



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

March 9, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,

Dear Sir:

**RE: 2009 Year-End Biosolids Land Application Program
Report for Biosolids Centralized Storage Facility (Storage for
Woodstock, Tillsonburg, and Ingersoll WWTP), Thamesford
WWTP, and Norwich Lagoons**

Attached is the monitoring report for 2009 for Oxford County's biosolids land application program.

I trust this report fulfills the intent of Certificates of Approval #'s A800939, 3816-76HRTS, 1680-6F6QRS, 3549-6YNMKK, 5950-7XQKXS, 8943-6YGPQT, 6974-6FKKAY, 0098-5SSJT4, and 6821-5FVSUE.

If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, Oxford County

Year-End Biosolids Land Application Program Report 2009

This monitoring report is prepared for the Ministry of the Environment as part of the requirements of several Certificates of Approval #'s A800939, 3816-76HRTS, 1680-6F6QRS, 3549-6YNMKK, 5950-7XQKXS, 8943-6YGPQT, 6974-6FKKAY, 0098-5SSJT4, and 6821-5FVSUE.

CONTENTS

- OVERVIEW OF THE LAND APPLICATION PROGRAM
- SAMPLING DESCRIPTION
- DISCUSSION OF RESULTS
- BIOSOLIDS CENTRALISED STORAGE FACILITY OPERATION
- **EXHIBIT 1**
TABLES FOR ANALYTICAL RESULTS BY SOURCE
- **EXHIBIT 2**
TABLES FOR ANALYTICAL RESULTS RESAMPLED AT FARM APPLICATION SITE
- **EXHIBIT 3**
LAND APPLICATION CONTRACTOR APPLICATION SITE TABLE

OVERVIEW OF THE LAND APPLICATION PROGRAM

Oxford County owns and operates nine wastewater treatment plants within the County; namely, Woodstock Wastewater Treatment Plant (WWTP), Ingersoll WWTP, Tillsonburg WWTP, Thamesford WWTP, Drumbo Sequencing Batch Reactor (SBR), Norwich Lagoons, Plattsville Lagoons, Tavistock Lagoons, and the Mt. Elgin Septic Tank Effluent Gravity (STEG) system with recirculating sand filters. The four larger mechanical plants generate biosolids on a daily basis while the other systems inventory the material within their treatment systems over long periods of time, or in the case of Drumbo SBR, have it transported to another facility (Woodstock) on a weekly basis for treatment.

Of the four larger mechanical plants, two plants digest material anaerobically (Woodstock and Ingersoll) and two digest biosolids aerobically (Thamesford and Tillsonburg). Woodstock WWTP produces roughly half of all the biosolids produced in the County excluding lagoons and traditionally has landfilled this material while the other plants traditionally used a combination of some land application and some landfilling of the material. This all changed with the implementation of the Biosolids Management Master Plan (BMMP) with dewatering at three of the four mechanical plants and biosolids taken for storage at the Biosolids Centralized Storage Facility (BCSF) for application to land as a nutrient.

Oxford County biosolids program was a winner of the Biosolids Award from the Water Environment Association of Ontario for small producers. There are five main elements of the Biosolids Management Master Plan which include: more enforcement of the Oxford County Sewer use by-law and optimizing digestion processes at the wastewater treatment plants; dewatering of stabilized biosolids at each of the major wastewater treatment plants; transporting thickened sludge from smaller plants to the nearest major wastewater treatment plant for processing and dewatering; land application of all biosolids on approved soil conditioning sites; and centralized storage of biosolids when the material cannot be land applied.

The enforcement of the Oxford County sewer use bylaw was an important step and Oxford County hired two enforcement personnel and acquired additional sophisticated automatic sampling equipment with a view to improving both the quality and reducing the quantity of biosolids produced. The efforts were ongoing for the last four years and benefits were realized at the Woodstock Wastewater Treatment Plant where in the past the biosolids were non-compliant with the metal limits. They were reduced to well below acceptable limits for the land application program.

The biosolids from the Woodstock WWTP have been compliant for more than three years and are acceptable for land application. Please see the 2009 year end biosolids summary below for Woodstock WWTP comparing metal concentration to the required compliance criteria in Table 1.

SAMPLING DESCRIPTION

A sample is collected from each bin that leaves the wastewater treatment plants and composited over each two week period. This is then sent out for analysis of eleven metals, nutrients and E.coli. The frequency would be consistent with the minimum frequency for small generators per NMA.

As a small generator, our sampling program will ensure two samples within 30 days of land application and two additional samples within 90 days for nutrients. This can be accomplished by monthly sampling of the biosolids and additional sampling during biosolids removal.

The samples are analyzed by SGS Lakefield Research Ltd. a CAEAL certified lab. The results are entered into an excel spreadsheet and checked for compliance to the regulations at the time of being entered. The biosolids are also summarized on an annual spreadsheet to calculate monthly and yearly averages.

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

DISCUSSION OF RESULTS

Table 1 highlights the analytical results for metals versus the Ministry of The Environment's (MOE) guideline criteria. All sources were compliant with the guideline and were acceptable to be used as a nutrient for the land application program. More information can be found in Exhibit 1 for analytical results for different sources of biosolids.

The biosolids were resampled at the farm at the time of application and those results may be found in Exhibit 2, these samples provide a further check on the quality of the material and all samples complied with the MOE's criteria as well.

The Norwich table combines both the samples at the lagoon site and the samples at the field site into a single table for the system, as it is unlike the other plants which generate a daily amount of material that must be trucked, sampled and stored.

Also for the requirements of the individual farmers, our Biosolids contractor provides Nutrient reports to them on each application to aid in the beneficial use of the product as a nutrient. The contractor's table of permitted sites indicating spreading applications on MOE approved sites complete with permit numbers is also included. The farm nutrient reports are on file at the Woodstock WWTP and are available upon request.

In summary, Oxford County’s land application program provided for the effective production, transport, storage and eventual reuse as a nutrient for all the biosolids generated under the program. All operation and maintenance activities were performed by the staff in the wastewater treatment plants. The transportation of the biosolids from the facilities to the storage building was done through a contractor working on our behalf. The land application itself was completed by WESSUC Inc. There were no notable upsets or spills during the year of operation and no complaints were received to date.

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

Table 1

Parameter	Woodstock WWTP	Tillsonburg WWTP	Ingersoll WWTP	Thamesford WWTP	Norwich Lagoons	MOE Criteria
Metals mg/kg dry solids	2009 Annual Average	2009 Annual Average	2009 Annual Average	2009 Annual Average	2009 Annual Average	Guideline Maximum
Arsenic	6	3.8	3	9	4	170
Cadmium	3	0.8	2	1	1	34
Cobalt	9	3	6	2	8	340
Chromium	73	32	86	11	18	2800
Copper	757	580	669	261	48	1700
Mercury	1	1	1	0.1	0.2	11
Molybdenum	13	7	11	5	1	94
Nickel	90	29	28	9	12	420
Lead	63	25	28	8	22	1100
Selenium	4	4	4	10	1	34
Zinc	1502	767	1002	497	120	4200

BIOSOLIDS CENTRALIZED STORAGE FACILITY (BCSF) OPERATION

The Biosolids Centralized Storage Facility (BCSF) was built for the dewatered biosolids for periods when the dewatered product cannot be directly land applied. The storage building designed to provide a minimum of 240 days storage. It is also designed with segregated storage areas so that should material be determined to be non-compliant, it can

be removed to landfill and not mixed with biosolids destined for land application. Please see below in Table 2 the biosolids production rate, type, and destination.

The BCSF is located near Salford Ontario adjacent to the Oxford County Landfill and behind the compost area. This location was arrived at after public consultation through a class environmental assessment process and involvement of the local liaison committee. It is operated in such a way as to minimize the impact to neighbours as all the loading and unloading activities take place inside the building. The location is far enough back and surrounded by Oxford County buffer lands as to prevent nuisance dust or noise from impacting neighbours. Trees have also been planted to help with the visual impact of the large building.

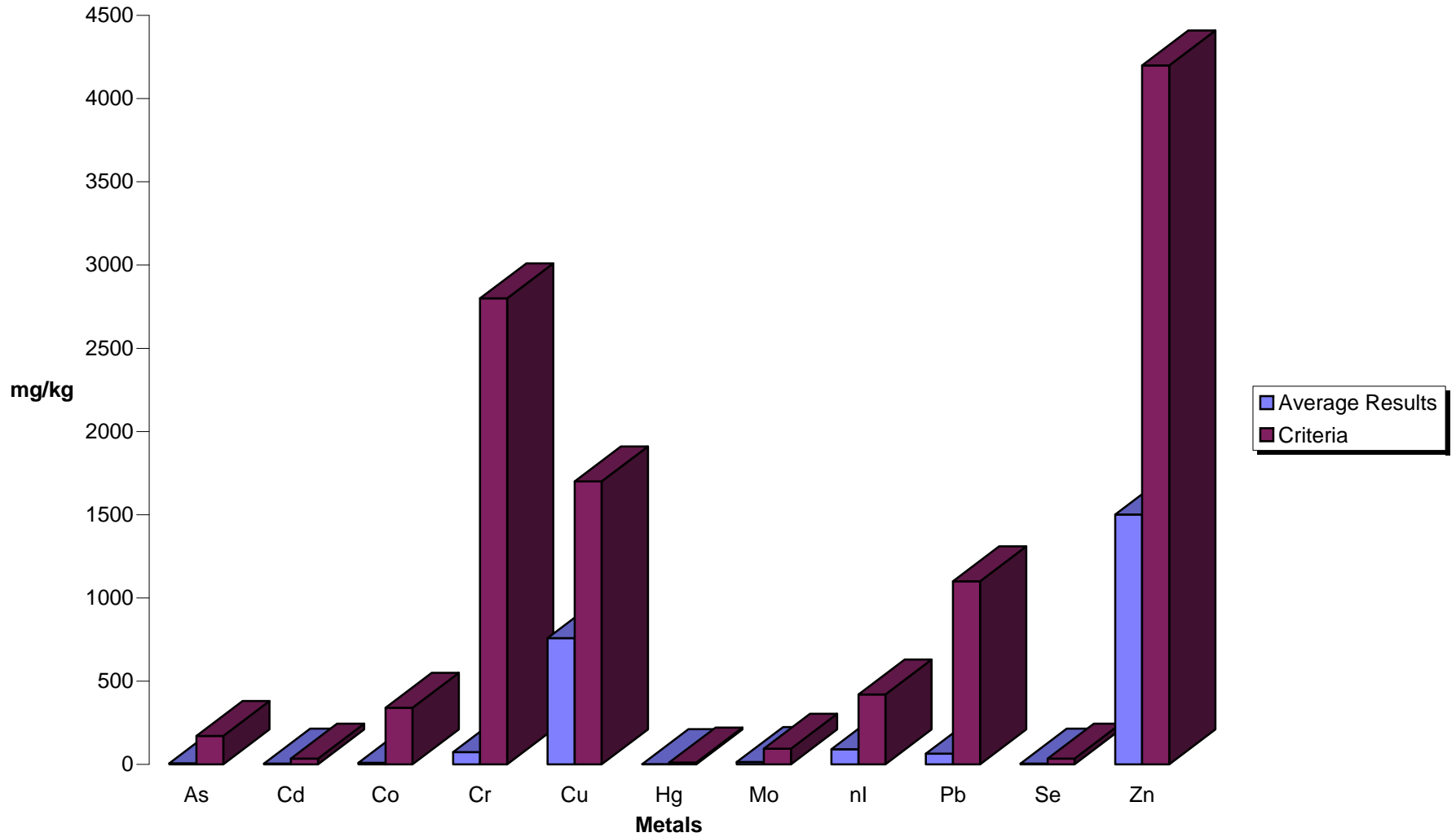
The building has sufficient room to house 7000 m³ of material and was built in two phases. The first phase includes 12 bays; and a future phase two would add an additional four. The facility has sufficient space to accommodate the 240-day storage requirements for the plants although not all systems will dewater and store at first. Thamesford WWTP will stay with a liquid land application program for the time being and phased in to dewatering at a later time. The individual bays are slightly inclined with cement walls to allow for easy piling of the material. The incoming material is segregated by system and month and is deposited in the appropriate bay, after which our staff push the biosolids into higher piles at the back of the bay using the existing loader. There are large ventilation panels in the walls to allow for good ventilation and light into the building. The building is not connected to hydro. While there are lights, they will be powered by a portable generator only if needed during times of biosolids removal. The daily transport of the material will be done during daylight hours.

Table 2

FACILITY	2009 BIOSOLIDS PRODUCTION RATE (wet tonnes or m3)	2009 BIOSOLIDS PRODUCTION RATE (dry tonnes)	BIOSOLIDS TYPE	2009 DESTINATION
Woodstock WWTP	3020 tonnes	770	Anaerobic dewatered	Storage Facility & Land Application
Ingersoll WWTP	802 tonnes	132	Anaerobic dewatered	Storage Facility & Land Application
Tillsonburg WWTP	1288 tonnes	304	Aerobic dewatered	Storage facility & Land Application
Thamesford WWTP	7124 m3	174	Aerobic liquid	Land Application
Drumbo SBR	1481 m3	--	Waste Activated Sludge Liquid	Woodstock WWTP
Norwich Lagoons	4301 tonnes	3183	Lagoon Cleanout sludge cake	Land Application

EXHIBIT 1

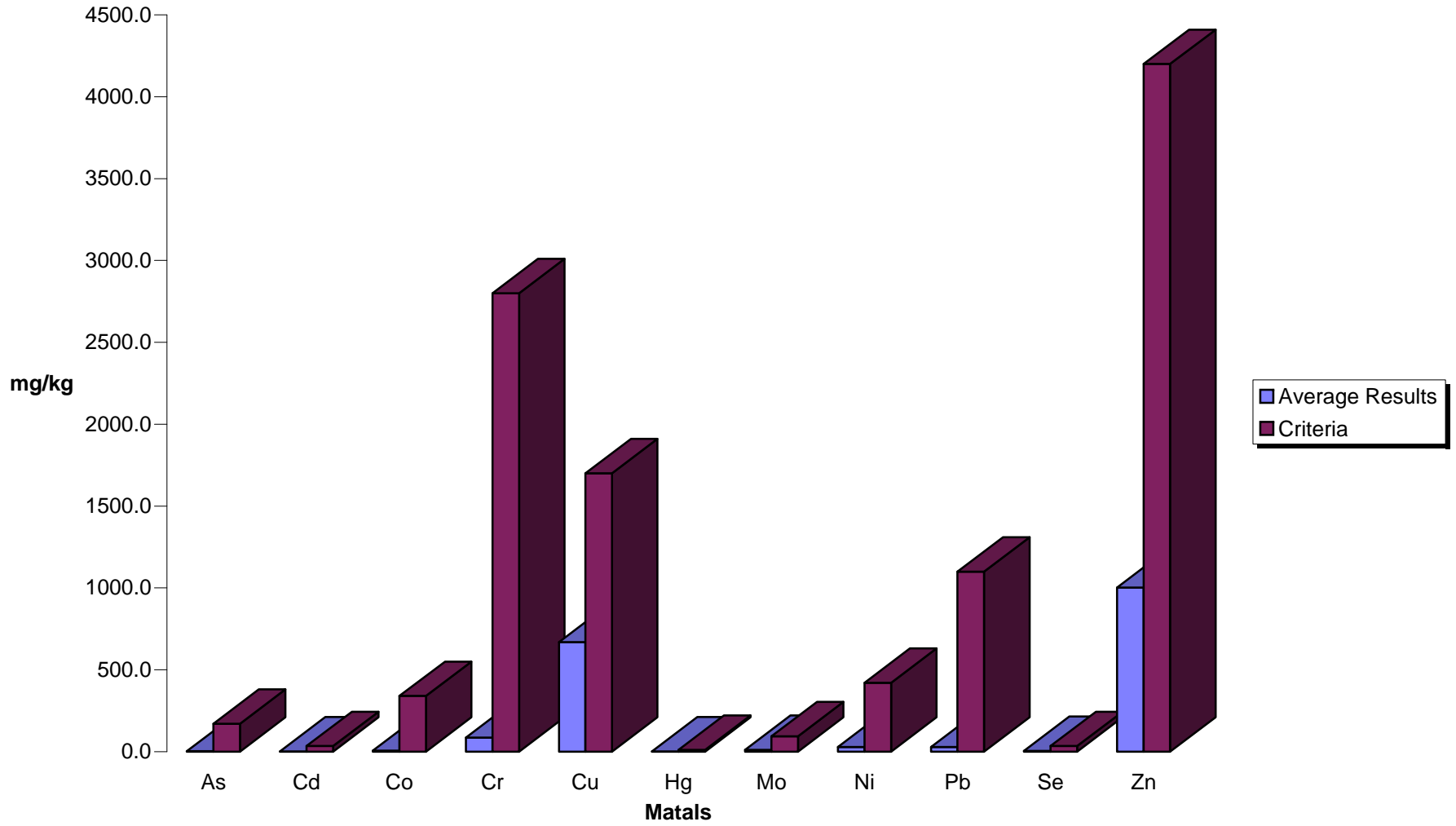
Metal Results Woodstock WWTP Biosolids 2009 vs Criteria



Woodstock WWTP Biosolids 2009

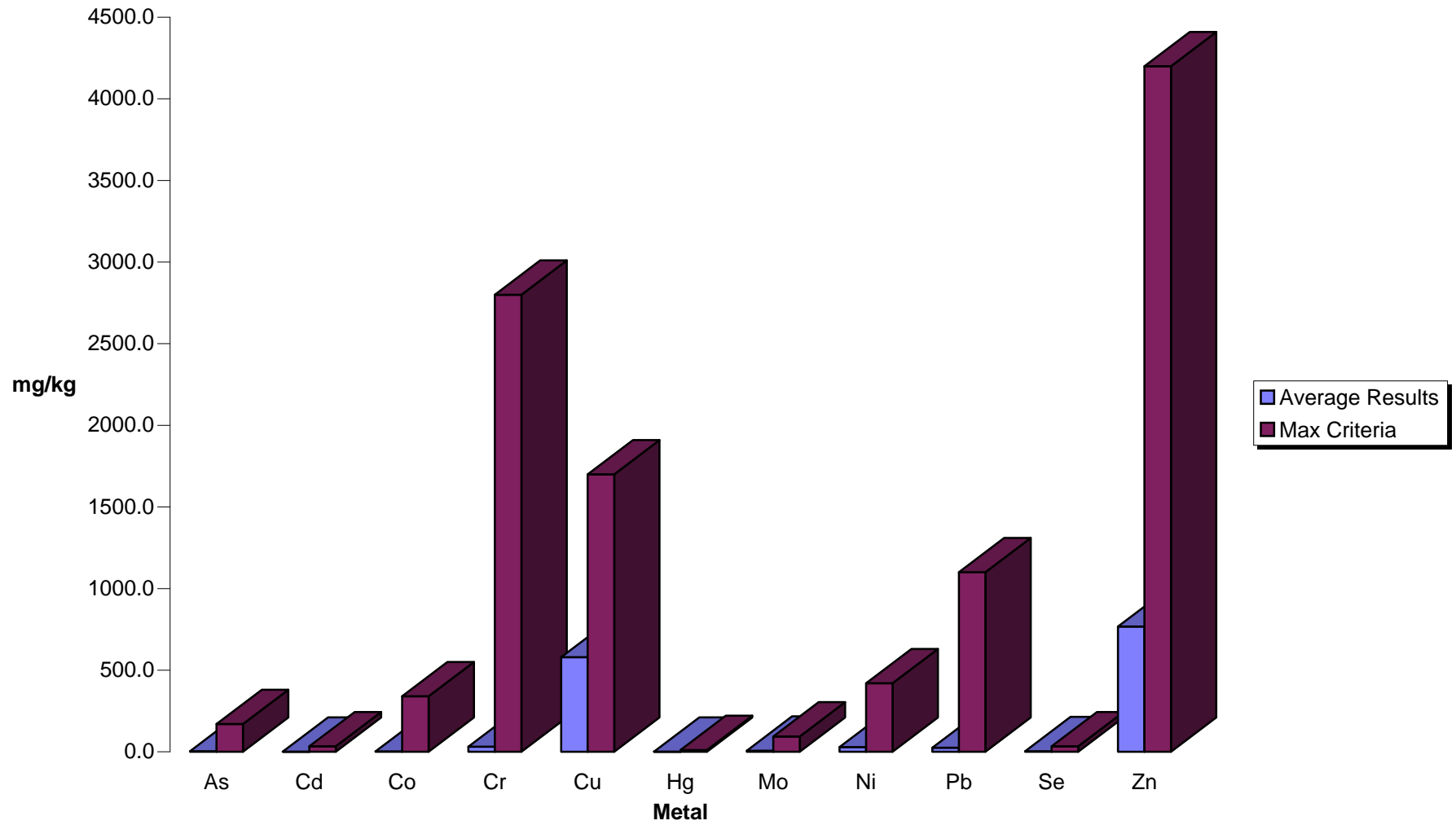
	January	February	March	April	May	June	July	August	September	October	November	December	Annual Average	Total
Biosolids Utilization Dewatered Quality	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009		
# of loads	21	19	15	21	19	22	20	18	21	24	31	23	21	254
Hauled Mass (kg) Wet Weight	215580	215340	267580	232350	219170	252540	228490	173620	236320	291250	407720	280420	251698	3020380
Hour Counter														
Transfer Flow m3 to press	1267	1499	1942	1597	1462	1776	1416	1415	1560	1773	2564	1850		
Filtrate TSS %	0.26%	0.44%	0.28%	0.23%	0.22%	0.21%	0.21%	0.19%	0.20%	0.19%	0.20%	0.22%	0.24%	
Cake TS %	24.51%	24.90%	25.43%	25.14%	25.77%	25.94%	27.03%	27.69%	24.81%	24.65%	25.23%	24.80%	25.49%	
NH3+NH4+-N (mg/L)	1150	1100	1350	1650	1280	1355	742.8	975	1450	1160	866.6667	1067	1178.84	
Nitrate-N (mg/L)	0.3	0.6	0.35	0.3	0.55	0.525	0.88	0.4	0.3	1.25	0.3	0.3	0.50	
Nitrite-N (mg/L)	0.3	0.4	0.3	0.5	0.3	1.425	0.3	2.05	0.45	0.45	0.433333	0.67		
Total P (mg/L)	9500	9050	9500	8700	8950	8550	8740	7800	8750	8950	8467	7867	8735.28	
pH	7.445	7.765	7.56	7.745	7.615	7.67	7.494	7.27	7.38	7.46	7.20	7.53	7.51	
Metals														
[As] in sludge (mg/L)	1	1	1.5	1	1.5	1.5	1.8	2	1.5	1.5	1.333333	2.3		
[Cd] in sludge (mg/L)	0.92	0.815	0.875	0.82	0.85	1.0375	1.012	0.765	0.715	0.775	0.99	0.7		
[Co] in sludge (mg/L)	2.2	1.95	2.45	2.15	2.5	2.15	2.4	2.15	2.3	2.3	2	1.8		
[Cr] in sludge (mg/L)	20	19.5	20	20.5	19.5	19	18.6	17	18	18	16	15.3		
[Cu] in sludge (mg/L)	175	170	175	165	185	192.5	194	210	220	235	206.6667	186.7		
[Hg] in sludge (mg/L)	0.15	0.45	0.2	0.25	0.2	0.2	0.3	0.35	0.25	0.25	0.466667	0.5		
[Mo] in sludge (mg/L)	3.05	3.25	3.05	2.8	2.9	3.05	3.44	3.9	3.1	4.05	3.7	3.3		
[Ni] in sludge (mg/L)	9.5	10	13.5	17	19.5	26	29.6	31.5	31.5	33.5	27.66667	25.7		
[Pb] in sludge (mg/L)	16	15	15	16	16.5	12.5	20.8	18.5	20	17	13.1	12.3		
[Se] in sludge (mg/L)	1	1	1	1	1	1.25	1.2	1	1	1	1.666667	1.3		
[Zn] in sludge (mg/L)	345	385	360	300	325	342.5	576	425	430	440	356.6667	316.7		
Metals														
[As] in sludge (mg/kg)	4	4	6	4	6	6	7	7	6	6	5	9	6	170
[Cd] in sludge (mg/kg)	4	3	3	3	3	4	4	3	3	3	4	3	3	34
[Co] in sludge (mg/kg)	9	8	10	9	10	8	9	8	9	9	8	7	9	340
[Cr] in sludge (mg/kg)	82	78	79	82	76	73	69	61	73	73	63	62	73	2800
[Cu] in sludge (mg/kg)	714	683	688	656	718	742	718	758	887	953	819	753	757	1700
[Hg] in sludge (mg/kg)	1	2	1	1	1	1	1	1	1	1	2	2	1	11
[Mo] in sludge (mg/kg)	12	13	12	11	11	12	13	14	12	16	15	13	13	94
[Ni] in sludge (mg/kg)	39	40	53	68	76	100	110	114	127	136	110	103	90	420
[Pb] in sludge (mg/kg)	65	60	59	64	64	48	77	67	81	69	52	50	63	1100
[Se] in sludge (mg/kg)	4	4	4	4	4	5	4	4	4	4	7	5	4	34
[Zn] in sludge (mg/kg)	1408	1546	1416	1193	1261	1320	2131	1535	1733	1785	1414	1277	1502	4200
E. Coli	10212	38474	35926	28511	240755	109905	156336	1338127	533166	34511	155291	470886	262675	
Sample count	2	2	2	1	2	4	5	2	2	2	3	3		

Ingersoll Biosolids Metals vs Criteria 2009



Ingersoll WWTP Biosolids Summary 2008																
Biosolids Utilization [S]/ Quality	Month	January	February	March	April	May	June	July	August	September	October	November	December	Average	Total	
Hauled Vol. (kg)		84910	97720	146160	107650	115050	112910	64260	72830					100186	801490	
# loads		9	10	15	11	12	13	9	8					11	87	
TS (ppm)		167500	165000	165000	171333	155500	173000	165000	149000					163917		
NH3+NH4+-N (mg/L)		767	840	1400	983	835	926.5	345	100					774.5		
Nitrate-N (mg/L)		0	0.575	0.275	0	1.9	0.225	0.225	11					1.9		
Nitrite-N (mg/L)		1	0.325	0.15	2	2.4	1.95	3.55	0.4					1.4		
Total P (mg/L)		5935	6100	6000	5833	5050	5950	5550	5000					5677.3		
pH		7	7.265	7.79	8	7.76	7.41	7.04	6.74					7.4		
Metals	Metals													Average Results	Criteria	
[As] in sludge (mg/kg)	As	4.4	3.03	4.455	2.97	3.225	2.94	3.05	3.4					3.4	170.0	
[Cd] in sludge (mg/kg)	Cd	1.6	0.72	1.035	1.15	1.22	8.205	1.29	1.0					2.0	34.0	
[Co] in sludge (mg/kg)	Co	4.8	2.435	4.875	6.87	5.73	6.725	6.94	6.7					5.6	340.0	
[Cr] in sludge (mg/kg)	Cr	33.3	31.6	34.35	36.93	33.5	37.6	40.35	443.0					86.3	2800.0	
[Cu] in sludge (mg/kg)	Cu	760.0	757.5	726.5	486.97	740	749	397.12	738.0					669.4	1700.0	
[Hg] in sludge (mg/kg)	Hg	0.5	0.61	0.73	1.63	0.32	0.465	2.86	1.3					1.1	11.0	
[Mo] in sludge (mg/kg)	Mo	12.3	10.665	10.505	13.23	7.665	10.38	11.65	11.4					11.0	94.0	
[Ni] in sludge (mg/kg)	Ni	27.2	18.2	24.35	26.90	25.8	31.95	33.3	40.3					28.5	420.0	
[Pb] in sludge (mg/kg)	Pb	27.2	24.55	20.045	33.20	26.1	29.65	35.65	30.2					28.3	1100.0	
[Se] in sludge (mg/kg)	Se	3.0	3.03	3.045	3.78	3.225	11.75	3.05	3.4					4.3	34.0	
[Zn] in sludge (mg/kg)	Zn	880.1	788	759	863.77	1063	1219.5	829.5	1610.0					1002	4200.0	
Ecoli (cfu/1gm dried wgt)														#DIV/0!		
Sample count															Total	
Hauled Mass [kg] Wet	BCSF													#DIV/0!	0	
# pickups														#DIV/0!	0	

Metal Results Tillsonburg WWTP Biosolids vs Criteria 2009



Tillsonburg WWTP Biosolids 2008															
Biosolids Utilization Dewatered															
	January	February	March	April	May	June	July	August	September	October	November	December	Total	Average	
Hauled weight (kg) to BCSF	138020	126950	116400	77350	61970	135070	107120	58560	135300	144180	87070	99770	1287760	107313	
# of loads	12	11	10	7	6	13	11	7	16	16	9	11	129	11	
Hauled Vol. (m3) to Landfill															
TS (mg/L)	213000	224500	246000	224000	257000	242500	260500	221500	255500	284500	231000	175000		236250	
VS (mg/L)	154000	155500	168000	154000	165000	156000	170500	140500	164500	182000	150000	118000			
NH3+NH4+-N (mg/L)	210	215	365	140	170	115	125	115	210	165	120	270		185	
Nitrate-N (mg/L)	23.075	5.55	0.15	31.5	64.5	44	33	55.5	198.5	142	70.9	210		73.2229167	
Nitrite-N (mg/L)	6.075	2.65	0.8	15.5	19.5	4.2	6.25	20.65	21.5	1.4	10.65	11			
Total P (mg/L)	7400	7500	7800	350	12150	9200	10700	10700	10900	12000	9450	6350		8708.33333	
pH	7.1	7.005	6.875	6.91	6.08	6.75	6.66	6.34	5.71	6.49	6.31	6			
Metals															
Arsenic, AS (mg/L)	0.75	1	0.5	0.5	0.55	0.5	0.5	0.75	1	1.5	0.5	2.25			
Cadmium, Cd (mg/L)	0.15	0.095	0.165	0.17	0.24	0.185	0.275	0.22	0.215	0.28	0.058	0.135			
Cobalt, Co (mg/L)	0.45	0.4	0.5	0.4	0.85	0.55	0.8	0.7	0.8	0.95	0.55	0.40			
Chromium, Cr (mg/L)	6.35	7.25	6.4	6.15	9.25	6.85	8.85	9.3	9.65	7.95	7	4.8			
Copper, Cu (mg/L)	108	103	110	110	180	135	160	165	170	180	144	90.5			
Mercury, Hg (mg/L)	0.125	0.15	0.25	0.3	0.4	0.35	0.25	0.25	0.25	0.45	0.3	0.25			
Molybdenum, Mo (mg/L)	1.75	1.4	0.575	1.4	2.55	1.4	2.45	1.8	2.4	1.9	1.7	1			
Nickel, Ni (mg/L)	5.5	5.5	6	4.5	8	5.5	10	8.5	8	8	7	5			
Lead, Pb (mg/L)	4.35	4.1	4.8	5.15	7.5	5.6	7.05	7.35	7.85	7.35	5.9	3.95			
Selenium, Se (mg/L)	0.5	1	0.5	0.5	1	1.25	0.5	1.25	0.5	1.25	0.5	1.75			
Zinc, Zn (mg/L)	124	125	135	130	220	175	240	240	245	245	190	125			
[As] in sludge (mg/kg)	As	3.5	4.5	2.0	2.2	2.1	1.9	3.4	3.9	5.3	2.2	12.9		3.8	170
[Cd] in sludge (mg/kg)	Cd	0.7	0.4	0.7	0.8	0.9	0.8	1.1	1.0	0.8	0.3	0.8		0.8	34
[Co] in sludge (mg/kg)	Co	2.1	1.8	2.0	1.8	3.3	2.3	3.1	3.2	3.1	3.3	2.4		3	340
[Cr] in sludge (mg/kg)	Cr	29.8	32.3	26.0	27.5	36.0	28.2	34.0	42.0	37.8	27.9	30.3		32	2800
[Cu] in sludge (mg/kg)	Cu	507	459	447	491	700	557	614	745	665	633	623		580	1700
[Hg] in sludge (mg/kg)	Hg	0.6	0.7	1.0	1.3	1.6	1.4	1.0	1.1	1.0	1.6	1.3		1	11
[Mo] in sludge (mg/kg)	Mo	8.2	6.2	2.3	6.3	9.9	5.8	9.4	8.1	9.4	6.7	7.4		7	94
[Ni] in sludge (mg/kg)	Ni	25.8	24.5	24.4	20.1	31.1	22.7	38.4	38.4	31.3	28.1	30.3		29	420
[Pb] in sludge (mg/kg)	Pb	20.4	18.3	19.5	23.0	29.2	23.1	27.1	33.2	30.7	25.8	25.5		25	1100
[Se] in sludge (mg/kg)	Se	2.3	4.5	2.0	2.2	3.9	5.2	1.9	5.6	2.0	4.4	2.2		4	34
[Zn] in sludge (mg/kg)	Zn	582.2	556.8	548.8	580.4	856.0	721.6	921.3	1083.5	958.9	861.2	822.5		767	4200
Ecoli (cfu/1gm dried wgt)		137573	23321	78261	16483	652361	56114	19930	12064	262277	82937	131097		140833	

Thamesford WWTP Biosolids 2009

Metal Concentrations

Table 1

Date	Lab	Total Solids (%)	Metals mg/L										
			Arsenic (mg/L)	Cadmium (mg/L)	Cobalt (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molyb (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Zinc (mg/L)
8-Jan-09	SGS	3.53	0.3000	0.040	0.150	1.10	27.000	1.200	0.0120	0.4	0.900	0.3000	28.000
28-Jan-09	SGS	2.17	0.30	0.03	0.05	0.20	4.80	0.10	0.001	0.10	0.20	0.30	7.70
4-Feb-09	SGS	1.64	0.30	0.03	0.05	0.10	3.30	0.10	0.001	0.10	0.10	0.30	5.20
4-Mar-09	SGS	2.44	0.30	0.03	0.05	0.30	4.80	0.10	0.001	0.10	0.20	0.30	7.20
8-Apr-09	SGS	1.63	0.30	0.03	0.05	0.10	2.70	0.10	0.001	0.10	0.10	0.30	4.70
6-May-09	SGS	2.66	0.30	0.03	0.06	0.20	5.70	0.10	0.001	0.10	0.20	0.30	1.00
17-Jun-09	SGS	3.41	0.15	0.02	0.06	0.30	7.30	0.20	0.003	0.20	0.20	0.15	26.00
8-Jul-09	SGS	2.53	0.15	0.02	0.05	0.30	6.00	0.20	0.003	0.10	0.20	0.15	18.00
26-Aug-09	SGS	2.05	0.15	0.02	0.03	0.20	4.60	0.10	0.003	0.05	0.20	0.15	10.00
2-Sep-09	SGS	2.34	0.15	0.02	0.03	0.30	6.20	0.20	0.001	0.05	0.20	0.15	14.00
4-Nov-09	SGS	2.57	0.15	0.02	0.03	0.30	6.00	0.10	0.001	0.05	0.20	0.15	11.00
11-Nov-09	SGS	2.56	0.03	0.03	0.05	0.30	5.90	0.20	0.003	0.10	0.20	0.30	26.00
2-Dec-09	SGS	2.15	0.15	0.02	0.03	0.20	4.70	0.10	0.001	0.05	0.20	0.15	7.90
Average		2.44	0.21	0.02	0.05	0.30	6.85	0.22	0.00	0.12	0.24	0.23	12.82

Thamesford WWTP Biosolids 2009

COMPARISON TO GUIDELINE

Table 2

Date	Lab		Metals (mg/kg solids)										
			As	Cd	Co	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn
8-Jan-09	SGS	mg/kg	8.50	1.13	4.25	31.16	764.87	33.99	0.34	11.33	25.50	8.50	793.20
28-Jan-09	SGS	mg/kg	13.82	1.38	2.30	9.22	221.20	4.61	0.05	4.61	9.22	13.82	354.84
4-Feb-09	SGS	mg/kg	18.29	1.83	3.05	6.10	201.22	6.10	0.06	6.10	6.10	18.29	317.07
4-Mar-09	SGS	mg/kg	12.30	1.23	2.05	12.30	196.72	4.10	0.04	4.10	8.20	12.30	295.08
8-Apr-09	SGS	mg/kg	18.40	1.84	3.07	6.13	165.64	6.13	0.06	6.13	6.13	18.40	288.34
6-May-09	SGS	mg/kg	11.28	1.13	2.26	7.52	214.29	3.76	0.04	3.76	7.52	11.28	37.59
17-Jun-09	SGS	mg/kg	4.40	0.44	1.76	8.80	214.08	5.87	0.09	5.87	5.87	4.40	762.46
8-Jul-09	SGS	mg/kg	5.93	0.59	1.98	11.86	237.15	7.91	0.12	3.95	7.91	5.93	711.46
26-Aug-09	SGS	mg/kg	7.32	0.73	1.22	9.76	224.39	4.88	0.15	2.44	9.76	7.32	487.80
2-Sep-09	SGS	mg/kg	6.41	0.64	1.07	12.82	264.96	8.55	0.04	2.14	8.55	6.41	598.29
4-Nov-09	SGS	mg/kg	5.84	0.58	0.97	11.67	233.46	3.89	0.04	1.95	7.78	5.84	428.02
11-Nov-09	SGS	mg/kg	1.17	1.17	1.95	11.72	230.47	7.81	0.12	3.91	7.81	11.72	1015.63
2-Dec-09	SGS	mg/kg	6.98	0.70	1.16	9.30	218.60	4.65	0.05	2.33	9.30	6.98	367.44
Average			9.28	1.03	2.08	11.41	260.54	7.86	0.09	4.51	9.20	10.09	496.71
Max Criteria			170	34	340	2800	1700	1100	11	94	420	34	4200

Thamesford WWTP Biosolids 2009

Sampling Results

Table 3

Date	Lab	Total Solids (%)	Volatile Solids (%)	TP (mg/L)	TKN (mg/L)	Free NH3 (mg/L)	NO3 (mg/L)	pH (mg/L)	Alkalinity as CaCO3 (mg/L)
8-Jan-09	SGS	3.53	2.0	1200	1880	619	0.30	7.34	2570
28-Jan-09	SGS	2.17	1.4	770	1290	22.0	5.80	7.09	496
4-Feb-09	SGS	1.64	1.0	530	918	36.1	13.00	7.02	718
4-Mar-09	SGS	2.44	1.6	800	1200	37.8	0.30	7.26	521
8-Apr-09	SGS	1.63	1.1	440	936	14.1	6.10	7.27	1190
6-May-09	SGS	2.66	1.9	870	1310	41.1	0.30	7.09	503
17-Jun-09	SGS	3.41	2.2	1100	1590	121.0	0.15	7.33	745
8-Jul-09	SGS	2.53	1.6	970	1070	33.5	0.40	7.32	472
26-Aug-09	SGS	2.05	1.3	770	1130	12.0	32.00	7.31	313
2-Sep-09	SGS	2.34	1.4	1000	1240	2.6	0.70	7.21	521
4-Nov-09	SGS	2.57	1.7	970	1550	87.4	0.15	7.24	137
11-Nov-09	SGS	2.56	1.5	860	1700	774.0	0.30	7.46	3080
2-Dec-09	SGS	2.15	1.4	690	1190	10.7	9.00	7.35	382
Average		2.44	1.55	843.85	1308.00	139.33	5.27	7.25	896.00

Norwich Lagoon North Cell 2009
Bio Solids Analysis Results Works Number: 110001480

Sample Date	Jan	Feb	Mar	Apr	May	June	July	August	September	October	November	December	Avaerage Results	
Analysis														
Total.Solids	%				69	72.2	77.2	75	77.75	81.0			74.2	
Total Solids	mg/L				1320000	1350000	1310000	1410000	11000000	1700000			3278000.0	
Volatile Solids	%				3.3	4.18	3.4	4.0	4.2	4.2			3.8	
Volatile Solids	mg/L				63400	78200	57100	79500	78500	87500			71340.0	
Specific Gravity					1.9	1.9	1.7	1.9	1.85	2.1			1.9	
pH	units				6.96	7.59	7.39	7.68	7.01	7.44			7.3	
Alkalinity (as CaCO3)					2020	4500	3900	2800	2475	7740			3139.0	
Ammonia+Ammonium (N)	mg/L				190	190	170.0	190	5.0	< 210			149.0	
Nitrogen-kjeldahl (N)	mg/L				3800	4600	3900	5800	4050	5000			4430.0	
Nitrite as N	mg/L				1	0.3	0.3	0.3	0.3	0.3			0.4	
Nitrate as N	mg/L				20	18	18.0	19.0	43	37			23.5	
Nitrite+Nitrate as N	mg/L				21	18	18.0	19.0	43	37			23.7	
As Arsenic	mg/L				2	4	2	4	3	3.0			3.0	
B Boron	mg/L				9	5	8	8	9	8.0			7.7	
Cd Cadmium	mg/L				0.59	0.44	0.46	1.2	0.86	1.00			0.7	
Co Cobalt	mg/L				6.2	5.9	5.7	6.2	6.2	5.2			6.0	
Cr Chromium	mg/L				14	14	13	14	13.5	13.0			13.7	
Cu Copper	mg/L				45	27	37	40	33	36.0			36.4	
Hg Mercury	mg/L				0.1	0.1	0.1	0.2	0.3	0.1			0.2	
P Phosphorus	mg/L				2500	1400	1900	2000	1590	2100			1878.0	
K Potassium	mg/L				760	720	660	770	635	440			709.0	
Mn Magnesium	mg/L													
Mo Molybdenum	mg/L				0.6	0.5	0.6	0.5	1.0	1.0			0.6	
Na Sodium	mg/L				200	190	190	200	157	170			187.3	
Ni Nickel	mg/L				6	10	10	10	10	8			9.3	
Pb Lead	mg/L				18	15	16	16	16	18			16.2	
Se Selenium	mg/L				1	1	1	1	1	1			1.0	
Zn Zinc	mg/L				110	71	90	97	80	94			89.7	
E Coli (cfu/1gm dried wgt)					612	14	39	187	64	25			183.1	Geomean
E Coli (cfu/100gm)					42000	1000	3000	14000	2500	2000			12500.0	Geomean
Oil & Grease (Grease)	%													
Oil & Grease (Grease)	mg/L					2300	3200							
All results less than MDL taken as MDL														Criteria
As Arsenic	mg/kg				3	6	3	5	4	4			4	170
B Boron	mg/kg				13	7	10	11	11	10				
Cd Cadmium	mg/kg				0.9	0.6	0.6	1.6	1.1	1.2			1.0	34
Co Cobalt	mg/kg				9	8	7	8	8	6			8	340
Cr Chromium	mg/kg				20	19	17	19	17	16			18	2800
Cu Copper	mg/kg				65	37	48	53	42	44			48	1700
Hg Mercury	mg/kg				0.14	0.14	0.13	0.27	0.40	0.12			0.20	11
P Phosphorus	mg/kg				3623	1939	2461	2667	2045	2593				
K Potassium	mg/kg				1101	997	855	1027	817	543				
Mn Magnesium	mg/kg				0	0	0	0	0	0				
Mo Molybdenum	mg/kg				1	1	1	1	1	1			1	94
Na Sodium	mg/kg				290	263	246	267	201	210				
Ni Nickel	mg/kg				9	14	13	13	13	10			12	420
Pb Lead	mg/kg				26	21	21	21	21	22			22	1100
Se Selenium	mg/kg				1	1	1	1	1	1			1	34
Zn Zinc	mg/kg				159	98	117	129	103	116			120	4200

EXHIBIT 2

Ingersoll, Tillsonburg and Woodstock Biosolids from BCSF 2009

Farm Sampled Biosolids Analysis Results

Sample Date		May	May	August	September	September	Average Results		
Soil Site Permit #		S-0707-166	S-0707-158A	S-0708-102	S-0708-135	S-0708-133			
Analysis									
Total Solids	%	19.6	19.0	29.4	34.2	21.8	24.8		
Total Solids	mg/L	195500	190000	294000	342000	218000	247900		
Volatile Solids	%	10.6	10.5	17.3	18.2	12.9	14		
Volatile Solids	mg/L	106000	105000	173000	182000	129000	139000		
Specific Gravity		1.0	1.0	1.1	1.3	1.1	1.1		
pH	units	7.77	7.88	7.88	8.29	7.88	7.94		
Alkalinity (as CaCO3)		7910	9070	8450	18700	11000	11026		
Ammonia+Ammonium (N)	mg/L	1600	1800	2100	3200	2400	2220		
Nitrogen-kjeldahl (N)	mg/L	8900	8600	12000	14000	10000	10700		
Nitrite as N	mg/L	0.3	0.3	0.3	11	8.6	4.1		
Nitrate as N	mg/L	0.3	0.3	0.3	0.3	0.3	0.3		
Nitrite+Nitrate as N	mg/L	0.3	0.3	0.3	11	8.6	4.1		
As Arsenic	mg/L	1	1	1	2	1	1.2		
B Boron	mg/L	6.5	6	4	7	5	5.7		
Cd Cadmium	mg/L	0.475	0.39	1.3	2.1	0.62	0.98		
Co Cobalt	mg/L	1.45	1.4	1.9	2.6	1.1	1.69		
Cr Chromium	mg/L	11.35	9.7	14	24	10	13.8		
Cu Copper	mg/L	140	130	150	220	140	156		
Hg Mercury	mg/L	0.3	0.1	0.3	0.3	0.2	0.24		
P Phosphorus	mg/L	6750	6300	8400	11000	7100	7910		
K Potassium	mg/L	235	210	460	290	360	311		
Mn Magnesium	mg/L								
Mo Molybdenum	mg/L	2.2	1.7	2.6	4.2	2.3	2.6		
Na Sodium	mg/L	320	310	340	340	310	324		
Ni Nickel	mg/L	8	9	9	15	13	10.8		
Pb Lead	mg/L	9.45	7.9	12	17	8.1	10.9		
Se Selenium	mg/L	1	1	1	1	1	1		
Zn Zinc	mg/L	215	210	250	420	250	269		
E Coli (cfu/1gm dried wgt)		22196	38421	2207	190	247248	62052	Geomean	
Oil & Grease (Grease)	%								
Oil & Grease (Grease)	mg/L								
All results less than MDL taken as MDL								Criteria	
As Arsenic	mg/kg	5	5	3	6	5	5	170	
B Boron	mg/kg	33	32	14	20	23	23		
Cd Cadmium	mg/kg	2.4	2.1	4.4	6.1	2.8	3.9	34	
Co Cobalt	mg/kg	7	7	6	8	5	6.8	340	
Cr Chromium	mg/kg	58	51	48	70	46	56	2800	
Cu Copper	mg/kg	716	684	510	643	642	629	1700	
Hg Mercury	mg/kg	1.53	0.53	1.02	0.88	0.92	0.97	11	
P Phosphorus	mg/kg	34527	33158	28571	32164	32569	31908		
K Potassium	mg/kg	1202	1105	1565	848	1651	1255		
Mn Magnesium	mg/kg								
Mo Molybdenum	mg/kg	11	9	9	12	11	10.5	94	
Na Sodium	mg/kg	1637	1632	1156	994	1422	1307		
Ni Nickel	mg/kg	41	47	31	44	60	44	420	
Pb Lead	mg/kg	48	42	41	50	37	44	1100	
Se Selenium	mg/kg	5	5	3	3	5	4	34	
Zn Zinc	mg/kg	1100	1105	850	1228	1147	1085	4200	

