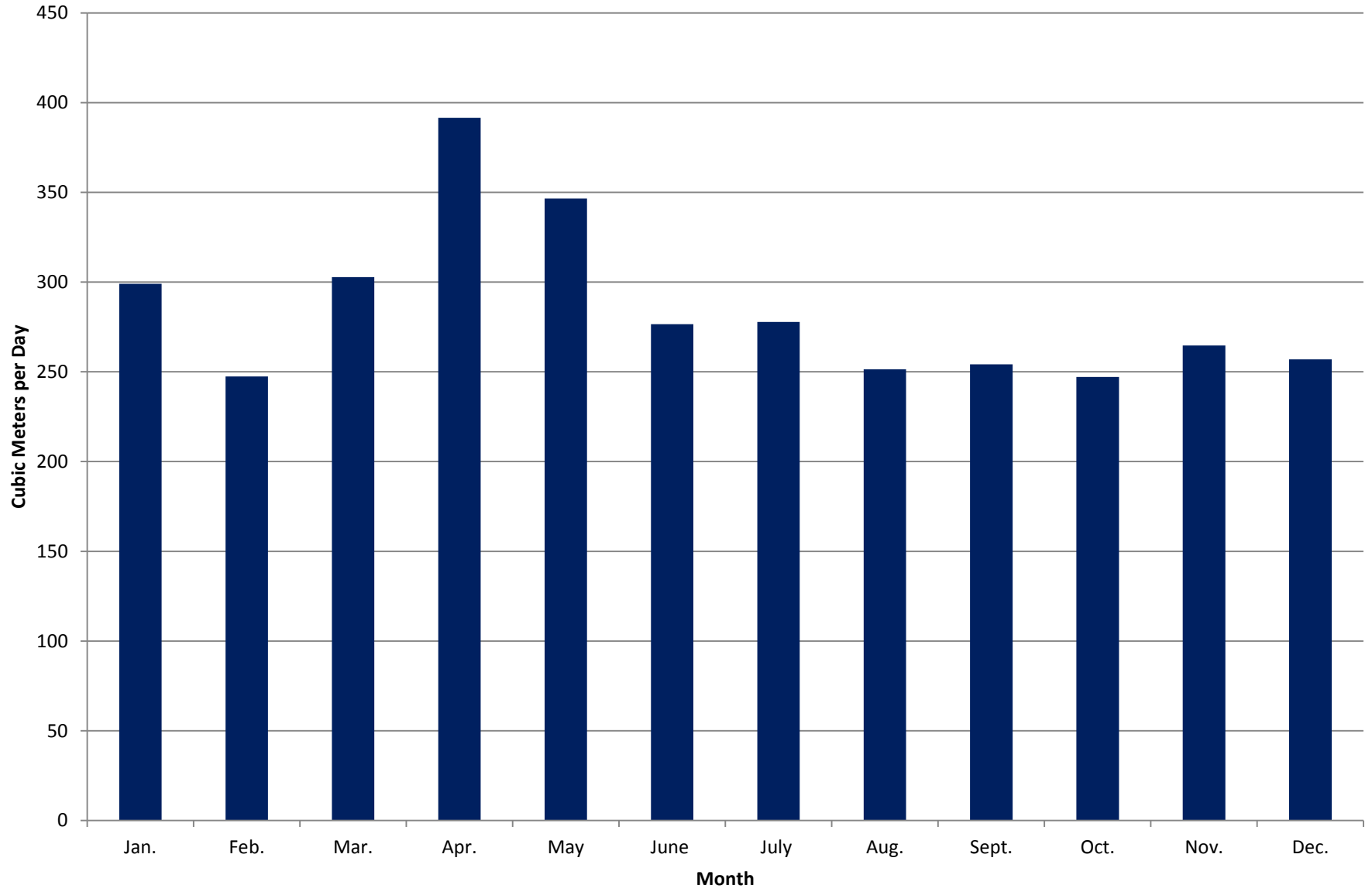


Drumbo WWTP Effluent, Monthly Geometric Mean Density E.Coli (#/100 mL), 2014



Drumbo WWTP, Monthly Average Daily Flow in Cubic Meters per Day, 2014

■ Monthly Average Daily Flow



DRUMBO RAW INFLUENT 2014

Month		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Ave.	Criteria
Volume	(m3)	9269	6928	9387	11745	10744	8297	8613	7794	7624	7660	7942	7967	103,970	8664	
Monthly Average Daily Flow	(m3/d)	299	247	303	392	347	277	278	251	254	247	265	257		285	272
Min	(m3/d)	227	192	199	305	287	245	228	218	218	227	222	229		233	
Max	(m3/d)	407	284	472	495	422	313	638	292	292	282	423	292		384	774
BOD ₅	(mg/L)	290	153	78	133	99	64	178	130	82	90	102	115		126	
CBOD	(mg/L)	205	121	64	65	82	60	149	122	51	64	81	80		95	
TSS	(mg/L)	239	144	60	89	89	50	133	70	47	53	60	39		89	
Total Phosphorus	(mg/L)	7	5	3	3	3	3	7	4	3	3	4	3		4	
ALKALINITY	(mg/L)	385	395	382	355	349	378	406	394	402	389	306	409		379	
TKN	(mg/L)	38	35	25	24	18	26	38	29	29	29	33	32		30	
AMMONIA	(mg/L)	24	27	22	18	14	21	28	25	24	25	29	28		24	
NITRATE	(mg/L)	0.06	0.06	0.06	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		0.06	
NITRITE	(mg/L)	0.07	0.03	0.04	0.08	0.06	0.03	0.04	0.03	0.03	0.03	0.05	0.04		0.04	
pH		7.36	7.33	7.62	7.52	7.44	7.51	7.30	7.37	7.40	7.76	7.46	7.39		7.45	
Temp		10	9	10	11	14	18	19	20	19	17	15	13		14	

DRUMBO FINAL EFFLUENT 2014

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Ave	Criteria A	Criteria B
BOD ₅	(mg/L)	3.3	4.5	5	6	4.5	7.5	6.7	10	4	2.5	8.7	3.7		5.5	10	15
CBOD	(mg/L)	2.3	2.5	2.5	3	2.5	2.0	2.0	2.5	2.0	2.0	2.5	2.3		2.3		
TSS	(mg/L)	6.0	7.5	4.5	4.5	4.5	5.5	5.7	5.0	6.0	7.3	4.5	4.3		5.4	10	15
Total P	(mg/L)	0.14	0.21	0.12	0.11	0.05	0.22	0.27	0.29	0.29	0.32	0.25	0.19		0.2	0.5	1
ALKALINITY	(mg/L)	225.0	207.0	210.5	232.5	233.0	237.5	231.3	234.5	229.0	221.5	231.0	235.3		227		
TKN	(mg/L)	3.1	2.6	2.8	4.4	1.8	2.0	2.1	1.6	0.8	1.2	4.2	1.7		2.3		
AMMONIA	(mg/L)	2.9	2.2	2.1	4.3	1.7	1.3	1.3	1.4	0.7	1	2.7	0.9		1.8	3	5
NITRATE	(mg/L)	9.6	14.5	12.3	8.5	11.9	10.4	10.9	12.3	12.9	15.2	12.3	9.5		11.7		
NITRITE	(mg/L)	2.4	1.97	2.8	2.08	0.75	0.39	0.34	0.26	0.12	0.19	0.54	2.92		1.23		
PH	(mg/L)	7.36	7.30	7.65	7.60	7.57	7.58	7.43	7.50	7.47	7.81	7.53	7.40		7.52		
Dissolved Phosphorus	(mg/L)	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.1		0.14		
Dissolved Oxygen	(mg/L)	9	8.7	9.6	9.2	8.2	7.5	8	7.9	6.8	7.7	8	7.6		8.2	Min= 5	Min= 5
E.Coli	#/100 mL	2	2	2	1	2	0	2	3	0	2	2	0		1.6	200	200

Compliance criteria are based on Periods A and B, where Period A refers to the time that the receiving stream exceeds 5 degrees C. and Period B refers to the time that the receiving stream is less than or equal to 5 degrees C, as measured by operating staff.