**Thamesford WWTP Biosolids 2009
Farm Sampled Biosolids Analysis Results**

Sample Date		Apr	October	November	Average Results	
Soil Site Permit #		S-0709-84	S-0708-132	S-0709-154		
Analysis						
Total Solids	%	3.88	27.1	25.6	18.9	
Total Solids	mg/L	38800	27100	25600	30500	
Volatile Solids	%	2.82	18.1	15.5	12.1	
Volatile Solids	mg/L	28200	18100	15500	20600	
Specific Gravity						
pH	units	7.18	7.54	7.46	7.39	
Alkalinity (as CaCO3)		1900	3340	3080	2773	
Ammonia+Ammonium (N)	mg/L	579	761	774	705	
Nitrogen-kjeldahl (N)	mg/L	2530	2510	1700	2247	
Nitrite as N	mg/L	7.1	1	1.6	3.23	
Nitrate as N	mg/L	1.0	0.3	0.3	0.53	
Nitrite+Nitrate as N	mg/L	8.1	1.0	1.6	3.57	
As Arsenic	mg/L	0.3	0.3	0.3	0.30	
B Boron	mg/L	0.85	0.98	0.77	0.87	
Cd Cadmium	mg/L	0.03	0.03	0.03	0.03	
Co Cobalt	mg/L	0.06	0.06	0.05	0.06	
Cr Chromium	mg/L	0.4	0.5	0.3	0.40	
Cu Copper	mg/L	6.3	7.1	5.9	6.43	
Hg Mercury	mg/L	0.006	0.012	0.003	0.01	
P Phosphorus	mg/L	990	1100	860	983	
K Potassium	mg/L	120	100	98	106	
Mn Magnesium	mg/L					
Mo Molybdenum	mg/L	0.1	0.1	0.1	0.10	
Na Sodium	mg/L	320	380	390	363	
Ni Nickel	mg/L	0.2	0.3	0.2	0.23	
Pb Lead	mg/L	0.2	0.2	0.2	0.20	
Se Selenium	mg/L	0.3	0.3	0.300	0.30	
Zn Zinc	mg/L	16	38.0	26.0	26.7	
E Coli (cfu/1gm dried wgt)		927835	163701	320312	470616	Geomean
Oil & Grease (Grease)	%	NR				
Oil & Grease (Grease)	mg/L	NR				
All results less than MDL taken as MDL						Criteria
As Arsenic	mg/kg	8	1	1	2	170
B Boron	mg/kg	22	4	3	5	
Cd Cadmium	mg/kg	0.8	0.1	0.1	0.2	34
Co Cobalt	mg/kg	2	0	0	0.3	340
Cr Chromium	mg/kg	10	2	1	2	2800
Cu Copper	mg/kg	162	26	23	34	380
Hg Mercury	mg/kg	0.15	0.04	0.01	0.04	11
P Phosphorus	mg/kg	25515	4059	3359	5214	
K Potassium	mg/kg	3093	369	383	562	
Mn Magnesium	mg/kg					
Mo Molybdenum	mg/kg	3	0.4	0.4	0.5	94
Na Sodium	mg/kg	8247	1402	1523	1926	
Ni Nickel	mg/kg	5	1	1	1	420
Pb Lead	mg/kg	5	1	1	1	1100
Se Selenium	mg/kg	8	1	1	2	34
Zn Zinc	mg/kg	412	140	102	141	4200

EXHIBIT 3

WESSUC INC - WASTE MANAGEMENT SYSTEM NUMBER 1603-4LJGBN											
2009 ANNUAL REPORT FOR THAMESFORD LIQUID AEROBIC BIOSOLIDS - "SCHEDULE B"											
Wessuc #	C of A #	Farmer	Farm ID:	Lot	Concession	Township	County	Usable Ha	Expiry	Dates Spread	Volume M3
N/A	S-0709-84					Thames Centre	Middlesex	57.46	12-Apr-10	April 14-16	2752
OX2049	S-0708-132					SW Oxford	Oxford	13.1	15-Sep-14	Oct 13-15	2021
OX2051	S-0709-154					Zorra	Oxford	59.5	05-Nov-14	Nov 10-11	2351
Thamesford Total											7124

WESSUC INC - WASTE MANAGEMENT SYSTEM NUMBER 1603-4LJGBN											
2009 ANNUAL REPORT FOR THE BIOSOLIDS CENTRALIZED STORAGE FACILITY DEWATERED BIOSOLIDS- "SCHEDULE B"											
Wessuc #	C of A #	Farmer	Farm ID:	Lot	Concession	Township	County	Usable Ha	Expiry	Dates Spread	Wet Tonnes
OX2039	S-0707-166					Norwich	Oxford	17.8	01-May-14	May 5-6	738.66
OX2029	S-0707-158A					Norwich	Oxford	32	20-Nov-13	May 23	451.96
OX2016	S-0708-102					SW Oxford	Oxford	40.5	23-Oct-11	Aug 20, 26, 28	1254.05
OX2047	S-0708-133					SW Oxford	Oxford	48.9	13-Aug-14	Sep 2, 3, 4	1615.7
OX2048	S-0708-135					SW Oxford	Oxford	27.9	13-Aug-14	Sep 2	802.16
BCSF Total											4862.53

WESSUC INC - WASTE MANAGEMENT SYSTEM NUMBER 1603-4LJGBN											
2009 ANNUAL REPORT FOR NORWICH LAGOON NORTH CELL DEWATERED BIOSOLIDS - "SCHEDULE B"											
Wessuc #	C of A #	Farmer	Farm ID:	Lot	Concession	Township	County	Usable Ha	Expiry	Dates Spread	Wet Tonnes
OX2032	S-1004-114					Burford	Brant	31.81	13-Jan-14	Aug 17	99
OX2031	S-1004-113					Burford	Brant	36.6	10-Jul-14	Aug 17	363
OX2045	S-0402-41					Thames Centre	Middlesex	33.1	16-Jul-14	Aug 17, 18, 19, 26	968
OX2044	S-0402-40					Thames Centre	Middlesex	49.3	19-Jul-14	Aug 19, 20, 25	1375
OX2046	S-0708-131					SW Oxford	Oxford	35.02	28-Jul-14	Aug 26, 27, 28	627
OX2043	S-0708-134					SW Oxford	Oxford	73.5	27-Aug-14	Sep 3	869
Norwich Total											4301



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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

**RE: Year-End Report Woodstock Wastewater Treatment Plant
(WWTP) 2009**

(Certificate of Approval #3549-6YNMKK & #5950-7XQKXS)

This year-end report is prepared as required by the certificate of approval # 3549-6YNMKK and # 5950-7XQKXS.

I trust this report fulfills the intent of the Certificate of Approval. If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

Overview

The Woodstock Wastewater Treatment Plant (WWTP) is a conventional activated sludge system that provided effective wastewater treatment in 2009, with an average flow for the plant of 22 971 m³/day which represents 69.6 % of the design capacity of 33 000 m³/day. The total flow for 2009 was 8 366 922 m³.

Project Description

The facility is a conventional activated sludge plant consisting of primary and secondary treatment, with an outfall pipe to the Thames River. The facility adds Ferrous Chloride into the reactors for phosphate control, Sodium Hypochlorite for disinfection seasonally and then de-chlorination using Sodium Bisulfite. Oxford County owns and operates the facility.

Plant Specifications

Facility - Woodstock Wastewater Treatment Plant
Design Capacity - 33 000 m³ / day
Average Daily Flow - 22 971 m³ / day
Receiving Area - Thames River
Classification - WWT – IV
Certificate(s) of Approval 3549-6YNMKK & 5950-7XQKXS

<u>Effluent Limits:</u>	Ave. Monthly Concentration	Ave. Monthly Concentration	Ave. Monthly Concentration
	May 01-Nov. 30	Dec. 1-April 30	May 1 – Oct. 31
CBOD	15 mg/L	20 mg/L	--
Suspended Solids	15 mg/L	15 mg/L	--
Total Ammonia Nitrogen	3 mg/L	5 mg/L	--
Total Phosphorus	0.75 mg/L	0.75 mg/L	--
TRC	--	--	<0.05 mg/L
pH	6.0 – 9.5	6.0-9.5	--
			Monthly Geometric Mean
E. Coli	--	--	200 #/100 ml

Sampling Procedure

Sewage samples are collected weekly. Raw sewage samples are collected where the two sewer trunks combine before entering the sewage works. A composite sampler collects samples over a 24-hour duration. After primary treatment and before secondary treatment a second composite sample is collected. This also is a 24-hour composite sample.

Final Effluent 24-hour composite sample is collected after secondary treatment, disinfection and de-chlorination and 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.

Flows

The total flow treated in 2009 was 8 366 922 m³. The daily average flow was 22 971 m³/day which represents 69.6 % of the design flow for Woodstock WWTP of 33 000 m³/d.

Raw Sewage Quality

The annual average raw sewage CBOD concentration to the plant was 131 mg/L which represents an average loading of 3009 kg/day. The average suspended solids concentration was 178 mg/L (or 4088 kg/day of loading). Average nitrogen levels, as TKN were 17.4 mg/L (or a loading of 400 kg/day). Total phosphorus was 2.8 mg/L, which represents a loading of 64 kg/day.

Plant Performance & Effluent

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

Over the reporting period, the annual average effluent CBOD₅ concentration was 4 mg/L (or an equivalent 96.9 % reduction). The suspended solids average was 3 mg/L, which represents a 98.3 % reduction. Ammonia averaged 0.24 mg/L (or a 98.7 % reduction). Total phosphorus average was 0.27 mg/L, which represents a 90.4 % reduction.

All pH is measured for both Influent and Effluent by the operator with a minimum weekly basis and there was no single sample outside out limits of 6-9.5 for 2009.

Bypassing, Upset and Abnormal Conditions

There were no bypasses or upset conditions in 2009.

Maintenance and Calibration

The operating and maintenance staff from the Woodstock WWTP conducts regular scheduled maintenance of the plant equipment. Detailed maintenance records for each piece of equipment are kept on site at the Woodstock Plant.

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

Biosolids

Discussion:

The biosolids are anaerobically digested and dewatered at the Woodstock Wastewater Treatment Plant using an Alfa Laval Centrifuge. The biosolids are then disposed of on agricultural land or stored at the Oxford County biosolids centralized storage facility. The testing results and land application details are included and summarized at the end of this report in a separate Biosolids report.

Haulers Report

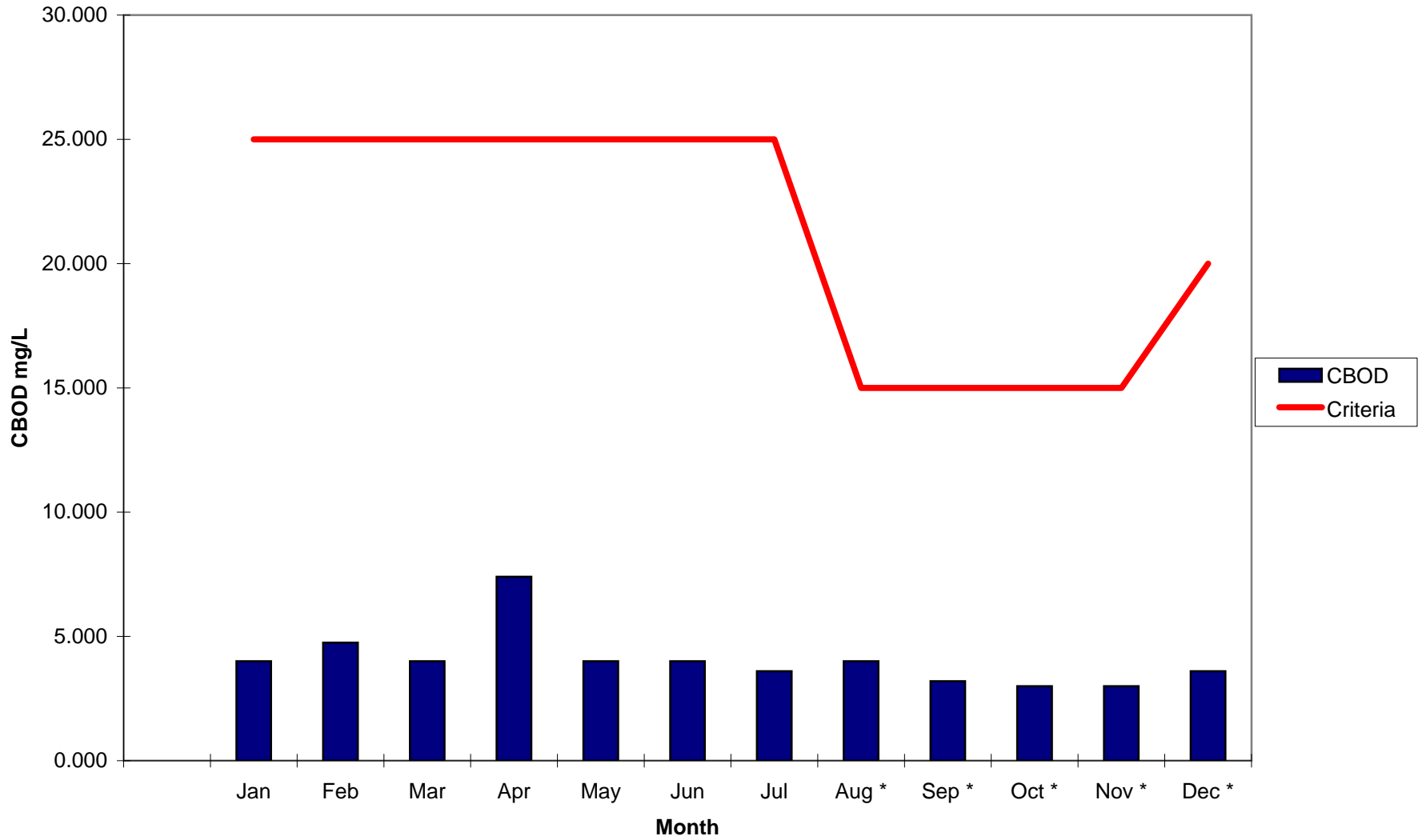
Exhibit 2 has a summary table for incoming septic haulers for volumes.

Summary and Recommendations

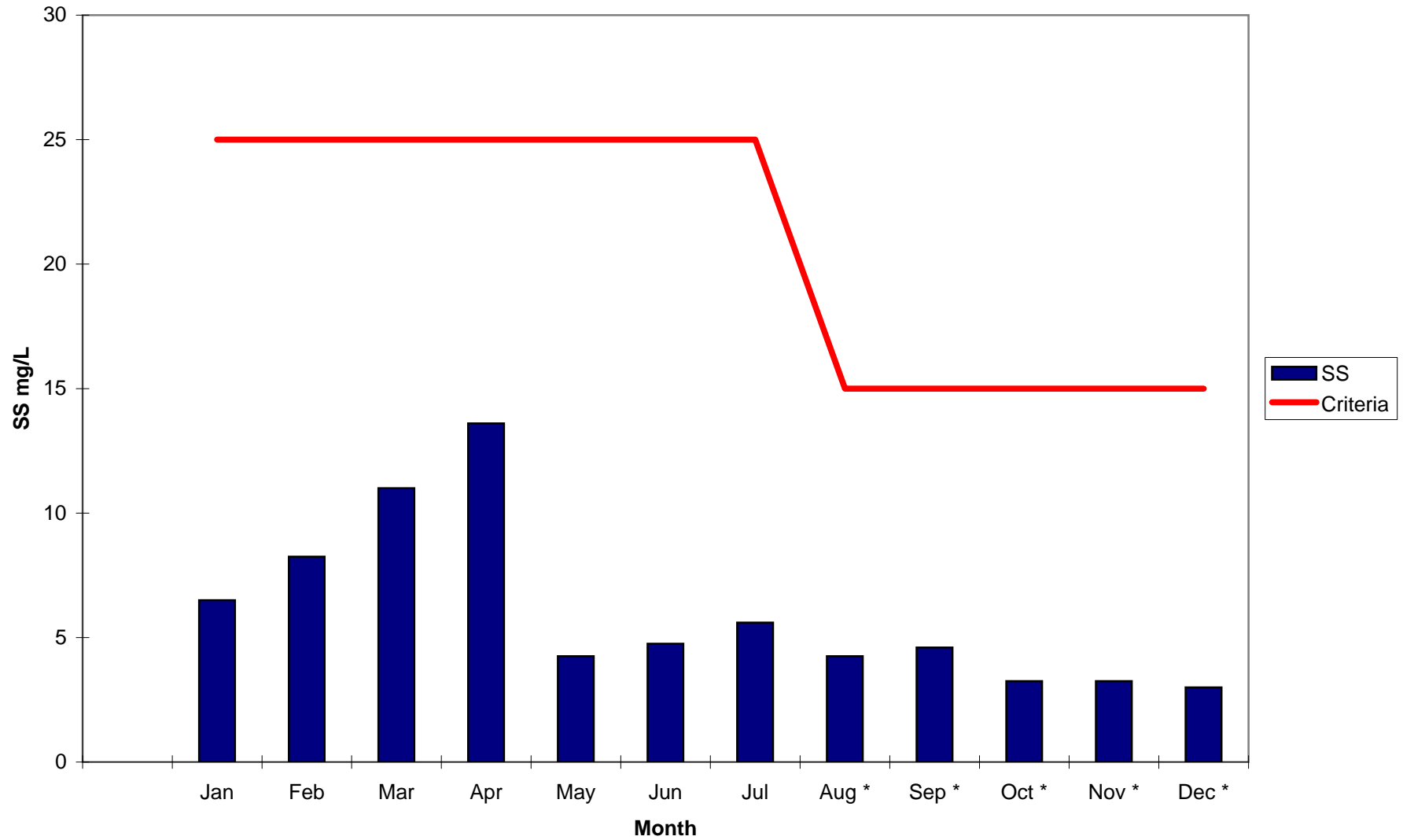
The Woodstock Wastewater Treatment Plant was operating within its design and discharge criteria for 2009.

Exhibit 1

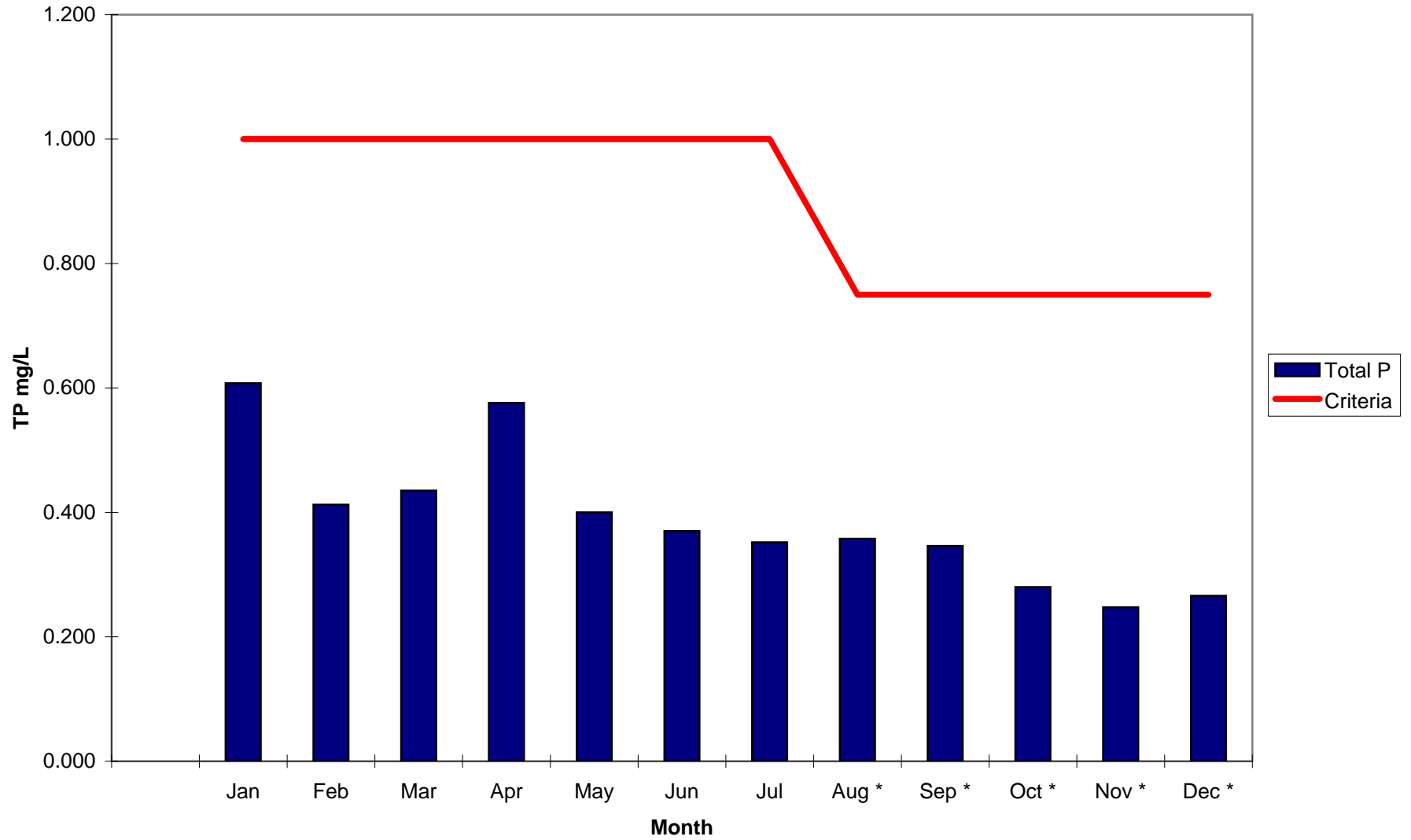
Woodstock Monthly Average Effluent CBOD mg/L vs Criteria 2009



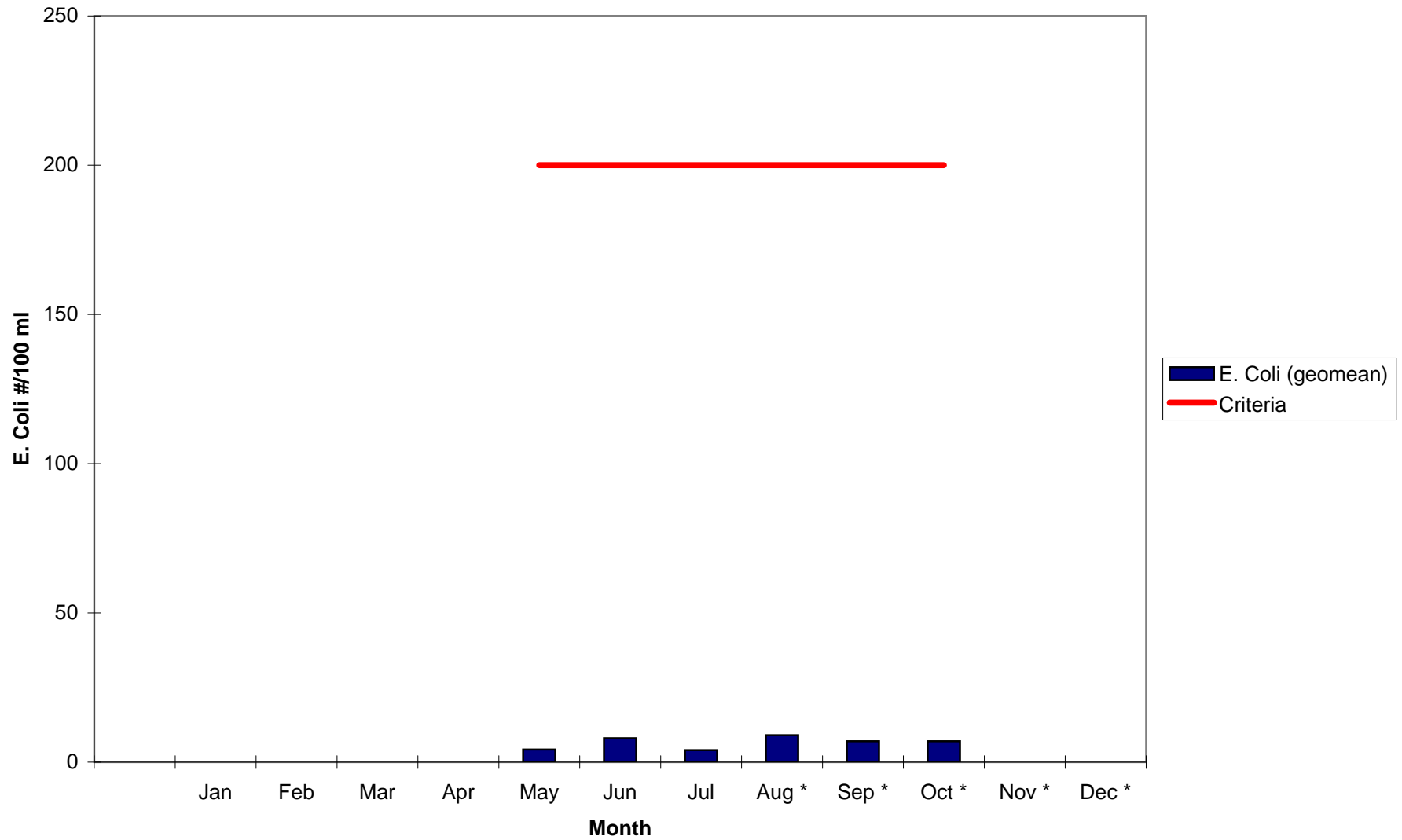
Woodstock WWTP Effluent Monthly Average SS vs Criteria 2009



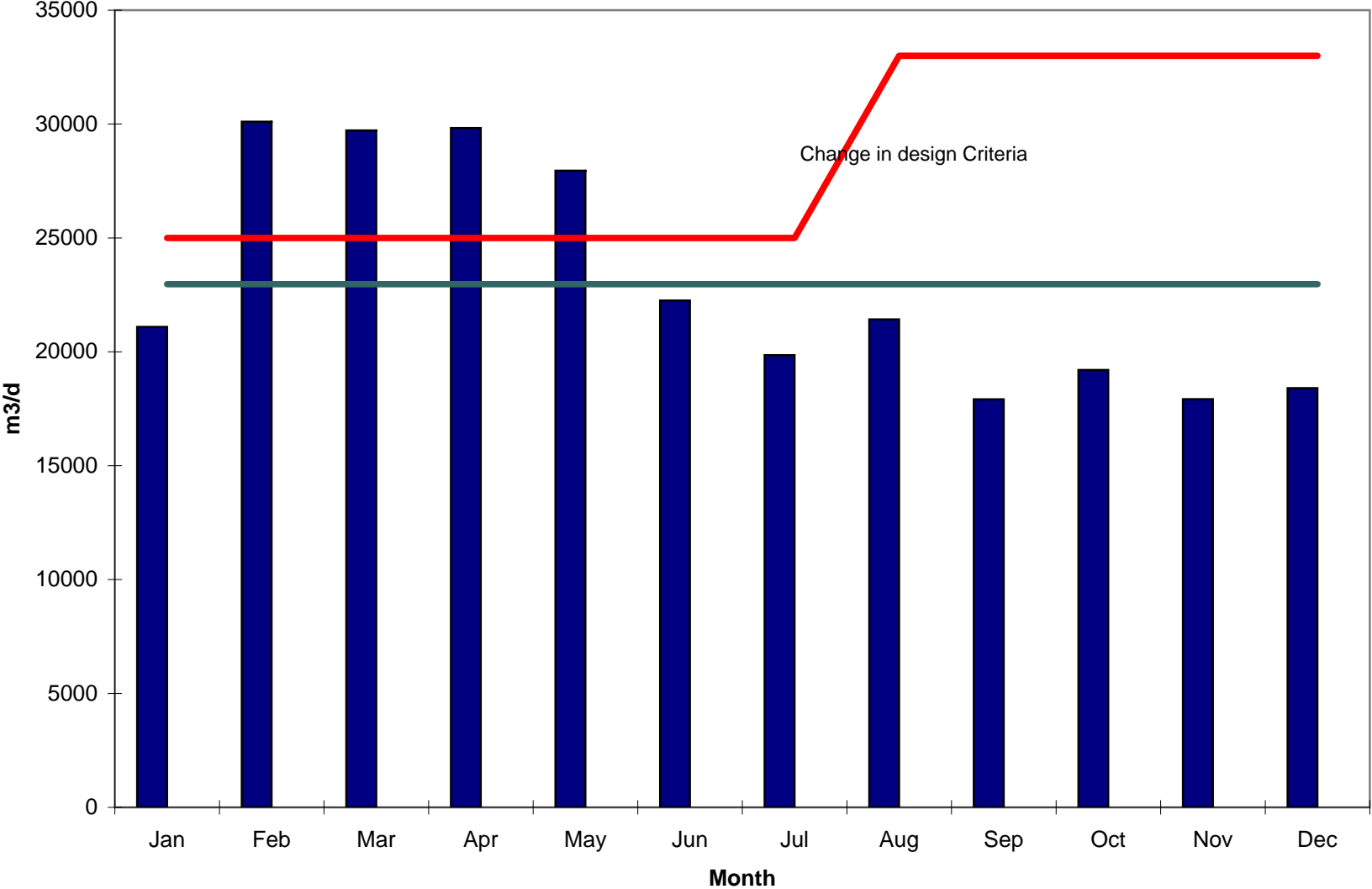
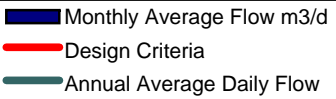
Woodstock WWTP Monthly Average Effluent TP mg/L vs Criteria 2009



Woodstock WWTP Monthly Effluent Geomean E. Coli vs Criteria 2009



Woodstock WWTP Effluent Flow Design vs Annual Average Flow m3/d 2009



Municipality: Woodstock																		
PROJECT: Woodstock WWTP																		
Operator: County of Oxford																		
Works Number: 120000685																		
2009																		
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug *	Sep *	Oct *	Nov *	Dec *	Average	Min	Max	Total	Total 1000m3	
Total Flow m3 (m3)	653817	842812	921306	894647	866435	667547	615449	664086	537487	595171	537604	570561				8366922	8367	Design
Flow m3/d	21091	30100	29720	29822	27950	22252	19853	21422	17916.2	19199	17920	18405	22971	17916	30100			25000*/33000
Min. Daily Flow (m3/d)	14901	12942	21321	14723	20174	17193	14881	13876	13463	15243	14789	14450	15663	12942	21321			
Max. Daily Flow (m3/d)	32901	75741	56493	45821	38789	28009	37637	45796	21166	29317	31761	25424	39071	21166	75741			
Influent																		
BOD5 (mg/L)	109	113	103	109	105	130	124	89	142	140	172	144	123	89	172			
SS (mg/L)	162	172	101	134	108	164	160	128	196	300	247	269	178	101	300			
Total P (mg/L)	2.4	3.2	1.7	2.7	2.1	3.5	2.5	2.0	2.9	4.4	3.6	3.0	2.8	1.7	4.4			
NH3+NH4-N (mg/L)	14.1	13.8	11.0	11.8	13.2	13.5	15.5	13.4	20.0	17.0	20.0	18.7	15.2	11.0	20.0			
TKN (mg/L)	16.5	15.6	13.4	15.5	13.8	15.3	17.3	14.9	19.3	23.9	22.9	20.8	17.4	13.4	23.9			
NITRITE (mg/L)	0.43	0.57	0.58	0.44	0.24	0.06	0.17	0.06	0.13	0.22	0.43	0.33	0.30	0.06	0.58			
NITRATE (mg/L)	1.46	0.63	1.05	0.62	0.38	0.05	0.06	0.05	0.15	0.13	0.17	0.51	0.44	0.05	1.46			
pH	7.71	7.60	7.64	7.54	7.56	7.55	7.51	7.57	7.54	7.67	7.63	7.65	7.60	7.51	7.71			
Temp Celcius	10.2	9.7	9.9	10.9	12.8	15.7	15.8	17.1	17.0	15.0	14.3	12.0	13.4	9.7	17.1			
CBOD (mg/L)	104	109	66	85	89	101	120	93	109	126	126	131	105	66	131			
Primary Effluent																		
																	Criteria	*Criteria
BOD5 (mg/L)	70	102	77	89	80	91	79	52	75	62	91	97	80	52	102			
SS (mg/L)	110	118	100	83	78	103	94	76	95	91	95	219	105	76	219			
Total P (mg/L)	2.1	2.3	1.7	1.8	1.9	1.9	1.9	1.4	1.4	1.8	2.0	3.1	1.9	1.4	3.1			
NH3+NH4-N (mg/L)	19.7	16.2	15.3	14.8	16.9	14.9	16.9	11.4	17.2	16.3	20.2	17.1	16.4	11.4	20.2			
TKN (mg/L)	22.0	17.6	17.0	15.8	19.8	16.4	17.8	13.4	18.7	17.7	21.0	19.6	18.1	13.4	22.0			
NITRITE (mg/L)	0.47	1.14	0.61	0.97	0.52	0.95	0.74	0.74	0.56	0.84	0.65	0.41	0.72	0.41	1.14			
NITRATE (mg/L)	5.19	3.19	3.57	2.65	2.73	1.91	2.32	1.89	2.56	4.15	3.26	3.49	3.07	1.89	5.19			
pH	7.62	7.56	7.54	7.52	7.53	7.52	7.53	7.65	7.59	7.69	7.66	7.65	7.59	7.52	7.69			
Temp Celcius	4.5	5.3	7.8	7.0	11.3	14.8	11.2	13.8	13.0	7.3	9.5	5.2	9.2	4.5	14.8			
CBOD (mg/L)	59	64	53	56	50	53	53	41	32	45	40	58	50	32	64			

Exhibit 2

Hauler Summary 2009

Hauler Name	Quantity						Gallons						Year to Date
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Grand Bend		220		450	250		400	555					1,875
Chitters	8,400	2,200	9,800	6,800	18,200	26,100	46,700	31,800	29,600	27,400	25,800	16,400	249,200
County	14,000	27,600	28,000	28,000	16,800	56,000	44,800	16,800	35,400	28,000	16,800	14,000	326,200
Denby	87,550	89,800	101,950	180,400	123,952	146,450	137,100	170,950	153,520	99,450	105,200	75,830	1,472,152
Oxford Ent.	360,800	385,400	574,000	598,600	475,600	360,800	377,200	483,800	442,800	483,800	369,000	377,200	5,289,000
Jack Hall	17,300	12,200	40,200	44,500	46,600	72,800	57,200	42,700	44,300	73,200	84,600	31,500	567,100
Norms	5,500	4300	12,200	20,300	27,300	21,800	30,200	26,100	29,400	35,700	48,100	17,600	278,500
Otterville	15,600	22,400	22,000	22,200	34,200	25,000	30,200	34,800	39,600	42,800	22,600	25,600	337,000
E + J	150	150	175	275	450		350	600	375			175	2,700
Watts	4,600	7,450	9,700		15,700	19,100	21,500	10,500	15,600	16,200	13,600	6,400	140,350
Aff Portables	895	1,280	1,040	630	1,075	1,000	1,040	1,240	985	1,140	955	570	11,850
Nor Pac	64,800	57,600	43,200									14,400	180,000
Total Haulage	579,595	610,600	842,265	902,155	760,127	729,050	746,690	819,845	791,580	807,690	686,655	579,675	8,855,927



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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

**RE: Year-End Report Ingersoll Wastewater Treatment Plant
(WWTP) 2009**

(Certificate of Approval # 0098-5SSJT4)

This year-end report is prepared as required by the certificate of approval # 0098-5SSJT4.

I trust this report fulfills the intent of the Certificate of Approval. If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

Overview

The Old and New Ingersoll Wastewater Treatment Plants (WWTP) are conventional activated sludge systems that provided effective wastewater treatment in 2009, with an average flow for the New Plant of 4621 m³/d and 2664 m³/d for the Old Plant. The combined average flow of 7285 m³/d represents 71.2 % of the design capacity of 10 227 m³/d for both plants. The total combined flow for 2009 was 2 662 421 m³.

Project Description

The Ingersoll Old Wastewater Treatment Plant began operation in 1947 and the Ingersoll New Plant in 1972. The facilities are conventional activated sludge plants consisting of primary and secondary treatment, with separate outfall pipes to the Thames River. The facility adds Ferric Chloride or Aluminum Sulphate into the reactors for phosphate control and chlorine gas for disinfection seasonally.

The County of Oxford owns and operates the facilities.

Plant Specifications

Facility - Ingersoll Wastewater Treatment Plant
Design Capacity - 10227 m³/d

Average Daily Flow - 7285 m³/d
Receiving Area - Thames River
Classification - WWT – III
Certificate(s) of Approval MOE CofA
0098-5SSJT4
MOE CofA as of October 2nd/09
0342-7WCKCJ

CofA Effluent Requirements	Limits Monthly Average Concentration	Limits Monthly Average Loading	Objectives Monthly Average Concentration
CBOD	25 mg/L	256 kg/d	15 mg/L
SS	25 mg/L	256 kg/d	15 mg/L
TP	1 mg/L	10.3 kg/d	0.8 mg/L
E.Coli	NA	NA	200 organisms/100 ml

Seasonal Disinfection May 1 - October 31

Sampling Procedure

Influent and Effluent samples are collected bi-weekly. Raw sewage samples are collected at the main lift station located on-site; the sample is drawn after pumping by the lift station pumps and prior to the primary tanks of either plant.

Two composite samplers collect samples over a 24-hour duration after the chlorine chamber at both the New and Old Plants. This sample is taken 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.

Flows

The total flow treated in 2009 was 2 662 421 m³. The daily average flow was 7285 m³/day which represents 71.2 % of the design flow for Ingersoll WWTP of 10227 m³/day.

Raw Sewage Quality

The annual average raw sewage CBOD concentration to the plant was 92 mg/L, which represents an average loading of 670 kg/day. The average suspended solids concentration was 119 mg/L, which represent a loading of 867 kg/day. Average nitrogen concentration, as TKN was 16.76 mg/L equivalent to a loading of 122 kg/day. Total phosphorus was 2.26 mg/L, which represents a loading of 16.5 kg/day.

Plant Performance & Effluent

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

Over the reporting period, the annual average effluent CBOD concentration for the New Plant was 5 mg/L or an equivalent 94.6 % reduction. At the Old Plant CBOD was 4 mg/L or an equivalent 95.7 % reduction. The New Plant suspended solids average concentration was 10 mg/L, which represents a 91.6 % reduction and the Old Plant suspended solids average concentration was 8.5 mg/L, which represents a 92.9 % reduction. New Plant Effluent Ammonia averaged 0.6 mg/L or a 95.6 % reduction and Old Plant effluent Ammonia averaged 0.6 mg/L or a 95.6 % reduction. New Plant effluent Total phosphorus average was 0.5 mg/L, which equates to a 77.9 % reduction and the Old Plant effluent Total Phosphorus was 0.48 mg/L, which represents a 78.8 % reduction.

All pH is measured for both Influent and Effluent by the operator at a minimum by-weekly frequency and there was no single sample outside out limits of 6-9.5 for 2009.

Bypassing, Upset and Abnormal Conditions

There were no bypasses or spills of raw wastewater at the Ingersoll Wastewater Treatment Plant in 2009.
All results for 2009 were compliant to the CofA limits.

Maintenance and Calibration

The operating and maintenance staff from the Ingersoll WWTP conduct regular scheduled maintenance of the plant equipment. Detailed maintenance records for each piece of equipment are kept on site at the Ingersoll WWTP.

R&R Instrumentation Services provided meter calibration service on both effluent meters.

Biosolids 2009

The Ingersoll Wastewater Treatment Plant utilizes anaerobic digesters to stabilize biosolids prior to dewatering through a belt press. The dewatered cake is stored at the Oxford County Biosolids Centralized Storage Facility and land applied.

Please see biosolids report appended to this annual report.

Summary and Recommendations

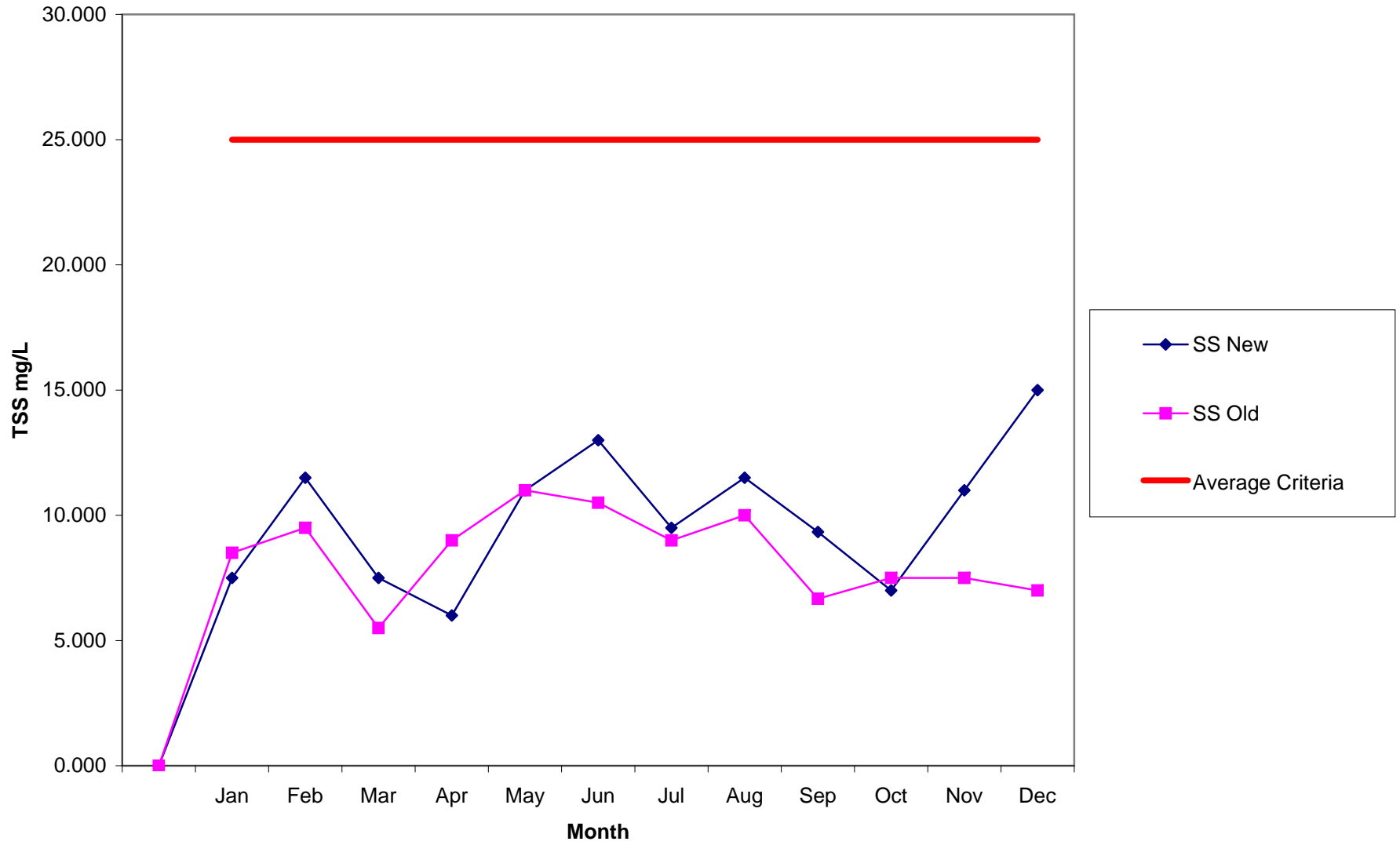
The Ingersoll Wastewater Treatment Plant was operating within its design and discharge criteria in 2009.

The installation of UV disinfection commenced in the fall of 2009 for completion early 2010. The digester upgrades entered the initial phases with a cleaning of the secondary digester in fall 2009 and the tendering of new cladding for both primary and secondary digesters to take place early 2010. The Old Plant, the New Plant, the main lift station and the anaerobic digesters will need continuing capital investment to sustain them as many components are nearing the end of their life cycle.