Drumbo SBR Effluent Discharge Loading kg/d 2014

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Ave.	Criteria A	Criteria B
BOD ₅	(kg/d)	1.0	1.1	1.5	2.3	1.6	2.1	1.9	2.5	1.0	0.6	2.3	0.9		1.6	2.8	4.0
TSS	(kg/d)	1.8	1.9	1.4	1.8	1.6	1.5	1.6	1.3	1.5	1.8	1.2	1.1		1.5	2.8	4.0
TP	(kg/d)	0.04	0.05	0.04	0.04	0.02	0.06	0.08	0.07	0.07	0.08	0.07	0.05		0.06	0.1	0.3
NH4	(kg/d)	0.88	0.54	0.62	1.66	0.57	0.35	0.36	0.34	0.17	0.23	0.70	0.22		0.55	0.80	1.36

Drumbo SBR Influent Loading kg/d 2014

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Ave.		
BOD	(kg/d)	87	38	23	52	34	18	49	33	21	22	27	29		36		
TSS	(kg/d)	72	36	18	35	31	14	37	17	12	13	16	10		25		
TP	(kg/d)	2	1	1	1	1	1	2	1	1	1	1	1		1		
TKN	(kg/d)	11	9	8	9	6	7	10	7	7	7	9	8		8		

Compliance criteria are based on Periods A and B, where Period A refers to the time that the receiving stream exceeds 5 degrees C. and Period B refers to the time that the receiving stream is less than or equal to 5 degrees C, as measured by operating staff

Calibration Records

Instrumentation Calibrations and Checks

Date 2014	Calibrated					Checked				
	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer	Lab pH Meter	Oper. pH Meter	Hach D.O. Meter	YSI D.O. Meter	Hach Spectro- photometer
Oct-06	jb	ms				jb		ms		
Oct-07			ms							
Oct-08							ms	ms		
Oct-10	jb					jb			jb	
Oct-14	jb	jb	jak	jak						
Oct-17						jak			jak	
Oct-20		jak	jak							
Oct-21	ms			ms						
Oct-22		jmt	jmt			ms			ms	
Oct-24	jb	jak	jak	jb		jb			jb	
Oct-27	jak	jb		jak		jb	jb			
Oct-29	jb	ms	ms			jb			jb	
Oct-30							ms	ms		
Oct-31	jb					hjb	ms	ms		
Nov-03	jak			jak			jmt	jmt		
Nov-04		jb				jak	jb		jak	
Nov-06			jb					jb		
Nov-10	jb					jb				
Nov-12	jmt	jmt	jmt							
Nov-14						ms	jak	jak		
Nov-17		jak	jak			ms				
Nov-18	ms	ms	ms							
Nov-24	jak	jb		jak			jb	jb		
Nov-26							jak		os	
Nov-28		jb					jb			
Dec-01	ms	ms	jmt							
Dec-03	ms					ms				
Dec-04			os				jak			
Dec-05							ms			
Dec-08	jab	jb	os	jak		jb	jb			
Dec-10						jak			jak	
Dec-15	jak			jak						
Dec-16		ms								
Dec-18		jb					jb		jb	
Dec-19	ms					ms			ms	
Dec-30	ms	ms		ms						

Please initial and date after each calibration or check.
 Hach Spectrophotometer calibrated yearly or at lamp replacement.
 All other meter calibrated once/week and checked twice/week.

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Drumbo ON
 Customer PO
 Our Job # B13 8576

R&R Instrumentation Services Inc

24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 9
 Cal Date June 12/14
 Due Date June 12/15
 Cal Freq Yearly
 Location North Return
 Description Flow Ind. Transmitter
 Manufacturer Krohne
 Model IFC 010F/D/6
 Serial # A 0235352
 Accuracy 1%
 Range 0-63.09 L/s; 0 - 227.124 m³/hr
 Size 150 mm/6"
 GKL 6.952

MEASURING EQUIPMENT

Manufacturer Fluke Krohne
 Model 725 GS 8A
 Serial # 7903019 404860
 Cal Reference Fluke
 Traceability NIST
 Accuracy 0.02% + 2 cnts 0.1%

INPUT SIM	DISPLAY m ³ /hr	OUTPUT*AAV mA	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.00	0.000	4.000	4.004	4.004	0.02	0.02
1.25	13.840	4.975	4.963	4.963	-0.07	-0.07
2.50	27.730	5.953	5.948	5.948	-0.03	-0.03
5.00	55.520	7.911	7.898	7.898	-0.08	-0.08
10.00	110.800	11.805	11.794	11.794	-0.07	-0.07

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:

R Thachuk

CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Drumbo ON
Customer PO
Our Job # B13 8576

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIR 9
Cal Date June 12/14
Due Date June 12/15
Cal Freq Yearly
Location North Return
Description Flow Ind. Recorder
Manufacturer Beijer
Model Scada Screen
Serial #
Accuracy 1%
Range 0 - 227.124 m³/hr

MEASURING EQUIPMENT

Manufacturer Fluke
Model 725
Serial # 7903019
Cal Reference Fluke
Traceability NIST
Accuracy 0.02% + 2 cnts

INPUT mA	%	OUTPUT*AAV m ³ /hr	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
4.004		0.06	0	0	-0.03	-0.05
4.963		13.66	14	14	0.15	0.27
5.948		27.64	28	28	0.16	0.28
7.898		55.30	55	55	-0.13	-0.24
11.794		110.58	111	111	0.18	0.33

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Drumbo ON
 Customer PO
 Our Job # B13 8576

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 9
 Cal Date June 12/14
 Due Date June 12/15
 Cal Freq Yearly
 Location North Return
 Description Flow Integrator
 Manufacturer Krohne
 Model IFC 010F/D/6
 Serial # A 0235352
 Accuracy 1%
 Range 0 - 227.124 m³/hr; 0 - 3.785 PPM (m³)
 Size 150 mm/6"
 GKL 6.952

MEASURING EQUIPMENT

Manufacturer NexXTech Krohne
 Model 09A10 GS 8A
 Serial # 6315002 404860
 Cal Reference
 Traceability NIST
 Accuracy .0001 0.1%

INPUT m ³ /hr	SIM Y	OUTPUT*AAV PPM (m ³)	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
0.000	0.00	0.0000	0.00	0.00	0.00	0.00
13.820	1.25	0.2303	0.23	0.23	0.02	0.02
27.700	2.50	0.4617	0.46	0.46	0.01	0.01
55.540	5.00	0.9257	0.93	0.93	0.01	0.01
110.800	10.00	1.8467	1.85	1.85	0.14	0.14
227.124		3.8754				

*Actual Applied Value

% Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

As Left 970045.00
 As Found 970026.19
 Difference 18.81

TECHNICIAN'S NOTES

CERTIFIED BY: *R. Thachuk* CET, CCST Level III Technician

Plant Maintenance Records

ID	Descriptio	Projected S	Shop	Instructions
6308	Lubricate	02/01/2014	250800	Blowers require oil and grease changes
6384	Repair	09/01/2014	250800	Drumbo reactor # 1 lid has broken needs repair
6448	Lubricate	05/02/2014	250800	Drumbo blowers require oil and grease (check belts & filters)
6457	Replace	10/02/2014	250800	Drumbo equalization blower piping needs replacing
6494	Replace	24/02/2014	250800	Repair blower line too reactor. (Drumbo)
6533	Lubricate	06/03/2014	250800	Drumbo blowers need oil and grease
6534	Repair	06/03/2014	250800	Drumbo filter # 1 leaking
6636	Lubricate	08/04/2014	250800	Drumbo blowers require oil and grease
6696	Lubricate	30/04/2014	250800	Drumbo blowers require oil and grease
6996	Lubricate	01/08/2014	250800	Blowers require oil and grease
7105	Lubricate	15/09/2014	250800	Blowers require oil & grease
7106	Repair	15/09/2014	250800	Hot water tank leaking birm area
7187	Lubricate	08/10/2014	250800	Pull all pumps for inspection of fluids etc.
7234	Lubricate	31/10/2014	250800	Blowers require oil and grease
7530	Lubricate	05/01/2015	250800	Blowers require oil and grease check filters
7531	Repair	05/01/2015	250800	Drumbo reactor # 2 waste pump blowing fuses



Public Works

P. O. Box 1614, 21 Reeve St., Woodstock, Ontario N4S 7Y3

Phone: 519-539-9800 Fax: 519-421-4711

Website: www.oxfordcounty.ca

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 Year-End Monitoring Report, Mount Elgin Wastewater Treatment Plant (WWTP)

The attached year-end report has been prepared as required by the Environmental Compliance Approval (ECA) #0611-6Q3JQL.

I trust this report fulfills the intent of the annual reporting requirements of the ECA.

If there are any questions, please contact me.

Yours truly,

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

The Mount Elgin Wastewater Treatment Plant (WWTP) provided effective wastewater treatment in 2014. The average daily flow for 2014 was 37 m³/d. This represents 38.9% of the design criteria of 95.25 m³/d. The daily maximum flow for 2014 was 61 m³/day.

Plant Description

The Recirculating Sand Filter (RSF) system is one component of the overall sewage treatment system. In septic tank effluent gravity (STEG) collection systems, the wastewater is collected from individual homes in septic tanks where it is pretreated to remove solids and grease before it drains by gravity to the small diameter collection mains. The small diameter collection mains direct the primary treated effluent to a pump station located near the Mount Elgin Road entrance of the sewage treatment plant.

The primary treated effluent is the raw influent to the sewage treatment system where it is pumped to recirculation tanks. The influent is pumped to the recirculating sand filter and then collected and pumped to a splitter valve that allows 80% of the flow to recirculate and 20% to enter the dosing tank. From the dosing tank, treated effluent is pumped to the shallow buried trench drainfield that provides for the subsurface discharge. Effluent samples are collected from the dosing tank ahead of the drainfield.

Effluent Quality Assurance and Control Measures

Sampling Description

Grab samples are collected from the influent lift station on a quarterly basis. Samples are tested for Carbonaceous Biochemical Oxygen Demand (CBOD), Suspended Solids (SS), Total Phosphorus (TP), and Total Kjeldahl Nitrogen (TKN).

Effluent grab samples are analyzed for CBOD, SS, TP, ammonia, TKN, nitrite, nitrate, pH, and E.Coli at least quarterly.

Groundwater testing is done for nitrites, nitrates, and pH on a quarterly basis.

Laboratory and Field Testing

Laboratory analysis is performed by SGS Lakefield Research Ltd. on all samples for all parameters except for pH, which is tested in the field during collection. These results are used in this report for determination of compliance. Any information generated in-house is used in process control but is not included in this report.

Summary and Interpretation of Monitoring Data

Raw Sewage Quality

Table 1 below contains the wastewater influent parameters required by the ECA displayed in both concentration and as calculated loading to the plant using the daily average flow of 37 m³/day.

Table 1

Parameter	Concentration mg/L	Loading kg/day
CBOD ₅	103	3.8
SS	36	1.3
TKN	59	2.2
TP	6.9	0.25

Plant Performance & Effluent

Table 2 below contains the wastewater effluent parameters required by the ECA displayed as an annual average concentration, an annual maximum concentration, as a percent removed, and as compared to the ECA objectives for the parameter.

Table 2

Parameter	Average Concentration mg/L	Maximum Concentration mg/L	Percent Removal %	ECA Effluent Objective mg/L
CBOD ₅	1.8	3	98.2	10
SS	2.5	5	93	10

There are no effluent limits for the system, however, the ECA requires Oxford County to use best efforts to operate the sewage treatment facility with the objective that the concentrations of both CBOD and Suspended Solids do not exceed 10 mg/L in the effluent ahead of the subsurface disposal system. The Mount Elgin facility met all effluent objectives for 2014.

The annual average effluent CBOD concentration was 1.8 mg/L. This represents a 98.2% removal efficiency. The annual average SS concentration was 2.5 mg/L. This represents a 93% removal efficiency. The annual average ammonia concentration was 1.5 mg/L. The annual average TP concentration was 7.4 mg/L which represents a 7.25% increase in TP.

The average, maximum, and minimum influent and effluent results were calculated and are given in Table A in Exhibit 1.

Description of Operating Problems, Bypassing, Spills, Abnormal Events, and Complaints Received

There were no overflows, spills, complaints, or bypasses of the treatment system.

Maintenance of Works

Maintenance was completed as needed on the wastewater system and was initiated by the operator during routine inspection of the system. The system is owned, operated, and maintained by Oxford County and is supervised as one of the nine wastewater treatment plants. Maintenance is completed by the southern area staff. A summary of activities is appended to this report.

Monitoring Equipment Maintenance and Calibration

R&R Instrumentation Services performed meter calibration on the influent meter and records are kept at the Ingersoll WWTP.

Monitoring equipment calibration records are appended to this report.

Other Activities

Under Exhibit 2, included in this report, are the results from groundwater monitoring for 2014 in a table format. In addition, the original monitoring report from 2006 detailing the monitoring wells is included which contains a sketch showing the well locations.

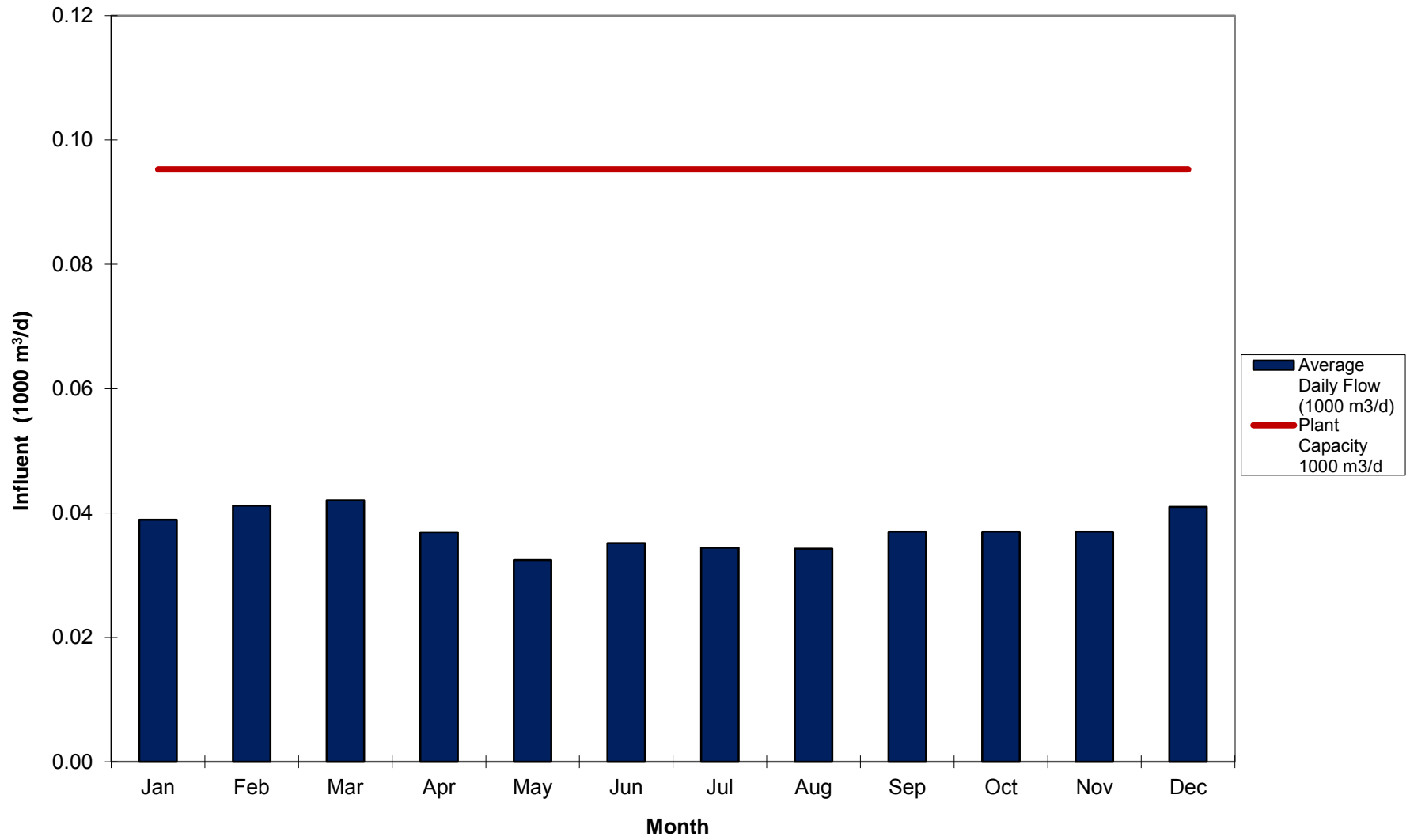
Summary

The Mount Elgin wastewater treatment system was operating within its design flow criteria and was within its objectives for 2014.