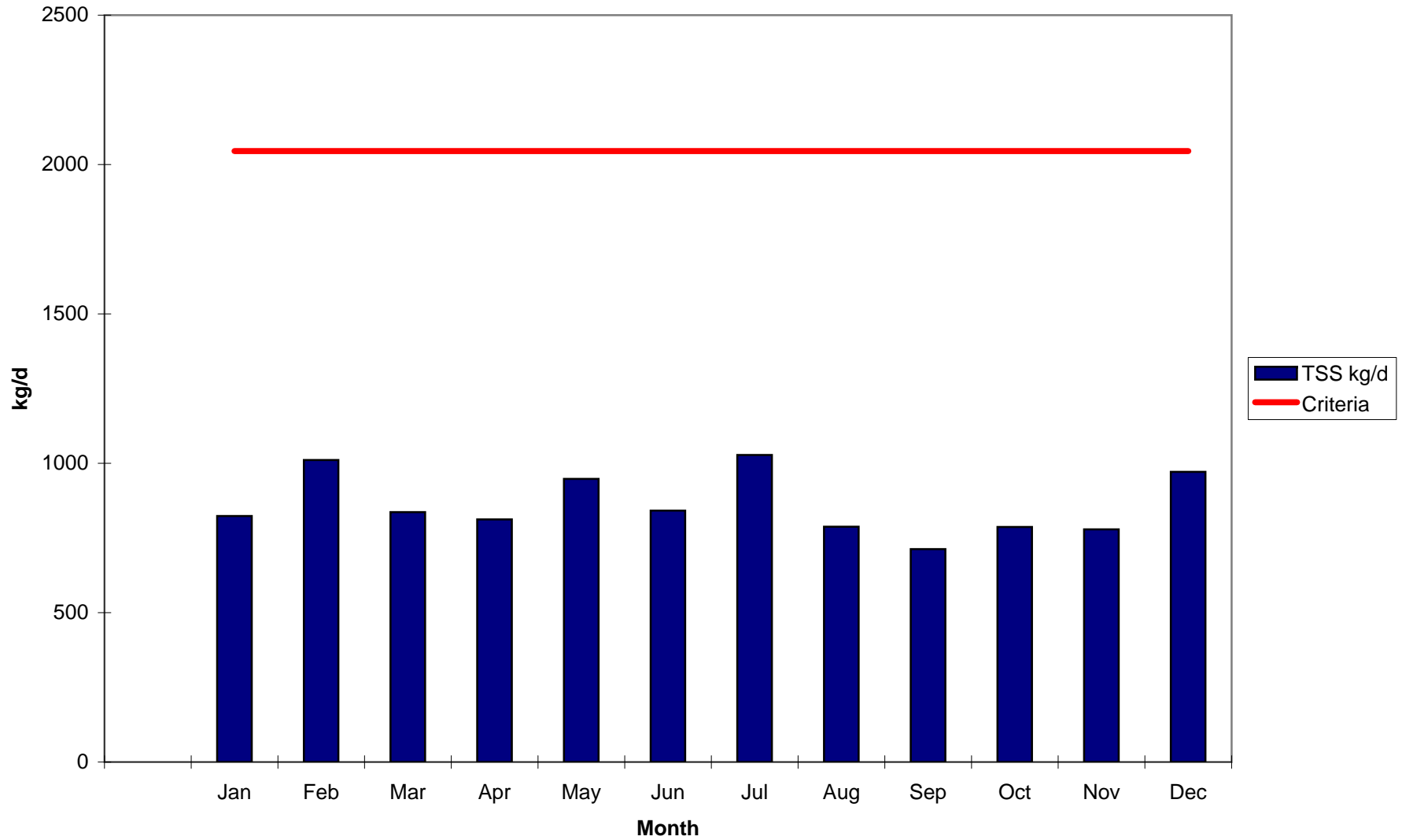
Exhibit 1

Municipality: INGERSOLL		2009																
PROJECT:INGERSOLL WWTP																		
Operator: County of Oxford																		
Works Number:																		
(O) 110003978 (N) 110003969																		
Month	(m3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Total	Total 1000m3
Total Flow m3	(m3)	198648	246106	281931	236529	226031	224904	205555	210501	198028	219764	206779	207645				2662421	2662.421
Flow m3/d (N)	(m3/d)	4197	5929	5981	4707	4075	4526	4310	4485	4242	4533	4362	4107	4621	4074.5	5981.1	Design	
Flow m3/d (O)	(m3/d)	2211	2861	3113	3177	3217	2729	2321	2305	2359	2556	2531	2591	2664	2211	3217	Criteria	
Flow m3/d (T)	(m3/d)	6408	8790	9094	7884	7292	7255	6631	6790	6601	7089	6893	6698	7285	6408.3	9094.1	10227	
Max Daily Flow	(m3/d)	8987	17891	15422	10582	9684	9735	4753	4901	4464	5189	2976	4236	8235	2976	17891		
Min Daily Flow	(m3/d)	5144	5426	6788	5013	5156	4339	8708	8464	8920	8460	8451	8798	6972	4339	8920		
Common Influent																		
CBOD	(mg/L)	106	88	80	102	98	91	94	104	81	95	76	91	92.01	76	105.5		
SS	(mg/L)	129	115	92	103	130	116	155	116	108	111	113	145	119.38	92	155		
Total P	(mg/L)	1.9	2.3	1.6	1.9	2.9	1.9	2.6	2.4	2.4	2.5	2.3	2.6	2.26	1.58	2.88		
NH3+NH4-N	(mg/L)	14.6	9.9	11.6	12.5	13.7	13.0	19.3	13.5	13.1	14.7	11.5	16.8	13.67	9.9	19.3		
TKN	(mg/L)	17.1	13.9	13.4	15.4	16.4	15.9	20.5	16.7	15.4	18.5	16.8	21.5	16.76	13.35	21.45		
NITRITE	(mg/L)	0.12	0.18	0.15	0.07	0.06	0.10	0.03	0.03	0.07	0.10	0.03	0.23	0.10	0.03	0.23		
NITRATE	(mg/L)	0.54	0.60	0.41	0.21	0.03	0.20	0.03	0.03	0.19	0.23	0.03	0.52	0.25	0.025	0.6025		
pH		7.40	7.17	7.55	7.19	7.41	7.55	7.34	7.36	7.33	7.31	7.40	7.69	7.39	7.17	7.685		
Effluent (N)														Objectives		Limits		
CBOD New	(mg/L)	6	7	4	4	5	7	4	6	3	2	5	11	5	2	11	15	25
SS New	(mg/L)	7.5	11.5	7.5	6.0	11.0	13.0	9.5	11.5	9.3	7.0	11.0	15.0	10	6.00	15.00	15	25
Total P New (mg/L)		0.34	0.43	0.37	0.42	0.54	0.57	0.36	0.55	0.54	0.56	0.58	0.73	0.5	0.4	0.7	0.75	1
NH3+NH4-N	(mg/L)	0.08	0.63	0.30	0.17	1.75	0.10	0.20	0.05	0.23	0.08	0.13	3.20	0.6	0.1	3.2		
TKN	(mg/L)	1.95	2.70	1.90	1.17	1.40	2.65	1.85	1.65	1.97	1.10	2.65	4.35	2.111	1.100	4.350		
NITRITE	(mg/L)	3.77	0.18	0.05	0.07	0.05	0.15	0.34	0.56	0.14	0.08	0.26	4.56	0.85	0.05	4.56		
NITRATE	(mg/L)	12.30	14.75	13.35	15.00	18.25	17.10	21.90	13.90	14.23	12.65	11.95	11.11	14.708	11.110	21.900		
pH		7.41	6.82	7.18	7.26	7.44	7.55	7.36	7.39	7.37	7.00	7.43	7.49	7.3	6.8	7.5		
E.Coli Geomean NEW						41	26	31	10	4	16			21	4.00	41	200	NA
Effluent (O)																		
CBOD Old	(mg/L)	4	6	3	4	4	8	3	2	3	2	4	5	4	2.00	8	15	25
SS Old	(mg/L)	9	10	6	9	11	11	9	10	7	7.5	8	7	8.5	5.50	11	15	25
Total P Old (mg/L)		0.35	0.40	0.33	0.41	0.51	0.43	0.25	0.44	0.58	0.73	0.72	0.61	0.48	0.25	0.73	0.75	1
NH3+NH4-N	(mg/L)	0.43	0.23	0.35	0.42	0.20	1.83	0.85	0.80	0.25	0.08	0.80	1.35	0.63	0.08	1.83		
TKN	(mg/L)	2.00	2.35	1.55	0.92	2.95	3.10	2.20	2.10	1.67	1.10	2.20	2.40	2.04	0.92	3.10		
NITRITE	(mg/L)	1.15	1.27	0.40	0.39	1.49	1.86	0.66	0.26	0.04	0.08	0.20	0.53	0.69	0.04	1.86		
NITRATE	(mg/L)	20.25	19.60	19.35	20.73	19.60	20.00	26.70	18.50	16.07	15.50	14.95	18.75	19.17	14.95	26.70		
pH		7.41	6.87	7.11	7.17	7.55	7.70	7.41	7.38	7.34	7.04	7.44	7.47	7.32	6.87	7.70		
E.Coli Geomean OLD						15	173	82	45	28	348			115	15.00	348	200	NA
Influent Loadings																		
Month		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Design	
CBOD kg/d		676	773	728	802	711	660	623	703	535	673	524	610	668	524	802	2045	
TSS kg/d		823	1011	837	812	948	842	1028	788	713	787	779	971	861	713	1028	2045	
Effluent Loadings to Thames River																		
Month		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Limits	
CBOD kg/d		33	59	32	32	31	50	21	32	20	12	28	58	34	12	59	256	
TSS kg/d		50	95	62	57	80	87	62	75	55	51	67	80	68	50	95	256	
TP kg/d		2	4	3	3	4	4	2	3	4	4	4	5	4	2	5	10.3	

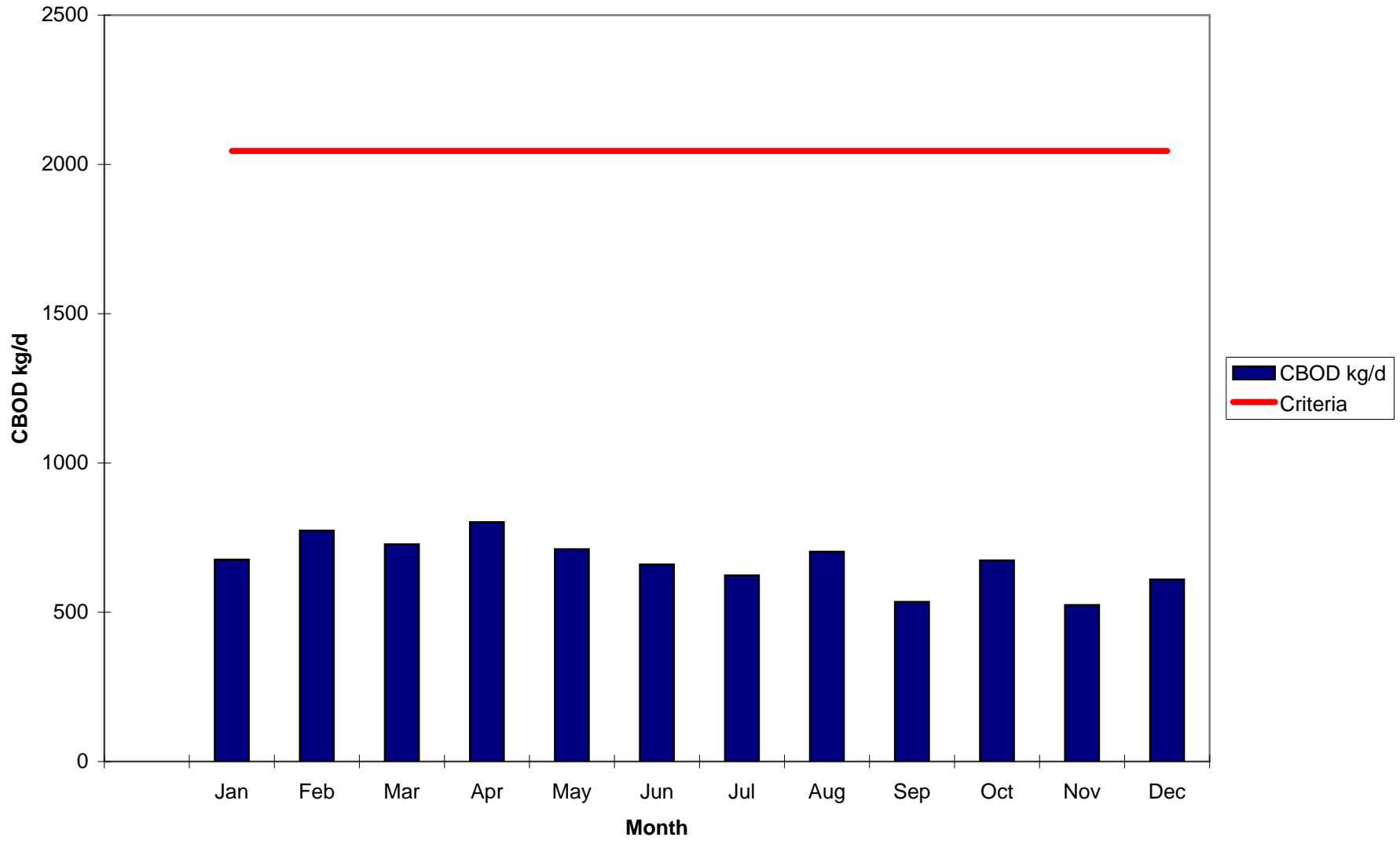
Ingersoll Effluent TSS vs Criteria 2009



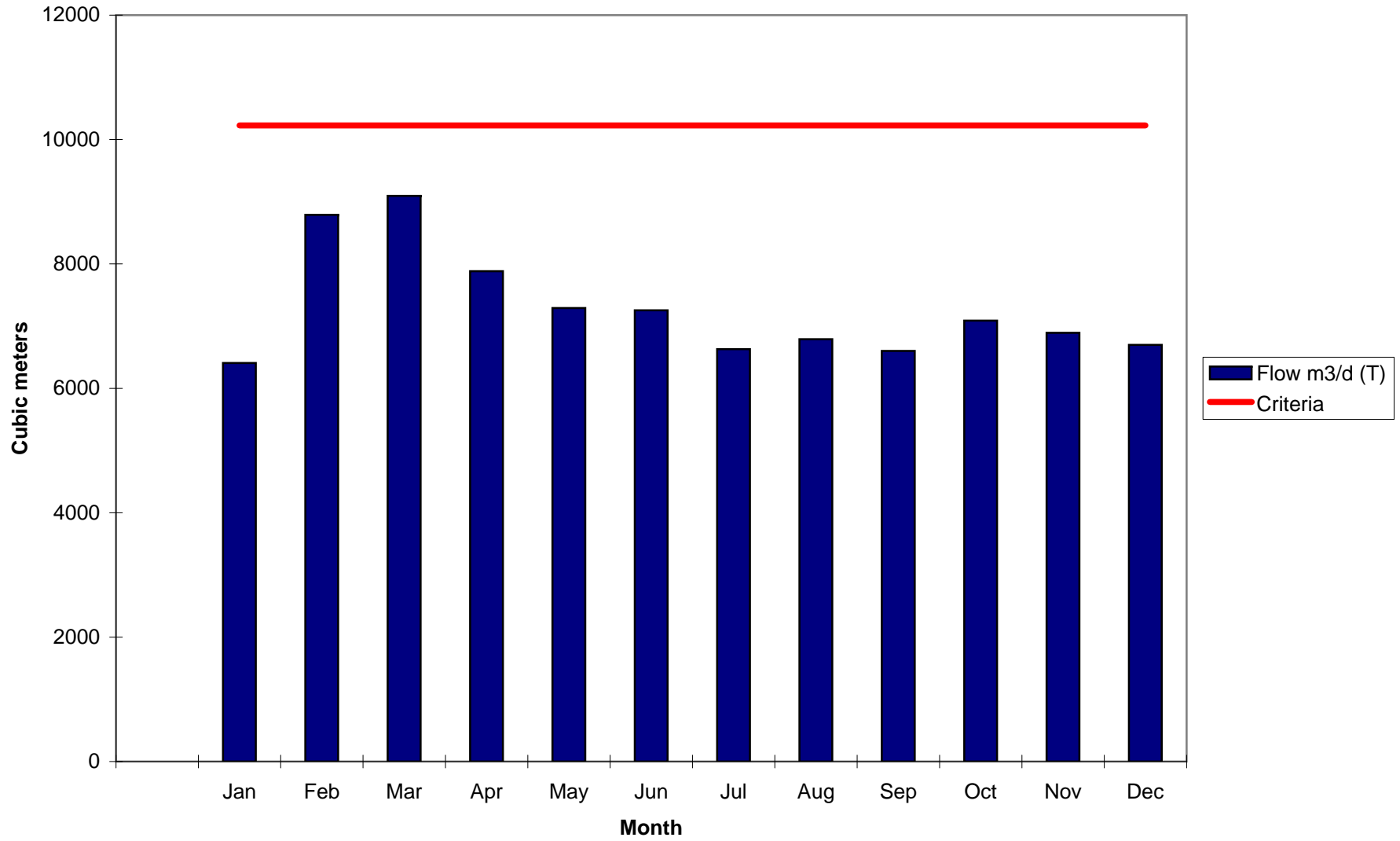
Ingersoll WWTP Influent TSS Loading Vs Design 2009



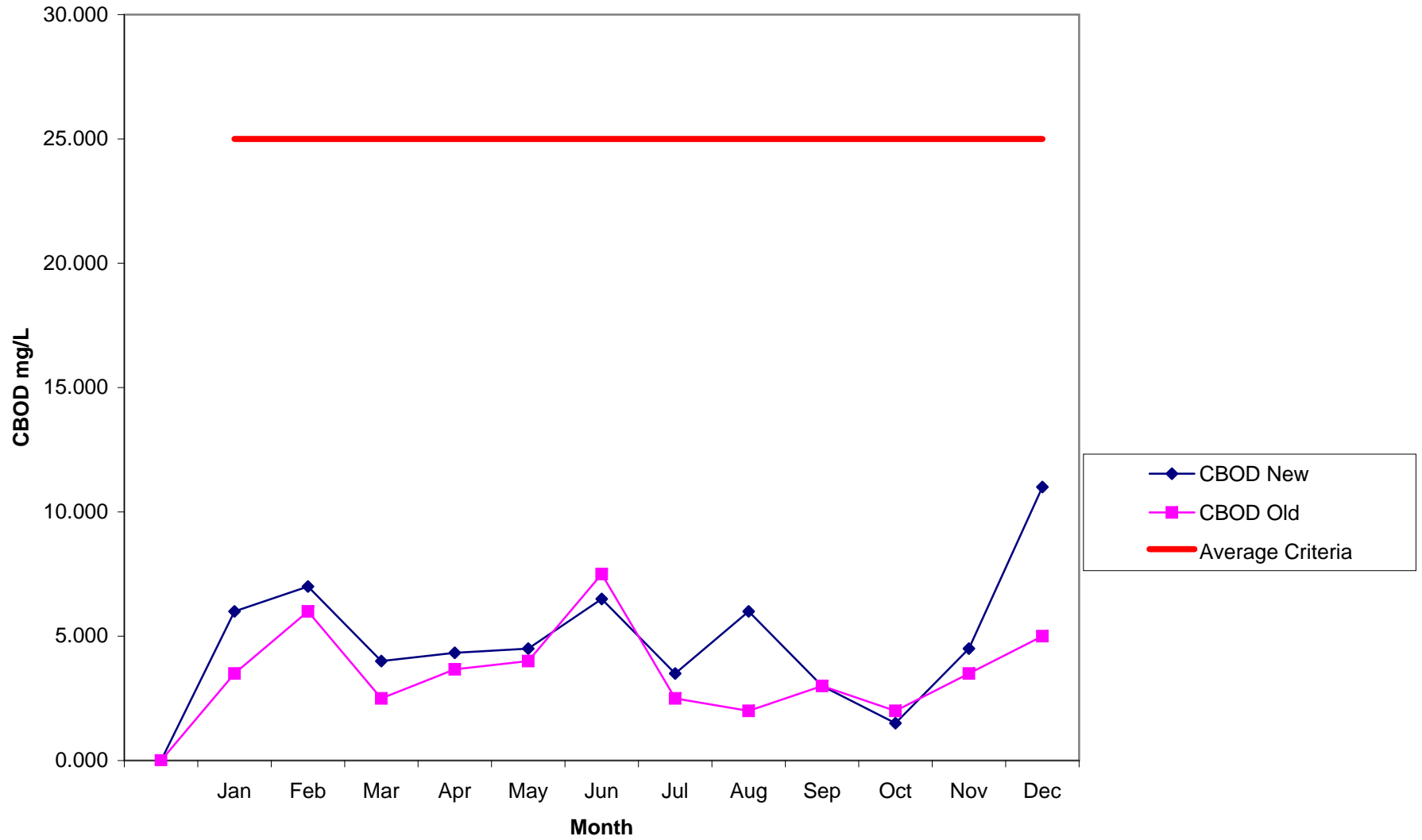
Ingersoll WWTP CBOD Loading Vs Design kg/d 2009



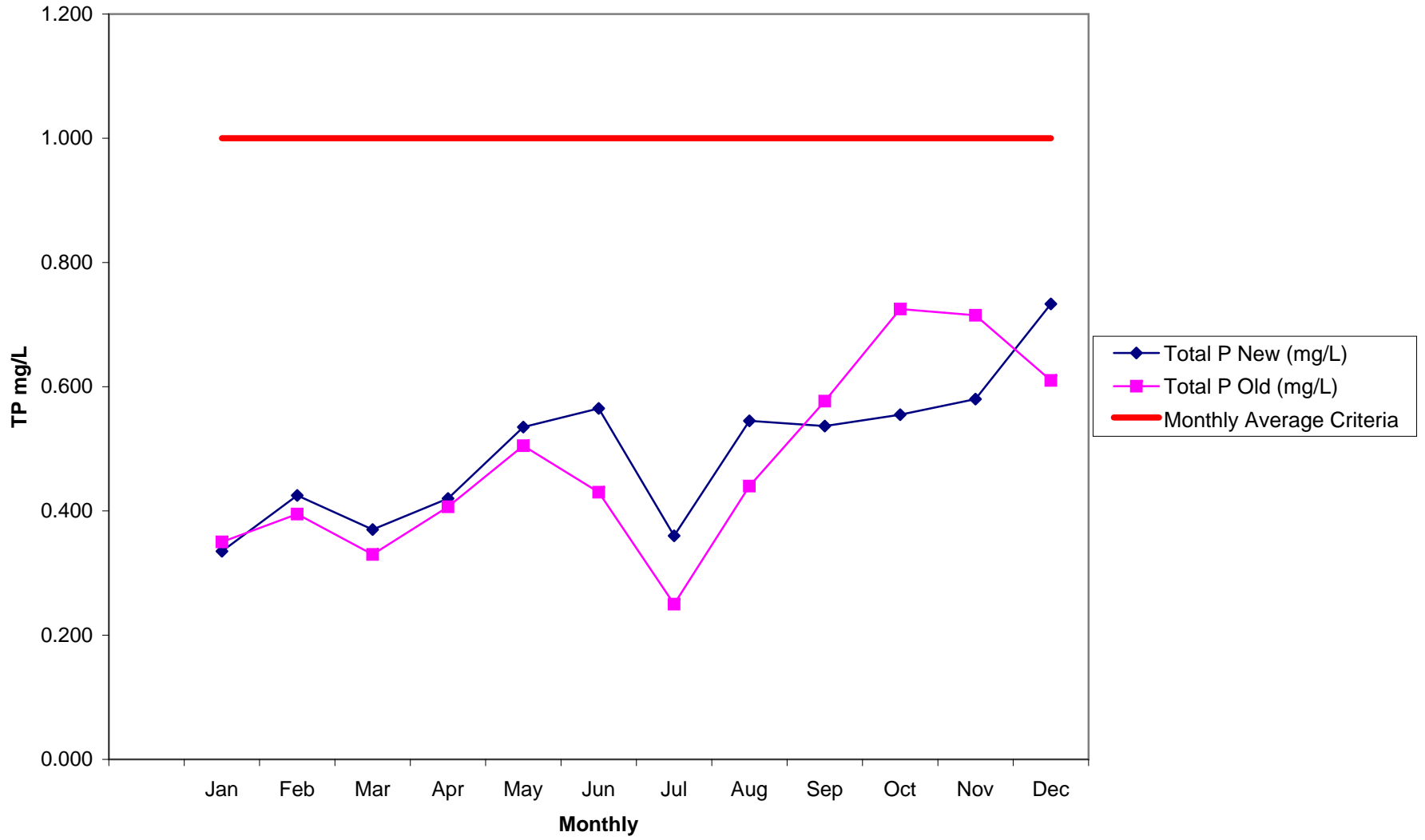
Ingersoll WWTP Flow Cubic Meters 2009



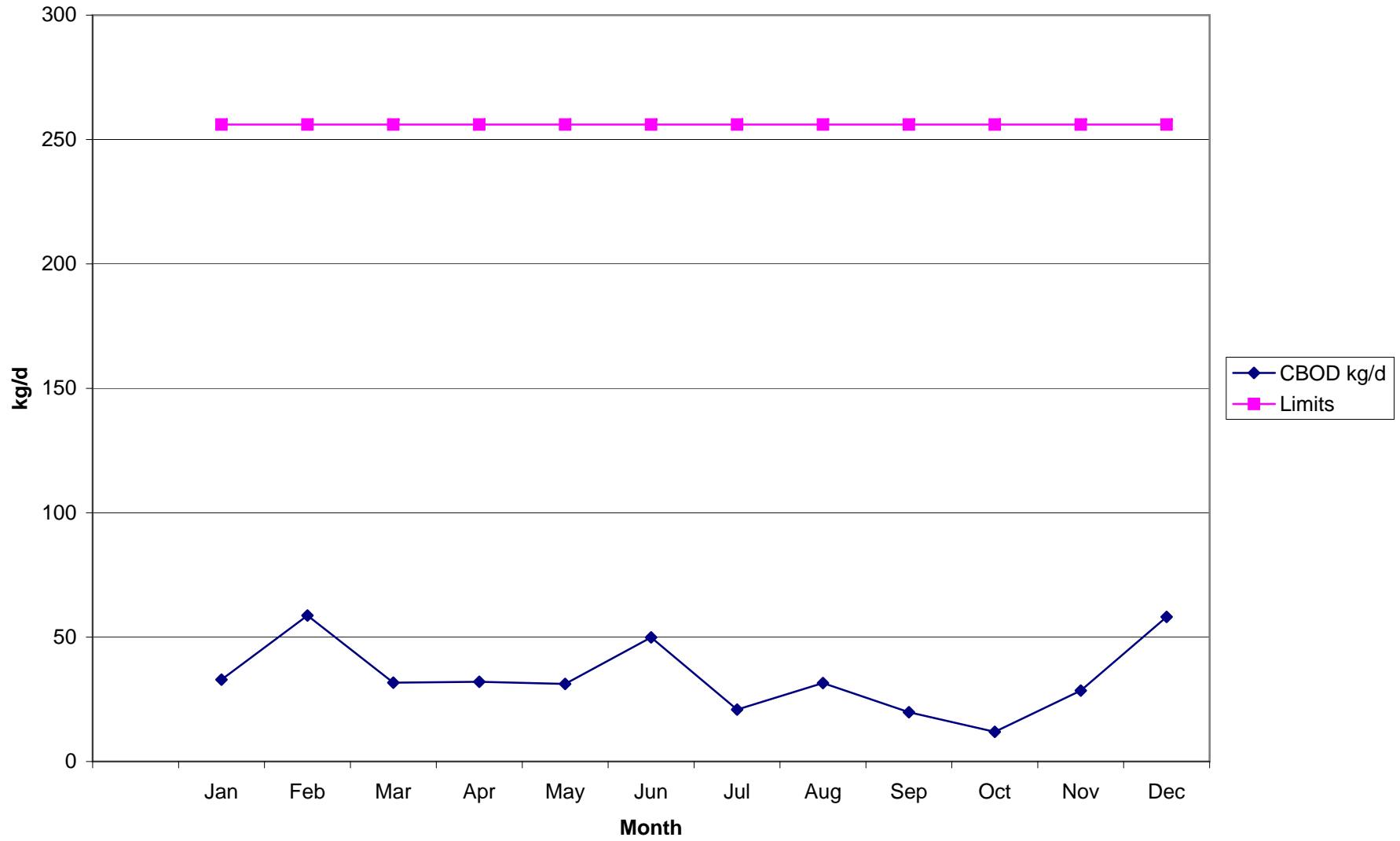
Ingersoll Effluent CBOD vs Criteria 2009



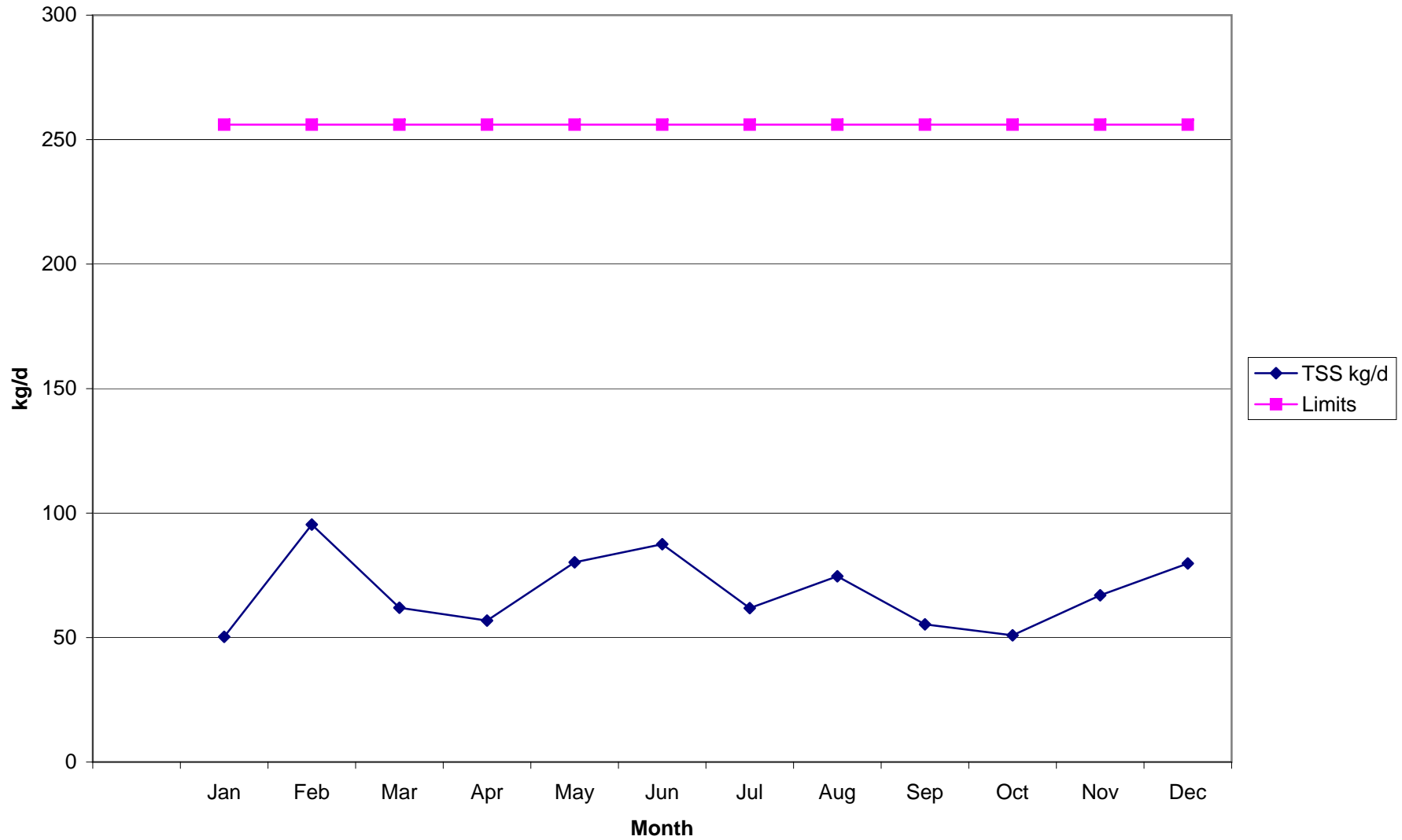
Ingersoll Effluent TP mg/L vs Criteria 2009



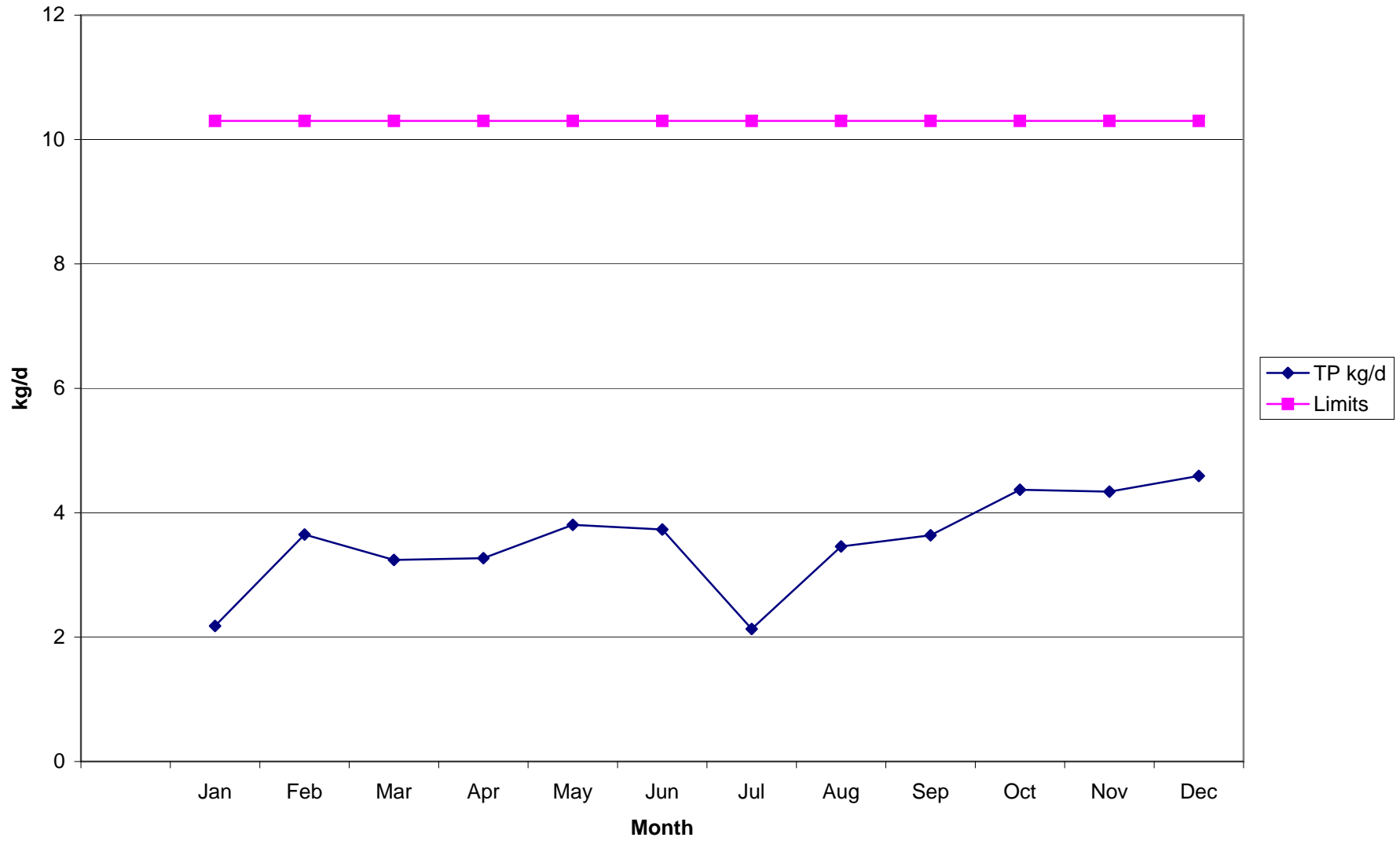
CBOD kg/d Effluent Loadings to Thames River



SS kg/d Effluent Loading to Thames River



TP kg/d Effluent loading to Thames River





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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

**RE: Year-End Report Tillsonburg Wastewater Treatment Plant
(WWTP) 2009**

(Certificate of Approval # 8943-6YGPQT)

This year-end report is prepared as required by the certificate of approval # 8943-6YGPQT.

I trust this report fulfills the intent of the Certificate of Approval. If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

Overview

The Tillsonburg Wastewater Treatment Plant (WWTP) is a conventional activated sludge system that provided effective wastewater treatment in 2009, with an average flow for the plant of 6851 m³/day which represents 83.8 % of the design capacity of 8180 m³/day. The total flow for 2009 was 2 497 728 m³.

Project 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 control and Ultraviolet Light for disinfection seasonally.

Oxford County owns and operates the facility.

Plant Specifications

Facility - Tillsonburg Wastewater Treatment Plant
Design Capacity - 8180 m³/day
Average Daily Flow - 6851 m³/day
Receiving Area - Big Otter Creek
Classification - WWT – III
Certificate(s) of Approval CoA # 8943-6YGPQT

CofA Effluent Requirements	Limits Monthly Average Concentration	Limits Monthly Average Loading	Objectives Monthly Average Concentration
CBOD	25 mg/L	203 kg/d	15 mg/L
SS	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
TRC			1.0

*Seasonal May 1 to Nov. 30

Sampling Procedure

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

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

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.

Flows

The total flow treated in 2009 was 2 497 728 m³. The daily average flow was 6851 m³/day which represents 83.8 % of the design flow for Tillsonburg WWTP of 8180 m³/day.

Raw Sewage Quality

The annual average raw sewage CBOD concentration to the plant was 157 mg/L which corresponds to an average loading of 1076 kg/day. The average suspended solids concentration was 165 mg/L that corresponds to 1130 kg/d. Average nitrogen level, as TKN was 17 mg/L which represent a load of 117 kg/d. Total phosphorus was 3.1 mg/L, which represents a loading of 21.2 kg/day.

Plant Performance & Effluent

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

Over the reporting period, the annual average effluent CBOD concentration was 2.3 mg/L this is a 98.5 % reduction. The suspended solids average concentration was 7.08 mg/L, which represents a 95.7 % reduction. Ammonia averaged 0.5 mg/L. Total phosphorus average was 0.43 mg/L, which results in an 86 % reduction.

All pH is measured in the Effluent by the operator a minimum of weekly and there was no single sample outside our range of 6-9.5 for 2009. The Tillsonburg Wastewater Treatment Plant was operating within its design and discharge criteria for 2009.

Bypassing, Upset and Abnormal Conditions

There were no bypasses of raw sewage to Big Otter Creek in 2009 from the Tillsonburg Wastewater Treatment Plant.

Maintenance and Calibration

The operating and maintenance staff from the Ingersoll and Tillsonburg WWTP conduct regular scheduled maintenance of the plant equipment. Detailed maintenance records for each piece of equipment are kept on site.

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

Summary and Recommendations

The Tillsonburg Wastewater Treatment Plant was operating within its discharge criteria for 2009.

A class environmental assessment has begun that includes the WWTP, looking at needed upgrades to meet future capacity needs.

Biosolids

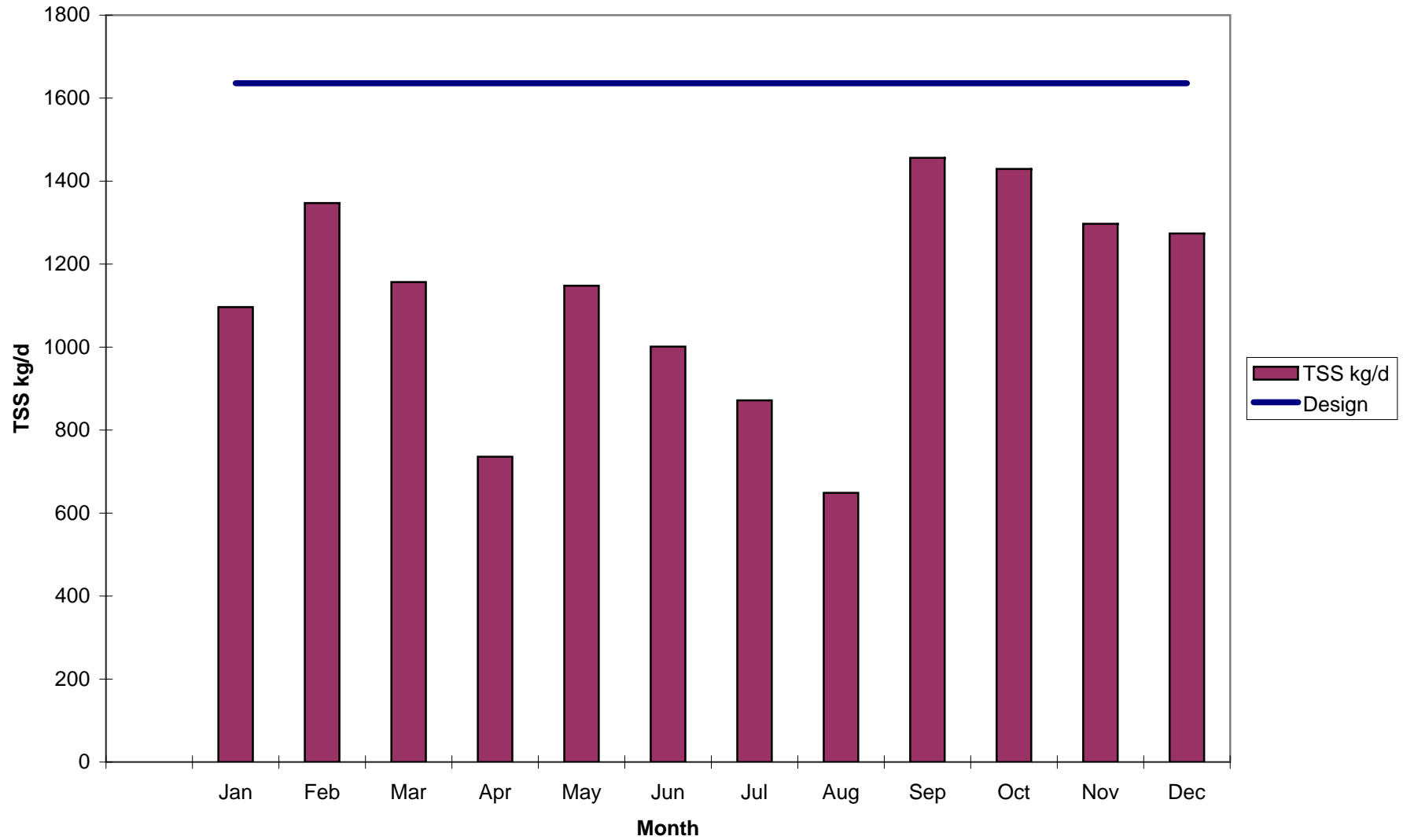
Discussion:

The biosolids are aerobically digested and dewatered then taken to the Oxford County's Biosolids Centralized Storage Facility after which they are land applied.

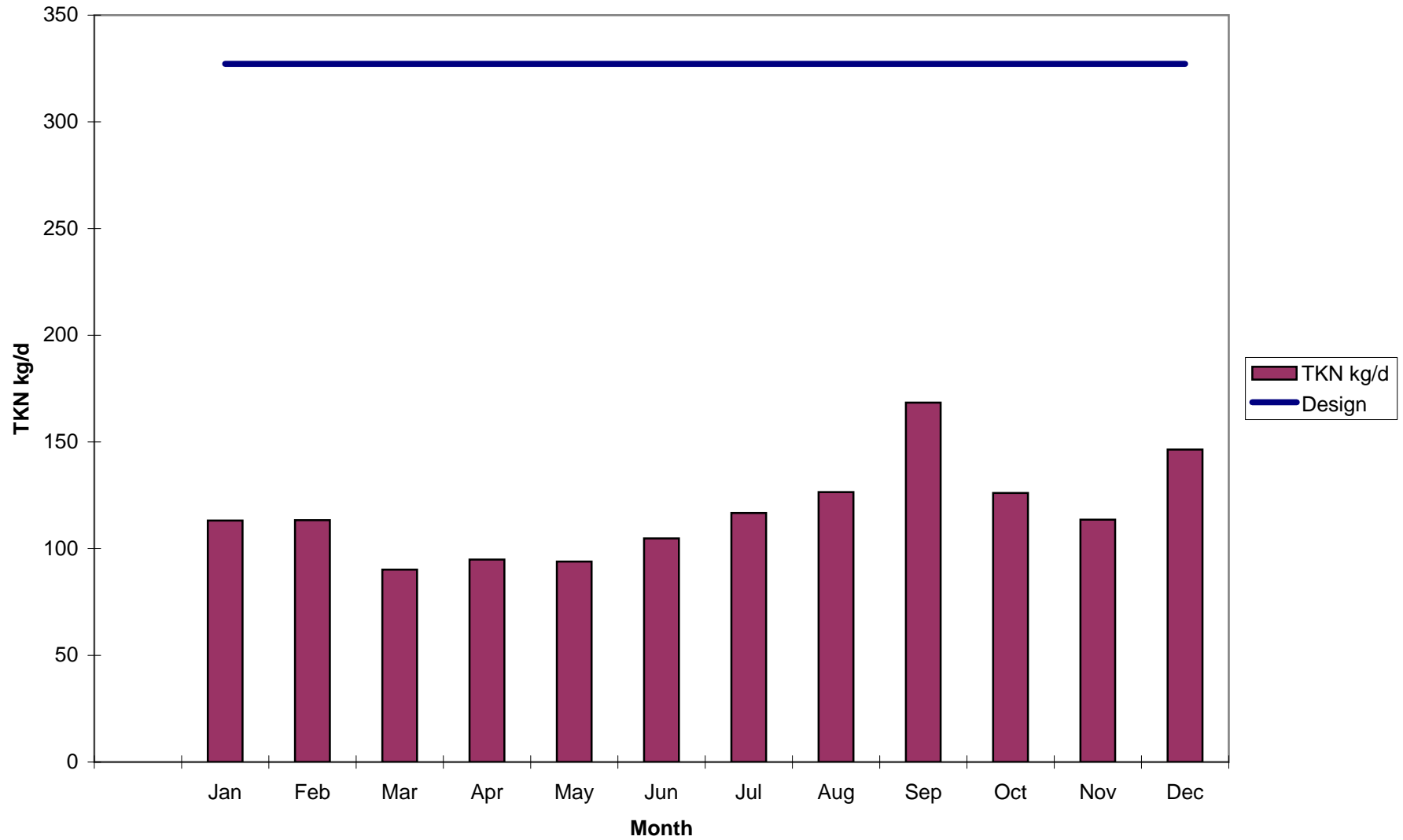
Details of the Biosolids and the land application program are contained in a separate biosolids report appended to this report.

Exhibit 1

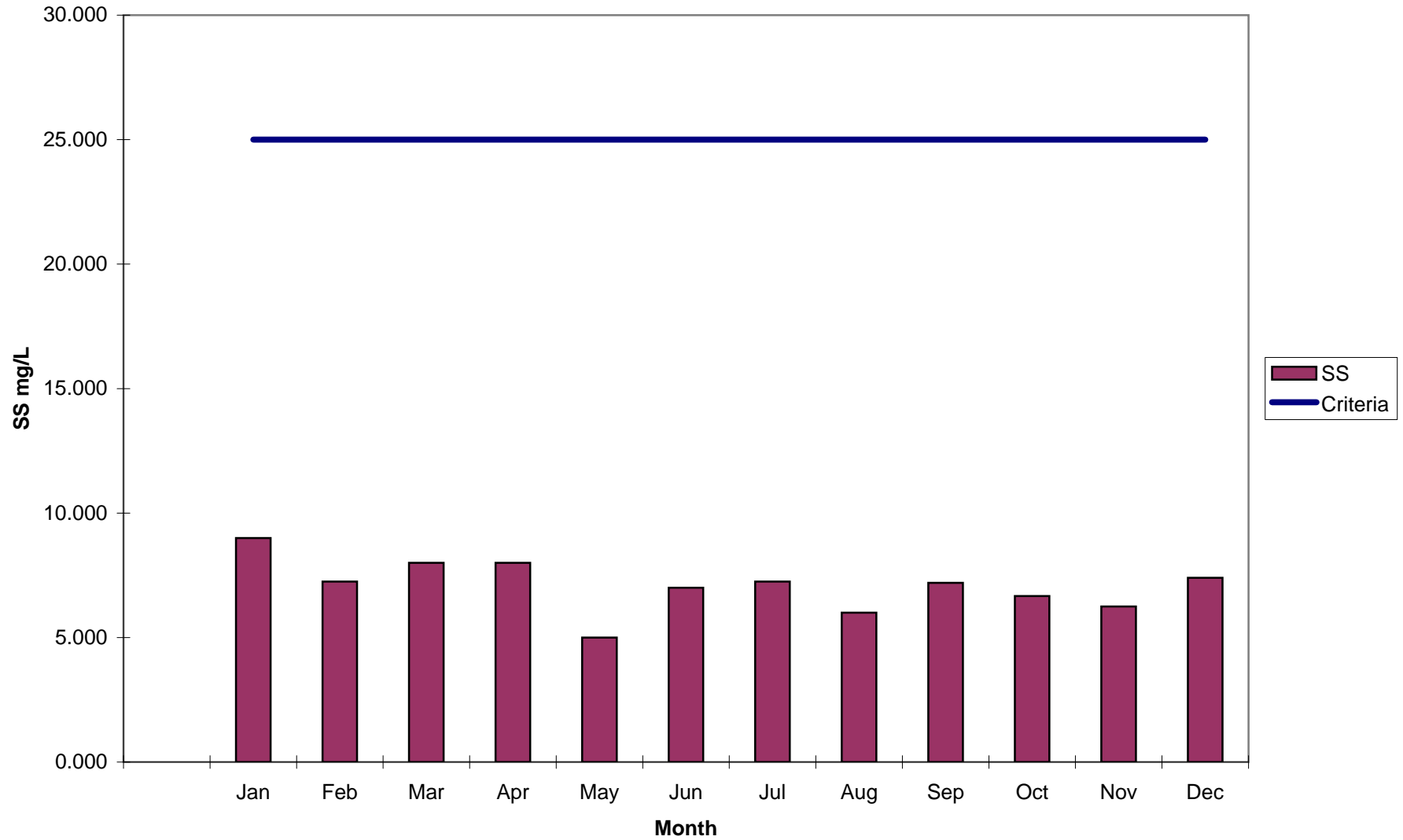
Monthly Tillsonburg TSS Influent Loadings kg/d Vs Criteria 2009



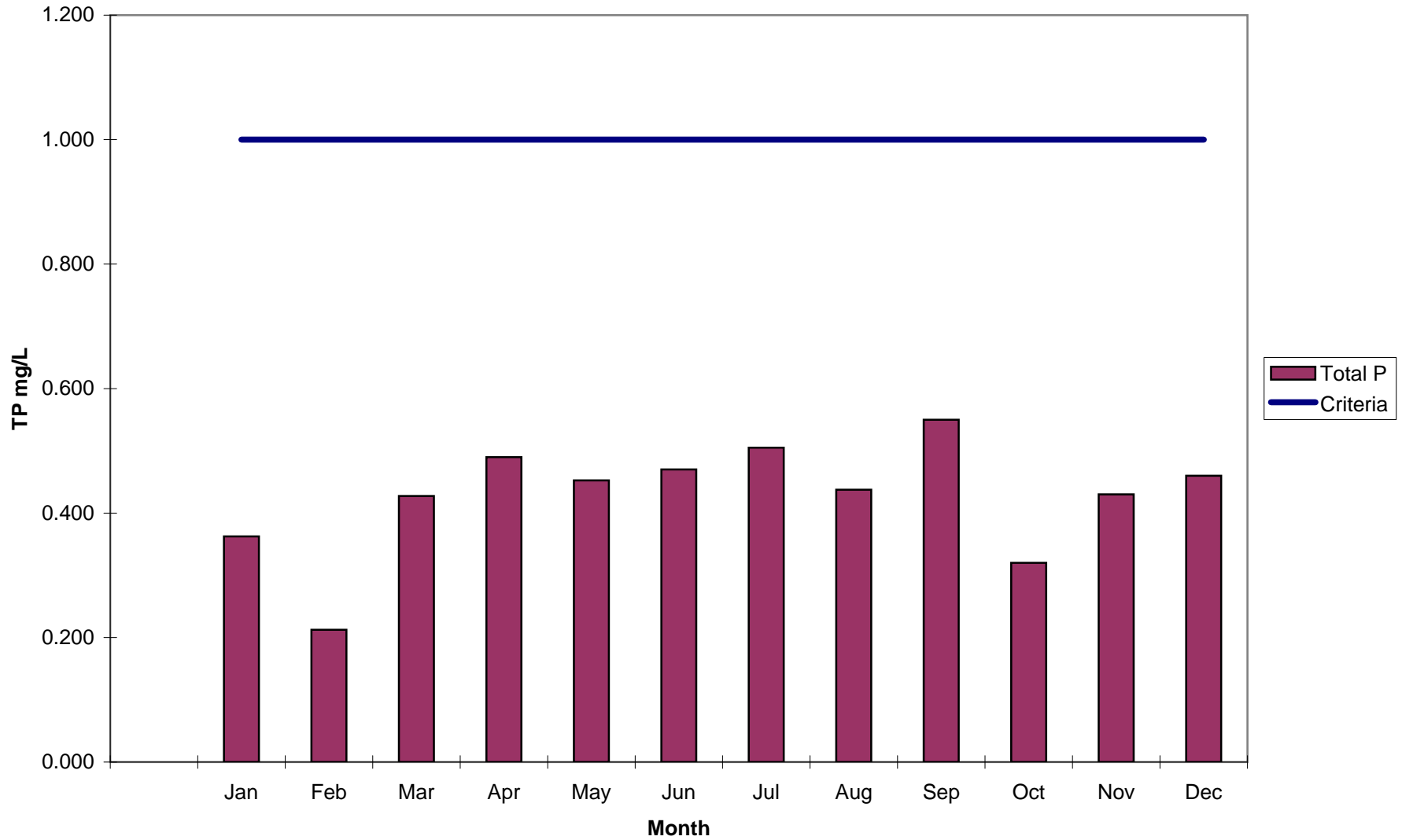
Monthly Tillsonburg TKN Influent Loadings kg/d Vs Criteria 2009



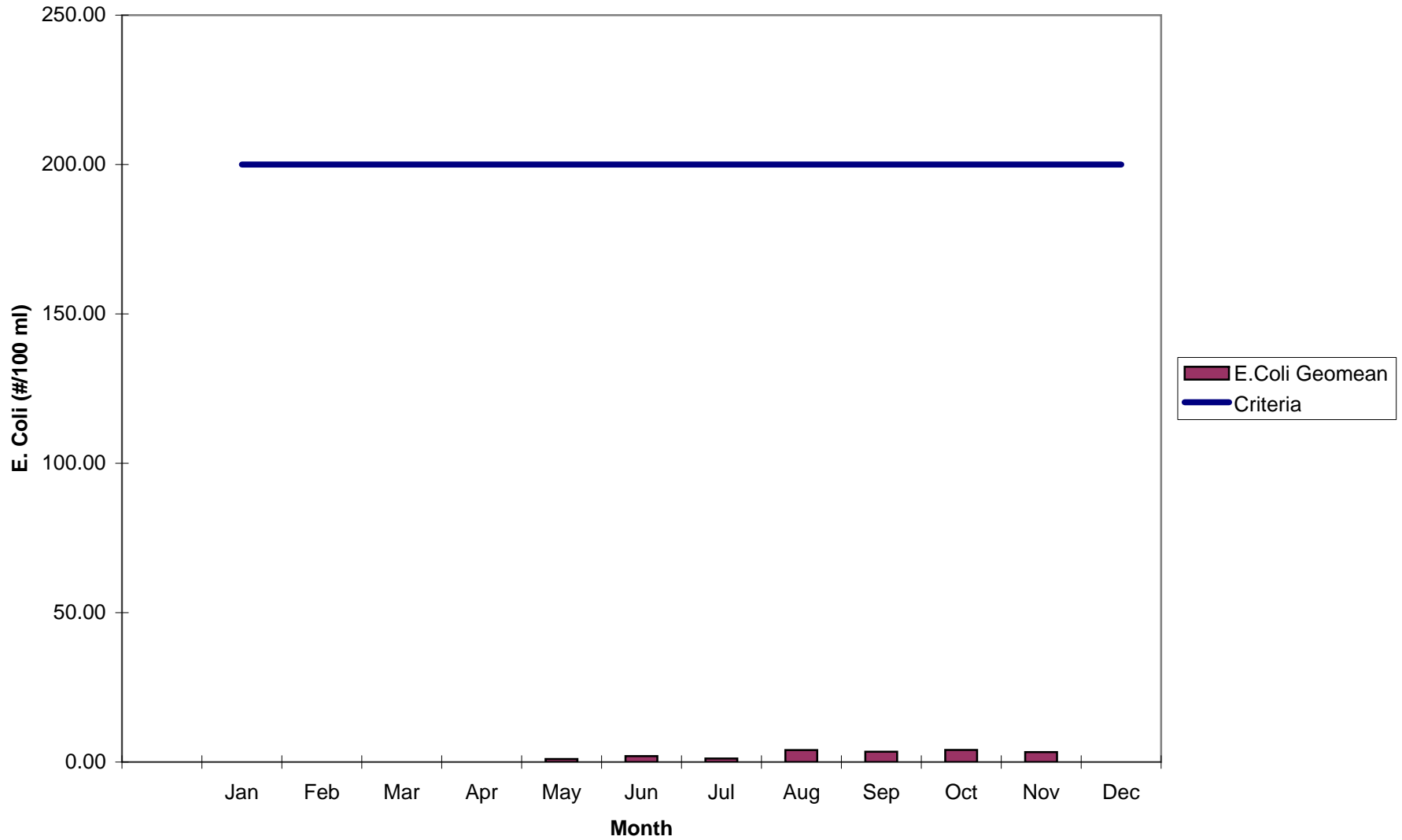
Tillsonburg Monthly Effluent SS Vs Discharge Criteria 2009



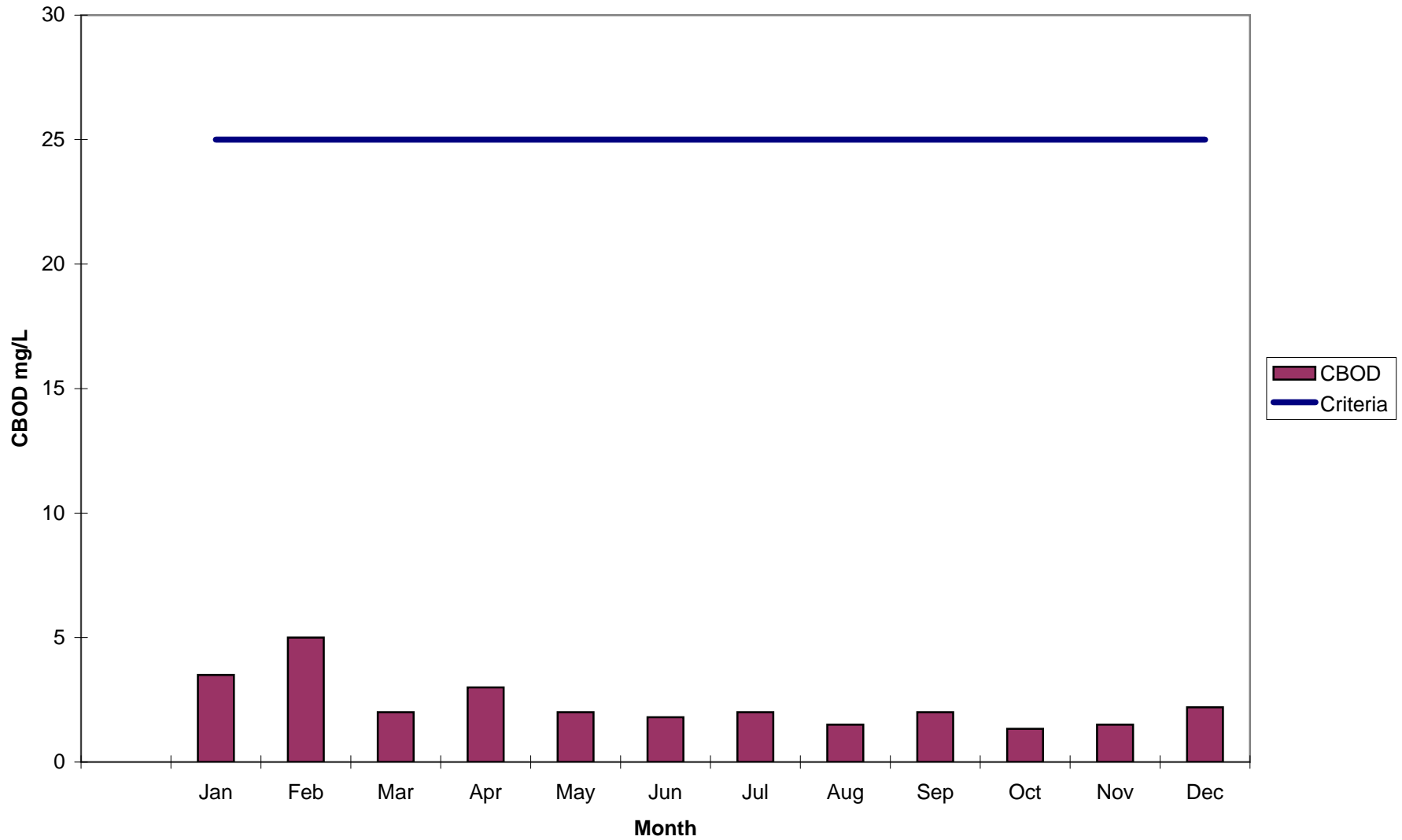
Tillsonburg Monthly Effluent TP mg/L Vs Discharge Criteria 2009



Tillsonburg Monthly Effluent E. Coli (#/100 ml) Vs Discharge Criteria 2009



Tillsonburg Effluent CBOD vs Criteria 2009





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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,

Dear Sir:

**RE: Year-End Monitoring Report 2009 for Thamesford
Wastewater Treatment Plant**
(Certificate of Approval #6974-6FKKAY)

Attached is the monitoring report for 2009 for the Thamesford Wastewater Treatment Plant. This report is prepared as required by the certificate of approval #6974-6FKKAY.

I trust this report fulfills the intent of the Certificate of Approval. If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, Oxford County

THAMESFORD WASTEWATER TREATMENT PLANT

YEAR END MONITORING REPORT FOR 2009

This monitoring report is prepared for the Ministry of the Environment as part of the requirements of our certificate of approval (CoA) #6974-6FKKAY

CONTENTS

- SAMPLING DESCRIPTION
- OVERVIEW THAMESFORD WASTEWATER TREATMENT PLANT
- UPSET AND BYPASS EVENTS
- DISCUSSION OF RESULTS
- BIOSOLIDS 2009
- TABLE 2A & 2B
- EXHIBIT 1: SUMMARY TABLE
- EXHIBIT 2: CONTAINS GRAPHS ILLUSTRATING THE FLOW AND DISCHARGE RESULTS VS CRITERIA
- EXHIBIT 3: CONTAINS GRAPHS SHOWING OUR INFLUENT LOADINGS VS DESIGN
- APPENDIX

SAMPLING DESCRIPTION

Influent samples were taken from sampling ports located in-line after the influent pumps. Two 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 Cold Springs Farm influent. The two Influents are separately tested and then the results mathematically combined based on flow.

Effluent samples were taken using a 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.

TRC samples are taken daily from the stilling well prior to the parshall flume. The stilling well follows the disinfection and dechlorination chambers. pH of the effluent composite is measured.

Dissolved Oxygen samples are taken at the discharge well. After the parshall flume, the effluent flows through a discharge pipe and drops about 30" into a discharge well prior to flowing to the river. This serves as re-oxygenation as reflected in the DO measurements.

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

OVERVIEW THAMESFORD WASTEWATER TREATMENT PLANT

The Thamesford Wastewater Treatment Plant provided effective wastewater treatment in 2009. The average daily flow for 2009 was 1384 m³/d this represents 55 % of the design criteria of 2500 m³/d. The total annual flow was 503 605 m³ with an average monthly flow of 41 967 m³.

The 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 meters are calibrated annually.

The Thamesford WWTP forms part of the Oxford County Wastewater Treatment System, which contains nine wastewater treatment facilities.

The main customer is Cold Springs Farm Ltd. (CSF) complex but the treatment plant also receives an amount of domestic wastewater via a connection to the sanitary sewer line and dedicated lift station. The wastewater from CSF Ltd. is collected from its various on-site business units and pumped to pretreatment through equalization and a Dissolved Air Flotation (DAF) unit. The influent enters the CSF lift station of the Wastewater Treatment Plant where it is pumped to the complete mix aeration basin. The system is an extended aeration system comprised of two tanks referred to as the complete mix basin and the plug flow reactor. After leaving the plug flow reactor, the wastewater enters one of two clarifiers where the activated sludge is either returned or wasted and the clear water goes to either sand filter and disinfection before direct discharge to the Middle Thames River. Sludge handling occurs in two aerobic digesters, which stabilize the sludge, which is then held on-site in a storage tank for eventual removal, and application to permitted soil-conditioning sites.

UPSET AND BYPASS EVENTS

There were no non-compliances for 2009.

Maintenance and Calibration

The operating and maintenance staff from the Ingersoll WWTP conduct regular scheduled maintenance of the plant equipment. Detailed maintenance records for each piece of equipment is kept on site at the Ingersoll Plant and is available upon request.

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

DISCUSSION OF RESULTS

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.

The average annual Influent BOD₅ concentration to the plant was 541 mg/L. This corresponds to an average BOD₅ loading of 618 kg/d. This is 46 % of a design value of 1333 kg/d. The average annual Influent TSS concentration to the plant was 284 mg/L. This corresponds to an average TSS loading of 324 kg/d which is 42 % of the design criteria of 779 kg/d. The annual average TKN concentration was 84.6 mg/L. This corresponds to 96 kg/d which is 48 % of a design value of 199 kg/d. The annual average TP concentration was 12.7 mg/L. This corresponds to 14 kg/d which is 61 % of a design value of 23 kg/d. The annual average O&G loading is 71 mg/L. This corresponds to 82 kg/d which is 33 % of the design criteria of 250 kg/d.

All analytical data included with this report shows the Thamesford WWTP complied with its discharge requirements. The annual average BOD concentration was 1.7 mg/L. This represents 99.7 % removal efficiency. The annual average TSS concentration was 3.1 mg/L which represents 98.9 % removal efficiency. The annual average Ammonia concentration was 0.077 mg/L. The annual average TP concentration was 0.13 mg/L. This represents 99 % removal efficiency.

All pH is measured in the Effluent by the operator a minimum of weekly and there was no single sample outside our range of 6-9.5 for 2009. The Thamesford Wastewater Treatment Plant was operating within its design and discharge criteria for 2009.

BIOSOLIDS 2009

Discussion:

The Biosolids removal was contracted out to WESSUC for land application. The details of the quantity and quality of the biosolids can be found in a separate Biosolids Report appended to this annual report

DAF BIO-SOLIDS ACTIVITY

January to December 2010

CSF Ltd. operates its own wastewater pretreatment system which includes a Dissolved air flotation (DAF) treatment where biosolids are produced. The material is transported to the Thamesford Wastewater Treatment Plant where it is combined with the stored Biosolids. There is an existing letter from the MOE indicating this practice is acceptable.

EXHIBIT 1

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

2009

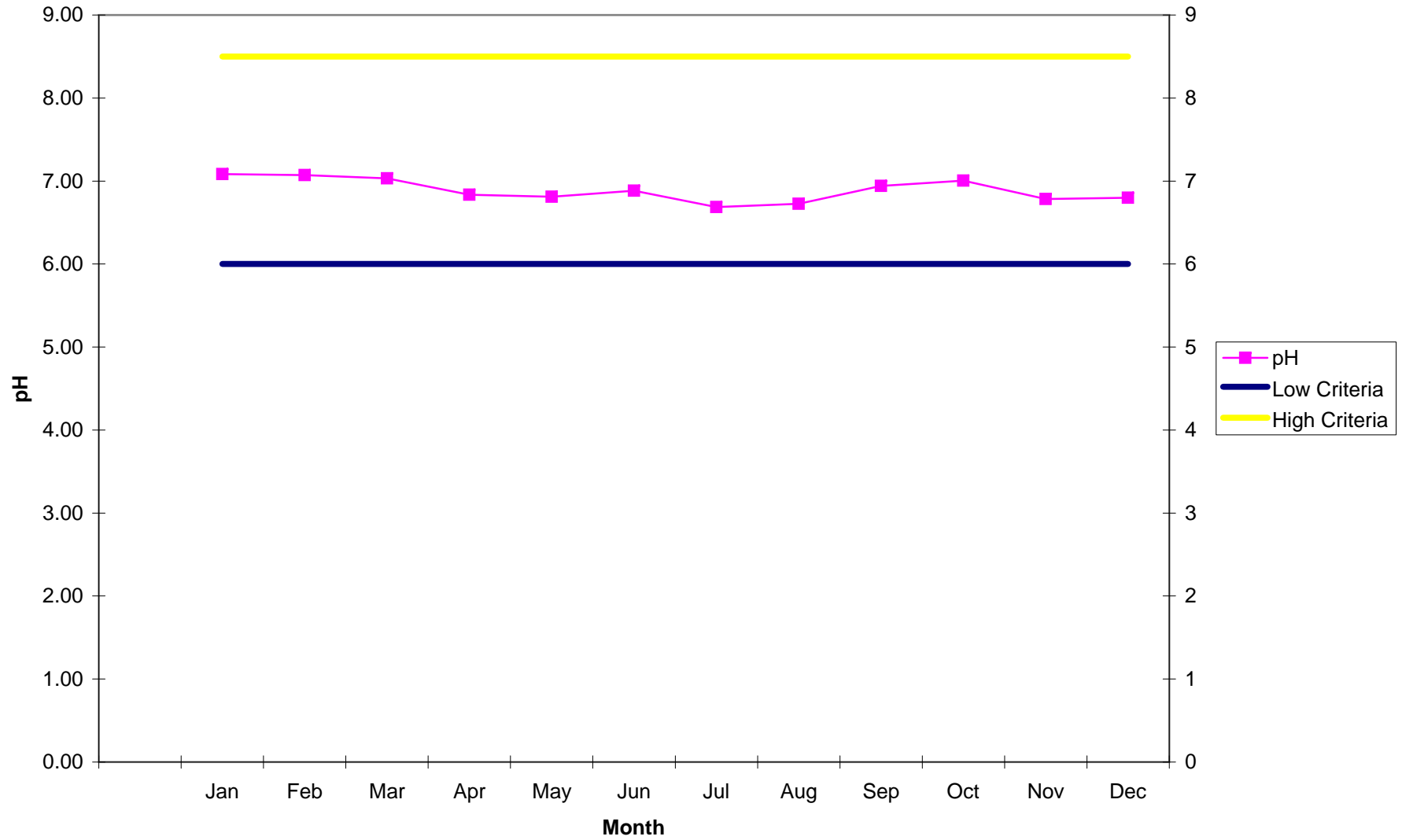
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Total	Criteria
Effluent Meter																	
Total Flow 1000m3	39.604	39.197	42.771	41.030	40.924	44.678	42.440	45.488	44.775	39.762	40.400	42.536	41.967	39.197	45.488	503.605	
Average Daily Flow 1000m3	1.278	1.400	1.380	1.368	1.320	1.489	1.415	1.467	1.492	1.283	1.347	1.372	1.384	1.278	1.492		2.5
Maximum Daily Flow 1000 m3	1.940	2.038	1.983	1.925	1.974	2.230	2.071	2.720	2.003	1.952	2.093	2.149	2.090	1.925	2.720		
Daily Average Influent																	
CSF Flow (m3/d)	758	781	802	913	751	976	930	985	900	710	746	799	838	710	985		
Municipal (m3/d)	264	265	272	287	279	327	274	276	221	364	360	350	295	221	364		
Combined Flow (m3/d)	1022	1045	1075	1199	1030	1304	1204	1261	1121	1073	1106	1148	1132	1022	1304		
Production Average Influent																	
CSF Flow (m3/d)	1078	1059	1050	1201	1048	1254	1141	1307	1167	1003	1060	1109	1123	1003	1307		
Municipal (m3/d)	270	268	275	299	287	347	281	286	233	371	385	359	305	233	385		
Combined Flow (m3/d)	1348	1327	1325	1500	1335	1601	1422	1593	1400	1374	1445	1469	1428	1325	1601		
Combined Influent																	
pH	7.25	7.27	7.07	7.35	7.25	7.27	7.01	7.04	7.04	6.81	7.11	7.14	7.13	6.81	7.35		
BOD (mg/L)	465	514	438	523	442	597	755	570	615	505	468	602	541	438	755		
TSS (mg/L)	203	252	212	240	239	326	390	299	211	402	258	376	284	211	402		
TKN (mg/L)	81.1	83.8	74.1	85	72	81.3	96	90.0	94	92	80	86.7	84.6	72.4	95.5		
TP (mg/L)	12.5	12.4	12.9	11	11	14.3	14	13.8	14	13.4	12.0	10.7	12.7	10.7	14.3		
O&G (mg/L)	56	37	32	67	45	54	66	125	57	73	153	92	71	32	153		

Effluent	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Criteria
pH	7.08	7.07	7.03	6.84	6.81	6.88	6.69	6.73	6.94	7.01	6.78	6.80	6.89	6.69	7.03	6.0-9.5
BOD ₅ (mg/L)	3.75	2.75	1.25	2.0	1	1.5	1.4	1.4	2.0	1.25	1.3	1.2	1.7	1.0	2.0	10/15
TSS (mg/L)	5.25	4	2.8	3	1.5	1.75	4.0	3.4	2	2.5	4.8	2.8	3.1	1.5	4.8	10/15
Ammonia (mg/L)	0.18	0.18	0.05	0.08	0.05	0.08	0.05	0.06	0.05	0.05	0.03	0.07	0.08	0.030	0.082	2/5
TP (mg/L)	0.28	0.10	0.03	0.08	0.08	0.10	0.20	0.18	0.12	0.18	0.09	0.09	0.13	0.03	0.20	0.2/0.5
TRC mg/L	0.01	0.01	0.01	0.01	0.01	0.005	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.005	0.01	0.01
Temp (C)	8.8	11.5	12.4	14.6	16.89	19.4	21.2	22.4	20.6	17.5	16.7	13.8	16.3	11.5	22.4	
DO (mg/L)	7.9	7.8	7.6	7.0	5.9	5.5	5.6	5.35	5.49	5.86	6.15	6.68	6.40	5.35	8	5
E. Coli (#/100mL)	99	7	2	3	1	1	15	12	57	2	3	5	17	1	57	200

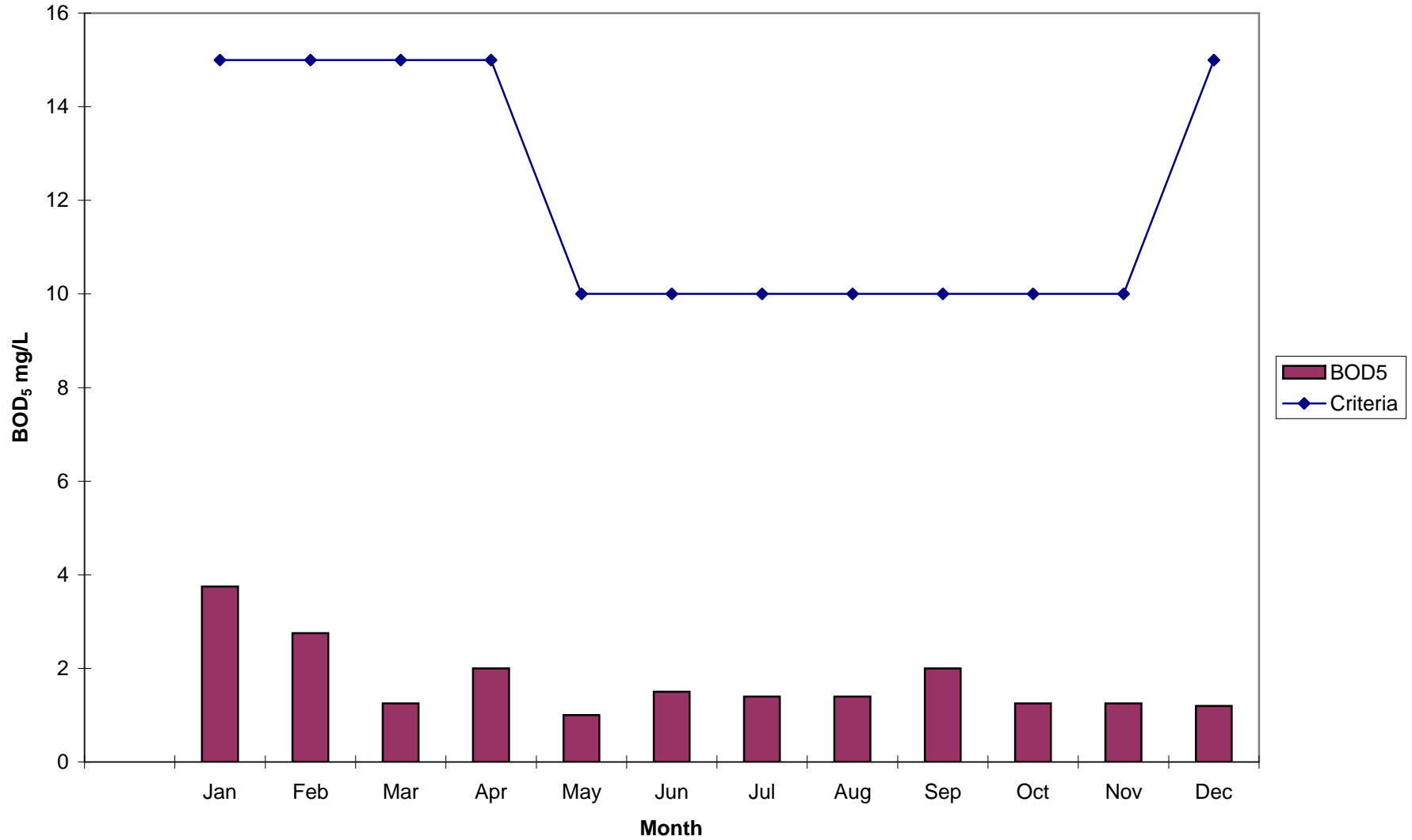
Influent Loadings based on Combined Average Daily Influent Flows and Results																
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Min	Max	Design Criteria
BOD ₅ kg/d	475	537	470	627	455	778	908	718	690	542	518	692	618	455	908	1333
TSS kg/d	208	263	228	288	246	425	470	377	236	431	285	432	324	208	470	779
TKN kg/d	83	88	80	102	75	106	115	113	105	99	88	100	96	75	115	199
TP kg/d	13	13	14	14	12	19	17	17	16	14	13	12	14	12	19	23
O&G kg/d	57	38	34	80	46	70	79	157	64	78	169	106	82	34	169	250

EXHIBIT 2

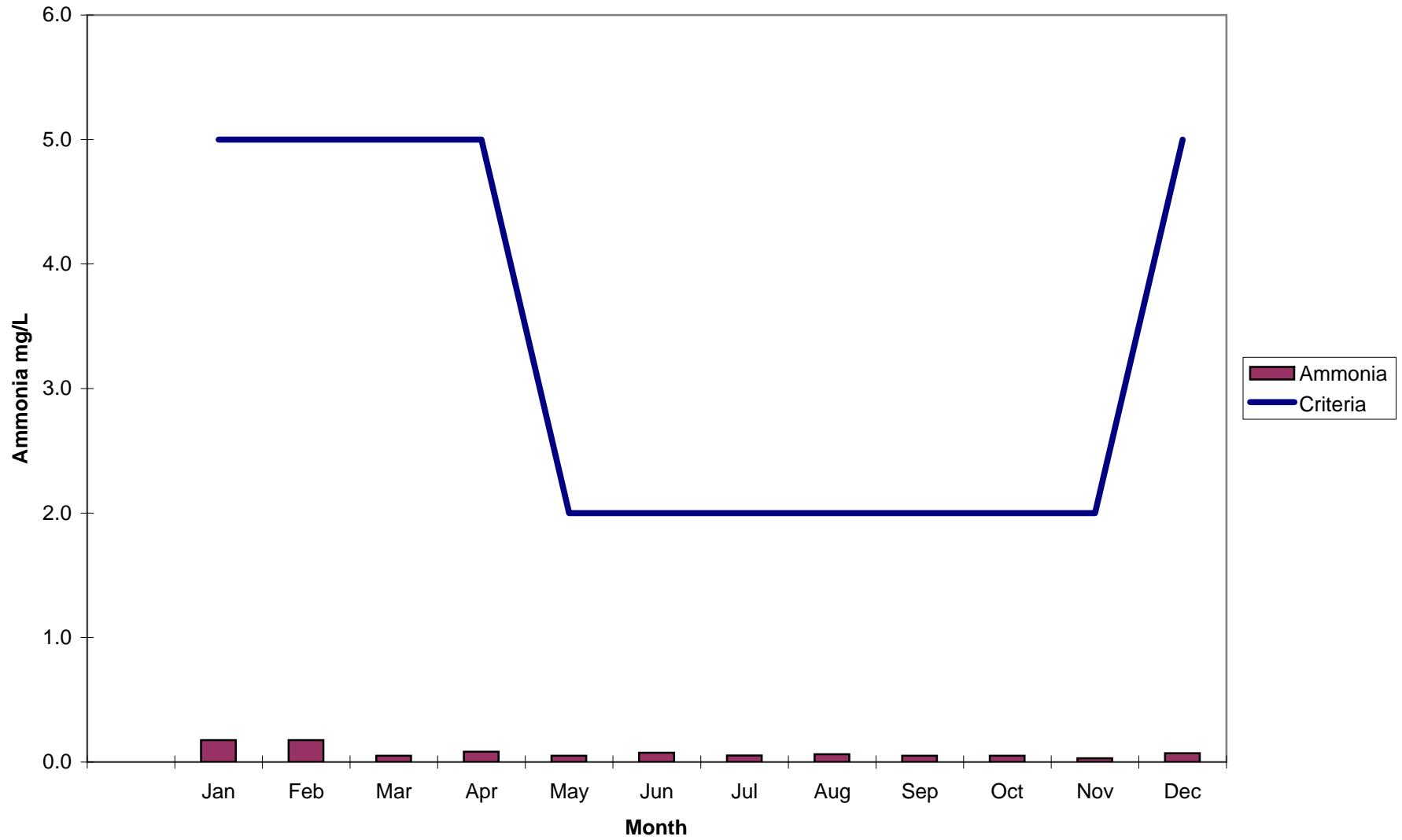
Monthly Average Effluent pH vs Discharge Criteria



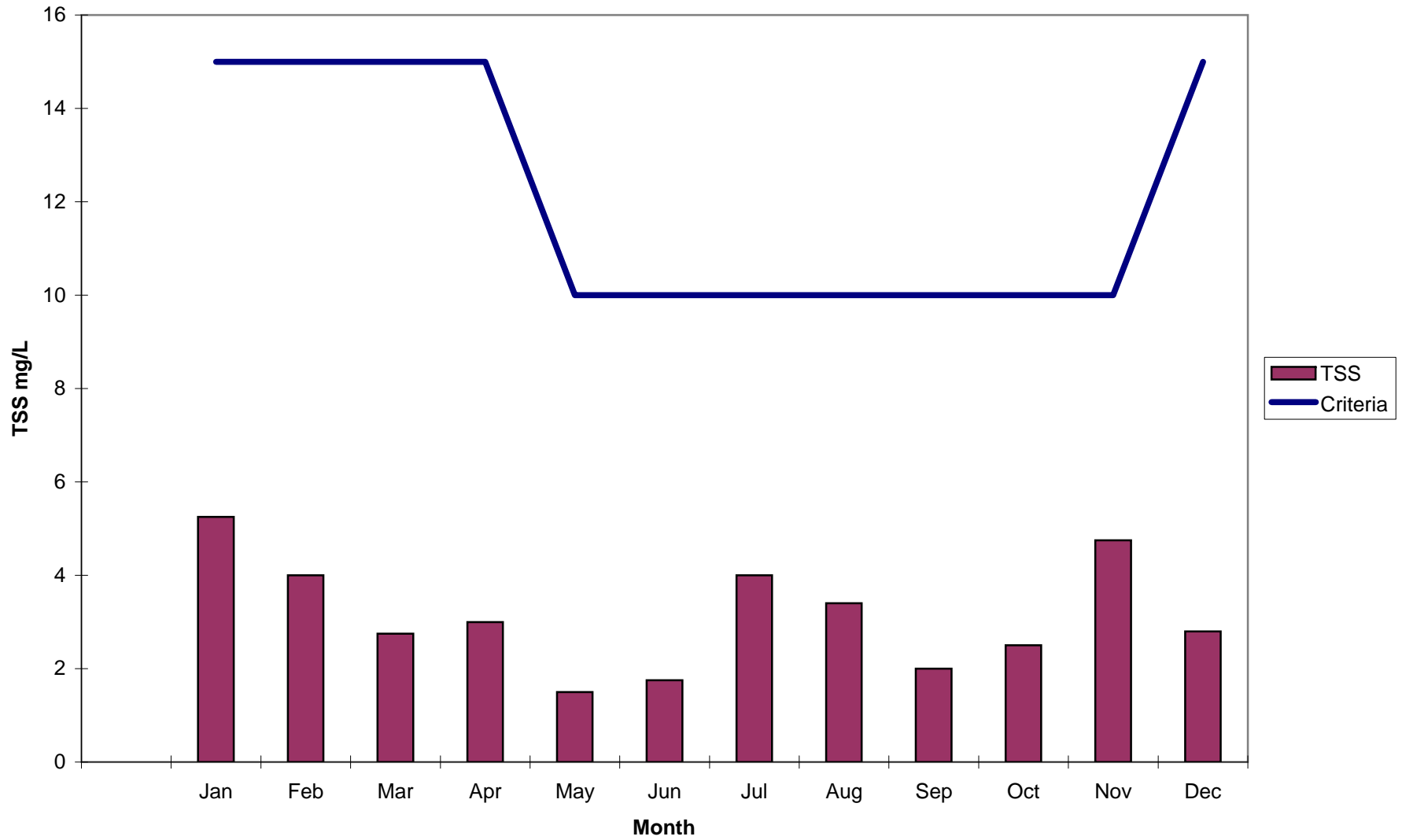
Monthly Average Effluent BOD₅ mg/L Vs Discharge Criteria



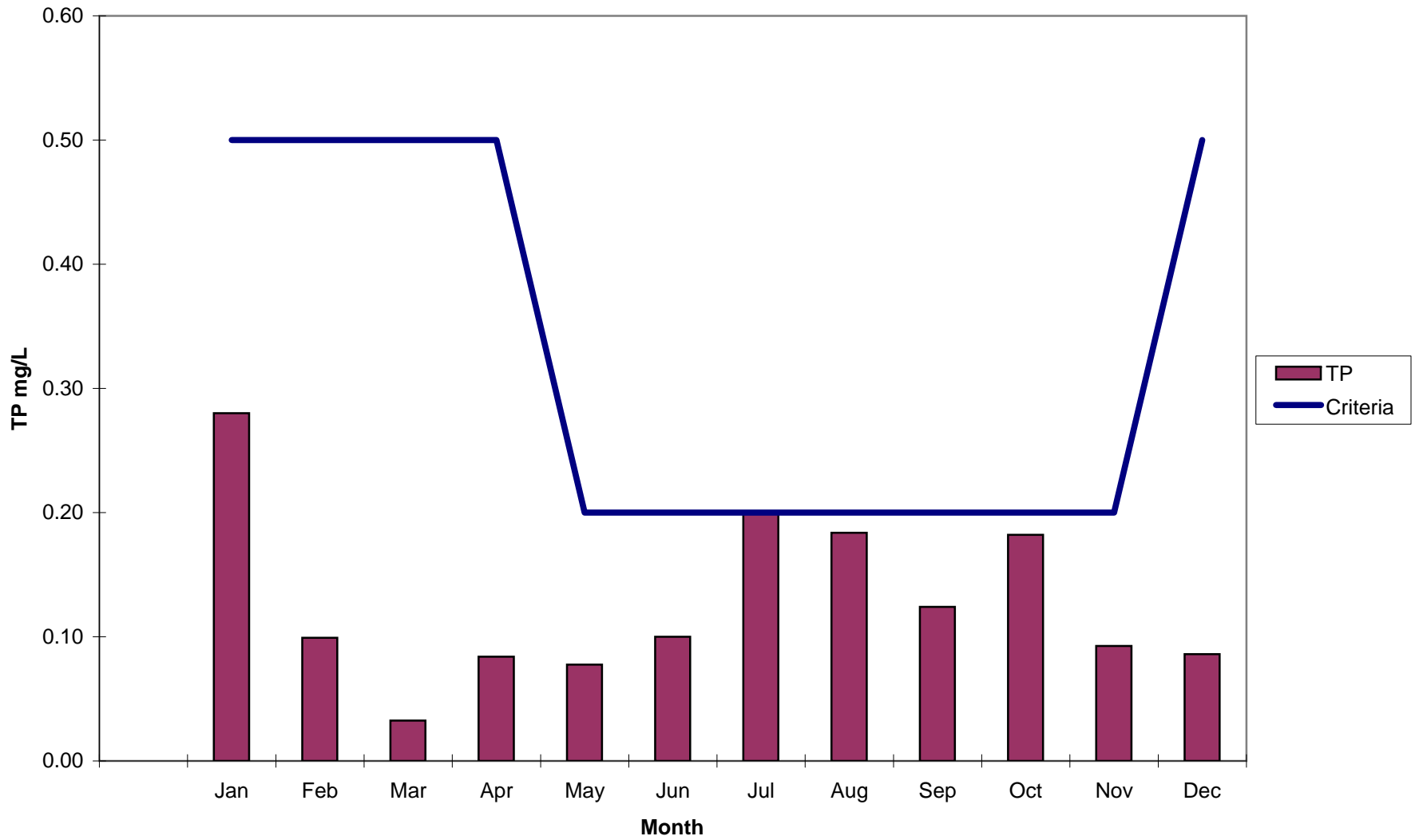
Monthly Average Effluent Ammonia mg/L Vs Discharge Criteria



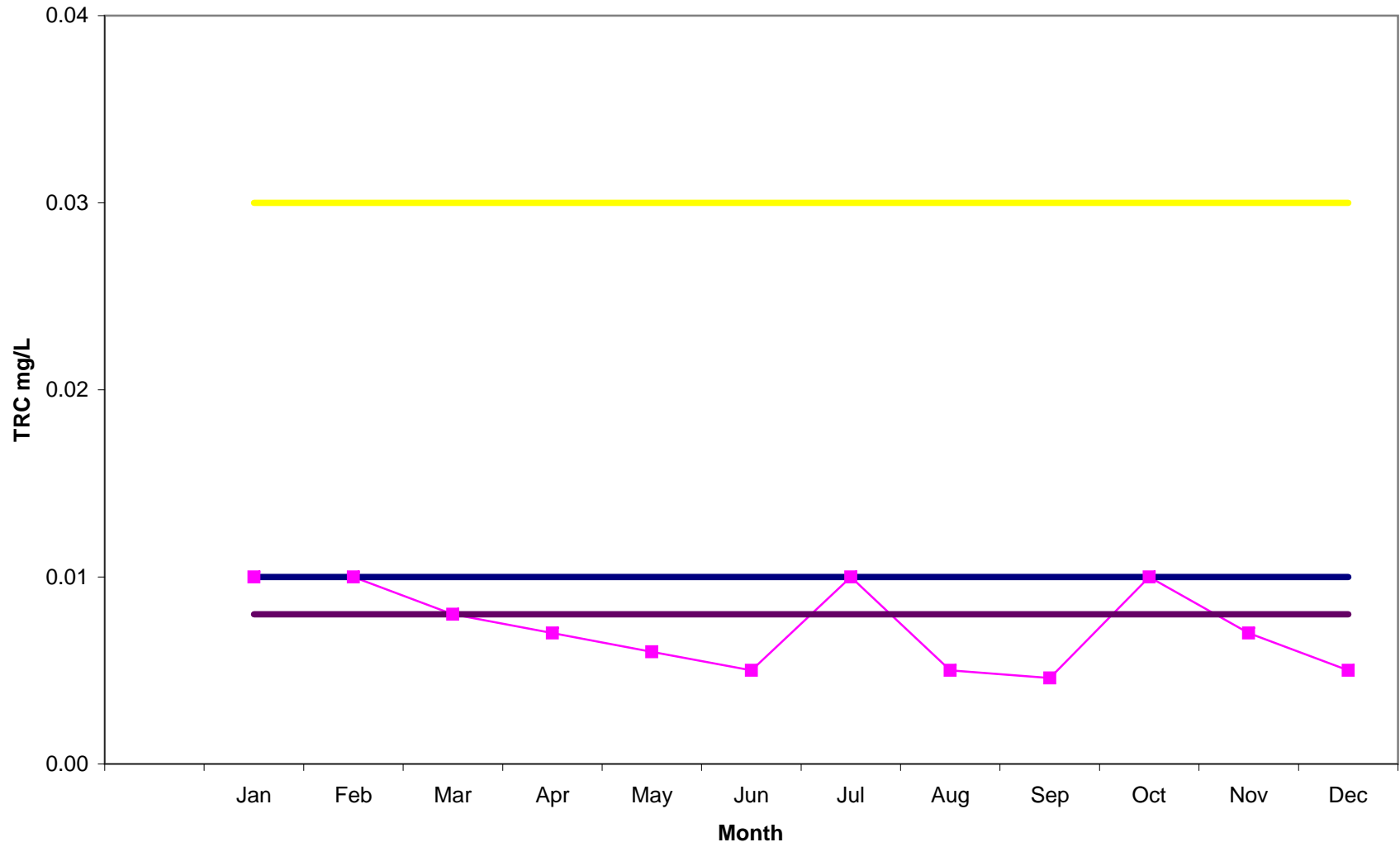
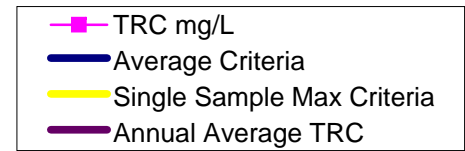
Monthly Average Effluent TSS mg/L Vs Discharge Criteria