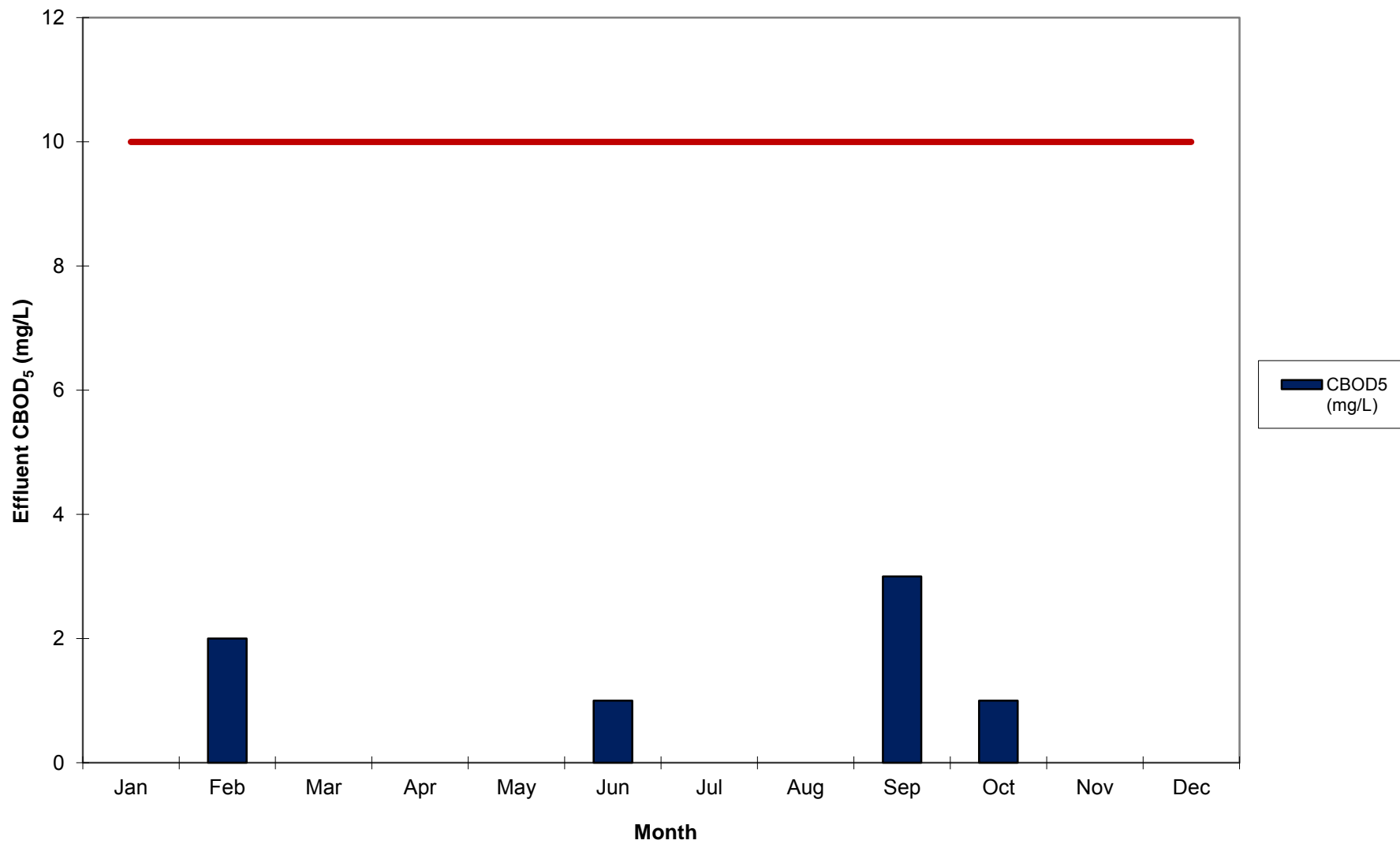
Oxford County proceeded to construct Phase 2 in 2014, which will increase the rated capacity of the plant to 191 m³/d. Commissioning of Phase 2 is underway. These upgrades were completed ahead of a mandatory connection deadline of 2016 for the remaining properties in Mount Elgin which are currently on private septic systems.

EXHIBIT 1

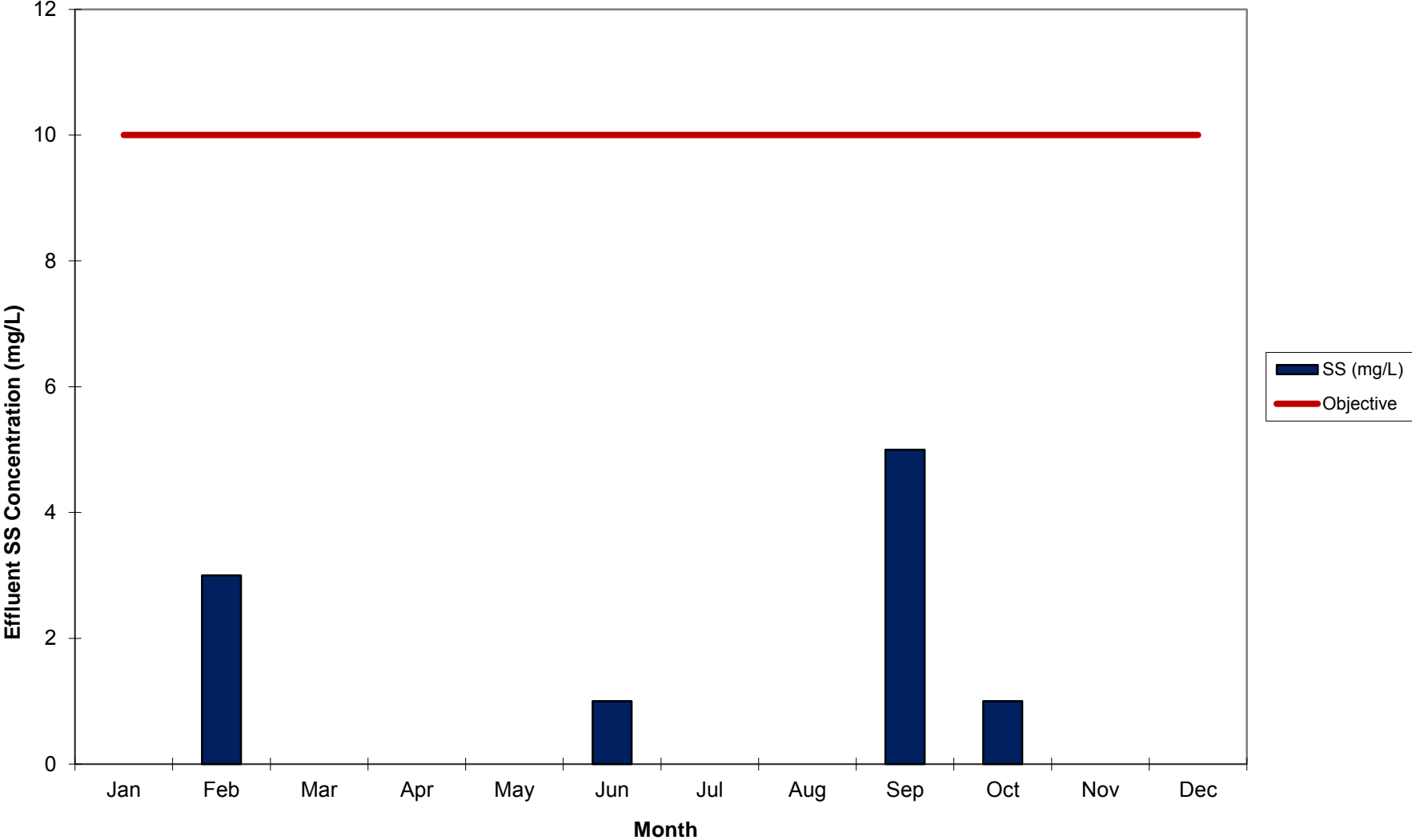
Mount Elgin Influent, Average Daily Flow (1000 m³/d), 2014