Monthly Average TP mg/L Vs Discharge Criteria



Monthly Average Effluent TRC mg/L Vs Discharge Criteria



Average Daily Flow

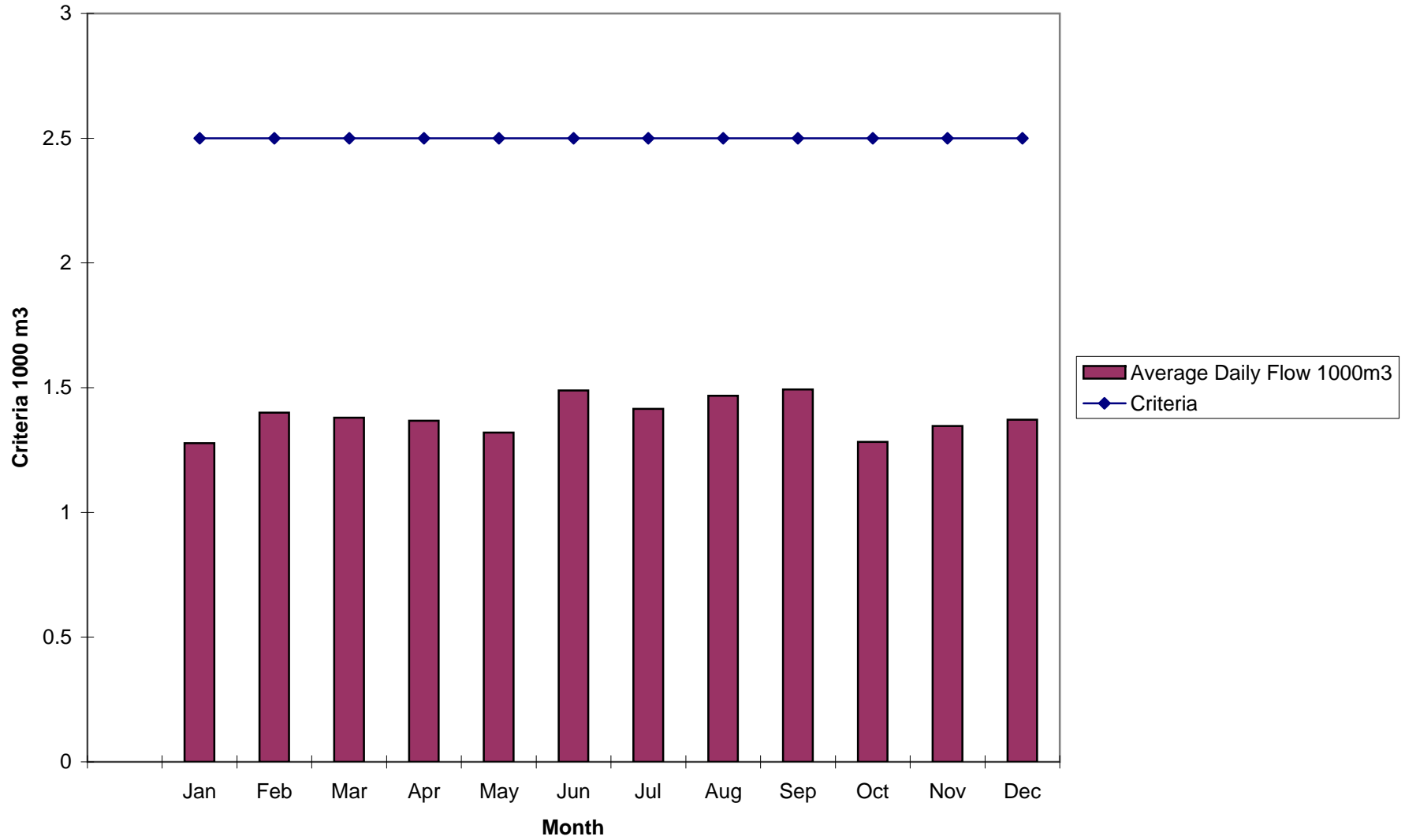
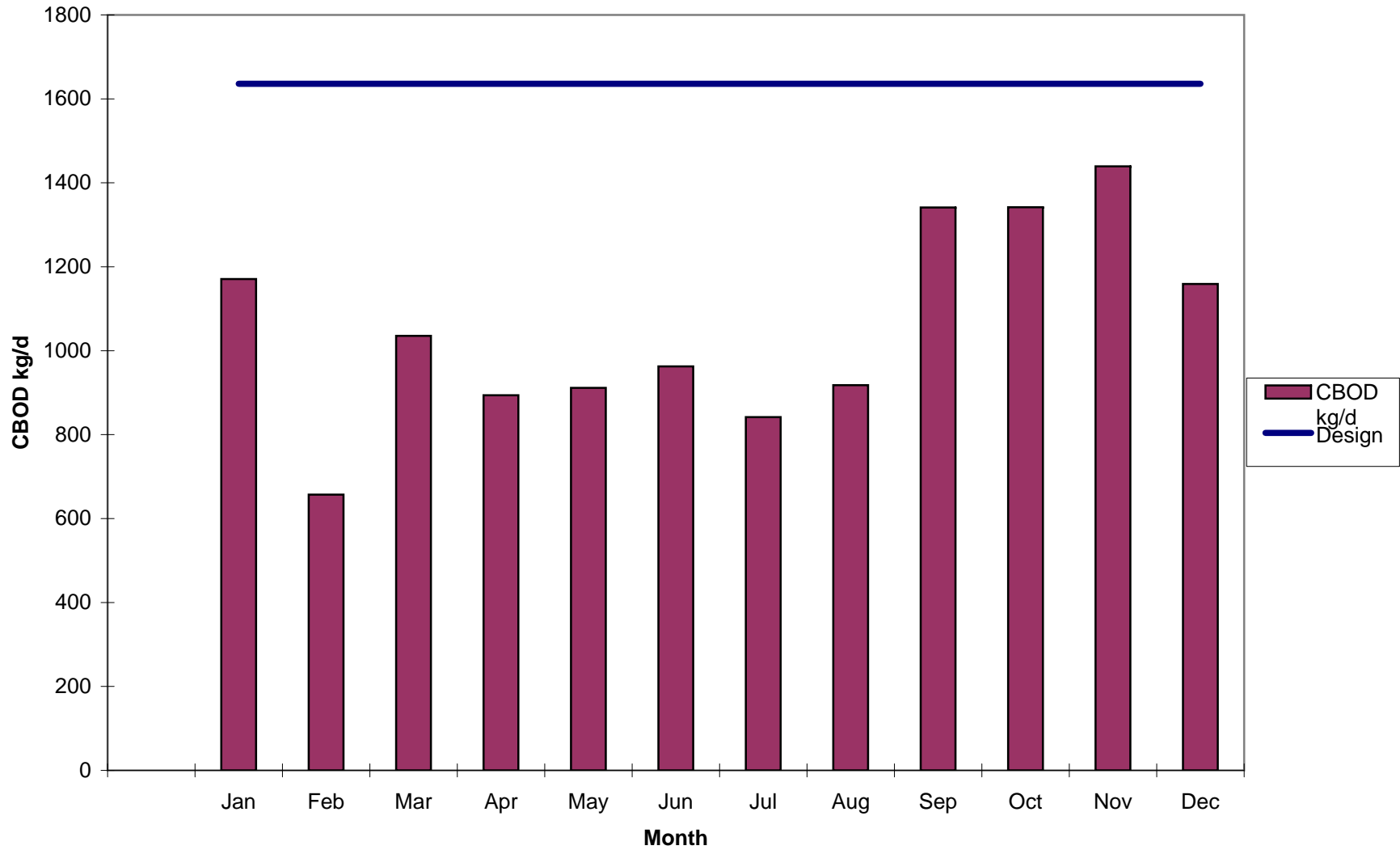
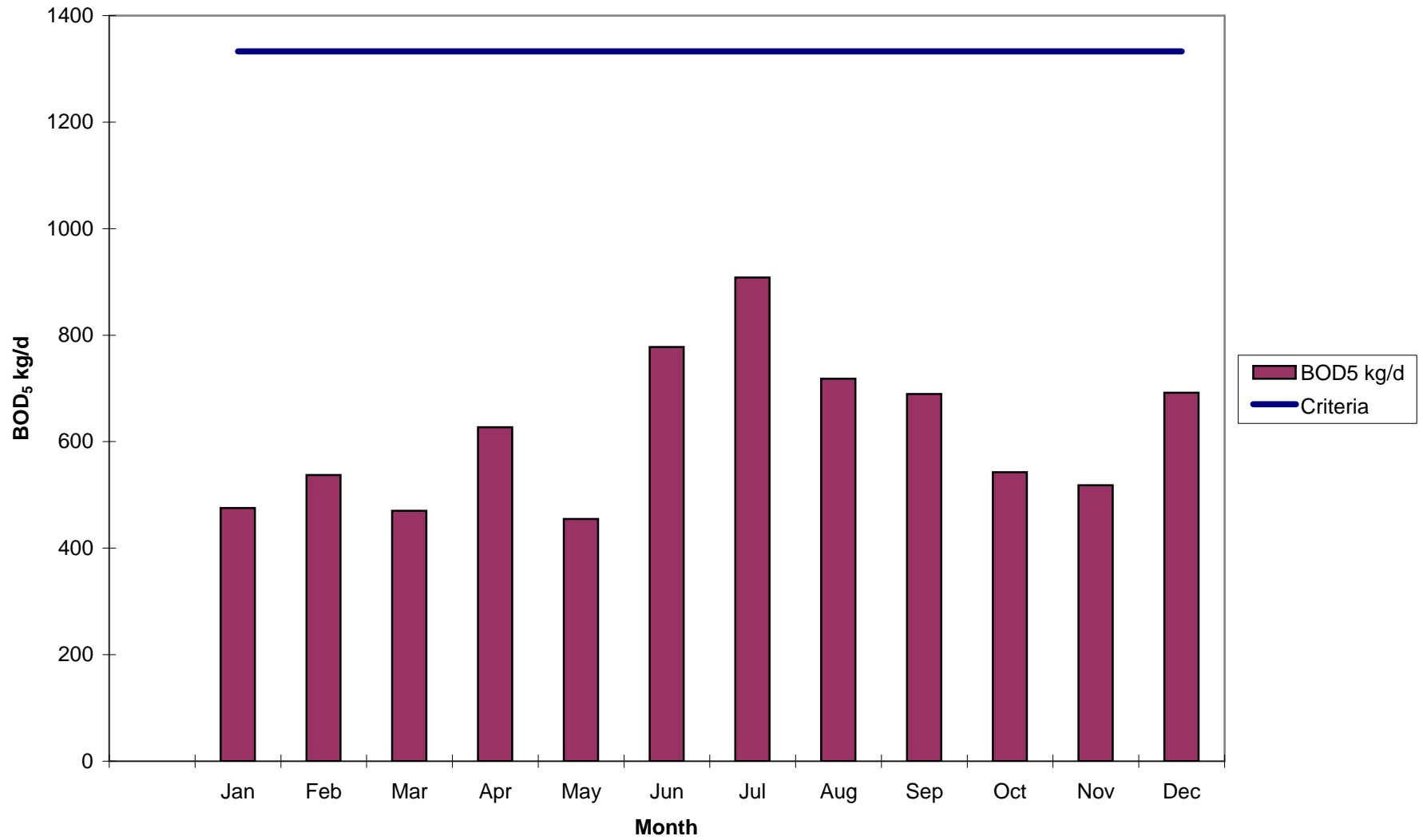


EXHIBIT 3

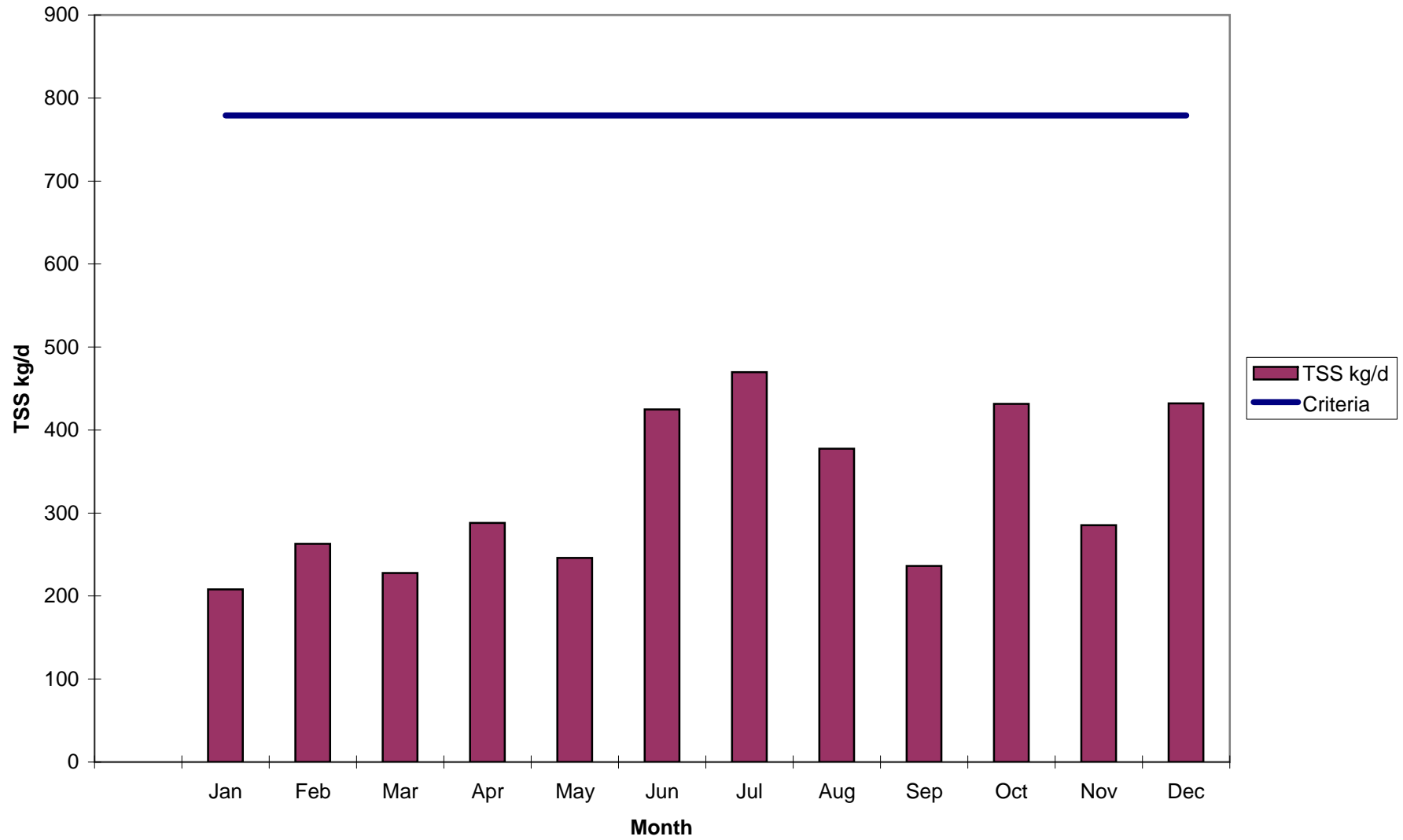
Tillsonburg Monthly CBOD Influent Loadings kg/d Vs Criteria 2009



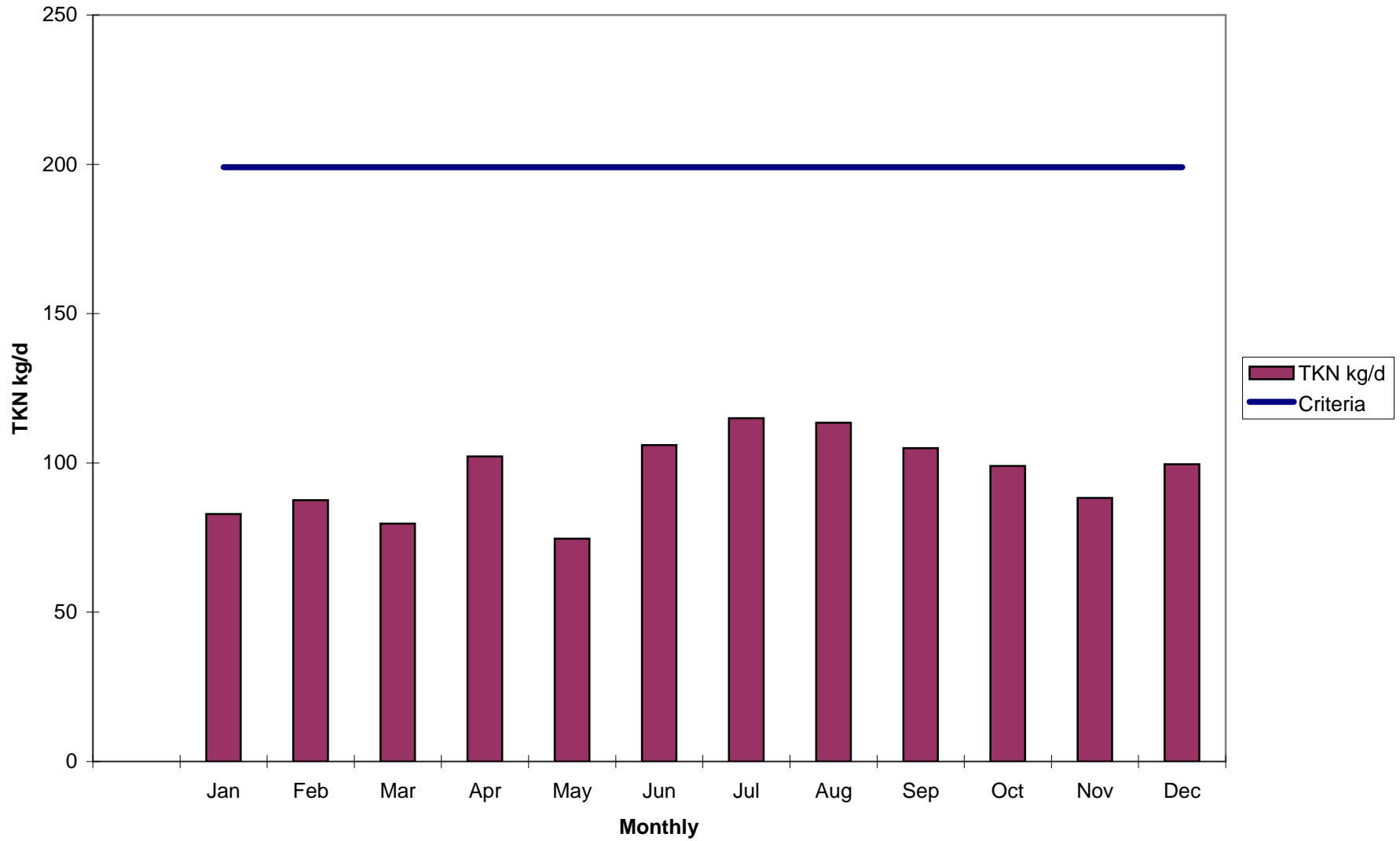
Thamesford WWTP BOD₅ kg/d Influent Loading vs Design



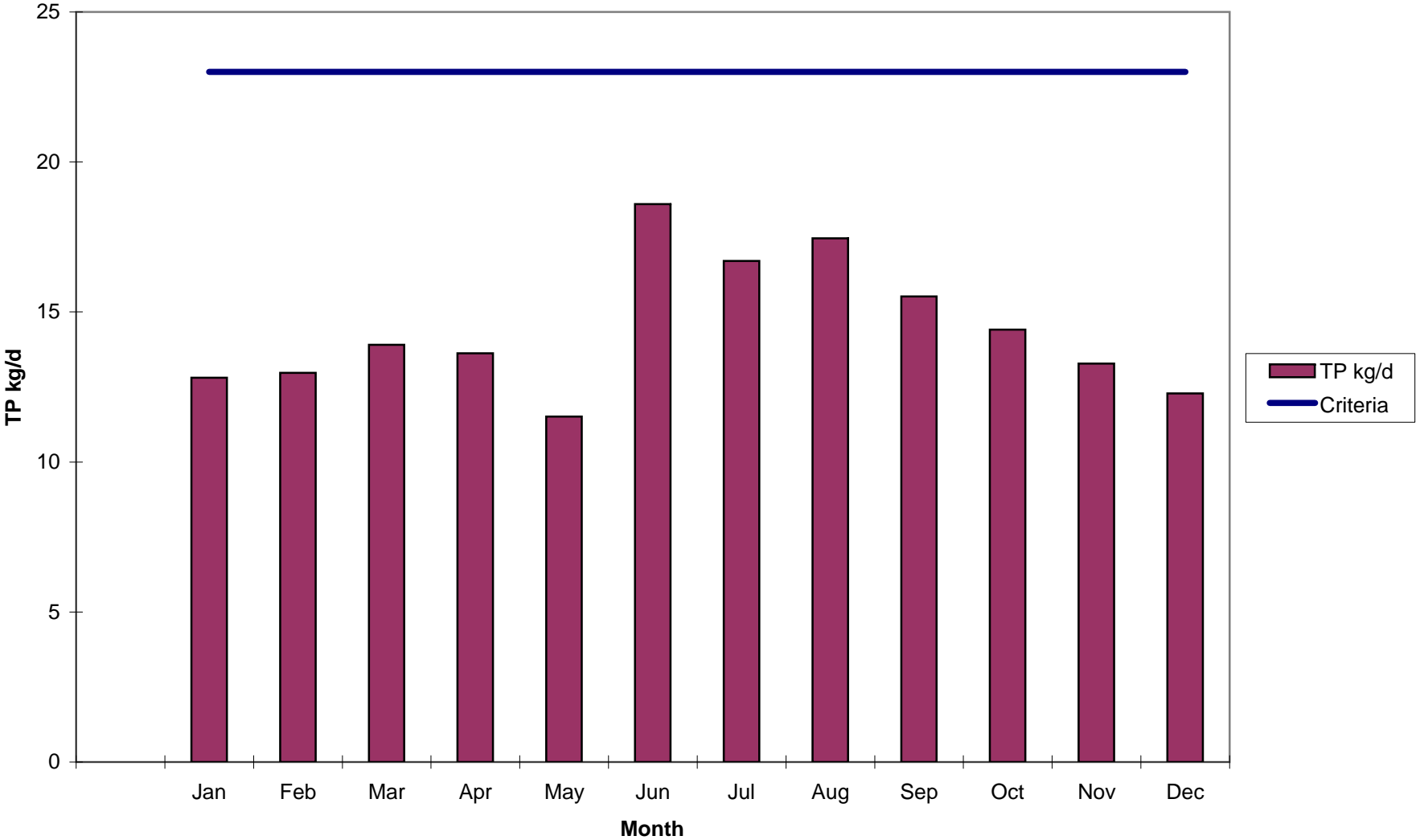
Monthly TSS kg/d loading vs Design Criteria



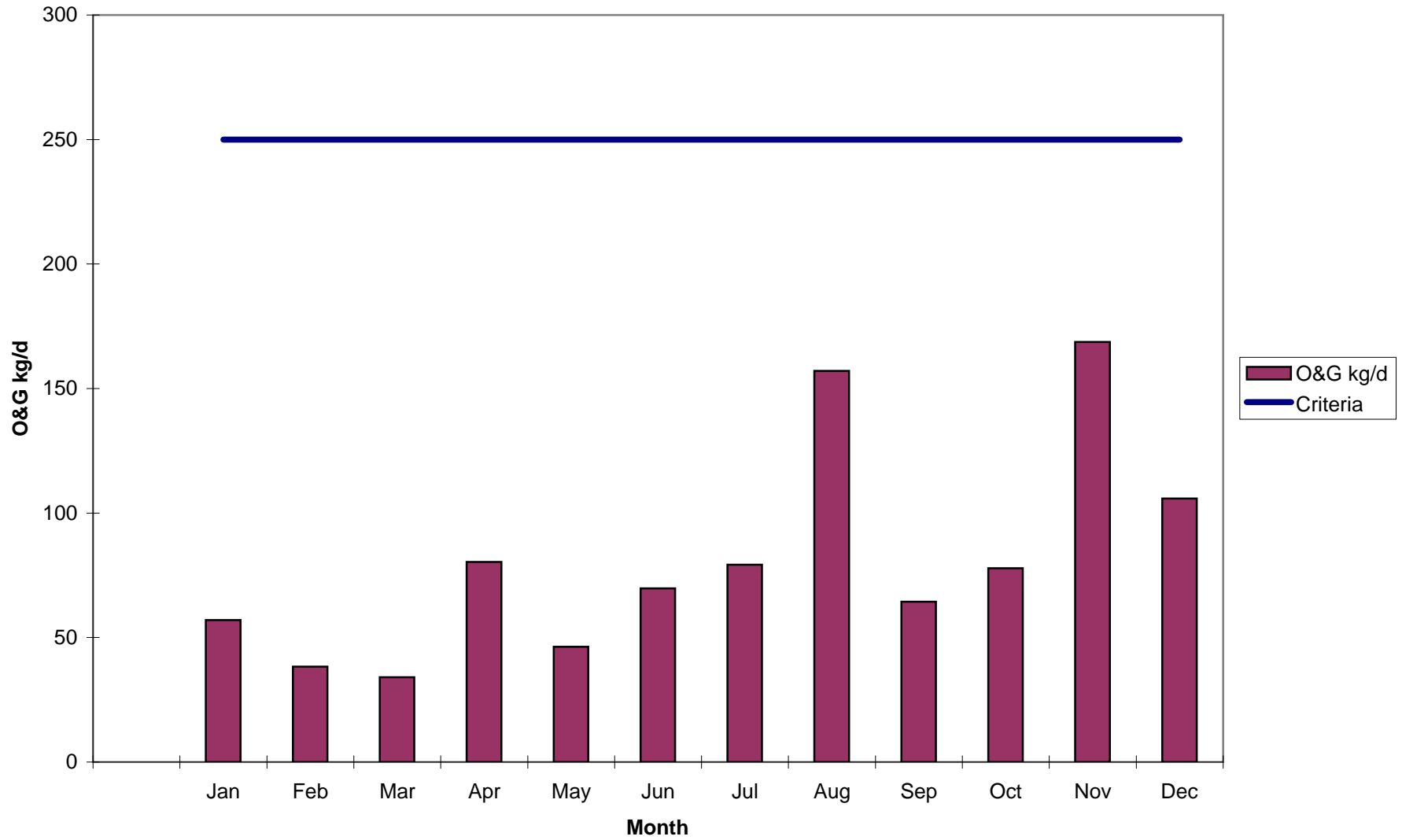
Monthly TKN kg/d Loading vs Design Criteria



Monthly TP kg/d loading Vs design Criteria



Monthly O&G kg/d Loading Vs Design Criteria





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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

**RE: Year-End Monitoring Report 2009 for Norwich
Wastewater Treatment Plant**
(Certificate of Approval #1680-6F6QR5)

Attached is the monitoring report for 2009 for the Norwich Wastewater Treatment Plant. This report is prepared as required by the certificate of approval #1680-6F6QR5.

I trust this report fulfills the intent of the Certificate of Approval. If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

YEAR END MONITORING REPORT FOR 2009

This monitoring report is prepared for the Ministry of the Environment as part of the requirements of our certificate of approval (CofA #1680-6F6QR5)

CONTENTS

- SAMPLING DESCRIPTION
- OVERVIEW OF NORWICH WASTEWATER TREATMENT PLANT
- DISCUSSION OF RESULTS
- UPSET CONDITIONS 2009
- OTHER ACTIVITIES 2009
- EXHIBIT 1: INFLUENT & EFFLUENT LAGOON SUMMARY - TABLE A

CONTAINS GRAPHS ILLUSTRATING THE FLOW AND
DISCHARGE RESULTS VS CRITERIA
- APPENDED BIOSOLIDS REPORT

SAMPLING DESCRIPTION

Influent samples were taken from the Sutton St. lift station using a composite sampler set to take a sample every 15 minutes for 24 hours. The sampling frequency is once per week and samples are tested for Biochemical Oxygen Demand (BOD₅), and Suspended Solids (SS) monthly, and Total Phosphorus (TP) and Total Kjeldahl Nitrogen (TKN) weekly.

Effluent samples are taken using a composite sampler set to take a sample every 15 minutes for the duration of the discharge period. BOD₅, 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 analysis is performed by SGS Lakefield Research Ltd. on all samples except pH, temperature and dissolved oxygen which is tested in the field during collection. These results are used here for determination of compliance. Any information generated in-house is used in process control but is not included in this report.

OVERVIEW OF NORWICH WASTEWATER TREATMENT PLANT

The Norwich Wastewater Treatment Plant provided effective wastewater treatment in 2009. The average daily flow for 2009 was 1167 m³/d this represents 76.3 % of the design criteria of 1530 m³/d.

The Norwich Wastewater Treatment plant is a lagoon system serving the community of Norwich, Ontario. The wastewater is pumped from one of two pump stations to a splitter box; then to either of two lagoons as determined by the operator. The lagoons are operated in series with the 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 from December to April each year.

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 the County of Oxford and is supervised as one of nine plants. The maintenance is completed by the southern area staff. Detailed records on each piece of equipment are kept at the Ingersoll Wastewater Plant.

R&R Instrumentation Services did meter calibration on the lagoon effluent meter.

DISCUSSION OF RESULTS

Calculated in Table A that follows are the average, maximum and minimum values for all influent, and effluent parameters. The calculation is on all external test results and both flow meters.

The average annual Influent BOD₅ concentration to the plant was 159.1 mg/L. The average flow was 1167 m³/d representing 76.3 % of the design criteria of 1530 m³/d. This corresponds to an average BOD₅ loading of 186 kg/d. The average annual Influent SS concentration to the plant was 163.2 mg/L. This corresponds to an average SS loading of 191 kg/d. The annual average TKN concentration was 25.1 mg/L. This corresponds to 29 kg/d. The annual average TP concentration was 3.4 mg/L. This corresponds to 4 kg/d.

The annual average Effluent BOD₅ concentration was 3.4 mg/L. This represents a 97.9 % removal efficiency. The annual average SS concentration was 3.5 mg/L. This represents 98.2 % removal efficiency. The annual average Ammonia concentration was 1.4 mg/L. The annual average TP concentration was 0.31 mg/L. This represents a 90.8 % removal efficiency.

All pH is measured in the Effluent by the operator a minimum of three times a week during discharge and there was no single sample outside our range of 6-9.5 for 2009.

Please find the average, maximum, and minimum influent and effluent results calculated in Table A in Exhibit 1.

UPSET CONDITIONS 2009

Reported Non-Compliance 2009:

February 25th single sample Ammonia result 10.4 which is over our single sample max during freezing period of 8 mg/L. Lagoon was shut down and result reported to MOE.

Raw sewage sample of BOD and TSS missed by operator in July this caused a violation of the minimum frequency of sampling. This event was reported to MOE and the operators were reinstructed on minimum frequency of sampling.

October 2009 monthly average TP result was 0.65 mg/L just over our requirement of 0.50 mg/L. Lagoon Effluent was shut down and aluminum sulphate pumps were inspected. It was decided to go to new pumps and replace some pipe work on the chemical addition system. This was reported to MOE at the time of occurrence.

The Lagoon did not bypass or spill during the reporting period.

OTHER ACTIVITIES 2009

The biosolids removal from the North Cell was completed this year and the data is contained in a separate biosolids report appended to this annual report.

The Berms were raised on the North cell to match the South cell as per the CofA.

MISCELLANEOUS 2009

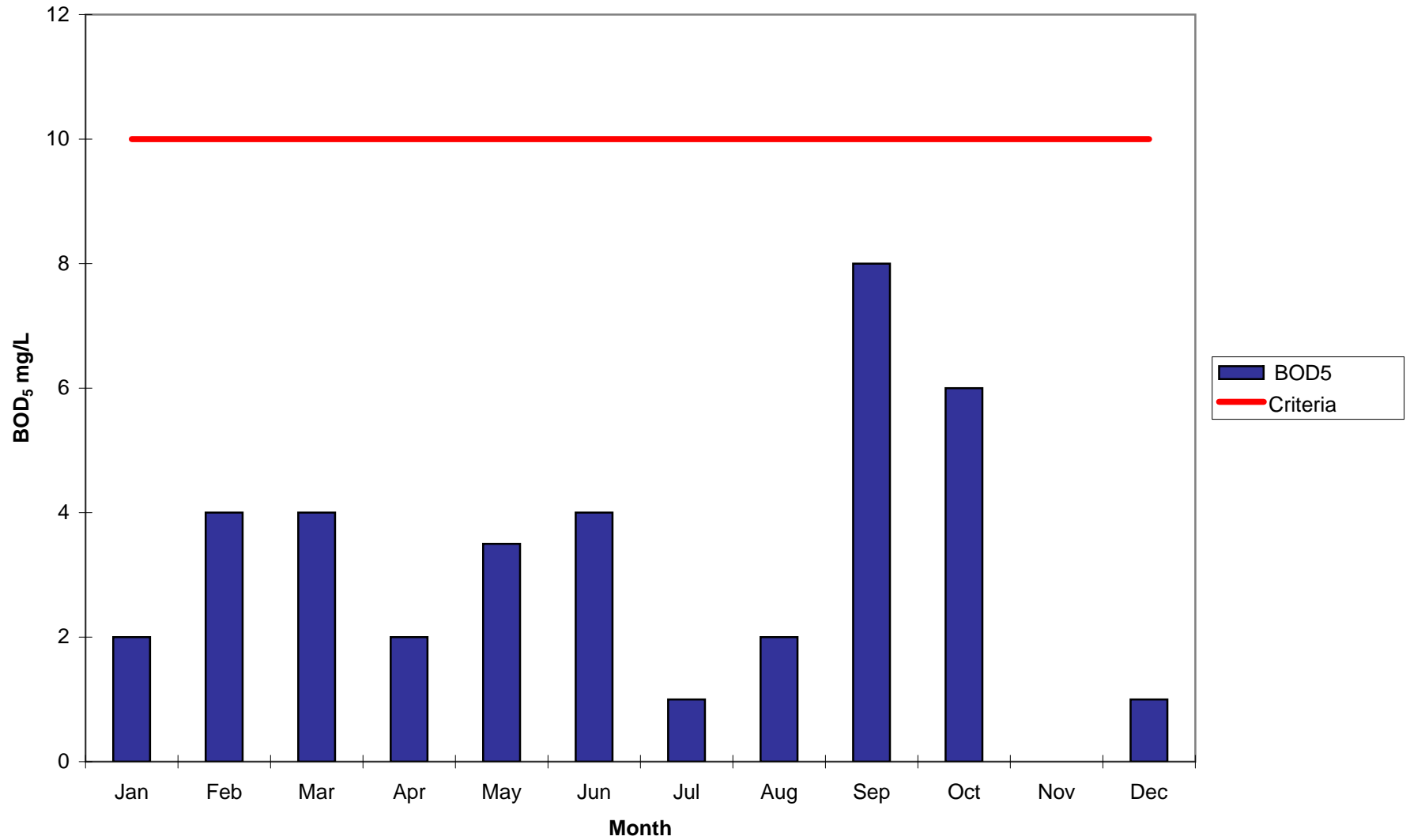
The following sewage collection system event was reported to the Spills Action Center; on December 11 2009, about 12 m3 of wastewater from the Norwich Sutton Street SPS overflowed for 16 minutes. Due to a control panel malfunction the pumps and the alarm device were non-operational. This has since been repaired and the alarm wired separately to avoid a similar event from occurring in future.

EXHIBIT 1

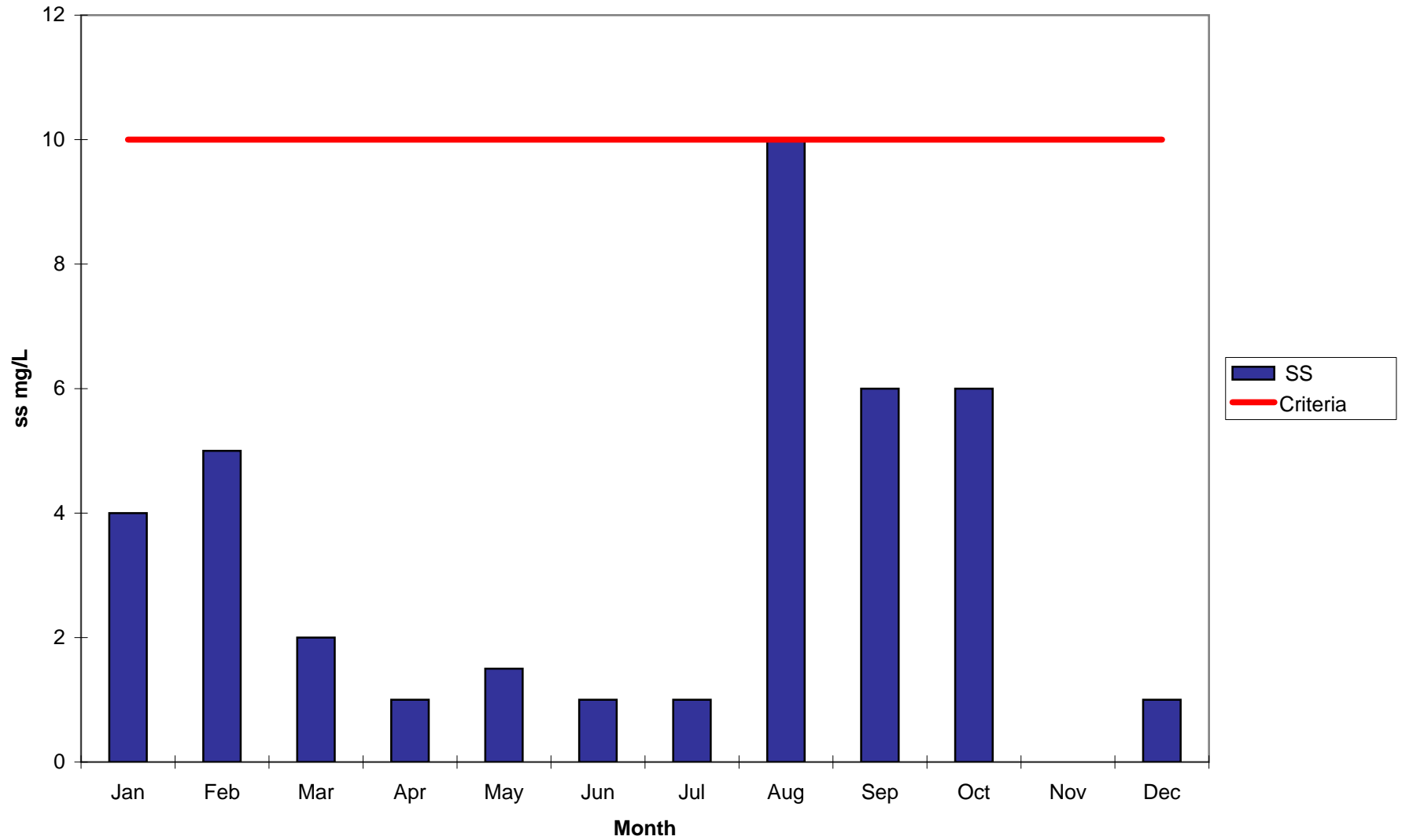
TABLE A	YEAR 2009	NORWICH LAGOONS			WORKS # 110001480															
LAGOON INFLUENT FLOW		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		ANNUAL	DESIGN CRITERIA	CofA Criteria	% Capacity		
TOTAL	1000m3	30.787	46.930	44.374	41.352	38.347	33.988	31.375	44.991	26.327	28.593	24.258	33.439	TOTAL	424.760					
AVERAGE DAILY FLOW	1000m3/d	0.993	1.676	1.431	1.378	1.237	1.133	1.012	1.451	0.878	0.922	0.809	1.079	AVERAGE DAILY FLOW	1.167		1.53	76.3%		
MAX. DAILY FLOW	1000m3/d	2.239	6.153	4.194	2.400	2.559	4.429	1.542	3.230	1.434	1.466	1.118	2.410	MAX. DAILY FLOW	6.153					
MIN. DAILY FLOW	1000m3/d	0.571	0.779	0.534	0.685	0.625	0.559	0.469	0.417	0.420	0.600	0.436	0.371	MIN. DAILY FLOW	0.371					
LAGOON INFLUENT RESULTS														ANNUAL AVERAGE		ANNUAL MAXIMUM	ANNUAL MINIMUM			
BOD	mg/L	131	208	142	126	197	156		112	128	151	259	140		159.1		259	112		
SS	mg/L	130	235	226	164	26	169		128	130	216	209	162		163.2		235	26		
AMMONIA	mg/L																			
TKN	mg/L	27.98	21.63	16.48	22.06	22.23	27.36	25.73	16.28	33.36	25.55	38.88	24.10		25.1		38.9	16.3		
NITRITE																				
NITRATE																				
TOTAL P.	mg/L	3.60	3.11	2.21	2.69	2.90	3.77	3.50	2.47	4.46	3.25	5.63	3.45		3.4		5.6	2.2		
H2S																				
pH		7.60	7.67	7.56	8.02	7.82	7.91	7.70	7.41	7.74	8.20	7.62	7.60		7.74		8.20	7.41		
LAGOON EFFLUENT FLOW														TOTAL ANNUAL FLOW	Monthly AVERAGE	DESIGN CRITERIA	CofA Criteria	CofA 236 day		
TOTAL	1000m3	55.420	80.749	26.280	85.47	89.851	31.509	28.814	50.872	55.104	29.604		36.105	569.774	51.798					
AVERAGE DAILY FLOW	1000m3/d	3.959	2.884	2.389	2.947	4.279	2.626	2.216	3.913	2.900	1.850		2.257		2.929					
MAX. DAILY FLOW	1000m3/d	5.601	3.426	3.097	3.903	8.065	3.698	5.432	5.058	3.245	2.475		4.313		4.392					
MIN. DAILY FLOW	1000m3/d	0.378	2.520	1.291	1.480	0.641	0.991	0.300	2.932	1.038	0.834		0.205		1.146					
LAGOON EFFLUENT RESULTS														Monthly AVERAGE	DISCHARGE CRITERIA	ANNUAL MAXIMUM	ANNUAL MINIMUM			
BOD ₅	BOD ₅	2	4	4	2.0	4	4.0	1	2	8.0	6		1		3.4	10	8	1.0		
SS	SS	4	5	2	1.0	1.5	1.0	1	10	6.0	6		1		3.5	10	10.0	1		
AMMONIA	AMMONIA	3.0	4.5	1.9	0.4	0.7	0.1	0.12	0.2929	0.095	0.15		3.69		1.4	3.0 non freezing & 5.0 freezing	4.5	0.06		
TKN	TKN																			
NITRITE	NITRITE																			
NITRATE	NITRATE																			
TOTAL P.	TOTAL P.	0.14	0.1667	0.16	0.10	0.26	0.31	0.41	0.37	0.49	0.65		0.37		0.31	0.5 non freezing & 1.0 freezing	0.65	0.10		
H2S	H2S																			
pH	pH	7.70	7.41	7.54	7.48	7.47	8.26	7.21	6.94	7.42	7.87		7.50		7.53	6.00-9.50	8.26	6.94		
E. Coli	E. Coli	3	25	29	8	8	1	13	30	14	46		3		16	200	46	1		
Temp.	Temp.	2.3	2.3	4.5	7.9	13.7	20.9	21.6	22.1	18.52	10.375		2.8		11.5		22.1	2.3		
D.O.	D.O.	10.2	9.6	8.1	7.8	6.1	8.0	6.0	4.5	4.83	7.8		11.4		7.7	(4.0)	11.4	4.5		

All results below method detection Limit (MDL) list at the MDL value.

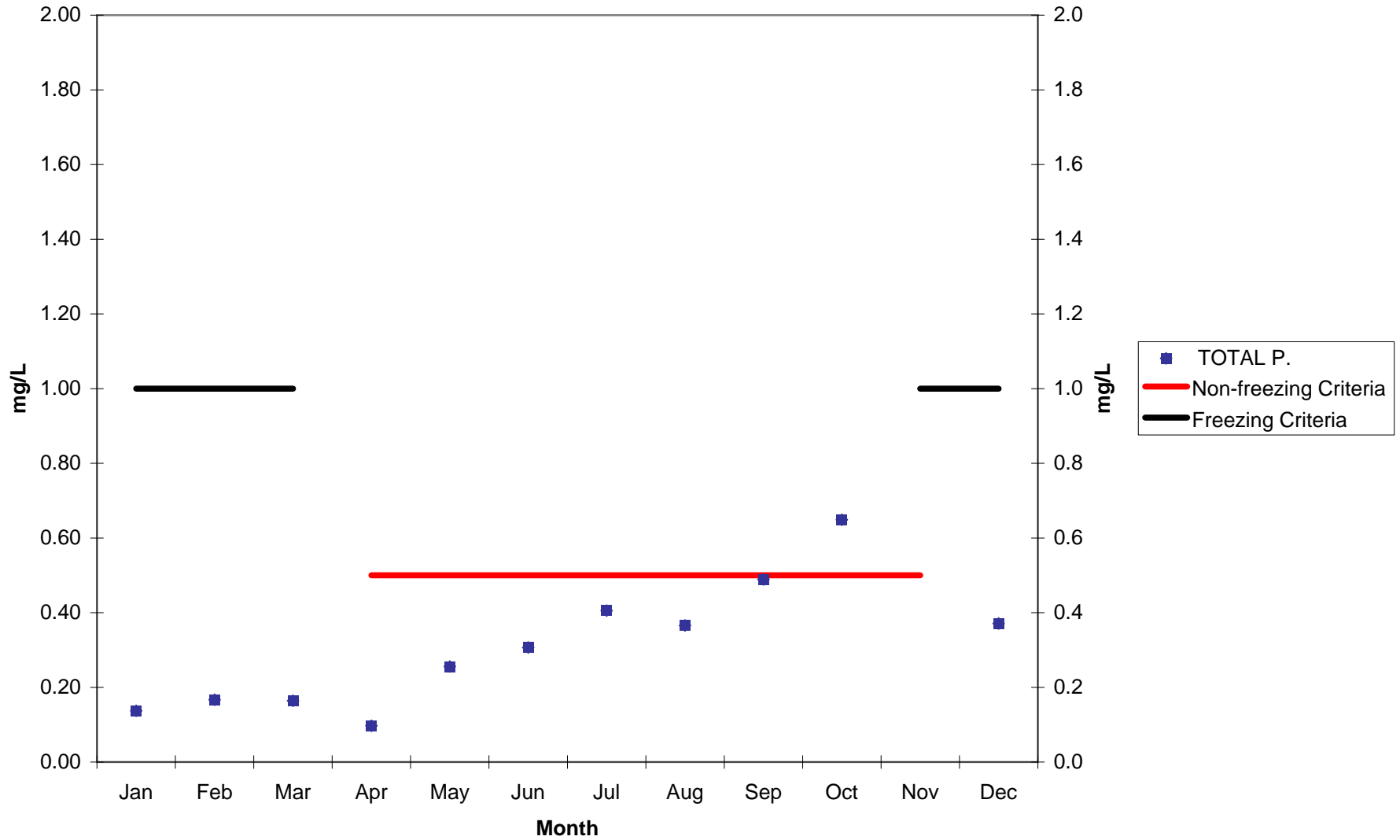
Norwich Lagoons Effluent Monthly Average BOD₅ mg/L 2009



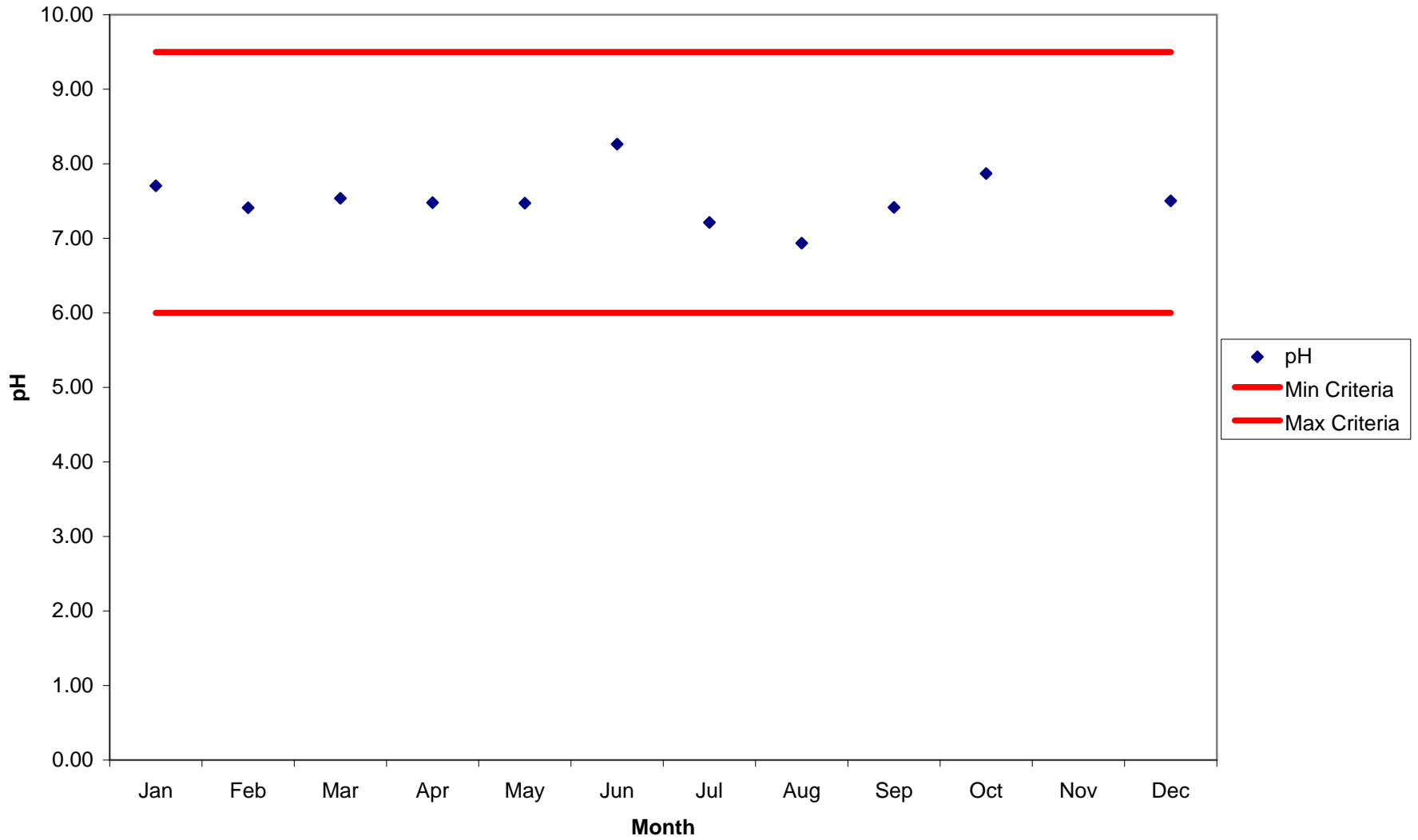
Norwich Lagoons Effluent Monthly Average SS mg/L vs Criteria 2009



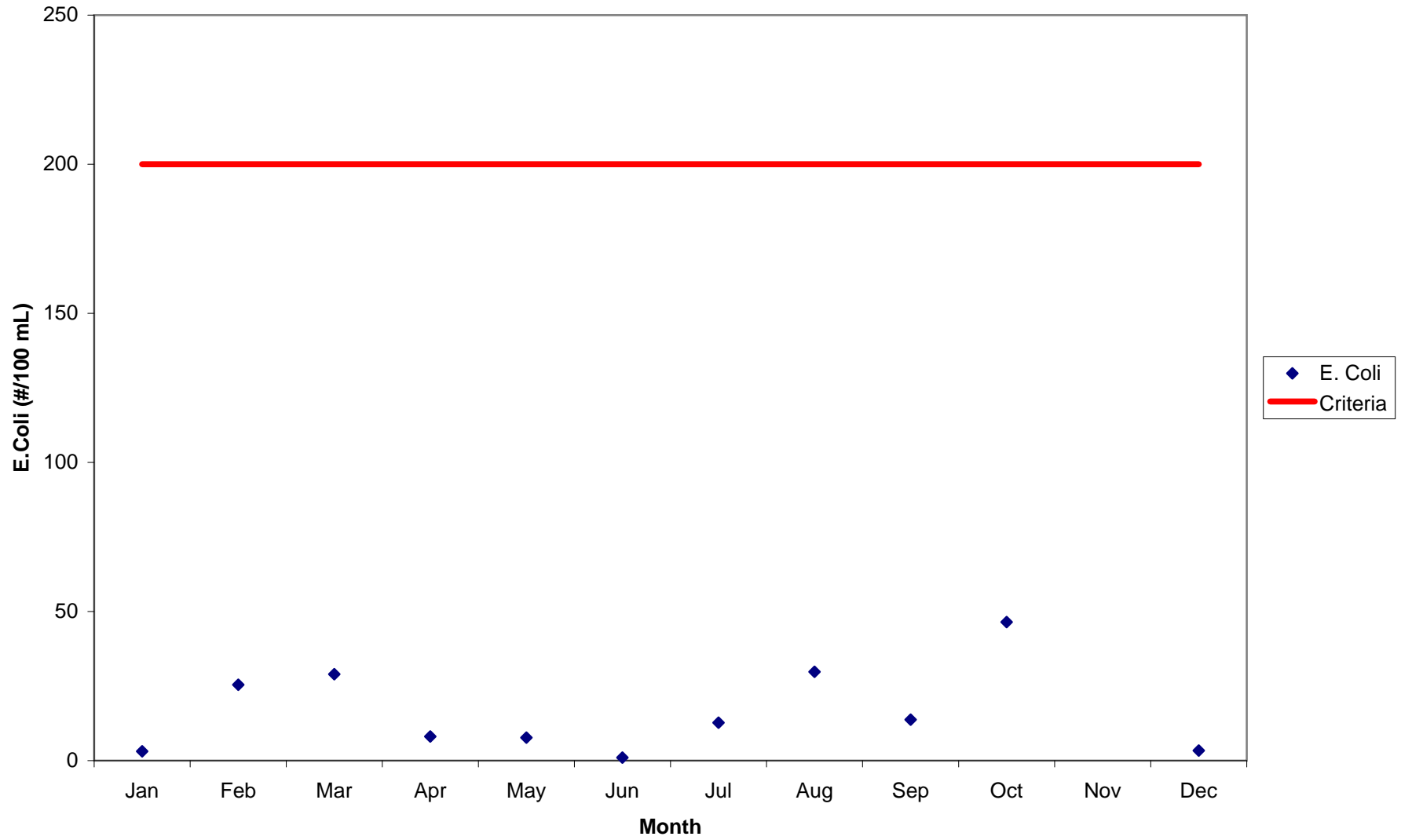
Norwich Lagoons Effluent Monthly Average TP mg/L vs Design 2009



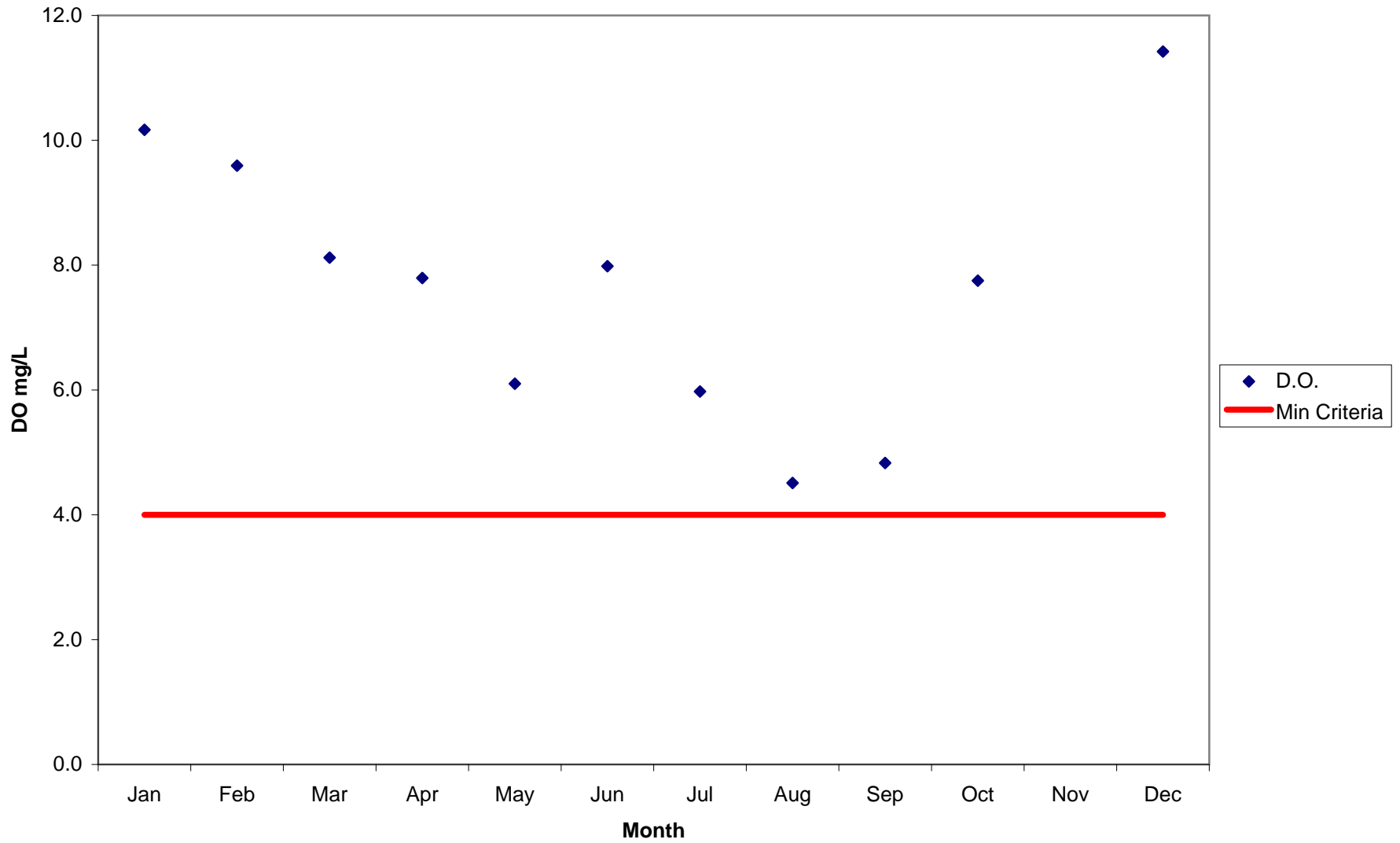
Norwich Effluent pH Vs Criteria 2009



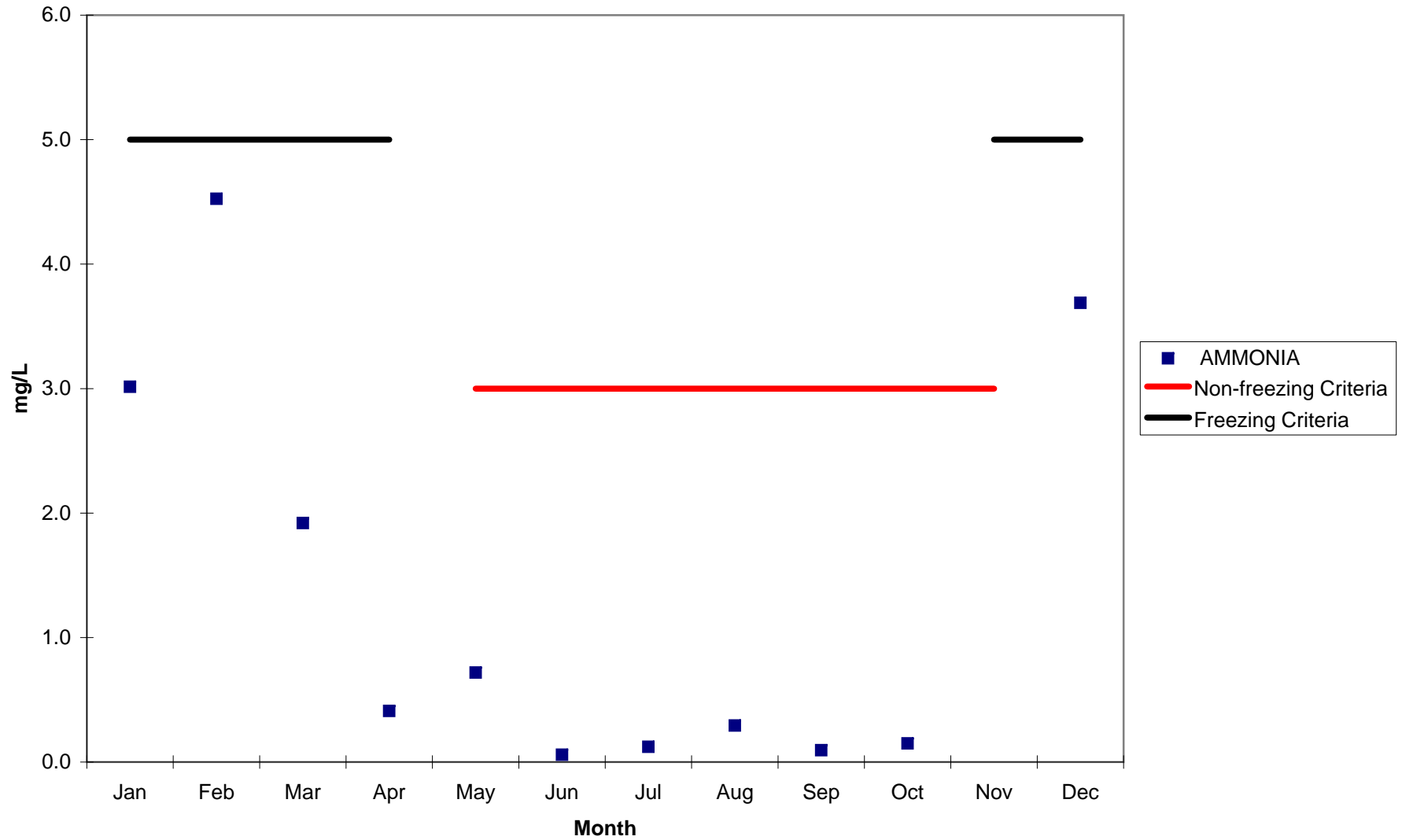
Norwich Efluent E.Coli Vs Criteria 2009



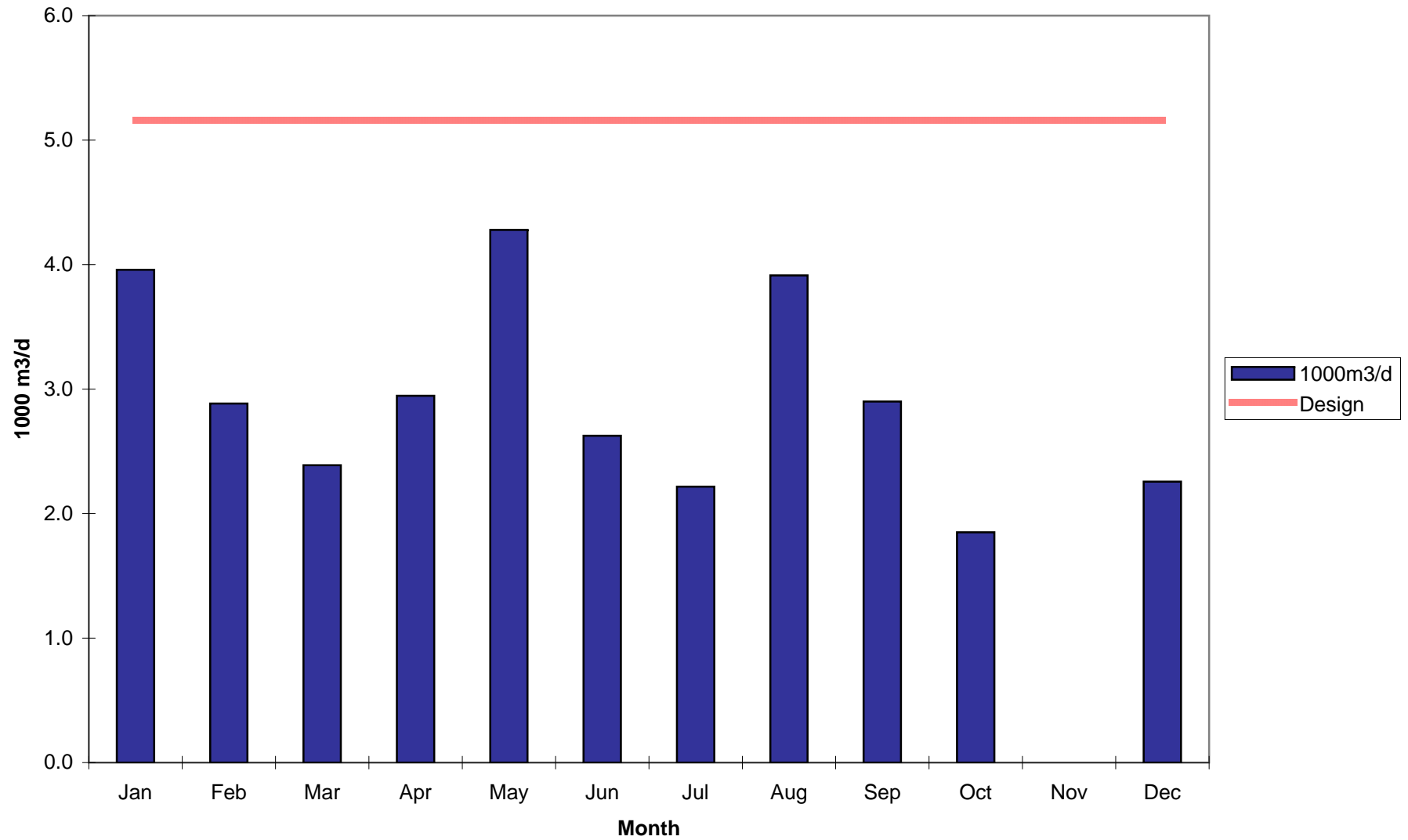
Norwich Effluent DO Vs Criteria 2009



Norwich Effluent Monthly Average Ammonia mg/L vs Criteria 2009



Norwich Average Daily Effluent Flow by Month vs Design Criteria 2009





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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

**RE: Year-End Monitoring Report 2009 for Mount Elgin
Wastewater Treatment Plant**
(Certificate of Approval # 4672-5EAGKD)

Attached is the monitoring report for 2009 for the Mount Elgin Wastewater Treatment Plant. This report is prepared as required by the certificate of approval # 4672-5EAGKD.

I trust this report fulfills the intent of the Certificate of Approval. If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

YEAR END MONITORING REPORT FOR 2009

This monitoring report is prepared for the Ministry of the Environment as part of the requirements of our certificate of approval (CofA # 4672-5EAGKD)

CONTENTS

- SAMPLING DESCRIPTION
- OVERVIEW OF MOUNT ELGIN WASTEWATER SYSTEM
- DISCUSSION OF RESULTS
- UPSET CONDITIONS 2009
- OTHER ACTIVITIES 2009
- EXHIBIT 1: INFLUENT & EFFLUENT SAMPLING SUMMARY - TABLE A

CONTAINS GRAPHS ILLUSTRATING THE FLOW AND
DISCHARGE RESULTS VS CRITERIA

SAMPLING DESCRIPTION

Grab samples were taken from the influent lift station, the minimum sampling frequency is quarterly and samples are tested for Carbonaceous Biochemical Oxygen Demand (CBOD), Suspended Solids (SS), Total Phosphorus (TP), and Total Kjeldahl Nitrogen (TKN).

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

OVERVIEW OF MOUNT ELGIN WASTEWATER TREATMENT SYSTEM

The Mount Elgin wastewater provided effective wastewater treatment in 2009. The average daily flow for 2009 was 17 m³/d. This represents 18 % of the design criteria of 95.25 m³/d.

The Septic Tank Effluent Gravity (STEG) system is one component of the overall sewage treatment system. In 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 main road at the entrance of the sewage treatment plant.

The primary treated effluent now becomes the raw influent to the sewage treatment system where it is pumped to recirculation tanks. The influent is then 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. The dosing tank is where the effluent sample is collected and is the tank that pumps to the shallow buried trench drain field that provides the subsurface discharge.

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 and operated by the County of Oxford and is supervised as one of nine plants. The maintenance is completed by the southern area staff. Detailed records on each piece of equipment are kept at the Ingersoll Wastewater Plant.

R&R Instrumentation Services did meter calibration on the influent meter; however estimating flow is permitted under the certificate of approval and was necessary as groundwater infiltration to the meter compartment disabled the equipment for long periods of time in 2009.

DISCUSSION OF RESULTS

Table A includes the average, maximum and minimum values for all influent, and effluent parameters. The table includes external test results and flow information.

The average annual Influent CBOD concentration to the plant was 88.9 mg/L. With an average flow of 17 m³/d, this corresponds to an average CBOD loading of 1.5 kg/d. The average annual Influent SS concentration to the plant was 51.6 mg/L. This corresponds to an average SS loading of 0.9 kg/d. The annual average TKN concentration was 55.7 mg/L. This corresponds to 0.95 kg/d. The annual average TP concentration was 7.0 mg/L. This corresponds to 0.12 kg/d.

The annual average Effluent CBOD concentration was 1.8 mg/L. This represents 98 % removal efficiency. The annual average SS concentration was 3.4 mg/L. This represents 93 % removal efficiency. The annual average Ammonia concentration was 0.8 mg/L. The annual average TP concentration was 6 mg/L. This represents a 14 % removal efficiency.

Please find the average, maximum, and minimum influent and effluent results calculated in Table A in Exhibit 1.

UPSET CONDITIONS 2009

There were no upset conditions in 2009.

OTHER ACTIVITIES 2009

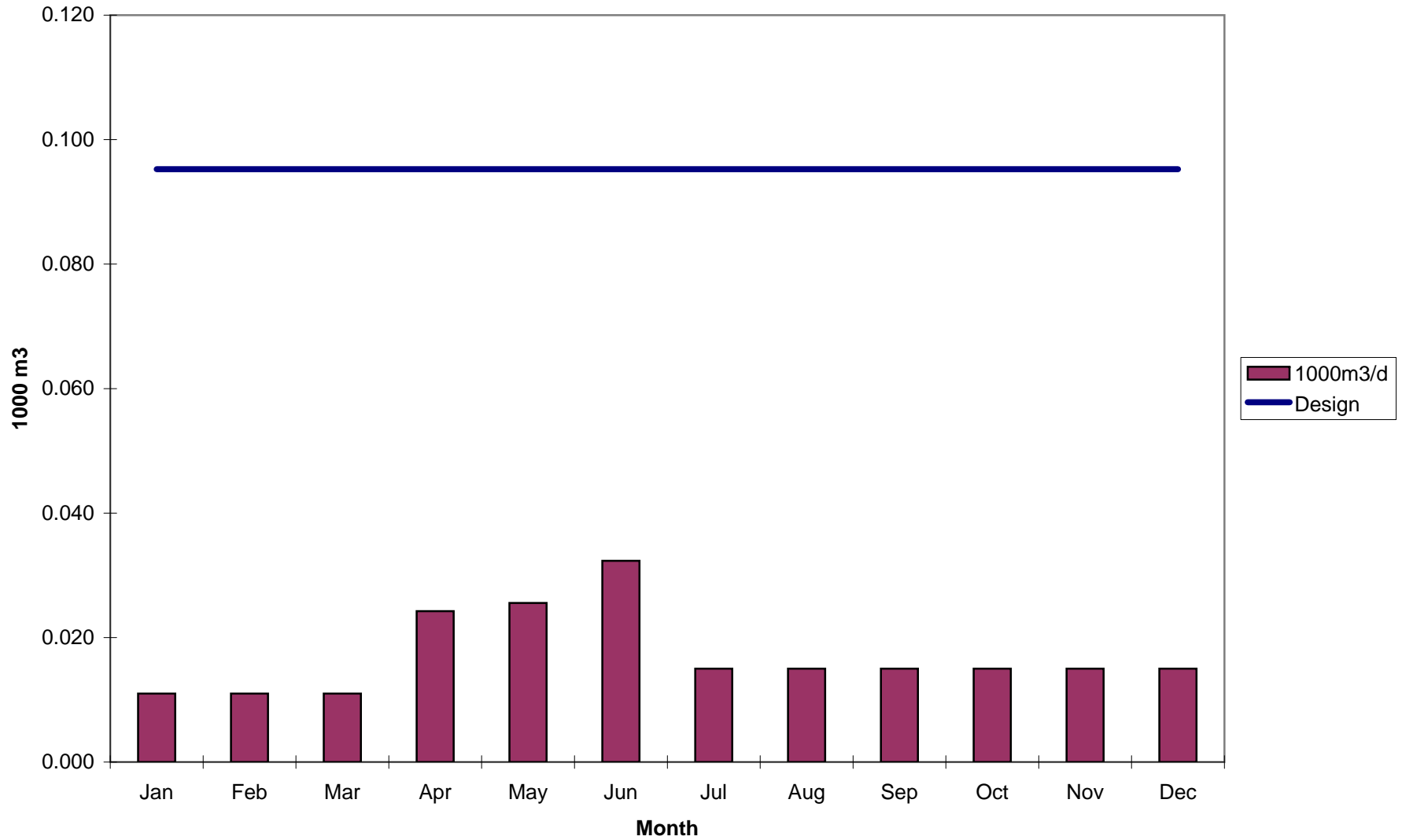
There were no alterations or changes in operation for 2009.

EXHIBIT 1

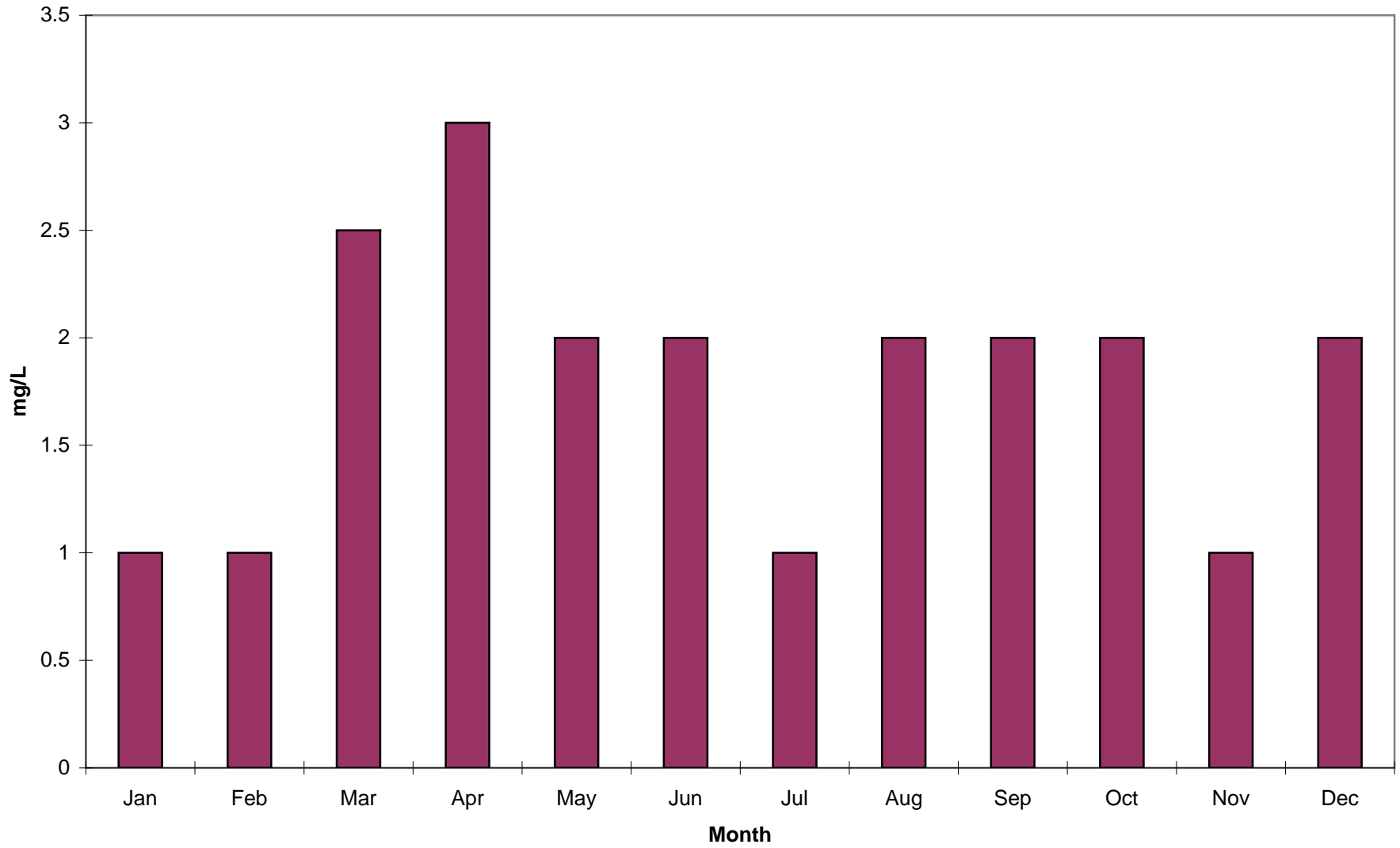
TABLE A	YEAR 2009	Mount Elgin Wastewater	WORKS # 120002870															
INFLUENT FLOW														AVERAGE		DESIGN CRITERIA	DESIGN CRITERIA	
																Phase 1	All Phases	
TOTAL	1000m3	0.330	0.294	0.330	0.727	0.792	0.970	0.465	0.465	0.450	0.465	0.450	0.465	TOTAL	6.203			
AVERAGE DAILY FLOW	1000m3/d	0.011	0.011	0.011	0.024	0.026	0.032	0.015	0.015	0.015	0.015	0.015	0.015	AVERAGE DAILY FLOW	0.017	0.09525	0.381	
MAX. DAILY FLOW	1000m3/d	0.011	0.011	0.011	0.027	0.027	0.048	0.015	0.015	0.015	0.015	0.015	0.015	MAX. DAILY FLOW	0.048			
INFLUENT RESULTS														AVERAGE		Results MAXIMUM	Results MINIMUM	
CBOD	mg/L	94	31	60	87	90	96	109	110	121	116	108	45		88.9		121	31
SS	mg/L	40	23	23	53	26	43	45	63	90	63	61	89		51.6		90	23
TKN	mg/L	62	25	36	48	75	53	66.3	70	64	65	65	39		55.7		74.9	25.2
TOTAL P.	mg/L	7.90	3.69	4.53	3.44	7.02	8.46	9.23	9.33	7.72	8.36	8.75	4.98		7.0		9.33	3.44
pH		7.58	7.23	7.37	7.28	7.36	7.84	7.28	7.33	7.31	7.38	7.55	7.35		7.4		7.84	7.23
GROUNDWATER														AVERAGE				
pH				7.44		7.43				7.693					7.521			
Nitrates	mg/L			0.05		0.05				0.025					0.043			
Nitrites	mg/L			0.03		0.03				0.030					0.030			
EFFLUENT TO DRAIN FIELD RESULTS														AVERAGE		Results MAXIMUM	Results MINIMUM	
CBOD	mg/L	1	1	2.5	3.0	2	2.0	1	2	2.0	2	1	2		1.8		3	1.0
SS	mg/L	1.5	1.0	2.5	2.5	11	3.0	2	3	3.0	8	1	2		3.4		11	1.0
Ammonia	mg/L	1.1	0.05	0.7	0.25	0.40	0.30	1.3	0.50	0.5	0.50	1.10	2.40		0.8		2.4	0.1
TKN	mg/L	1.13	0.6	1.1	1.3	1.1	0.25	1.3	1.3	1.6	0.6	1.8	2.5		1.2		2.5	0.3
Total P.	mg/L	4.3	2.2	3.6	5.9	6.5	6.5	8.0	6.5	7.4	6.9	7.17	7.04		6.0		7.99	2.2
pH		7.31	6.98	6.98	7.06	7.03	7.72	7.14	7.19	7.14	7.29	7.23	7.015		7.2		7.72	7.0
E. coli	#/100 ml	420	200	493	350	107	39	68	125	32	67	162			187.5		493	32.0
NITRATES	mg/L	27.2	14.9	22.1	26.3	22.8	22.7	20.4	17.6	18.4	23.7	23.8	27		22.2		27.2	14.9
NITRITES	mg/L	0.16	0.06	0.05	0.1	0.1	0.1	0.4	0.16	0.14	0.1	0.2	0.12		0.1		0.36	0.1

All results below method detection Limit (MDL) listed at the MDL value.

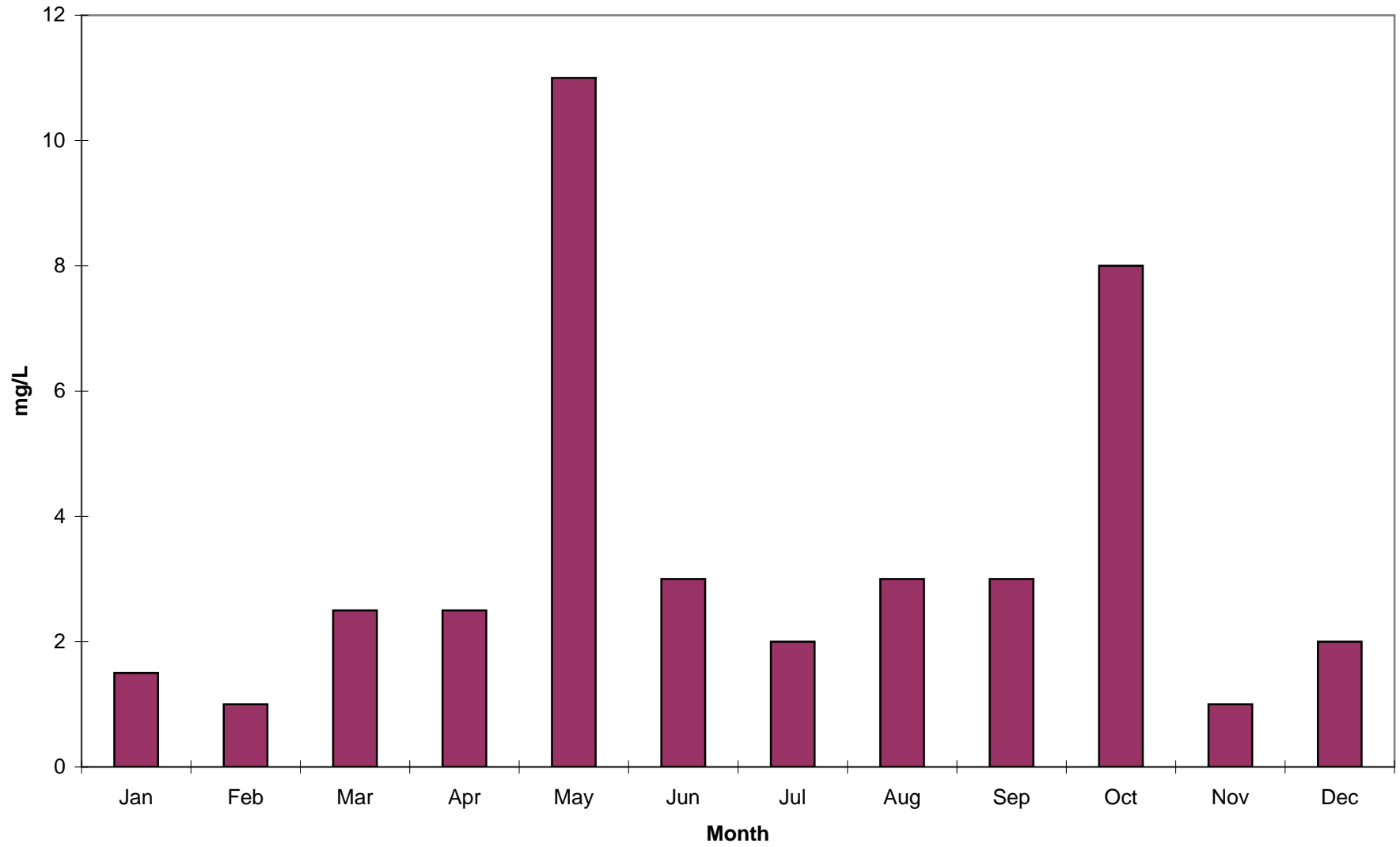
Mount Elgin Average Daily Flow vs Design 2009



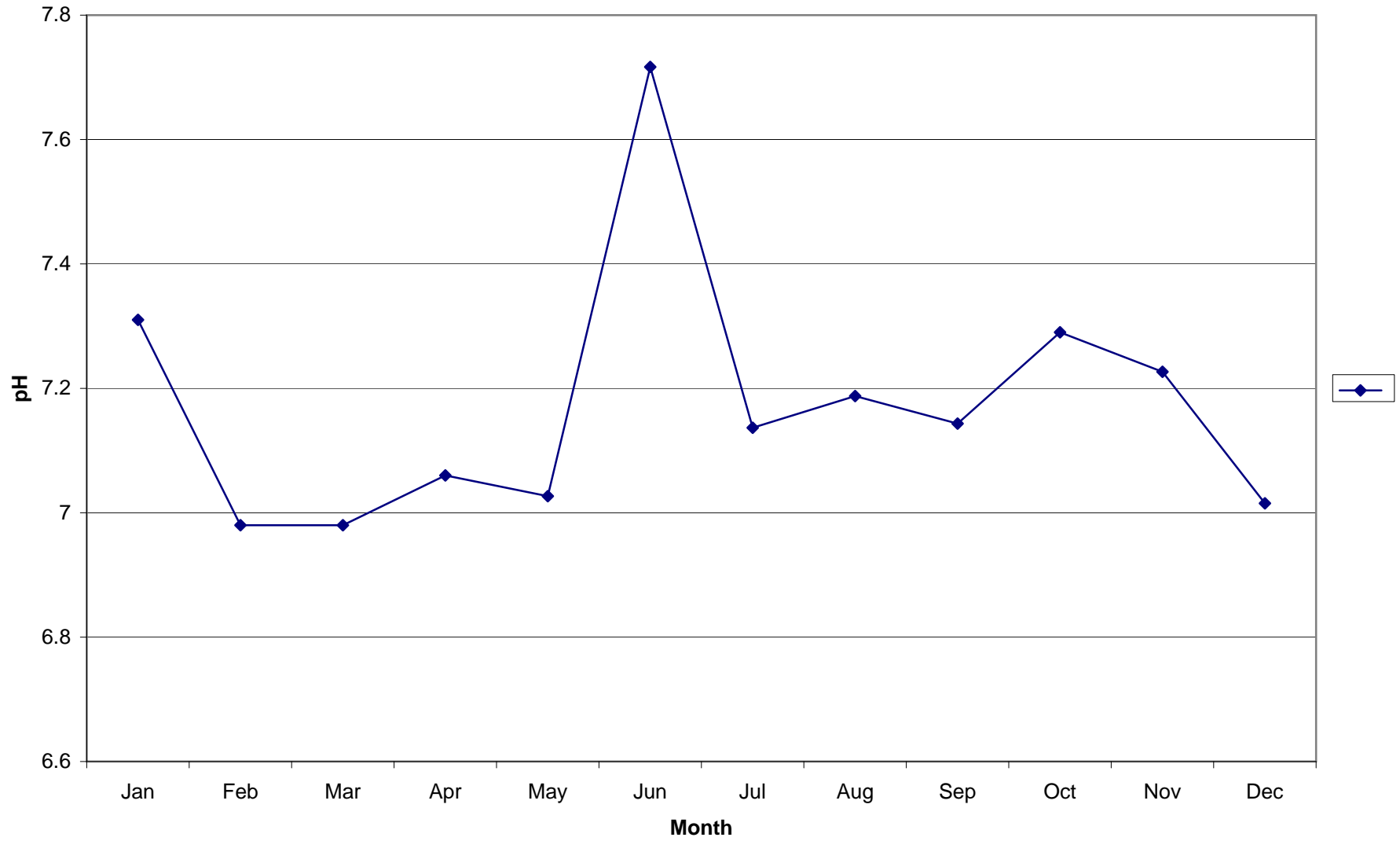
Mount Elgin Effluent to Drain Field CBOD mg/L



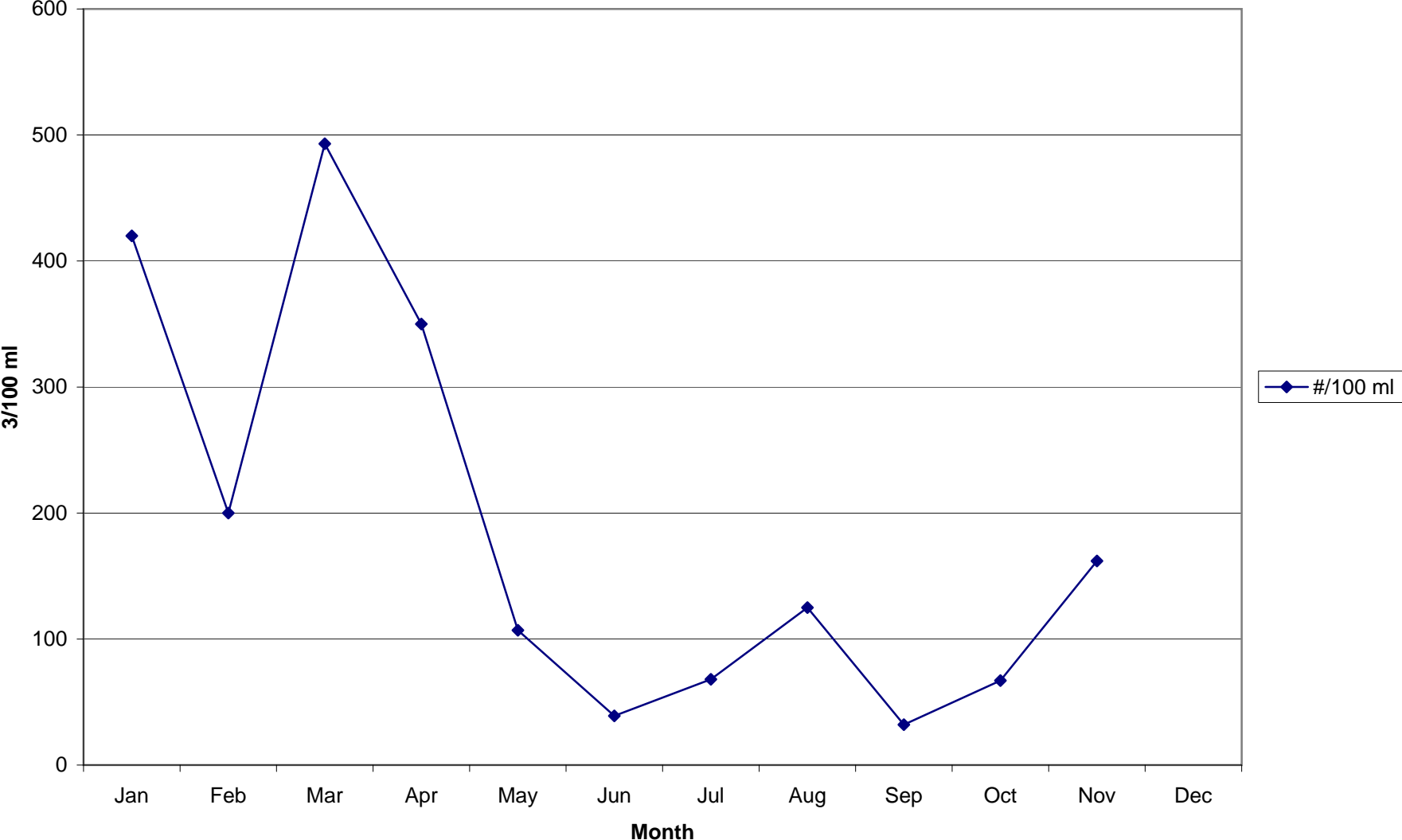
Mount Elgin Effluent to Drain Field SS mg/L



pH Effluent 2008



E. coli #/100 ml





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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

RE: Year-End Report Tavistock Lagoon 2009
(Certificate of Approval #8316-6JSJF)

This year-end report is prepared as required by the certificate of approval #8316-6JSJF.

I trust this report fulfills the intent of the Certificate of Approval. If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

Overview

The Tavistock Lagoon System provided effective wastewater treatment in 2009 and all effluent concentration limits as specified by the certificate of approval are met on a monthly basis. The annual average daily flow of 1636 m³/ day was 79 % of the design capacity of 2070 m³/ day.

Project Description

The Tavistock Wastewater Treatment Plant began operation in its present configuration in 1988. The facility consists of three facultative lagoons equipped with Mat Aerators in all three cells and continuous Aluminum Sulphate addition for phosphorus removal. Wastewater is pumped to the treatment plant from two pumping stations in the collection system. The wastewater is dosed with aluminum sulphate as it enters cell #1 and as the flow enters cell #2. Any two of the three existing rotary positive displacement blowers provide air into cell #1 and cell #2. Effluent from cell #1 overflows to cell #2 then into cell #3 where it is stored until discharge from November 1 to April 30. Again this year a one-time amendment was issued to the CofA allowing for an early release covering the period July to October. This was necessary due to high influent organic loadings effecting ammonia removal and our inability to hold the wastewater to a November release.