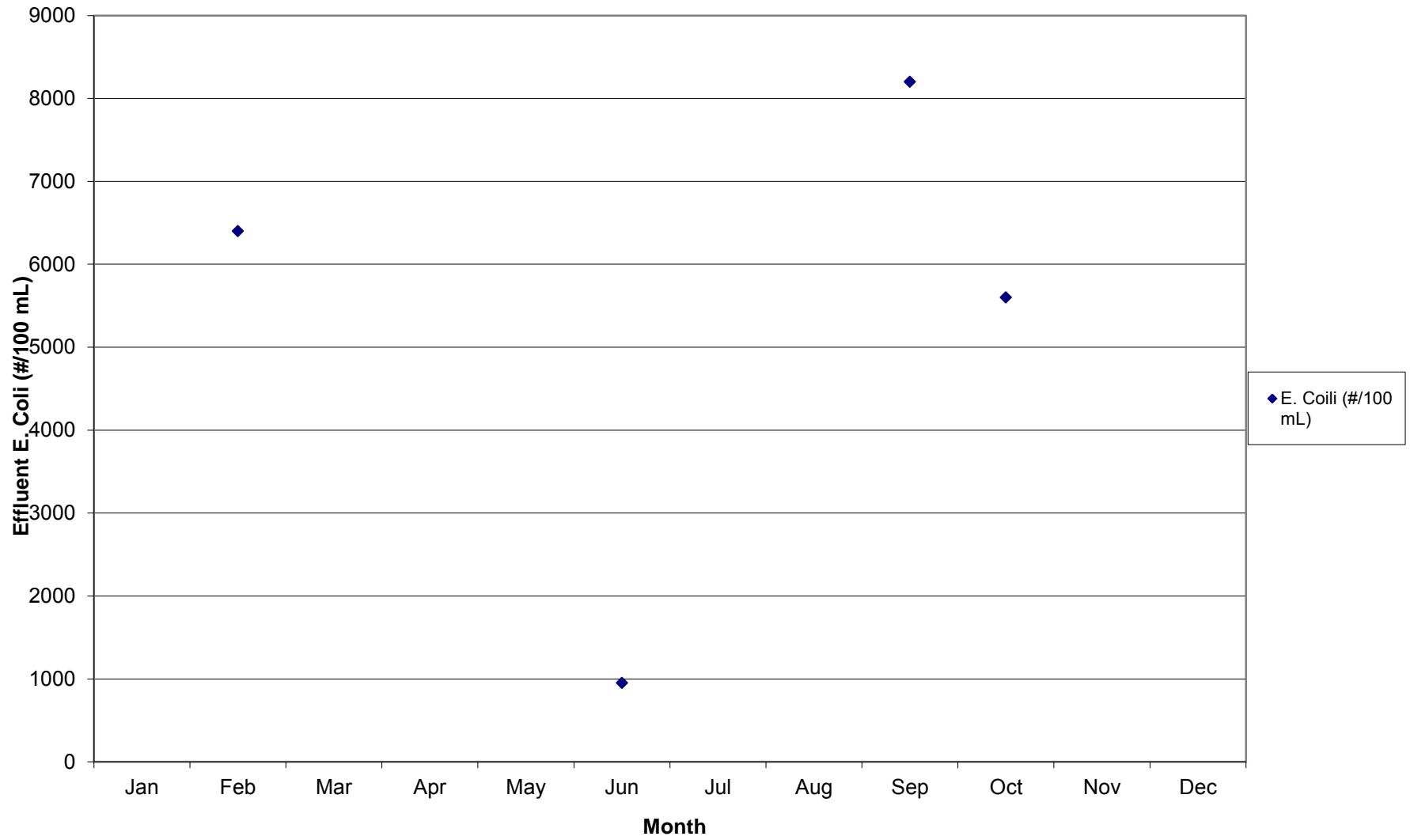
Mount Elgin Effluent CBOD₅ (mg/L), 2014



Mount Elgin Effluent, SS Concentration (mg/L), 2014



Mount Elgin Effluent E. Coli (#/100 mL), 2014



Mount Elgin Effluent pH, 2014

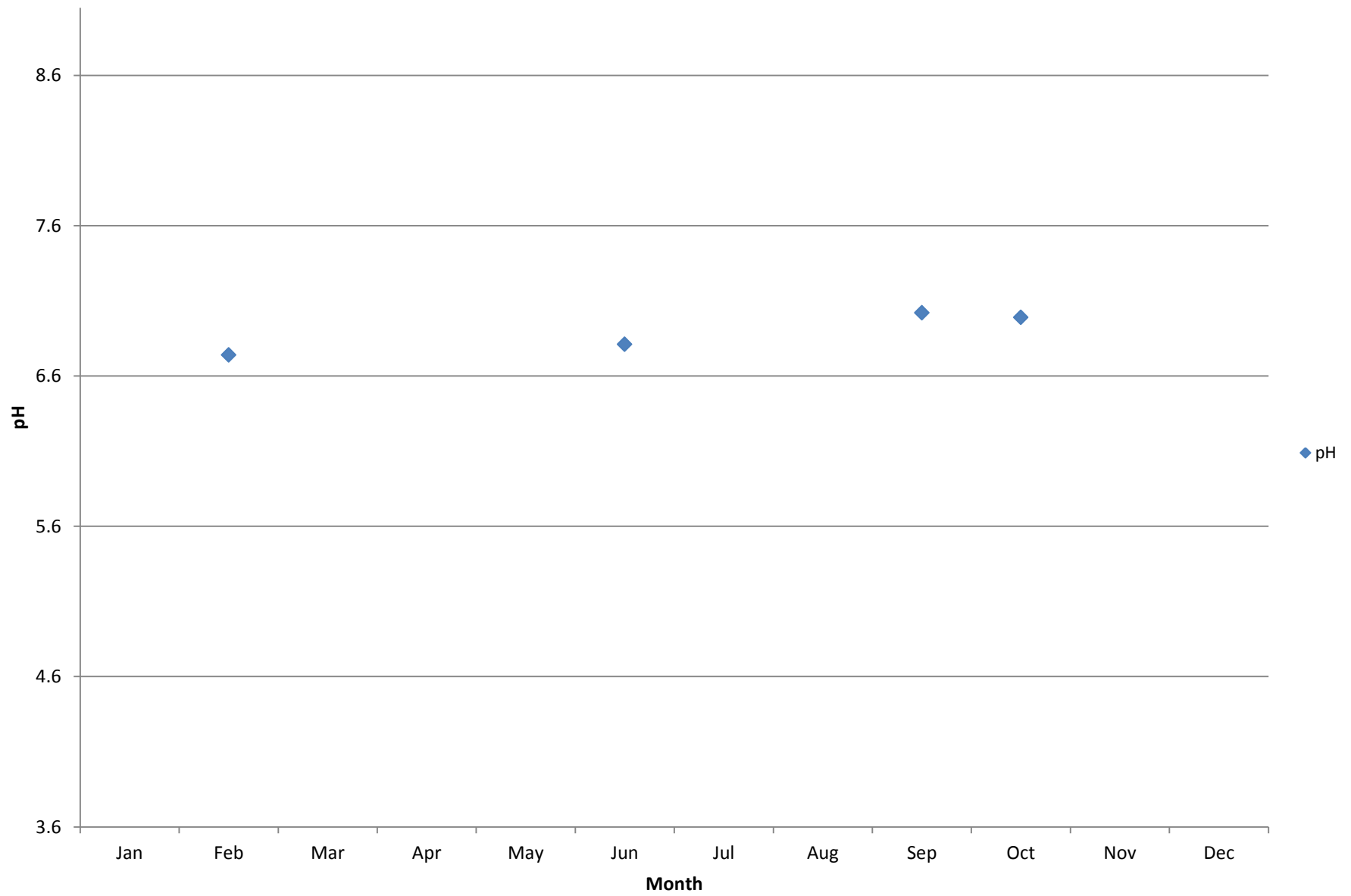


TABLE A	Mt Elgin Wastewater Draft			WORKS # 120002870			YEAR 2014										
INFLUENT FLOW	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		AVERAGE	DESIGN CRITERIA	DESIGN CRITERIA	
															Phase 1	All Phases	
TOTAL (1000m ³)	1.207	1.154	1.304	1.108	1.005	1.055	1.067	1.063	1.110	1.147	1.110	1.270	TOTAL	13.600			
Average Daily Flow (1000 m ³ /d)	0.039	0.041	0.042	0.037	0.032	0.035	0.034	0.034	0.037	0.037	0.037	0.041	AVERAGE DAILY FLOW	0.037	0.09525	0.381	
MAX. DAILY FLOW (1000 m ³ /d)	0.061	0.045	0.049	0.042	0.048	0.046	0.041	0.038	0.037	0.037	0.037	0.044	MAX. DAILY FLOW	0.061			
INFLUENT RESULTS														AVERAGE	Results MAXIMUM	Results MINIMUM	
CBOD5 mg/L			98			116			97	99				102.5		116	97
SS (mg/L)			44			34			34	32				36		44	32
TKN (mg/L)			53			58			61	65				59.4		65	53
TOTAL P. (mg/L)			6.5			8.8			6.6	5.6				6.9		8.8	5.6
EFFLUENT RESULTS														AVERAGE	Results MAXIMUM	Results MINIMUM	
CBOD ₅ (mg/L)		2.0				1.0			3.0	1.0				1.8		3	1.0
SS (mg/L)		3.0				1.0			5.0	1.0				2.5		5	1.0
Ammonia (mg/L)		2.0				0.6			2.9	0.4				1.5		2.9	0.4
TKN (mg/L)		2.0				3.1			3.2	0.3				2.1		3.2	0.3
TP (mg/L)		6.0				11.0			5.6	7.1				7.4		11	5.6
pH		6.69				6.76			7.0	6.9				6.84		6.97	6.7
E. Coili (#/100 mL)		6400				950			8200	5600				4088	Geomean	8200	950.0
Nitrates (mg/L)		38.5				36.4			31.4	46.9				38.3		46.9	31.4
Nitrites (mg/L)		38.5				0.37			0.36	0.09				9.8		38.5	0.1

EXHIBIT 2

**Mt Elgin Wastewater Treatment Facility
Monitoring Well Chemistry (Lab Analyses)**

	2014					
	Well 1	Well 2	Well 3	Well 1	Well 2	Well 3
Parameter	March 18-2014	March 18-14	March 18-14	June 10-14	June 10-14	June 10-14
Well Level (metres)	3.24	3.41	3.91	2.96	3.31	3.48
Nitrite (mg/L N)	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (mg/L N)	< 0.06	12.1	< 0.06	< 0.06	12.7	< 0.06
Nitrate+Nitrite (mg/L N)	< 0.06	12.1	< 0.06	< 0.06	12.7	< 0.06
Ph	7.77	7.79	8.12	8.1	8.12	8.22
	Well 1	Well 2	Well 3	Well 1	Well 2	Well 3
Parameter	Sept 11-14	Sept 11-14	Sept 11-14	October 21-14	October 21-14	October 21-14
Well Level (metres)	3.41	3.86	3.87	3.16	3.61	3.88
Nitrite (mg/L N)	< 0.03	< 0.03	< 0.03	<0.03	<0.03	<0.03
Nitrate (mg/L N)	< 0.06	10.6	< 0.06	<0.06	10.6	<0.06
Nitrate+Nitrite (mg/L N)	< 0.06	10.6	< 0.06	<0.06	10.6	<0.06
Ph	7.26	7.26	7.28	7.19	7.18	7.11
Note Well depths as:	3.66m	3.96m	3.96m			

Notes: There is a single monitoring well at the site. The monitoring well is equipped with separate shallow and deep monitoring intervals: Shallow 4.4 - 6.3 m BGL, Deep 9 - 12.2 m BGL.

January 24, 2006

EMAIL TRANSMISSION

The Corporation of the County of Oxford
P.O. Box 397
21 Market Square
Woodstock, Ontario
N4S 7Y3

Attention: Mr. Todd Gregg, C.E.T.
Oxford County Water and Wastewater Operations Coordinator

Dear Sir:

**Re: Installation of Monitoring Wells for Mount Elgin Wastewater Treatment System
Lots 12 and 13, Concession 4 (Former Township of Dereham)
Township of South-West Oxford, County of Oxford**

Please find enclosed our report of the installation of on-site monitoring wells as part of the groundwater monitoring program for the Mount Elgin Wastewater Treatment System, as required by terms and conditions of Ministry of The Environment (MOE) Certificate of Approval (C of A) Number 4672-5EAGKD.

Monitoring Program

In order to comply with the monitoring requirements of the C of A, Naylor Engineering Associates Ltd. (Naylor Engineering) was retained by the County of Oxford to drill and sample three on-site boreholes, and to install groundwater monitoring wells at each borehole location. The boreholes were located around the perimeter of the leaching beds in order to monitor groundwater conditions both up and down gradient of the treatment system. The installed monitoring wells were surveyed for location (± 0.3 m) and elevation (± 0.03 m), relative to a geodetic site benchmark, by the County of Oxford, as shown in the attached Site Plan, from the County of Oxford.

Quality assurance/quality control (QA/QC) was maintained during the field program through equipment decontamination, and the in-house QA/QC measures implemented by the analytical laboratory.

On December 21, 2005, the boreholes and monitoring well installations were completed using a CME-55 track-mounted drill rig equipped with continuous flight hollow stem augers, supplied and operated by Geo-Environmental Drilling Ltd., under the direction of Naylor Engineering staff. Soil cuttings generated during the drilling operations were stockpiled on site adjacent to the borehole locations.