Six 15 hp aspirating surface aerators are used in addition to provide the necessary dissolved oxygen for the lagoons.

The County of Oxford operates the facility, utilizing the staff located at the Woodstock Wastewater Treatment Plant.

Plant Specifications

Facilities - Three Facultative Lagoons
Design Capacity - 2070 m³/day
Peak Capacity - 7556 m³/day
Average Daily Flow - 1636 m³/day
Receiving Stream - Thames River via Hohner Drain
Plant Classification - WWT – I
Certificate(s) of Approval 8316-6jSJJF
Effluent requirements:
CBOD 25.0 mg/L
Suspended Solids 25.0 mg/L
Total Phosphorous 1.0 mg/L
Dissolved Oxygen >4.0

Free Ammonia

(Jan. & Feb.)	8.6 mg/L	(Mar.)	4.5 mg/L
(Apr.)	2.0 mg/L	(Nov.)	2.3 mg/L
(Dec.)	6.8 mg/L		

During the period of May 1 to October 31, no effluent is to be discharged to the receiving stream without prior written consent of the Director of MOE, Southwestern Region. A letter from the Manager of the London District Office of the MOE was received, allowing discharge from August to October 2009 but limiting volumes and with additional limits on discharge criteria.

Sampling Procedures

Raw Sewage is sampled a minimum of once monthly and tested for BOD₅, 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 provide a significant loading on the Tavistock Lagoon system and is under a surcharge agreement with Oxford County.

Grab samples of final effluent is taken weekly during effluent discharge and tested for BOD₅, suspended solids, total phosphorous, pH, temperature, TKN and free ammonia. Un-ionized ammonia and E.Coli were also included under the amendment. SGS Lakefield Research Ltd. perform all sample analyses. A detailed summary of monthly raw sewage and final effluent analysis is provided in this report, please see Exhibit 1.

Flows

The total Influent flow treated in 2009 was 596 762 m³. The average daily flow of 1636 m³/day was 79 % of the design capacity of 2070 m³/day.

Plant treated effluent volume of 995 483 m³ was released in 2009, this represents everything that came in during 2009 and a reduction in our inventory of wastewater within cell #3 and cell #2, effectively draining them to their lowest level.

Raw Sewage Quality

The annual average raw sewage CBOD concentration to the plant was 285 mg/L. This corresponds to an average CBOD loading of 466 kg/day. The average suspended solids loading was 298 mg/L or 488 kg/day. The annual raw sewage nitrogen levels as TKN were 25 mg/L or a loading of 41 kg/day. Phosphorous levels averaged 8 mg/L, which correspond to 13 kg/day.

Plant Performance & Effluent Quality

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

The annual CBOD concentration was 3.6 mg/L with a removal efficiency of 99 %. The annual suspended solids concentration was 4 mg/L with a removal efficiency of 99 %. The annual average TKN concentration was 1.19 mg/L with removal efficiency of 95.2 %. The annual total phosphorous level was 0.04 mg/L, which represents a removal efficiency of 99.5 %.

For compliance purposes, annual average concentrations are based only on data from the effluent discharge period, while raw sewage flows for the entire year are used to assess loading and hydraulic capacity.

All pH is measured in the Effluent by the operator a minimum of weekly during discharge and there was no single sample outside our range of 6-9.5 for 2009. The Tavistock Lagoon System was operating within its discharge criteria for 2009.

Bypassing and Abnormal Conditions

There were no spills or bypasses of the wastewater lagoons in 2009.

Maintenance and Calibration Activities

Regularly scheduled maintenance of the lagoon equipment is conducted by the operating and maintenance staff of the Woodstock WWTP. Detailed maintenance records are kept on file at the Woodstock Plant.

R & R Instrumentation calibrated all flow measuring equipment.

Summary and Recommendations

The Tavistock Wastewater Treatment Plant performed within its discharge criteria in 2009 despite the heavy loading that exists from the major cheese factory in town.

Design of an upgraded lagoon system is under way in 2009 as indicated by an already completed class environmental assessment. Construction is anticipated in 2010/2011.

MISCELLANEOUS

Although not required under the Tavistock Lagoon CofA the following sewage collection system event was reported to the Spills Action Center; that on February 11th, 2009 about 92.4 m³ of wastewater overflowed the William Street SPS for 6 hours and 25 minutes. Due to unusually excessive runoff from a snow melt and simultaneous rain event the pumping station was unable to keep up with the inflow. A new sewage lift station is under design to help reduce the impact of future episodes.

EXHIBIT 1

Tavistock Influent Data 2009

																Special Permit
																July-Oct.
		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	AVE.	Criteria
Total Raw	1000 m3	37.92	48.87	61.63	62.49	54.18	49.88	47.87	48.05	41.50	49.16	43.24	51.98	596.762	49.730	
Average Monthly Influent Flow	1000 m3/d	1.22	1.75	1.99	2.08	1.75	1.66	1.54	1.55	1.38	1.59	1.44	1.68		1.636	2.07
Max Raw	1000 m3/d	1.68	6.64	3.91	3.45	3.37	2.24	1.81	2.01	1.88	2.29	1.68	2.26		2.770	
Min Raw	1000 m3/d	0.86	1.05	1.45	1.39	0.76	1.20	1.04	0.93	1.00	1.22	1.10	1.31		1.110	
Cheese Total	1000 m3	17.60	15.17	16.34	17.57	15.76	18.76	20.48	17.7	17.04	17.25	16.00	17.47	207.172	17.26	
Cheese Average	1000 m3/d	0.57	0.54	0.53	0.59	0.51	0.63	0.66	0.57	0.57	0.56	0.53	0.56		0.57	
Cheese Max	1000 m3/d	0.73	0.68	0.73	0.70	0.71	0.92	0.90	0.85	0.89	1.00	0.72	0.83		0.80	
Cheese Min	10070m3/d	0.33	0.34	0.23	0.26	0.20	0.23	0.24	0.23	0.21	0.23	0.19	0.20		0.24	
Effluent Total	1000 m3	428.68							84.26	73.71	104.72	142.40	161.72	995.483	165.91	46.5-108
Effluent Average	1000 m3/d	13.83							3.01	4.91	6.55	4.91	5.22		6.40	
Effluent Max	1000 m3/d	18.41							11.24	8.37	11.91	7.05	9.86		11.14	
Effluent Min	1000 m3/d	0.00							1.83	0.00	0.94	3.78	2.23		1.46	

Tavistock Cheese Influent

BOD	mg/L	763	974	917.8	1081	1217.50	1090	674.8	621.5	806.4	657.67	851	836		874	
SS	mg/L	397	326	323	188	290.50	299	463	238.25	254.8	230.00	285.25	232.75		294	
AMMONIA	mg/L	7.6	9.075	10.2	8.20	9.70		10.4	12.65	13.88	10.57	9.05	9.05		10	
TKN	mg/L	53	56.4	59.44	38.20	87.95		59.5	51.575	58.08	47.13	60.35	50.075		57	
NITRITE	mg/L	0.3	0.6475	8.32	11.47	13.9125	1.058	3.322	3.855	0.172	12.52	14.85	6.44		6	
NITRATE	mg/L	49.5	32.9	26.202	14.30	0.05	0.17	0.05	0.05	0.14	0.05	0.05	19.1375		12	
TOTAL P.	mg/L	31	29.25	21.66	20.50	27.95	25.70	20.54	21.8	21.78	18.33	21.875	23.85		24	
pH	mg/L	9.71	9.83	8.92	7.83	6.25	6.55	7.1	7.14	7.00	6.77	6.83	7.59		8	

Tavistock Lagoon Influent

	mg/ L															
CBOD	mg/ L	346	315	202	293	302	264	285	272	380	280	259	229.00		285.42	
SS	mg/ L	379	271	176	331	323	229	421	294	352	280	210	311.5		298.0	
AMMONIA	mg/ L	19.4	13	8	12	16	16	16	18	16	16	10	16		15	
TKN	mg/L	29	21.2	14.2	25.8	24.9	24	36.8	24.0	31.9	23.8	21.7	25.9		25.2	
NITRITE	mg/L	1.2	0.8	1.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9		0	
NITRATE	mg/L	0.1	1.8	2.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.8		1	
TOTAL P.	mg/L	11	7	4	11	6	5	12	6	8	7	11	11		8	
pH		7.78	7.56	7.64	7.31	7.21	7.01	7.22	7.01	7.11	7	7	7		7	
Temperature (celcius)		9.9	10.6	10.1	13.8	17.9	21.5	19.3	20.2	19.0	14.9	16.2	11.0		15.4	

Tavistock Lagoon Effluent													TOTAL	AVE.	Criteria	Special Permit July-Oct.	
CBOD	mg/ L	4.3							4.0	4.0	4.0	2.0	3.2		3.58	25	10
SS	mg/ L	6.0							3.8	2.0	4.0	2.3	4.6		4	25	20
AMMONIA	mg/ L	1.85							0.175	0.1	0.13	0.18	0.24		0.45	2.0-8.6	2
TKN	mg/L	2.9							0.8	1.1	0.7	0.9	0.82		1.19		
NITRITE	mg/L	0.1							0.1	0.1	0.1	0.1	0.1		0.1		
NITRATE	mg/L	1.7							1.4	0.9	0.4	0.6	1.0		1.0		
TOTAL P.	mg/L	0.09							0.04	0.03	0.03	0.05	0.03		0.04	1.00	0.5
pH		8.16							8.35	8.42	8.09	8.07	8.20		8.22		
E. Coli		11							27	4	59	4	4		18		200
Temp.	Celcius	2.89							20.29	18.76	10.02	8.92	4.39		10.88		
D.O.	mg/L	8.2							8.3	8.5	8.0	8.0	8.2		8.2	(4.0)	
Un-ion'd Ammonia	mg/L								0.011	0.004	0.005				0.007		0.1

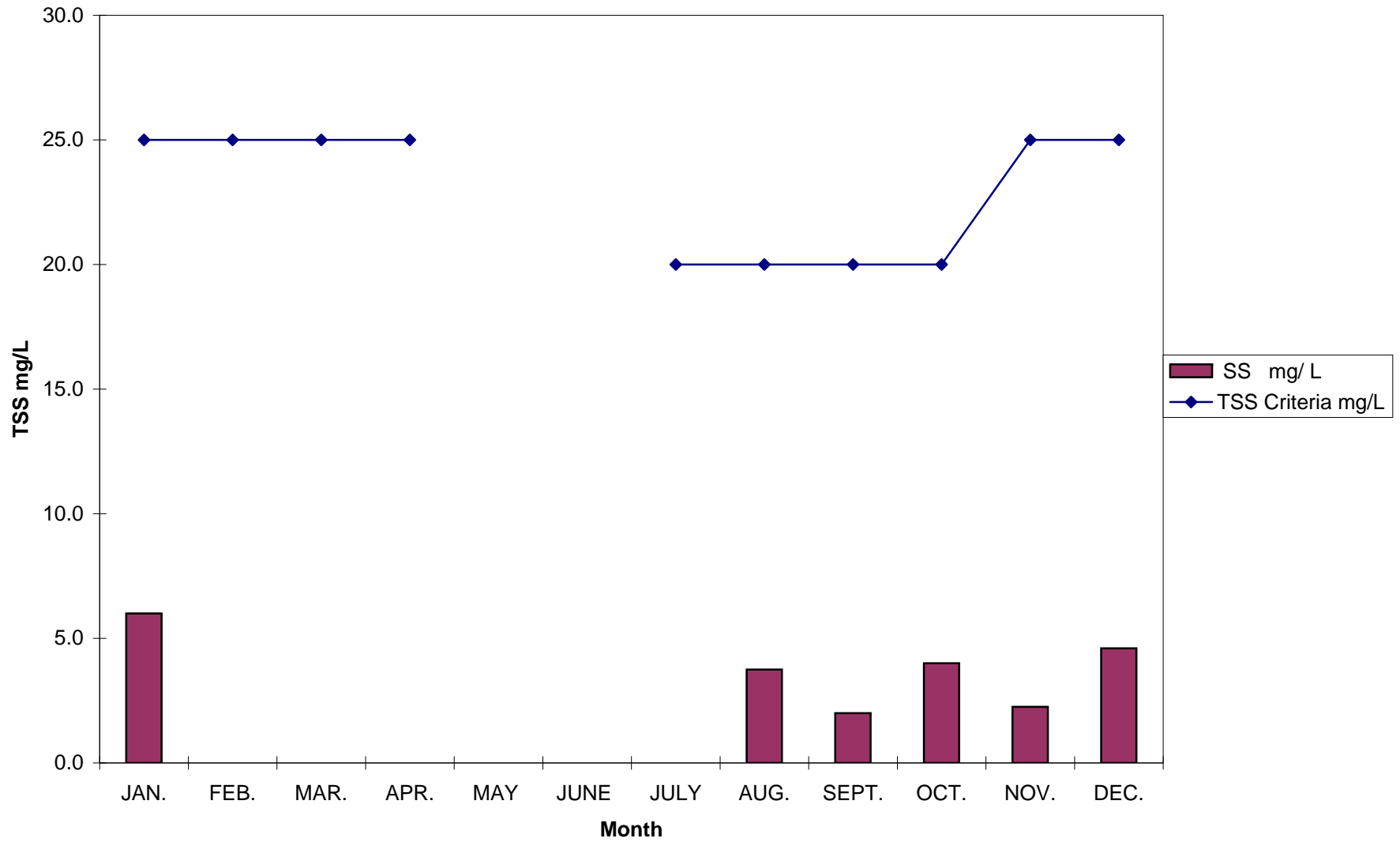
Criteria per Month

		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
CBOD Criteria	mg/ L	25	25	25	25			10	10	10	10	25	25
TSS Criteria	mg/L	25	25	25	25			20	20	20	20	25	25
P. Tot. Criteria	mg/L	1	1	1	1			0.5	0.5	0.5	0.5	1	1
NH3-N Criteria	mg/L	8.6	8.6	4.5	2			2	2	2	2	2.3	6.8
DO	mg/L	4	4	4	4							4	4
Influent Flow Criteria	1000m3/d	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07
al Average Daily Influent	1000 m3/d	1.636	1.636	1.636	1.636	1.636	1.636	1.636	1.636	1.636	1.636	1.636	1.636
Un-ion'd Ammonia Criteria	mg/L							0.1	0.1	0.1	0.1		
E.Coli Criteria	#/100 ml							200	200	200	200		
Effluent Flow	1000m3/d							46.5	46.5	75	108		
CBOD	mg/L	25	25	25	25	25	25	25	25	25	25	25	25

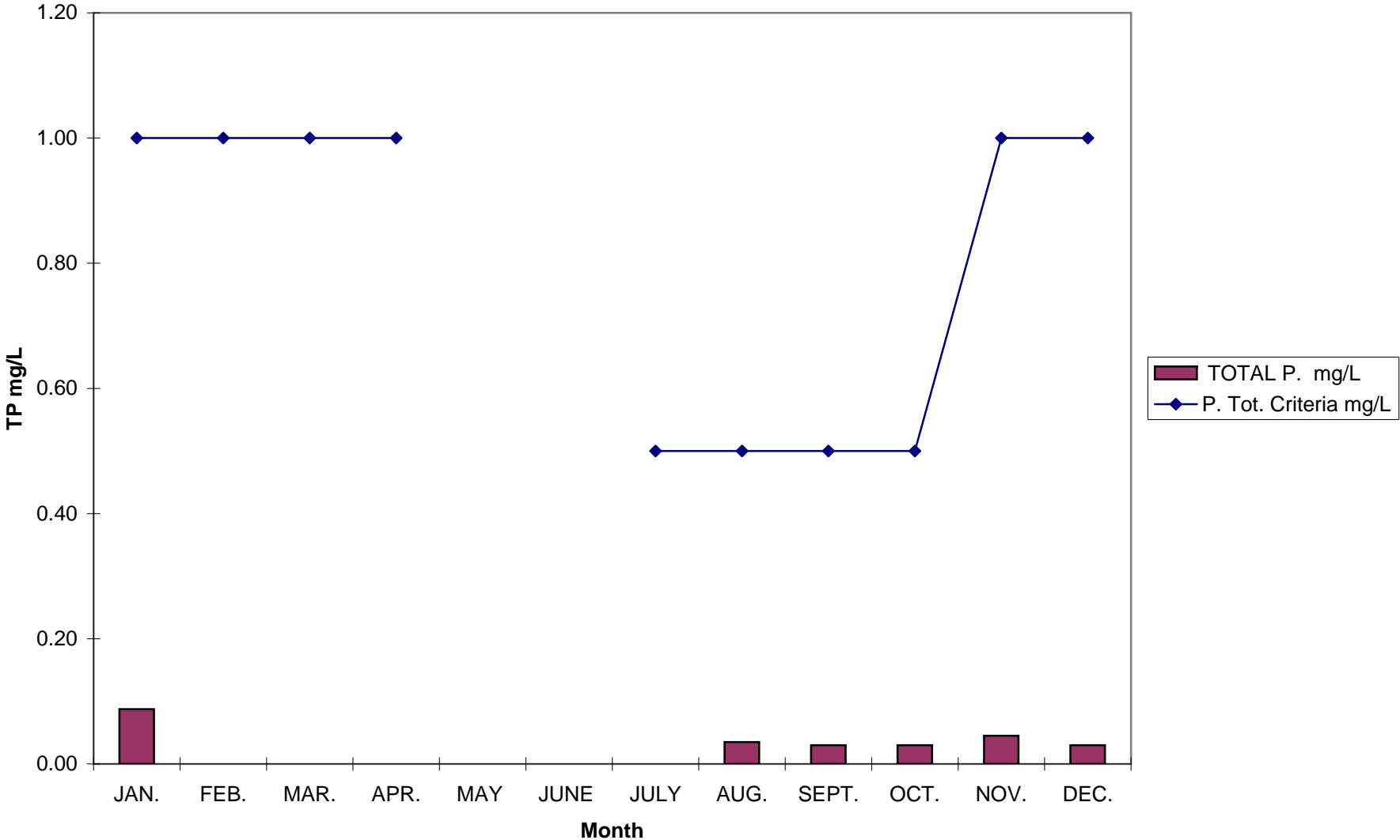
Tavistock Influent Loading kg/d 2009

		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVE.
BOD Loading	kg/d	423	550	402	609	527	439	441	421	525	443	373	384	461
TSS Loading	kg/d	464	472	350	688	564	381	650	456	487	443	303	522	482
Cheese BOD Loading	kg/d	433	528	484	633	619	682	446	356	458	366	454	471	494
Cheese TS Loading	kg/d	225	177	170	110	148	187	306	136	145	128	152	131	168
Cheese TKN Loading	kg/d	30	31	31	22	45		39	30	33	26	32	28	32
Cheese TP Loading	kg/d	18	16	11	12	14	16	14	12	12	10	12	13	13

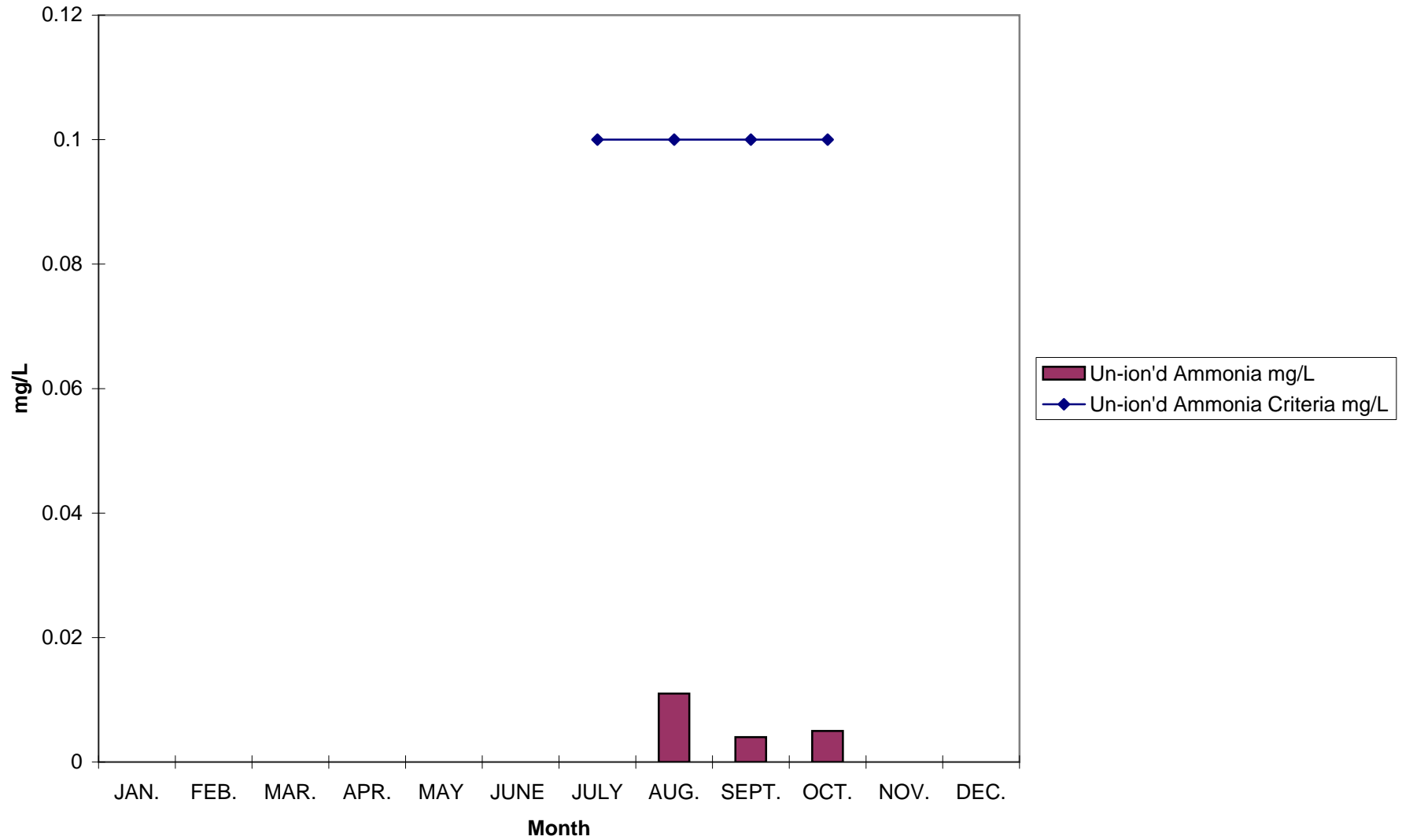
Tavistock TSS vs Discharge Criteria 2009



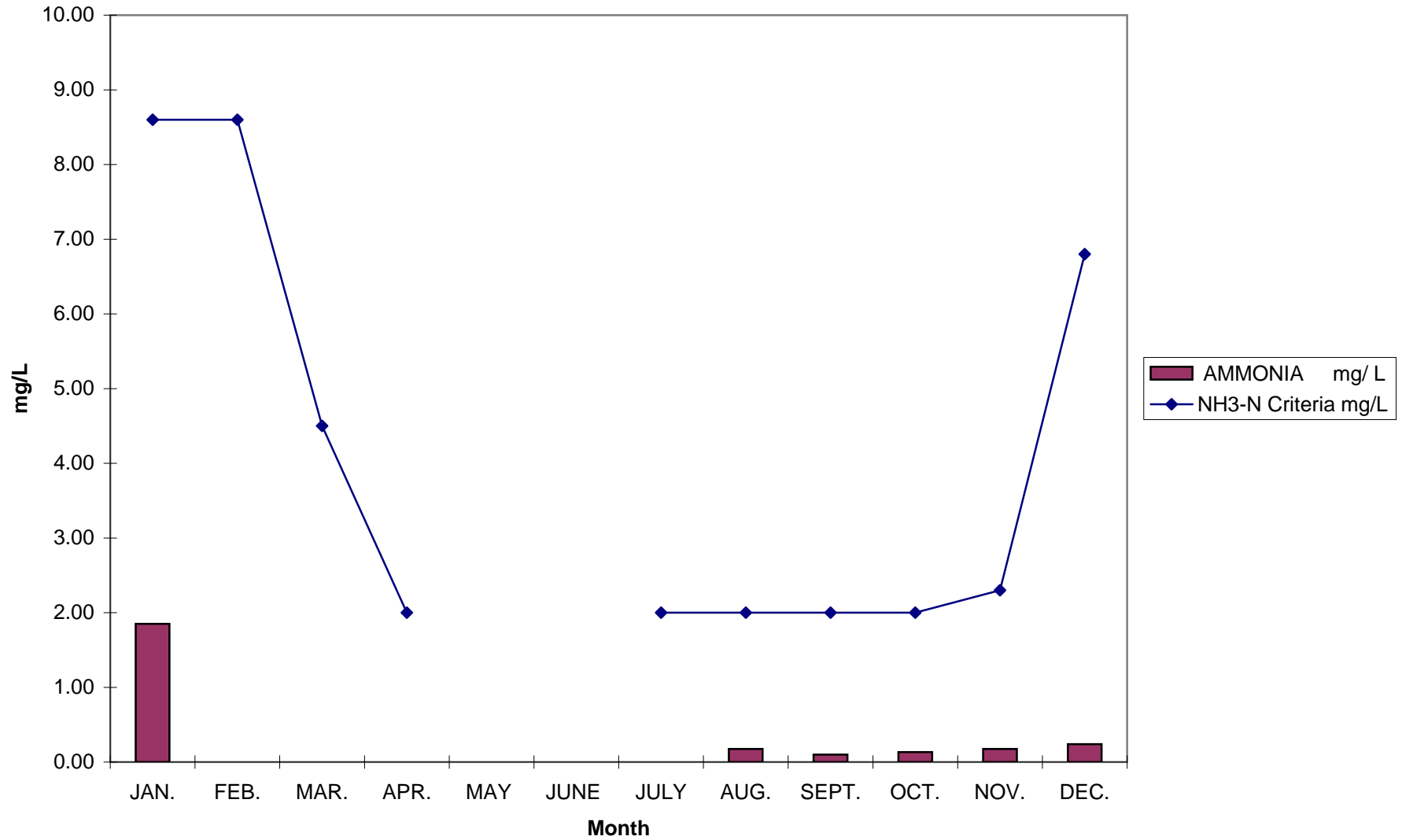
Tavistock Effluent TP vs Criteria 2009



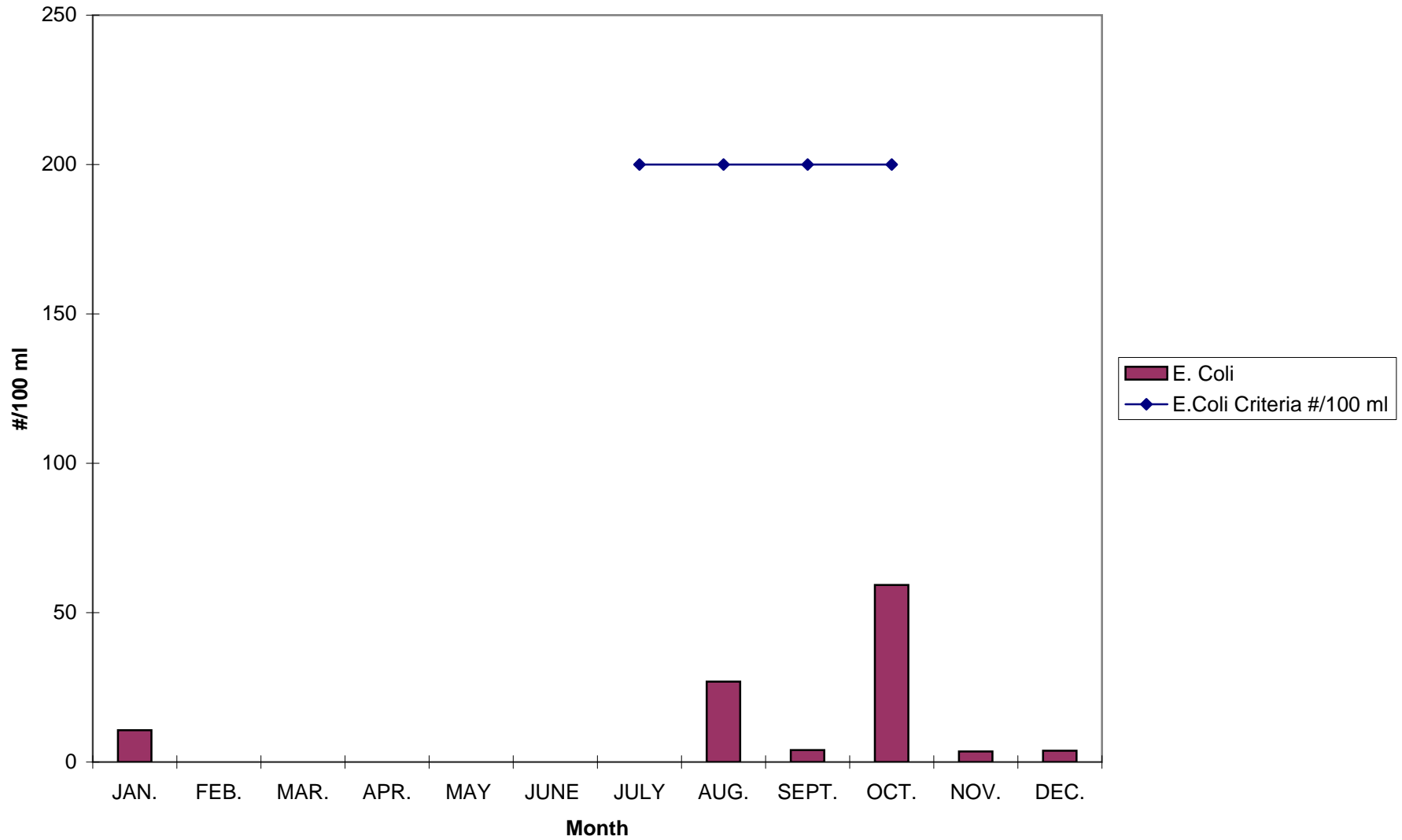
Tavistock Effluent Un-ionized Ammonia vs Criteria 2009



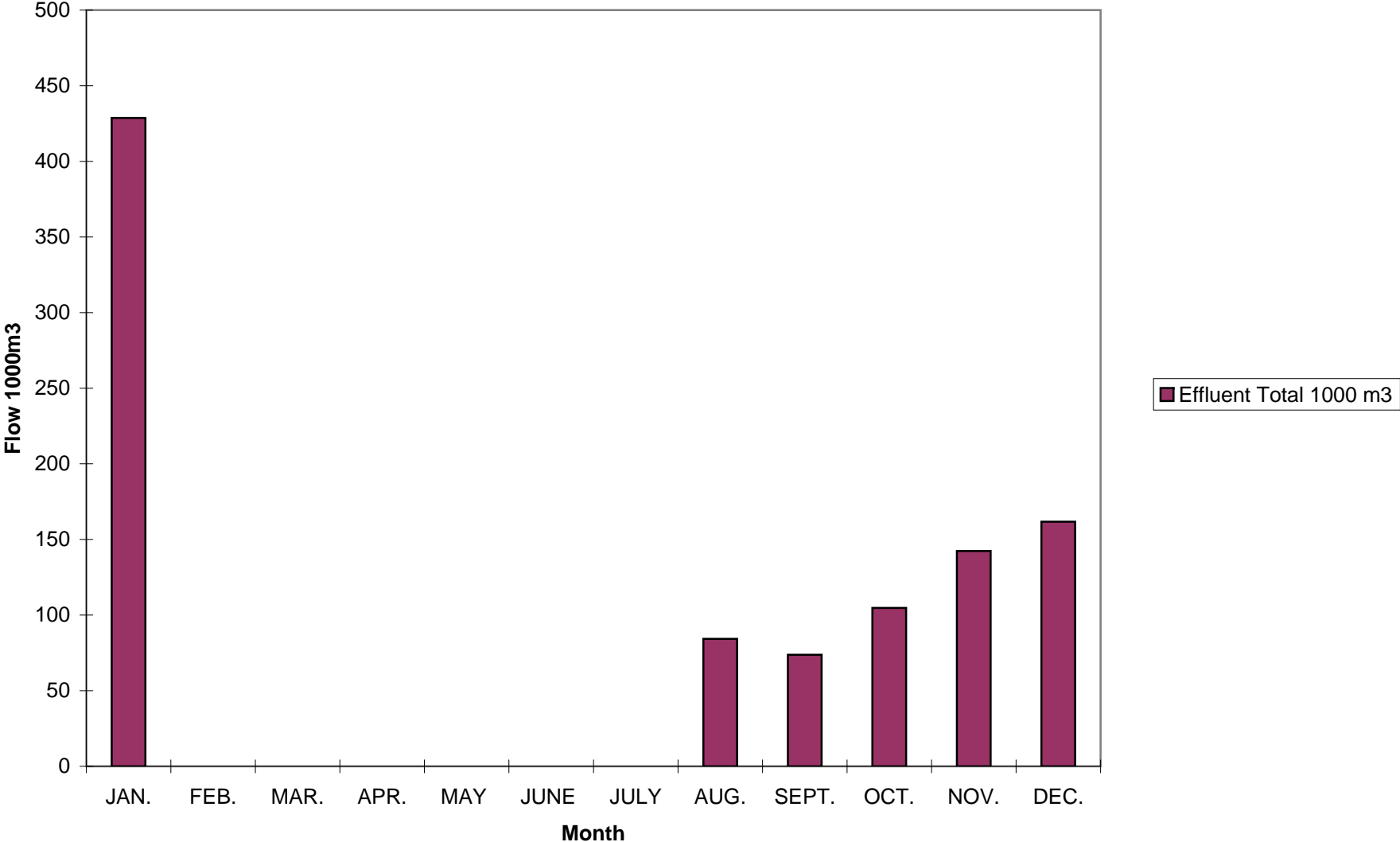
Tavistock Effluent Ammonia vs Criteria 2009



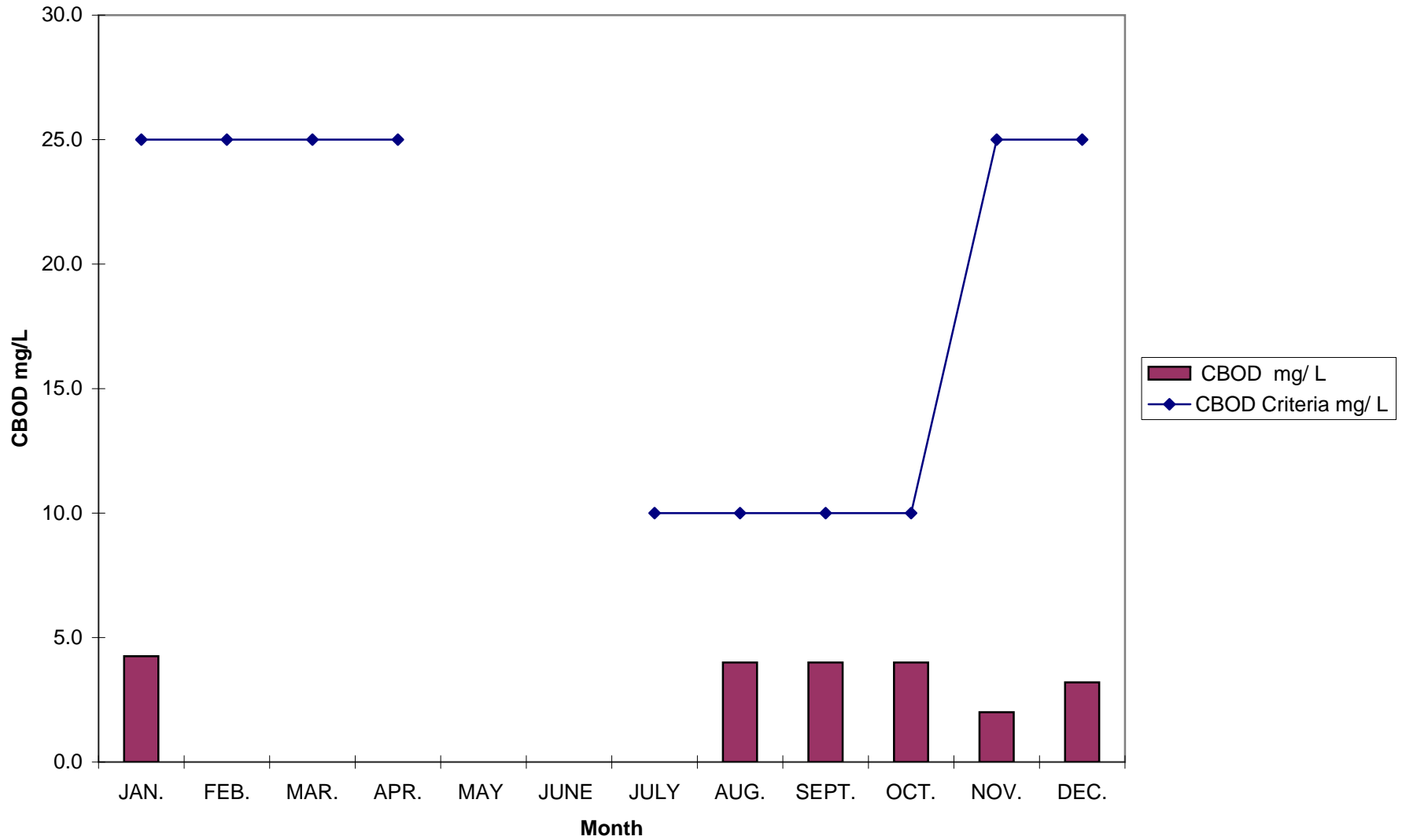
Tavistock Effluent E.Coli vs Criteria 2009



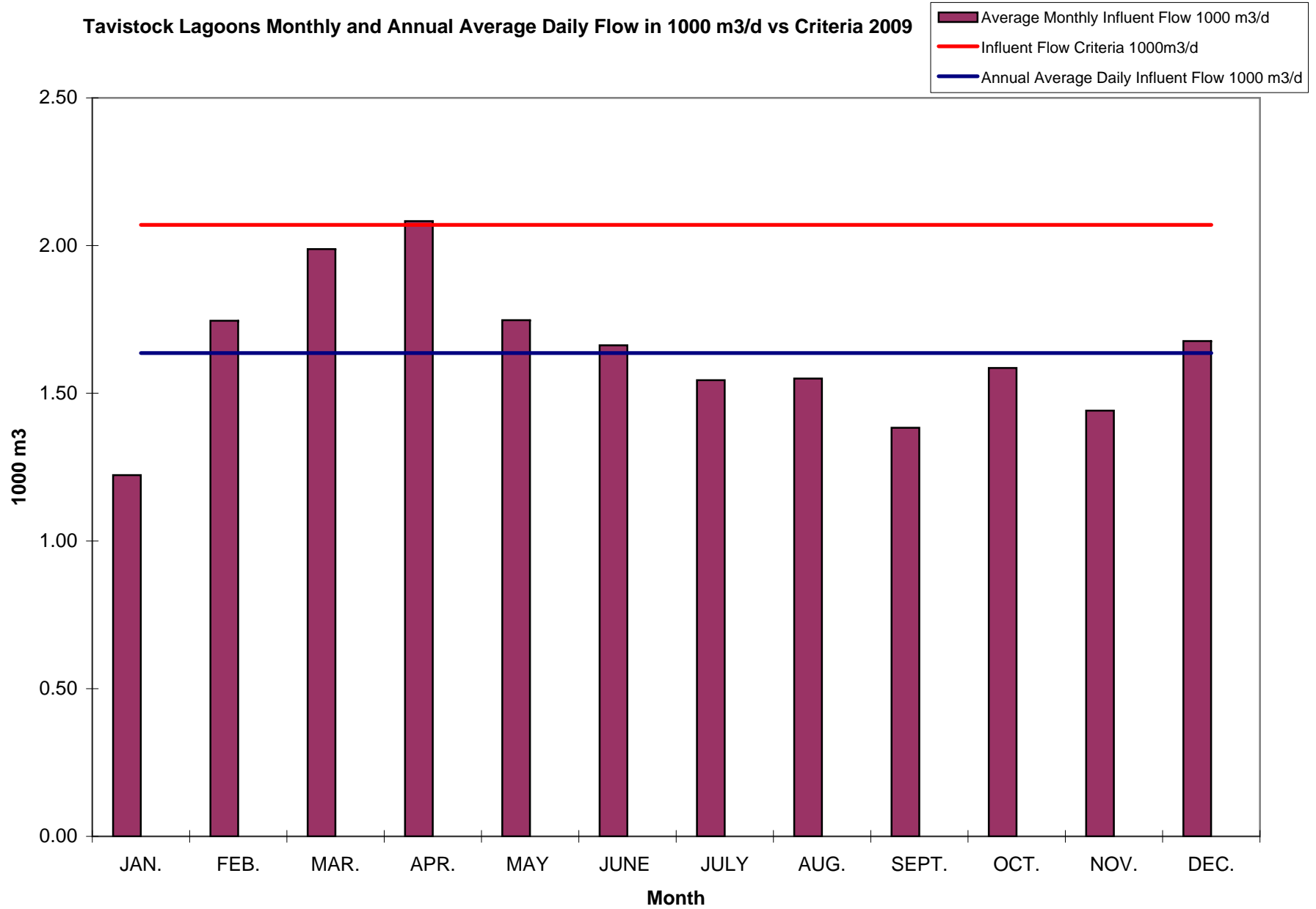
Tavistock Total Effluent Flow 1000 m3 per Month 2009



Tavistock Eff CBOD vs Criteria 2009



Tavistock Lagoons Monthly and Annual Average Daily Flow in 1000 m3/d vs Criteria 2009





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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

RE: Year-End Report for Plattsville Lagoons 2009

(Works # 110003022)

This year-end report is prepared as a yearly summary of works #110003022.

If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

Overview

The Plattsville Lagoon System provided effective wastewater treatment in 2009 and all effluent concentration limits as specified by MOE guidelines are met on an annual basis. The annual average daily flow rate of 493 m³/d, which represents 82.9 % of the rated capacity of 595 m³/d.

Project Description

The Plattsville Wastewater Treatment Lagoon was constructed in the late 1970's. Wastewater is treated at the lagoon, which includes two aerated cells and two conventional wastewater stabilization ponds. Phosphorus removal is accomplished through batch dosing of Aluminum Sulphate.

The County of Oxford operates the facility, utilizing the staff located at the Woodstock Wastewater Treatment Plant.

Plant Specifications

Facilities - Lagoons
Design Capacity - 595 m³/day
Average Daily Flow - 493 m³/day
Receiving Stream - Nith River
Plant Classification - WWT – I
Works Number - 110003022
Regulated by MOE guideline and new CofA # 3133 7QWH4N
Effluent MOE Guideline:
Annual Average BOD₅ 25.0 mg/L
Annual Average Suspended Solids 25.0 mg/L
Monthly Average Total Phosphorous 1.0 mg/L

Effluent is discharged in spring and fall as has been the case traditionally.

Sampling Procedures

Sampling is done on a bi-weekly basis of the raw influent wastewater and analyzed for BOD₅, SS, TKN, TP and pH. Effluent discharge samples are gathered bi-weekly during discharge periods and analyzed for BOD₅, SS, Ammonia, TKN, TP, and pH.

Flows

The total flow treated in 2009 was 179 680 m³. The average daily flow of 493 m³/day was 82.9 % of the design capacity of 595 m³/day.

Plant effluent can be discharged in the Spring and Fall. The total discharge for 2009 was 199 800 m³/d.

Raw Sewage Quality

The annual average raw sewage BOD₅ concentration to the plant was 121 mg/L. This corresponds to an average BOD₅ loading of 60 kg/day. The average suspended solids loading was 121 mg/L or 60 kg/day. The annual raw sewage nitrogen levels as TKN were 32.6 mg/L, or a loading of 16 kg/day. Phosphorous levels averaged 3.8 mg/L, which correspond to 2 kg/day.

Plant Performance & Effluent Quality

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

Over the reporting period, the annual average effluent BOD₅ concentration was 5.8 mg/L with a removal efficiency of 95.2 %. The annual suspended solids concentration was 7 mg/L with a removal efficiency of 94.2 %. The annual average nitrogen concentration as TKN was 5.85 mg/L with removal efficiency of 82 %. The annual total phosphorous level was 0.19 mg/L, which represents a removal efficiency of 95 %.

For compliance purposes, annual average concentrations are based only on data from the effluent discharge period, while raw sewage flows for the entire year are used to assess loading and hydraulic capacity.

All pH is measured in the Effluent by the operator during discharge of the lagoon and there was no single sample outside out limits of 6-9.5 for 2009. The Plattsville Lagoon System was operating within its design and discharge criteria for 2009.

Bypassing and Abnormal Conditions

There was no bypass of the treatment system at the Wastewater Lagoons to the Nith River.

Maintenance Activities

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.

Summary and Recommendations

Construction of an upgraded lagoon system including aeration system and an intermittent sand filter is under way in 2009 as indicated by an already completed class environmental assessment. Substantial completion and operation is planned for 2010.