The monitoring wells were constructed, developed, and sampled by Naylor Engineering staff in accordance with the procedures specified in the MOE's Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario. This ensures that sampling activities and laboratory procedures comply with industry-accepted standards, and that the results are suitable for future use.

As per the requirements of Ontario Regulation 903, of the Ontario Water Resources Act, the licensed drilling contractor will forward a completed well record to the property owner and the Ministry of the Environment for Ontario. This regulation encompasses test holes and provides detailed requirements for monitoring well construction, test hole sealing, well record submission, drilling contractor licensing, well tagging, protective covers, and decommissioning.

Monitoring Well Installation and Well Development

The subsurface conditions encountered at the borehole locations generally comprised surficial topsoil and sand, underlain by native deposits of sand, and sand and gravel; further underlain by native silt and silt till. The boreholes were terminated in the silt and silt till soils, at depths of 3.66 to 3.96 m below existing grade. Descriptions of the soil stratigraphy and well construction details are contained on the appended borehole logs.

Each monitoring well was constructed using flush-threaded 50 mm diameter Trilock pipe with rubber O-ring seals to prevent leakage. The monitoring well screens comprised 3 m lengths of 10-slot well screen delivered to the site pre-cleaned, and enclosed in individually sealed plastic bags. Prior to installation, the screens and riser pipes were not allowed to come into contact with the ground or any drilling equipment.

The wells were installed by inserting the screen and pipe into the hollow stem of the augers and then pulling back the augers. Sand was added as the augers were removed in order to pack the screens in place. Sand filter material was added until the level of sand was approximately 60 cm above the top of the screens. Bentonite seals were then placed at the top of each sand pack up to the ground surface to prevent the infiltration of surface water. Protective steel well casings with locking caps were installed for each well and concreted into place. The tops of the riser pipes were vented to allow accurate measurement of stabilized groundwater levels.

Dedicated Waterra™ tubing and inertial pumps (i.e. foot valves) were installed in the wells to facilitate well development and groundwater sampling, and to eliminate the possibility of cross contamination during sampling activities. On January 4, 2006 (approximately two weeks after drilling to allow the wells to equilibrate and to allow disturbance from drilling to subside) the static groundwater level was measured at each monitoring well location using a Heron water level meter. The water table was encountered at depths of 0.26 to 0.71 m below grade, corresponding to Elevations 273.21 to 273.80 m) as shown on the appended borehole logs.

The tape measure and probe were washed with an Alconox solution spray and then rinsed with distilled water prior to, and on completion of all measurements. After measuring the static water levels, the monitoring wells was purged of a minimum of five well volumes, prior to obtaining groundwater samples using the dedicated Waterra™ tubing and inertial pump installed in the wells. Well development water from the purging process was re-infiltrated onto the ground surface. Groundwater characteristics, including temperature, pH, and electrical conductivity were monitored and recorded in the field during well development and sampling, to ensure that the groundwater matrix had stabilized after drilling and well-purging and that representative water samples were obtained.

Groundwater Sampling and Analytical Testing

Following well development, representative groundwater samples were obtained by Naylor Engineering staff and submitted to the County of Oxford, to forward to SGS Lakefield Research Limited of Lakefield, Ontario, a CAEL-accredited analytical testing laboratory. Groundwater samples collected from the monitoring wells were collected directly from the pump discharge line into the appropriate sample containers supplied by the analytical laboratory. Samples were packaged in a rigid, thermally insulated cooler to maintain specified sample temperatures (4°C). A completed chain of custody form prepared by County of Oxford staff accompanied the samples.

All groundwater sampling and analytical testing was completed in accordance with the Guidance on Sampling and Analytical Methods for Use at Contaminated Sites In Ontario (MOE, 1996). Standard laboratory QA/AC procedure will be followed to ensure the quality of analytical results obtained from all samples. The analytical test results, as reported to the County of Oxford by SGS Lakefield Research Limited, are enclosed.

We trust that this letter report is sufficient to meet the requirements of the County of Oxford, and the Ministry of the Environment. If you have any questions or comments regarding the information presented herein, please contact the undersigned at your convenience.

Yours very truly,

Bill Leedham, C.E.T., C.E.S.A.
Senior Environmental Technologist

Carol L. Mitchell, P.Eng.
Senior Environmental Engineer

jmp

Att.

Encl. Borehole/Monitoring Well Logs (MW1, MW2, and MW3)
Encl. Site Plan (as supplied by the County of Oxford)
Encl. Certificate of Analysis from SGS Lakefield Research Limited



Monitoring Well Number: 1

Ground Elevation: 273.68 m

Project: Monitoring Program for Wastewater Plant

Job No.: 5849E1

Location: Mount Elgin Wastewater Treatment Plant, Mount Elgin, Ontario

Drill Date: December 21, 2005

SOIL PROFILE			SAMPLE			Dynamic Cone X 20 40 60 80 X	Shear Strength (PP) kPa ▲ 50 100 150 200 ▲	Water Content (%) WP WL 10 20 30	Groundwater Observations and Standpipe Details
Depth (m)	Description	Symbol	Elevation (m)	Number	Type				
0.00	Ground Elevation		273.68						<p>bentonite seal</p> <p>January 4, 2006, water level at 0.47 m. (Elev. 273.21 m)</p> <p>3.0 m slotted filter</p> <p>sand pack</p> <p>50 mm pipe</p> <p>At drilling completion, water level at 0.47 m</p>
0.00 - 1.00	SAND: loose grey silty sand, very moist to wet	[Yellow dotted pattern]	273.00						
1.00 - 2.00	SILT: loose grey sandy silt, wet	[Green solid pattern]	272.00	1	SS	8	●		
2.00 - 3.00			271.00	2	SS	5	●		
3.00 - 4.00	Monitoring Well terminated at 3.66 m.		270.00						

Reviewed by: BL

Field Tech.: BL

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes: Top of Casing Elevation: 274.48 m.

Drafted by: SR(00b)



Monitoring Well Number: 2

Ground Elevation: 274.51 m

Project: Monitoring Program for Wastewater Plant

Job No.: 5849E1

Location: Mount Elgin Wastewater Treatment Plant, Mount Elgin, Ontario

Drill Date: December 21, 2005

SOIL PROFILE			SAMPLE			Dynamic Cone X 20 40 60 80 X	Shear Strength (PP) kPa ▲ 50 100 150 200 ▲	Water Content (%) WP WL 10 20 30	Groundwater Observations and Standpipe Details
Depth (m)	Description	Symbol	Elevation (m)	Number	Type				
0.00	Ground Elevation		274.51						
0.00 - 1.20	SAND: compact grey coarse sand, occasional gravel, trace silt, wet		274.00						<p>bentonite seal</p> <p>January 4, 2006, water level at 0.71 m. (Elev. 273.80 m)</p> <p>3.0 m slotted filter</p> <p>sand pack</p> <p>50 mm pipe</p> <p>At drilling completion, water level at 0.71 m</p>
1.20 - 2.00	SILT: compact grey sandy silt, interlayered with coarse sand and gravel, wet		273.00	1	SS	12	●		
2.00 - 3.00			272.00						
3.00 - 3.96	SILT TILL: loose to compact grey silt till, trace clay and fine sand, very moist		271.00	2	SS	7	●		
4.00	Monitoring Well terminated at 3.96 m.		270.00						

Reviewed by: *BL*

Field Tech.: *BL*

Drill Method: *Solid Stem Auger*

Sheet: *1 of 1*

Notes: *Top of Casing Elevation: 275.21 m.*

Drafted by: *SR(00b)*



Monitoring Well Number: 3

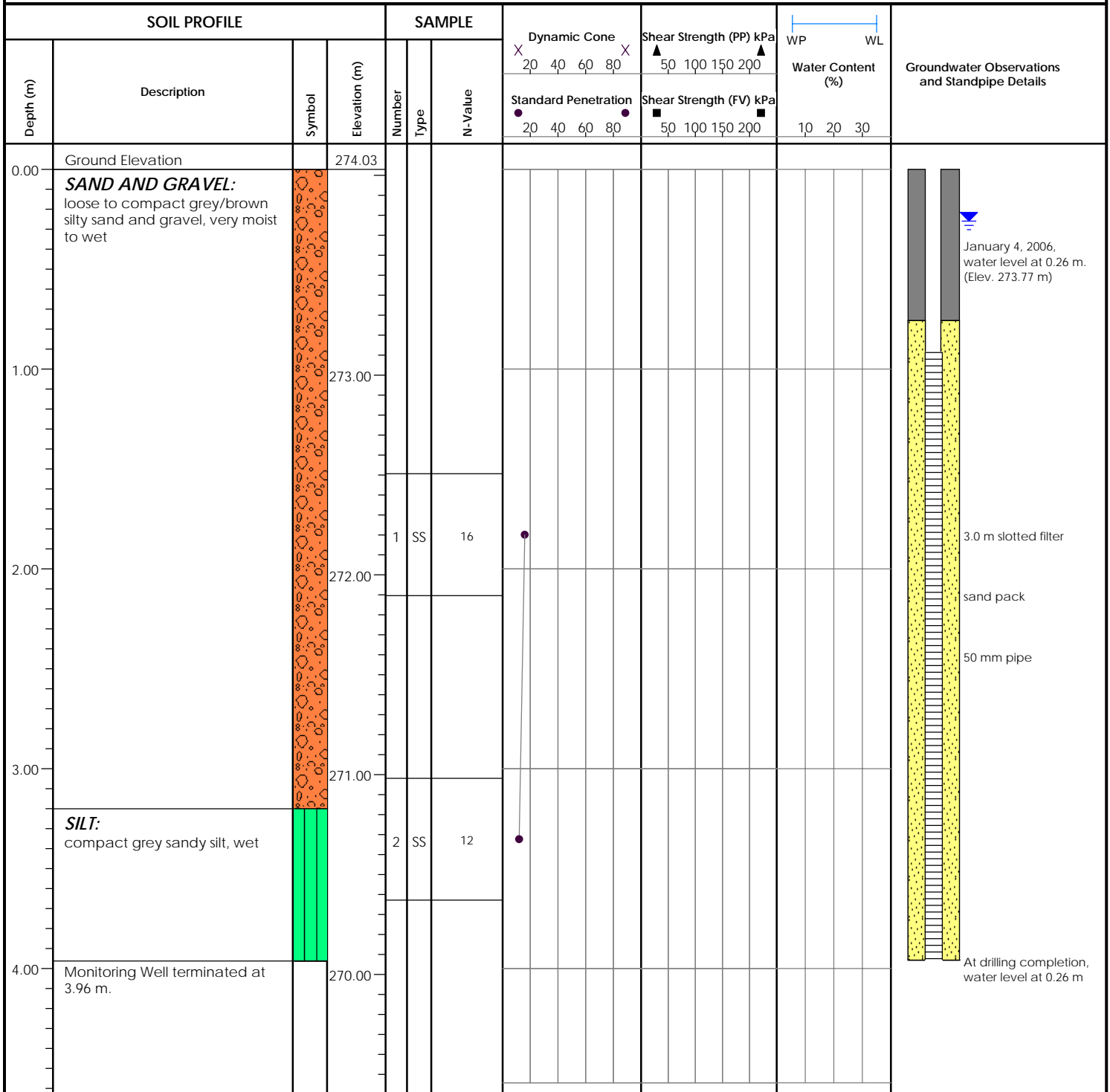
Ground Elevation: 274.03 m

Project: Monitoring Program for Wastewater Plant

Job No.: 5849E1

Location: Mount Elgin Wastewater Treatment Plant, Mount Elgin, Ontario

Drill Date: December 21, 2005



Reviewed by: BL

Field Tech.: BL

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes: Top of Casing Elevation: 275.03 m.