EXHIBIT 1

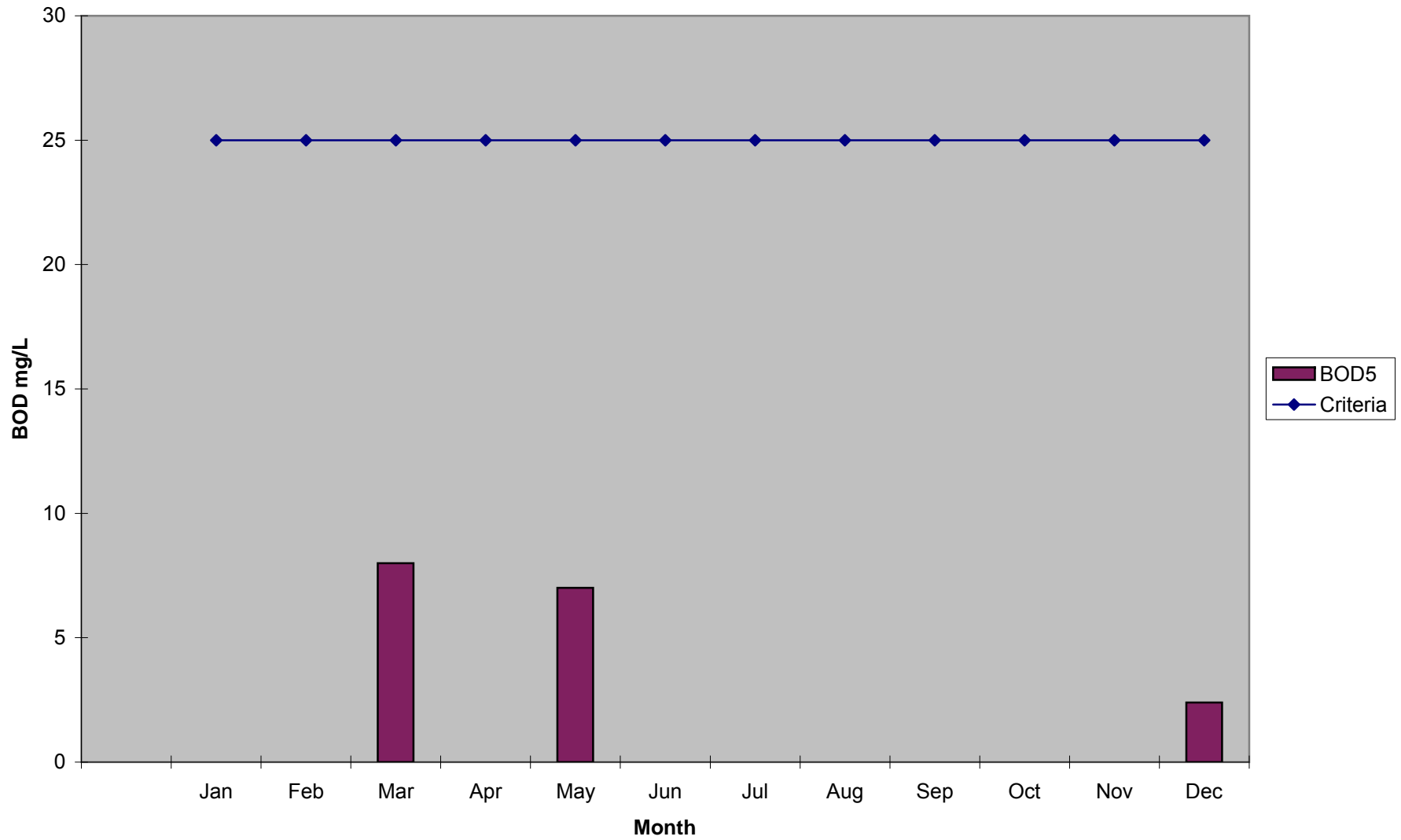
Municipality: Plattsville
 PROJECT:Plattsville Lagoons
 Operator: County of Oxford
 Works Number:
 110003022

2009

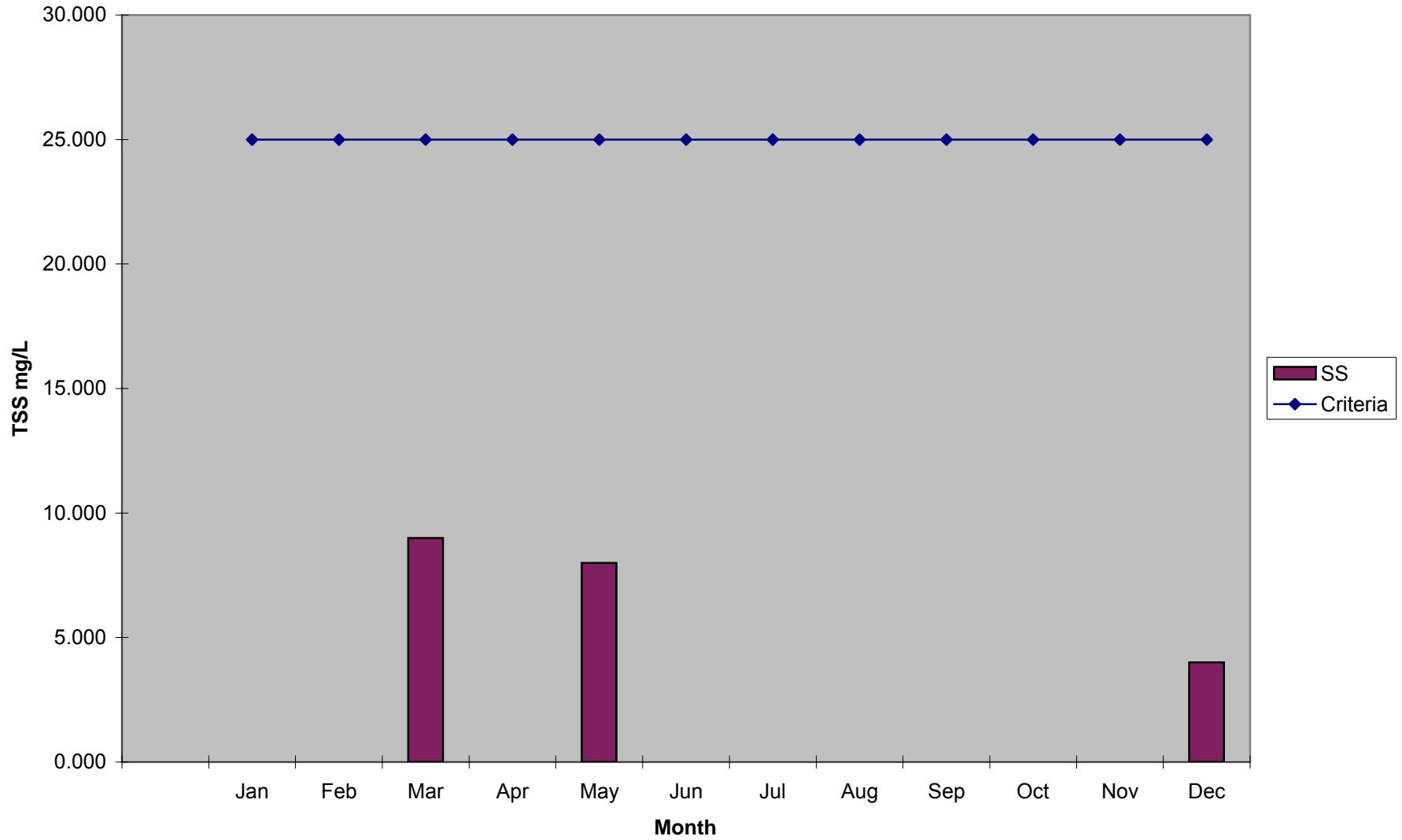
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average	Min	Max	Total	Criteria
Influent																	
Total Flow 1000m3	16.692	17.767	19.24	17.302	16.104	13.398	13.188	12.898	12.709	13.94	12.514	13.928				179.680	Criteria
Flow 1000m3/d	0.538	0.635	0.621	0.577	0.519	0.447	0.4254	0.4161	0.424	0.450	0.417	0.449	0.493	0.416	0.635		0.595
Max Flow 1000m3/d	0.825	2.038	1.271	0.766	0.762	0.618	0.7	0.514	0.475	0.565	0.535	0.552					
Min Flow 1000m3/d	0.340	0.324	0.425	0.435	0.413	0.336	0.144	0.334	0.283	0.371	0.351	0.383					
Influent																	
BOD5 (mg/L)	164	132	129	155	96	53	110	79	161	113	126	135	121	53	164		
SS (mg/L)	110	122	132	135	102	67	107	105	178	116	108	170	121	67	178		
AMMONIA (mg/L)	40.3	24.9	24.1	32.9	38.8	20.2	31.6	24.1	35.3	23.1	29.6	29.5	29.5	20.2	40.3		
TKN (mg/L)	46.3	30.3	28.0	35.9	39.0	21.4	36.0	25.4	36.3	27.3	33.8	31.7	32.6	21.4	46.3		
NITRITE (mg/L)	0.06	0.10	0.17	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.17		
NITRATE (mg/L)	0.05	0.24	0.90	0.06	0.05	0.35	0.05	0.05	0.05	0.05	0.05	0.05	0.16	0.05	0.90		
TP (mg/L)	3.9	4.0	3.5	4.4	4.1	2.4	3.9	3.0	4.6	3.2	4.2	4.4	3.8	2.4	4.6		
Temp Celcius	6.9	7.5	7.8	9.7	13.9	15.7	16.0	19.4	18.8	15.6	13.6	10.2	12.92	6.86	19.41		
pH	8.33	8.26	8.29	8.00	7.62	7.59	7.65	8.00	8.37	8.45	8.05	8.34	8.08	7.59	8.45		
Effluent																	
Total Flow 1000m3			67.810		11.004							13.489				199.800	
Flow 1000m3/d			13.562		3.668							1.927	6.4	1.9	13.6		
Plant Effluent													Annual Average	Min.	Max.	Conformance Criteria	
BOD5 (mg/L)			8		7							2	5.8	2.4	8.0	Average*	≤ 25
SS (mg/L)			9.0		8.00							4	7.0	4.0	9.0	Average**	≤ 25
Ammonia (mg/L)			9.43		2.80							2.06	4.76	2.06	9.43		
TKN (mg/L)			10		4							2.82	5.85	2.82	10.33		
NITRITE (mg/L)			0.06		0.08							0.06	0.07	0.06	0.08		
NITRATE (mg/L)			0.05		0.11							0.37	0.18	0.05	0.37		
TP (mg/L)			0.46		0.06							0.04	0.19	0.04	0.46	Average***	≤ 1
pH			7.65		7.59							7.99	7.75	7.59	7.99		
Temp.			6.1		17.5							5.9	9.8	5.92	17.5		
D.O. (mg/L)			4.7		8							11.0	8.0	4.68	11.0		
Influent Loadings																	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average	Min	Max	Criteria	
BOD kg/d	88.306	83.441	80	89.394	49.870	23.447	46.654	33.008	67.993	50.814	52.559	60.654	60	23	89		
TSS kg/d	58.960	77.413	82	77.57	52.728	29.922	45.662	43.69	75.195	52.163	45.050	76.379	60	30	82		

* MOE Criteria: BOD5 Annual Average not to exceed 25 mg/L
 ** MOE Criteria: TSS Annual Average not to exceed 25 mg/L
 *** MOE Criteria: TP Monthly Average not to exceed 1 mg/L

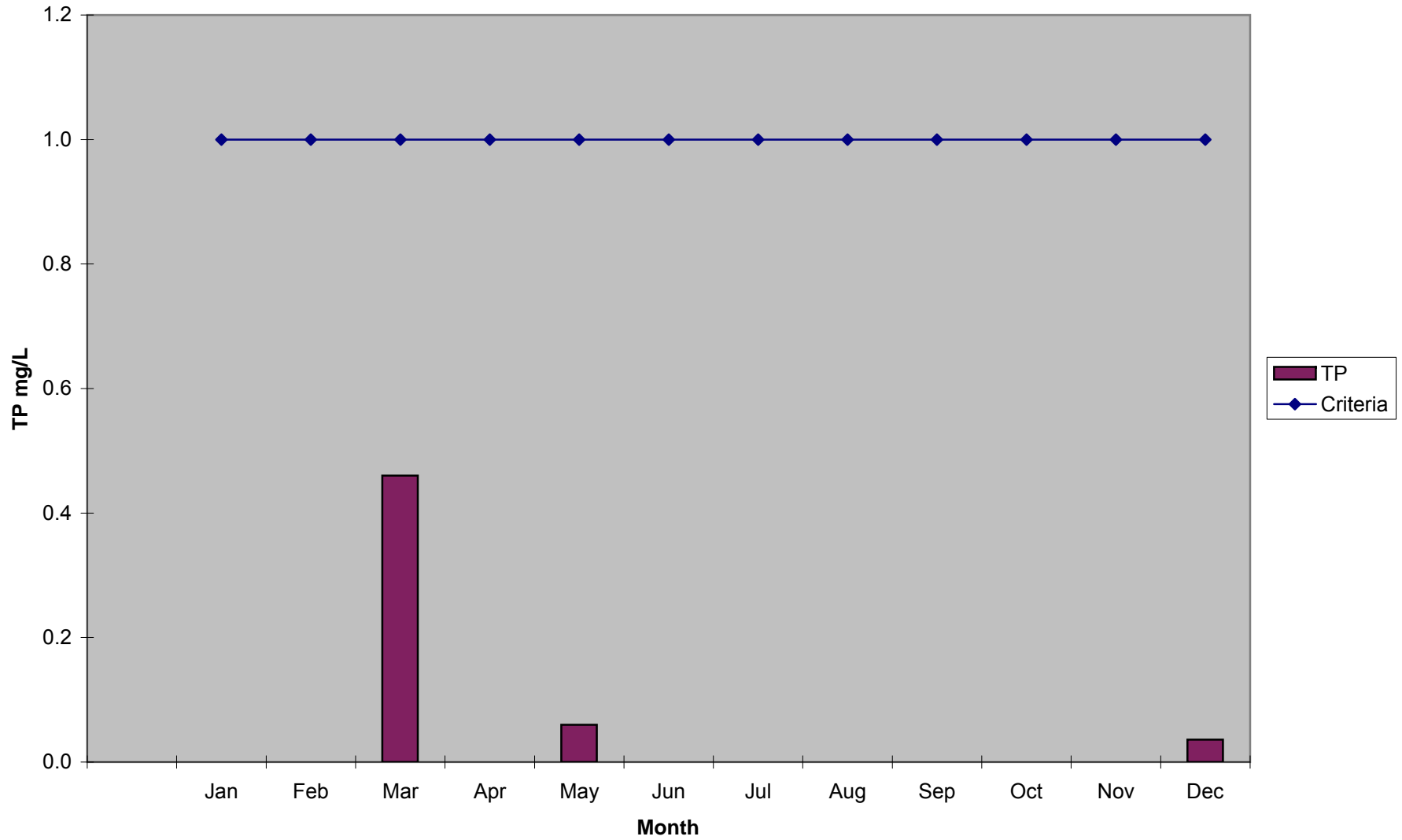
Plattsville Effluent BOD vs Criteria 2009



Plattsville Effluent TSS vs Criteria 2009



Plattsville Effluent TP vs Criteria 2009





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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

RE: Year-End Report Drumbo SBR 2009
(Certificate of Approval #3-2191-90-916)

This year-end report is prepared as required by the certificate of approval #3-2191-90-916.

I trust this report fulfills the intent of the Certificate of Approval. If there are any questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

Overview

The Drumbo Wastewater Treatment Plant is a Sequencing Batch Reactor (SBR) that provided effective wastewater treatment in 2009 with an average flow for the plant of 245 m³/d which represents 90 % of the design capacity of 272 m³/d. The total flow for 2009 was 89,460 m³.

Project Description

The Drumbo Wastewater Treatment Plant began operation in its present configuration in 1992. The facility is an SBR plant consisting of two alternating reactors, pressure filters and ultra-violet radiation for disinfection, with an outfall pipe to the Cowan Drain. The facility adds aluminum sulphate into the reactors for phosphate control. The County of Oxford operates the facility, utilizing the staff located at the Woodstock Wastewater Treatment Plant.

Plant Specifications

Facility - Sequencing Batch Reactor
Design Capacity - 272 m³ / day
Peak Capacity - 774 m³ / day
Average Daily Flow - 245 m³ / day
Receiving Area - Cowan Drain
Classification - WWT – II
Certificate(s) of Approval 3-2191-90-916
8-1158-92-006

<u>Effluent Requirements:</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.

Sampling Procedure

Influent samples are taken using a 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 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 analysis is performed by SGS Lakefield Research Ltd. on all samples that are reported for compliance except for pH, D.O., chlorine residual, and temperature.

Flows

The total flow treated in 2009 was 89,460 m³. The daily average flow was 245 m³/day which represents 90 % of the design flow for Drumbo of 272 m³/day.

Raw Sewage Quality

The annual average raw sewage BOD₅ concentration to the plant was 147 mg/L and an average loading of 36 kg/day. The average suspended solids concentration was 155 mg/L or 38 kg/day of loading. Average nitrogen levels, as TKN were 28 mg/L or a loading of 6 kg/day. Total phosphorus was 5 mg/L, which represents a loading of 1.2 kg/day.

Plant Performance & Effluent

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

Over the reporting period, the annual average effluent BOD₅ concentration was 4.9 mg/L or an equivalent 96.7 % reduction. The suspended solids average was 5.3 mg/L, which represents a 96.6 % reduction. Ammonia averaged 0.8 mg/L or a 96 % reduction. Total effluent phosphorus average concentration was 0.19 mg/L, which results in a 96.2 % reduction.

Bypassing, Upset and Abnormal Conditions

There were no spills from the Drumbo SBR in 2009.

Maintenance

The operating and maintenance staff from the Woodstock WWTP conduct regular scheduled maintenance of the plant equipment. Detailed maintenance records for each piece of equipment are kept on site at the Woodstock Plant.

Summary and Recommendations

The Drumbo Wastewater Treatment Plant was operating within its design and discharge criteria for 2009.

BIOSOLIDS REPORT 2009

Discussion:

The 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 sewage 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 County Of Oxford sewage truck with a useful volume of approximately 11 m³ (2400 Igals) as permitted under a Waste Management System certificate number A800939 or is accomplished by a contracted certified waste hauler as needed.

The biosolids are then transported to the Woodstock Wastewater Treatment Plant for final disposal.

The total volume was 1481 m³. Please find the volumes transported summarized in the following table.

SUMMARY OF ALL BIOSOLIDS REMOVAL

DATE	BIOSOLIDS QUANTITY(m³)
JAN. 08	64
FEB 08	125
MARCH 08	127
APRIL 08	127
MAY 08	76
JUNE 08	254
JULY 08	203
AUG. 08	76
SEPT. 08	161
OCT. 08	127
NOV. 08	76
DEC. 08	64
TOTAL	1481

Exhibit 1

DRUMBO RAW INFLUENT 2009

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Ave.	Criteria
Total	m3	7318	8037	8664	8908	8510	6843	6484	7334	6186	6833	6335	8008	89,460	7455	
Average	m3/d	236	287	279	297	275	228	209	237	206	220	211	258		245	272
Min	m3/d	174	171	213	231	224	206	189	205	182	189	197	198		198	
Max	m3/d	358	612	397	366	397	276	257	290	225	262	233	301		331	
BOD ₅	mg/L	156	133	119	110	288	272	149	107	78	109	124	127		147	
CBOD	mg/L	93	117	64	72	217	184	115	43	90	79	87	99		105	
TSS	mg/L	101	122	82	78	371	385	139	93	92	79	88	231		155	
Total P	mg/L	3.2	5.0	3.0	3.7	11.5	12.0	5.6	3.8	4.5	3.3	4.2	3.5		5	
ALKALINITY	mg/L	398.5	376.5	361.0	356.5	383.5	392.0	403.0	385.0	430.5	397.0	405.5	387.5		390	
TKN	mg/L	32.80	26.95	20.45	19.85	31.30	33.60	27.73	21.30	28.85	28.90	34.20	30.55		28	
AMMONIA	mg/L	28.65	25.35	18.15	18.15	18.95	30.60	26.63	20.40	25.65	26.57	34.65	25.40		25	
NITRATE	mg/L	0.05	0.35	1.03	1.42	0.05	0.05	0.05	1.24	0.07	1.17	0.05	0.05		0	
NITRITE	mg/L	0.09	0.26	0.35	0.42	0.16	0.06	0.06	0.35	0.11	0.50	0.06	0.06		0	
PH		7.74	7.63	7.82	7.79	7.73	7.75	7.71	7.85	7.77	7.85	7.54	7.74		8	
Temp		2.5	7.0	6.5	5.0	14.5	14.5	10.7	16.5	14.0	8.7	9.0	2.5		9	

DRUMBO FINAL EFFLUENT 2009

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Ave	Criteria A	Criteria B
BOD ₅	mg/L	12.5	3.0	9.0	4.5	4	4.0	4	3	4.0	3.3	3	4.0		4.9	10	15
CBOD	mg/L	3.5	4.0	3	4	4	3	3.33333	4	4.0	2.7	2.0	4.0		3.5		
TSS	mg/L	5.0	3.0	4	3.5	7.0	5.5	3.0	6.0	9.7	6.3	4.0	6.0		5.3	10	15
Total P	mg/L	0.18	0.10	0.08	0.14	0.11	0.21	0.28	0.28	0.35	0.27	0.150	0.20		0.19	0.5	1
ALKALINITY	mg/L	210	196	224	208	216	205	201	219	204	116	180	195		198		
TKN	mg/L	2.55	2.40	4.30	0.55	1.25	1.10	0.73	0.85	0.50	1.37	0.50	1.00		1.43		
AMMONIA	mg/L	1.900	2.350	3.150	0.200	0.100	0.350	0.100	0.100	0.100	0.767	0.100	0.650		0.822	3	5
NITRATE	mg/L	6.4	10.0	7.9	12.4	15.4	14.2	15.8	13.8	18.5	22.6	20.6	17.2		14.5		
NITRITE	mg/L	8.21	5.27	5.17	0.65	0.08	0.23	0.06	0.11	0.06	0.17	0.27	0.6		1.74		
PH	mg/L	7.96	7.70	7.77	7.99	8.04	8.11	8.13	8.09	8.04	8.21	7.78	8.05		7.99		
Dissolved Phosphorus	mg/L	0.08	0.05	0.04	0.03	0.06	0.12	0.21	0.16	0.14	0.08	0.07	0.10		0.09		
Dissolved Oxygen	mg/L	6.6	7.9	6.5	7.3	6.9	6.2	7.2	7.4	7.6	8.2	8.8	9.5		7.5	Min= 5	Min= 5
E.Coli	#/100 ml	19	3	2	2	19	4	4	10	2	8	3	2		6.5	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, typically Dec to April.

Drumbo SBR Effluent Discharge Loading kg/d 2009

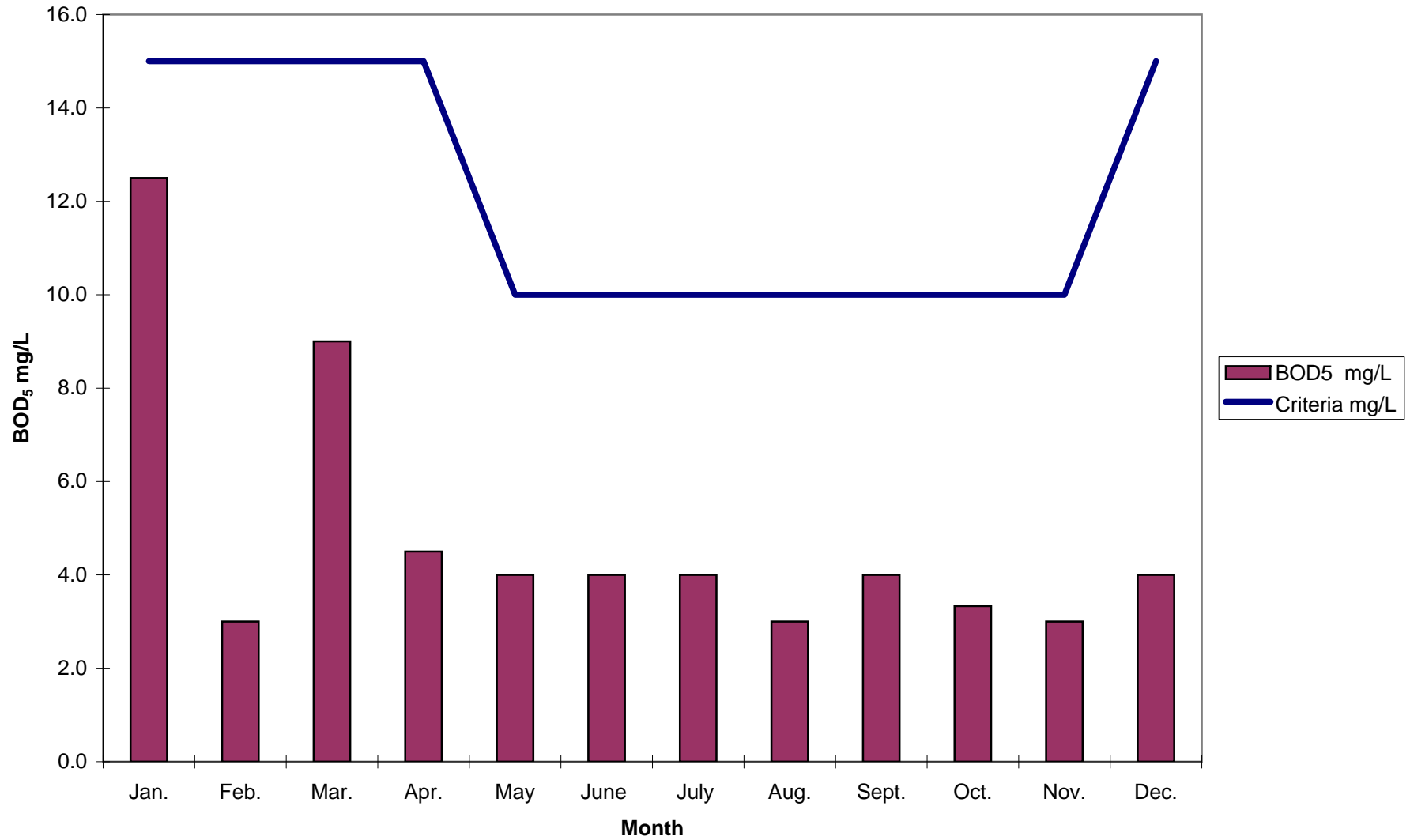
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Ave.	Criteria A	Criteria B
BOD ₅	kg/d	3.0	0.9	2.5	1.3	1.1	0.9	0.8	0.7	0.8	0.7	0.6	1.0		1.2	2.8	4.0
TSS	kg/d	1.2	0.9	1.1	1.0	1.9	1.3	0.6	1.4	2.0	1.4	0.8	1.5		1.3	2.8	4.0
TP	kg/d	0.04	0.03	0.02	0.04	0.03	0.05	0.06	0.07	0.07	0.06	0.03	0.05		0.05	0.1	0.3
NH4	kg/d	0.45	0.67	0.88	0.06	0.03	0.08	0.02	0.02	0.02	0.17	0.02	0.17		0.22	0.80	1.36

Drumbo SBR Influent Loading kg/d 2009

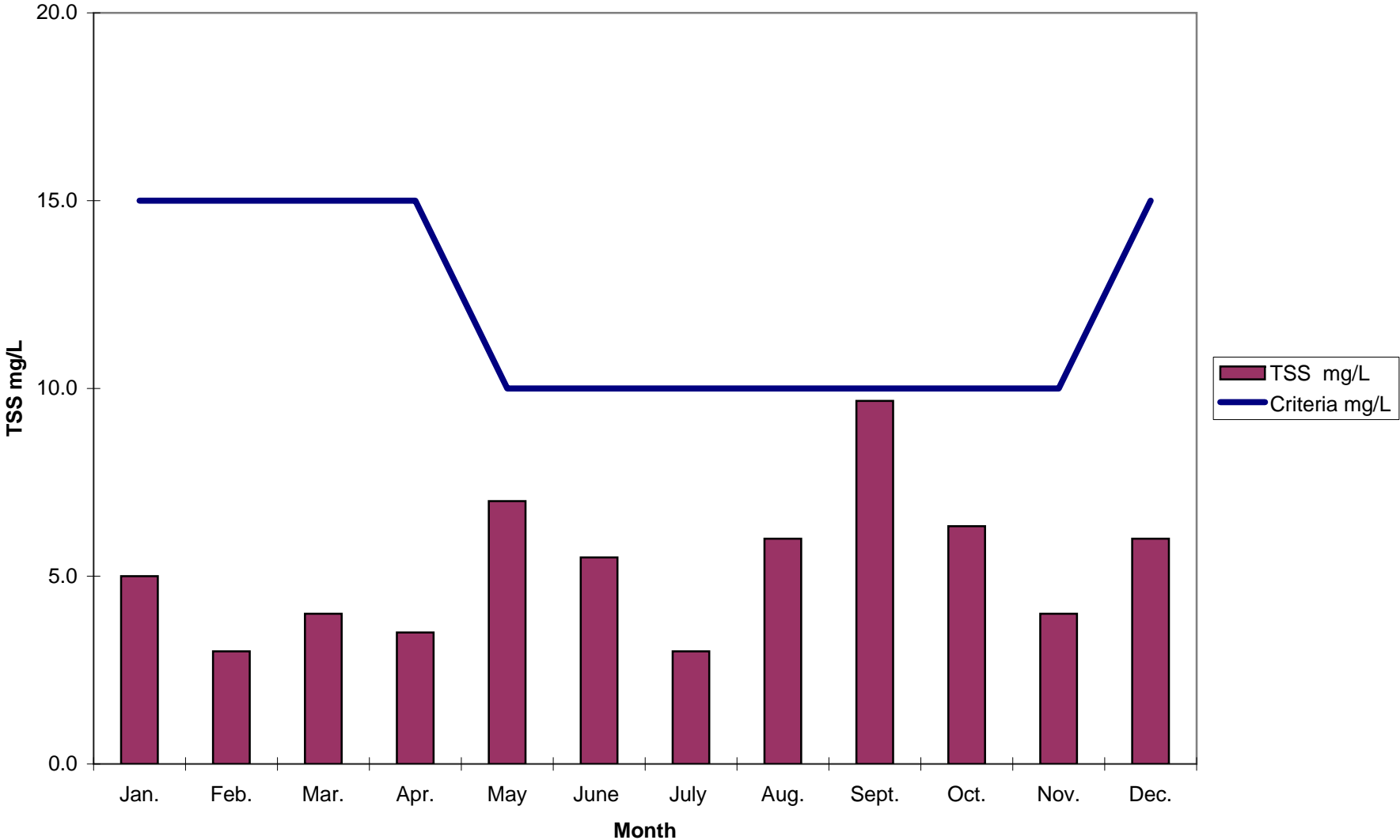
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Ave.		
BOD	kg/d	37	38	33	33	79	62	31	25	16	24	26	33		36		
TSS	kg/d	24	35	23	23	102	88	29	22	19	17	19	60		38		
TP	kg/d	1	1	1	1	3	3	1	1	1	1	1	1		1		
TKN	kg/d	8	8	6	6	9	8	6	5	6	6	7	8		7		

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, typically Dec to April.

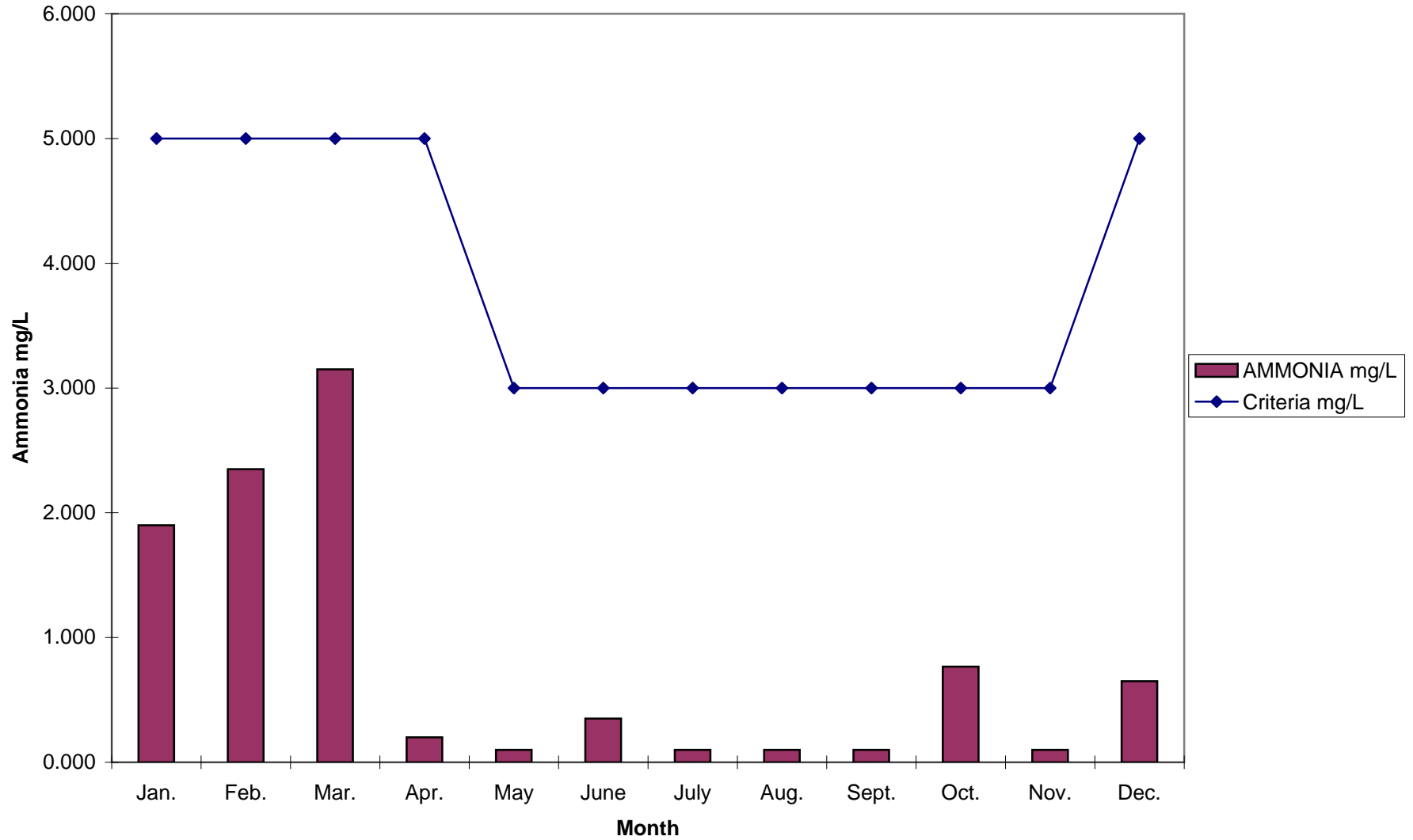
Drumbo Effluent BOD₅ mg/L vs Criteria 2009



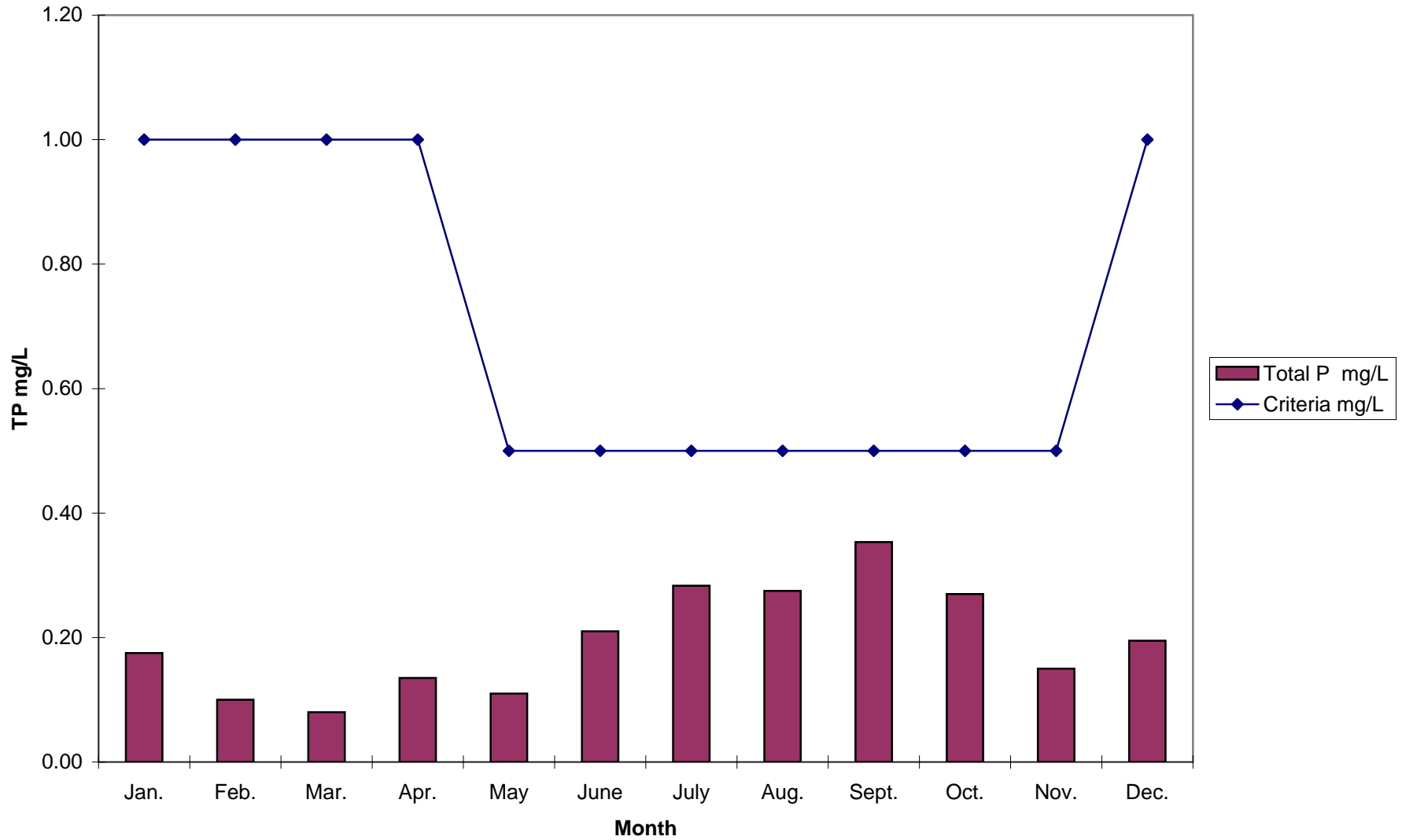
Drumbo Effluent TSS mg/L vs Criteria 2009



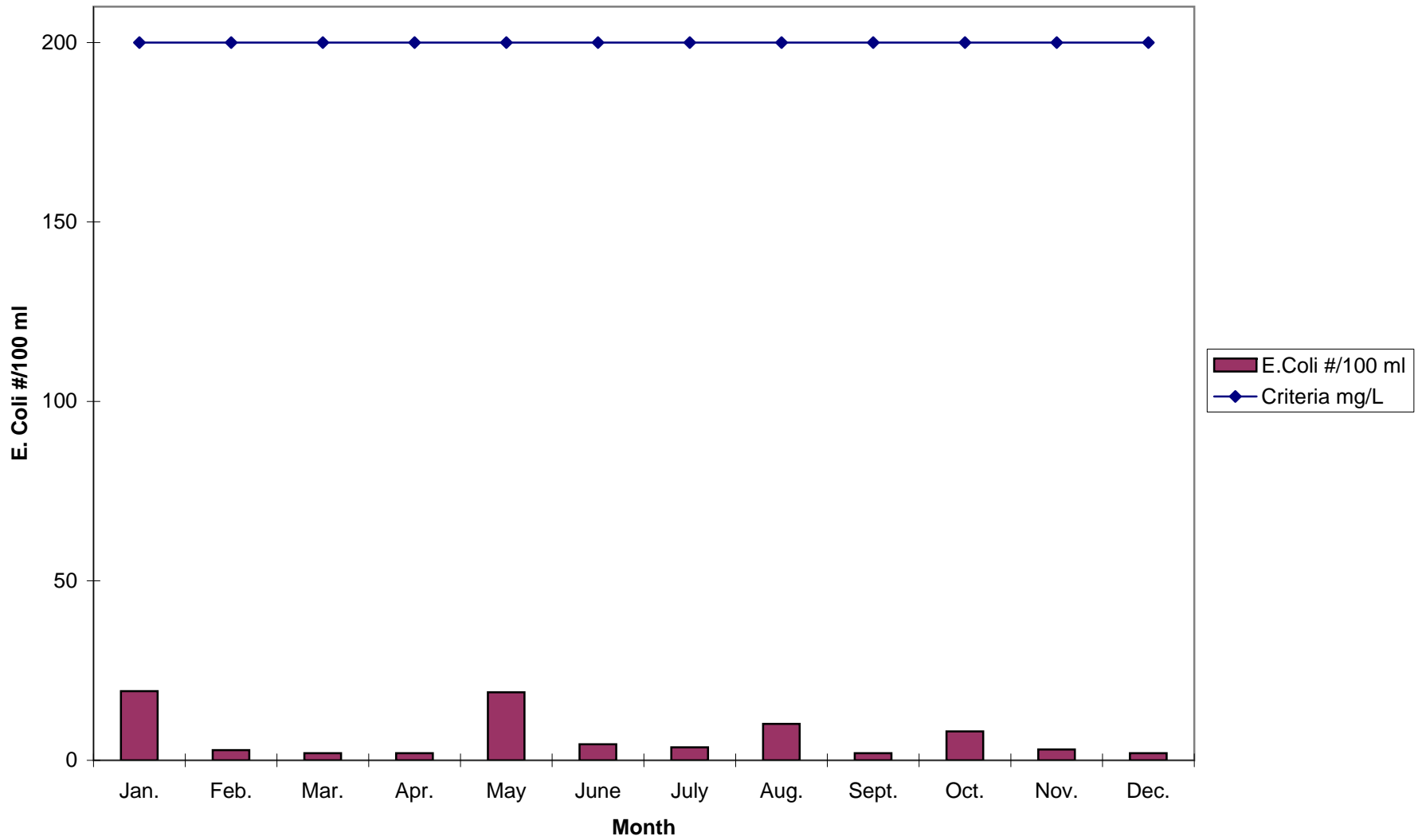
Drumbo Effluent Ammonia Discharge vs Criteria 2009



Drumbo Effluent TP vs Discharge Criteria 2009



Drumbo Effluent E.Coli vs Discharge Criteria 2009





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

March 10, 2010

District Manager,
Ministry of the Environment
London Branch
C/o
Mr. Ian Ness-Jack
Provincial Officer
733 Exeter Rd.,
London, Ont.,
N6E 1L3

Dear Sir:

**RE: Year-End Report Storm Water Management Facility for the
Bisolids Centralized Storage Facility (BCSF) and BCSF
Inspection**

(Certificate of Approval # 8633-76HSG)

This year-end report is prepared as required by the certificate of approval
8633-76AHSB.

I trust this report fulfills the intent of the Certificate of Approval. If there are any
questions, please contact me.

Yours Truly,

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

C.c. Mr. Shahab Shafai, M.Sc., P.Eng.
Manager Wastewater Services, Oxford County
Mr. Todd Gregg, CET,
Water/Wastewater Coordinator, County of Oxford

Overview

The storm water management facility services a total drainage area of 4.85 ha consisting of leaf and yard waste composting pad and a biosolids centralized storage facility (BCSF) located east of the Oxford County Landfill site, it was designed to attenuate storm water runoff from storm events.

Project Description and Specifications

The facility consists of approximately a 132 m long 300 mm diameter solid pipe running from the compost pad to the forebay, an approximately 50 m long 200 mm diameter storm sewer collecting from areas located east and north of the BCSF to the forebay, and approximately 300 m long perimeter ditches collecting storm water runoff from the BCSF building and from the south and west side of the structure discharging through a 300 mm diameter CSP culvert to the forebay. It also includes one 18 m long 1 m deep forebay complete with rip rap, two inlet structures and one concrete weir outlet structure discharging to a wet detention pond. The wet detention storm water pond with top dimensions of 78 m long by 38 m wide provides a permanent storage capacity of 1,564 m³ with a depth of 0.9 m. The pond is equipped with an outlet structure consisting of one 1200 mm diameter precast concrete manhole, one 75 mm diameter orifice plate and approximately 13 m long outlet sewer discharging to Hooper drain.

Sampling Procedure

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

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

Storm Water Facility Performance & Effluent

The facility is inspected regularly and a log book maintained at the BCSF of the inspections. The results of the sampling program are included in Exhibit 1 in a summary Table.

Spills, Upset and Abnormal Conditions

There were no spills or abnormal discharge events in 2009.

BCSF Maintenance

The Biosolids Centralized Storage Facility was cleaned and an in-house inspection took place on October 2nd, 2009

Building was cleaned by a sweeper, high pressure hose and brooms prior to inspection. Denby Sanitation pumped out sump pits in the storage bins.

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

Inspection Item	Action Taken
Cracks in floor at the aisle end of the concrete divider wall of Bins 1, 3, 4, 5, 6, 7, 8, 9, 10, 11&12.	No action required at this time, minor cracks.
There is one sump pit cover missing.	One cover was installed.
The sump pump lids don't fit properly in bins 4, 10 & 12.	Two covers fabricated to fit as time permits all covers are being re-shaped.
There is ground water leaking into the sump pit in bins 4, 6, 7, 9, 10 & 12.	Not significant quantity of water and no impact to storage bins.
In the centre aisle east of bin 5 there is a piece of concrete reinforcing steel exposed	Steel smooth to surface will not produce injury.

Summary and Recommendations

The storm water facility provided effective attenuation of storm water in 2009 with no adverse or abnormal conditions occurring.

The BCSF provided storage for the Oxford County biosolids land application program and was in excellent overall condition. No complaints were received about the operation of either facility in 2009.

Exhibit 1

BCSF Storm Water Pond 2009

Analysis	Units	BCSF Storm Water Pond 2009																	
		Jan.	Feb.	March	April	April Field	May	June	July	Aug.	Aug. Field	Sept.	Oct.	Nov	Dec.	Dec. Field	Average	Max	MIN
Temperature	C				7	21.3				14	26.4				6		14.94	26.40	6.00
pH	pH units				8.20	7.80				8.39	8.73				7.77		8.18	8.73	7.77
Alkalinity(as CaCO3)	mg/L				215					150					201		188.67	215.00	150.00
Conductivity	uS/cm					747.00					509.00					604	620.00	747.00	509.00
COD	mg/L				35					130					<8		83	130	35
NH3+NH4	as N mg/L				0.3					<0.1					0.1		0.20	0.30	0.10
TKN	as N mg/L				3					0.9					0.5		1.47	3.00	0.50
Tot Susp.Solids	mg/L				41					21					40		34	41	21
Sulphate	mg/L				41					18.00					23.000		27.33	41.00	18.00
Nitrite (as nitrogen)	mg/L				0					0					0		0	0	0
Nitrate(as nitrogen)	mg/L				7					1					9		6	9	1
Nitrate + Nitrite (as nitrogen)	mg/L				7					1					9		6	9	1
CBOD	mg/L				<4					9					4		7	9	4
Chloride	mg/L				83					58					38		60	83	38
4AAP-Phenolics	mg/L									<0.002					0		0	0	0
Fe iron	mg/L				1.6					0.51					0.78		0.97	1.61	0.51
Phosphorous	mg/L				0.22					0.200					0.320		0.247	0.320	0.200
Disolved Oxygen	mg/L					9.06					17.75					8.50	11.770	17.750	8.500

*If less than MDL, detection limit is used