Drafted by: SR(00b)

Note:
Monitoring Well elevations are on top of rim of plastic casing
R. Wilson - Jan 13/06



Project:	MOUNT ELGIN WASTEWATER TREATMENT PLANT
Drawing Title:	
Scale:	No Scale

Date:	Jan 13/06
File Location:	X:\wip\bran\MtElgin\WWTP_SitePlan.dwg
Drawn By:	BH

REV #	DATE	REVISIONS & ADDITIONS	BY



SGS Lakefield Research Limited

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2H0
Phone: 705-652-2038 FAX: 705-652-6441

County of Oxford (Mount Elgin WWTP Monitoring Wells)

Attn : Linda Truscott ltruscott@ocl.net; tgregg@ocl.net

21 Market St.
Woodstock, ON
N4S 1H6,

Phone: 519-421-2203 ext:226/519-539-0015 dial 7 x3115519-539-9800
Fax:pdf format

Wednesday, January 11, 2006

Date Rec. : 05 January 2006
LR Report: CA12116-JAN06

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: NR Mount Elgin WWTP MW 1	6: NR Mount Elgin WWTP MW 2	7: NR Mount Elgin WWTP MW 3
Sample Date & Time					04-Jan-06	04-Jan-06	04-Jan-06
Temperature [°C]	---	---	---	---	10.8	10.8	10.8
pH [no unit]	06-Jan-06	13:11	09-Jan-06	09:44	7.71	7.87	7.69
Phosphate [mg/L]	05-Jan-06	20:22	09-Jan-06	13:55	< 1	< 1	< 1
Chloride [mg/L]	05-Jan-06	20:22	11-Jan-06	14:19	3.1	< 2.0	9.5
Nitrite (as nitrogen) [mg/L]	05-Jan-06	20:22	06-Jan-06	14:32	< 0.06	< 0.06	< 0.06
Nitrate (as nitrogen) [mg/L]	05-Jan-06	20:22	06-Jan-06	14:32	< 0.05	2.90	< 0.05
Nitrate + Nitrite (as nitrogen) [mg/L]	05-Jan-06	20:22	06-Jan-06	14:32	< 0.06	2.90	< 0.06
Diss.Reactive Phos. [mg/L]	11-Jan-06	09:25	11-Jan-06	12:26	< 0.03	< 0.03	< 0.03

Carrie Greenlaw
Project Coordinator
Environmental Services, Analytical

Calibration Records

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
City/Town Mount Elgin
Customer PO
Our Job # B13 8568

R&R Instrumentation Services Inc
24 Midale Crescent
London ON N5X 3B9
Phone (519) 642-7197; Fax: (519) 642 1311
E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FIT 100
Cal Date June 06/14
Due Date June 06/15
Cal Freq Yearly
Location Raw Water
Description Flow Indicating Transmitter
Manufacturer Sonic Pro
Model S3C1A7020SDJL MALE
Serial # 4030912
Accuracy 2%
Range 0 313 L/min.; no mA output used
Range 0 - 5.217 L/s

MEASURING EQUIPMENT

Manufacturer SIM Sonic Pro
Model
Serial #
Cal Reference
Traceability
Accuracy

INPUT	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	% ERROR AS FOUND	% ERROR AS LEFT
P1	off	0.00	0.00	0.00	0.00	0.00
P1	on	1.80	1.80	1.80	0.00	0.00
P2	off	0.00	0.00	0.00	0.00	0.00
P2	on	2.20	2.20	2.20	0.00	0.00
P1 & 2	off	0.00	0.00	0.00	0.00	0.00
P1 & 2	on	2.20	2.10	2.10	-1.92	-1.92

*Actual Applied Value % Error = $\frac{\text{UUT Reading} - \text{AAV}}{\text{Span}} \times 100$

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

TECHNICIAN'S NOTES

CERTIFIED BY:



CET, CCST Level III Technician

INSTRUMENTATION CALIBRATION REPORT

CUSTOMER INFORMATION

Customer County of Oxford
 City/Town Mount Elgin
 Customer PO
 Our Job # B13 8568

R&R Instrumentation Services Inc
 24 Midale Crescent
 London ON N5X 3B9
 Phone (519) 642-7197; Fax: (519) 642 1311
 E-Mail: rthachuk@rrinstrumentation.com

UNIT UNDER TEST (UUT)

Tag # FQ 100
 Cal Date June 06/14
 Due Date June 06/15
 Cal Freq Yearly
 Location Raw Water
 Description Flow Indicating Totalizer
 Manufacturer Sonic Pro
 Model S3C1A7020SDJL MALE
 Serial # 4030912
 Accuracy 2%
 Range 0 - 5.217 L/s

MEASURING EQUIPMENT

Manufacturer NexXTech
 Model 09A10
 Serial # 6315002
 Cal Reference
 Traceability NIST
 Accuracy .0001%

INPUT L/s	%	OUTPUT*AAV L/s	UUT READING AS FOUND	UUT READING AS LEFT	METER ACC AS FOUND	METER ACC AS LEFT
0.00		0.00	0.00	0.00	0.00	0.00
2.20		132.00	130.00	130.00	98.48	98.48
1.80		108.00	107.00	107.00	99.07	99.07

*Actual Applied Value

Meter Accuracy = $\frac{\text{Meter Registration}}{\text{Test Meter Registration}}$ (%)

Test Unit Results

AS FOUND	AS LEFT
Pass: ✓	Pass: ✓
Fail:	Fail:

As Left 7935780.20
 As Found 7935629.30
 Difference 150.90

TECHNICIAN'S NOTES

Checked calibration-ok. Prosonic calibrator sensors for 2" not working. Couldn't verify sensors for Sonic Pro.
 Transmitter checked out ok.

CERTIFIED BY:



CET, CCST Level III Technician

Plant Maintenance Records

ID	Descriptio	Projected S	Shop	Instructions
6437	Inspect	01/05/2014	250900	Test distrubution valves to drainfield beds that proper sequencing of the valve is achieved. There are four valves in total . Test every 6 months
6438	Inspect	01/04/2014	250900	Inspect proper levels in recirculating tank and drainfield (effluent tank) Dip tanks for sludge accumulation and advise Foreman to scheldule tank clean outs . Every 3 months
6439	Operate	14/06/2014	250900	Remove end caps on Recirculating Sand Filter flush lines using effluent pumps check one lateral at at time .Laterals need flushing once per year
6440	Repair	01/05/2014	250900	Flushing of laterals on drainfield bed. Remove end caps on drainfeild laterals flush with drainfeild pumps .Test one lateral at a time . Laterals should be flushed once per year
6442	Repair	01/05/2014	250900	Pump down lift station and vacuum out grit in lift station , inspect pumps and guide rail system . This procedure is schelduled once a year.
6443	Operate	01/05/2014	250900	drainfield and effluent pumps in the system , operate high level alarm floats
6444	Repair	01/03/2014	250900	Inspect all Biofilters in the WWTP. Refer to proper procedure of cleaning biofilters in operations manual . This procedure is schelduled every 6 months.
6445	Repair	01/05/2014	250900	Inspect and remove weeds / debris out of sandfilter media . This procedure is schelduled every 6 months.
6575	Repair	14/03/2014	250900	Install new floats in recirc tank pumps were not coming on in Automatic
6610	Repair	01/09/2014	250900	Inspect all Biofilters in the WWTP. Refer to proper procedure of cleaning biofilters in operations manual . This procedure is schelduled every 6 months.
6623	Replace	31/03/2014	250900	Replace defective floats in dosing tank
6624	Replace	31/03/2014	250900	Replace sump pump in manhole where flow meter is located
6726	Repair	05/05/2014	250900	Inspect switch on panel for Raw pump #1 check floats for proper operation □
6833	Replace	02/06/2014	250900	Replace high level alarm float in dosing tank
6834	Repair	02/06/2014	250900	Remove guard rails from dewatering building bin room andf make changes to auger to retrofit truck haulage of materials.
6920	Repair	04/07/2014	250900	Replace start float on pump 15,16 for sandfilter cycle duty not working properly
7047	Operate	03/11/2014	250900	drainfield and effluent pumps in the system , operate high level alarm floats
7133	Operate	14/09/2014	250900	Pump down recirc tank for hydro shutdown , assist vac truck truck driver cleaning out recirc and sandfilter tanks during hydro outage.
7241	Replace	20/10/2014	250900	Install shelves abd organize control building
7369	Replace	01/12/2014	250900	Connect new flow meter on influent line to WWTP
7370	Replace	01/12/2014	250900	Replace sandfilter pump # 16 as it has failed.
7564	Replace	09/01/2015	250900	Repolace sasndfilter pump 15