TOWN OF INNISFIL

COOKSTOWN WASTEWATER TREATMENT PLANT
Certificate of Approval #3-0804-80-846

JANUARY 1, 2012 TO DECEMBER 31, 2012

Prepared by: Andrew Campbell, Director of Infrastructure & Engineering
And Richard Way, Wastewater Operator

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1. Executive Summary

The Cookstown Sewage Treatment Plant is an extended aeration mechanical facility constructed in 1986. It is located on the North ½ Lot 23, Concession 14 in the village of Cookstown. The treated effluent is discharged to Innisfil Creek through a pumping station and force main. Certificate of Approval (CofA) No. 3-0804-80-846 was issued in October 1986 and governs the operation of the facility. The CofA identifies a design capacity of 825m^3/day and currently services a population of 1540.

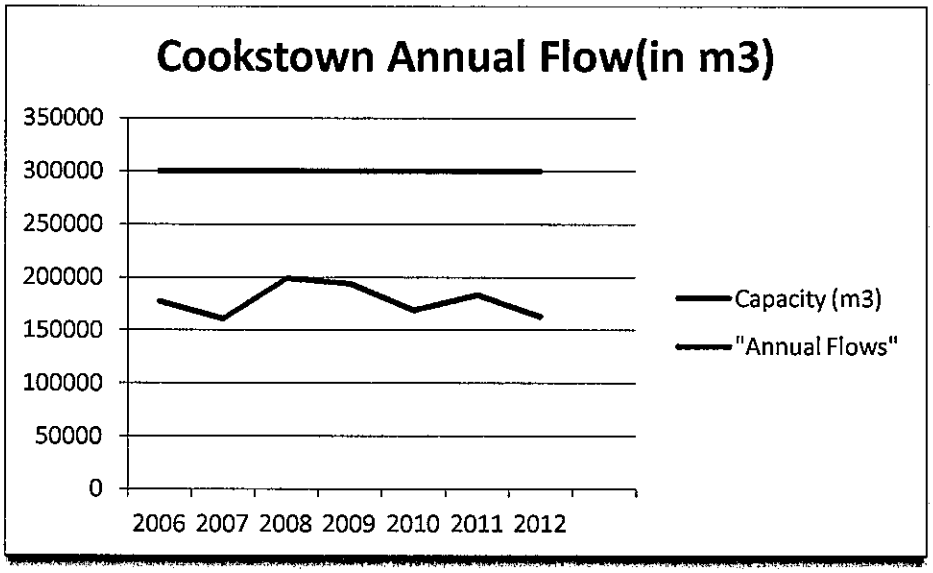
The Cookstown WWTP was in compliance throughout most of the year with no spills or upsets to report. Generally the plant operated well below all certificate of approval effluent criteria including B.O.D., suspended solids, and phosphates. In November the plant monthly average for Ammonia was exceeded resulting in the plant being out of compliance for that month with a monthly average of 6.2mg/l(the ECA states that the monthly average shall not exceed 4.0).The result was reported in writing and verbally to the Ministry of The Environment. The yearly geometric mean was 2.43mg/l which was well below the stated compliance level of 4.0mg/l. An effluent monitoring spreadsheet has been attached to this document comparing C of A criteria and evaluating efficiency. In 2012, ongoing monitoring and rehabilitation of the Cookstown collection system has been continuing as part of a response to the 2009 Inflow and Infiltration study that showed a large quantity of extraneous flow to the plant. That program, plus an unusually dry season, resulted in a reduction in flow from the plant to the receiving stream (see table 2).

No biosolids were removed from the Cookstown lagoons in 2012. Sludge blanket levels continue to be monitored and ammonia trends are tracked as an indicator of sludge blanket influence on the effluent.

On January 15, 2013 Mr. Richard Way was hired by the Town of Innisfil as a consultant to provide assistance to the wastewater staff and assist in the interim period until a replacement for the Superintendents position was found. It is in this capacity that he has contributed to the formulation of this document.

2. Operation

The average daily influent flow was 444 m^3 or 54 % of plant capacity. The plant received a raw influent total of 162,179 m^3 for the entire year. The graph below identifies the flows relative to the total plant capacity.



The table below identifies the discharge parameters of the certificate of approval and the compliance data recorded in 2012. All parameters were significantly below the regulated limits. In 2012 the annual average concentration for phosphorus was 0.04mg/l which compounded a total annual phosphorus load of 6.5kg.

Table 1 – Effluent Compliance

Effluent Limits		
Effluent Parameter	**Average Concentration Limits** (milligrams per litre unless otherwise indicated)	**2012 Treated Effluent Yearly Average Concentration** (milligrams per litre)
BOD_5	25	4.0
Total Suspended Solids	25	3.38
Total Phosphorus	1.0	0.04
Total Phosphorus Load	300kg/year	6.5 kg/year
Total Ammonia Nitrogen (Ammonia Nitrogen + Ammonium Nitrogen)	4.0	2.43

A total of 138,230 m³ of final effluent was discharged from the east polishing lagoon between January and December 2012. Samples for final effluent reporting were taken at the point of entry, except during winter months (January-early March) when the sampling point was inaccessible due to ice and snow and when the creek level rose above the inlet during the month of April. January through mid-March and April samples were taken from the sample ports on the discharge side of the effluent pumps after a 15 minute flush period.

Table 2 - 2012 Cookstown Effluent Discharge Flows

Date	Pump #	Max. L/S	Total m³
January	Mag Meter	10	20,481
February	Mag Meter	10	19,224
March	Mag Meter	10	18,303
April	Mag Meter	60	20,860
May	Mag Meter	10	0
October	Mag Meter	10	19,605
November	Mag Meter	10	18,634
December	Mag Meter	10	21,123
Total			138230

3. Calibration

The annual calibration on the flowmeter was completed on October 17, 2012 by V.Nowik Instrumentation and Controls (see attached documents).

4. Operational Problems

The aforementioned ammonia compliance exceedance in November of 2012 was the only operational issue reported at the plant in 2012. This compliance issue was suspected to have been caused by temperature fluctuations resulting in turnover in the lagoon thus discharging volumes of ammonia to the supernatant.

5. Maintenance

Regular maintenance was done by Town staff and logged in the preventative and incidental maintenance program. A sewer flushing and inspection program was initiated and all of the Cookstown collection system was flushed.

6. 2013 Objectives

In 2013, a program of monitoring and rehabilitation of the collection system infrastructure will be continued. Process monitoring equipment (DO meters) are expected to be added to the Cookstown aeration system as a way to more accurately monitor the effectiveness of the aerators and to give operations staff more information into the way the process is functioning. The existing effluent meter is to be installed in a chamber to allow for greater access for repair and calibration.

7. Staffing

Consultant	Richard Way	Class 4/3(#9969/14051)
Superintendent	Wesley Cyr	Class 2 (#12158/48819)
Operator	Keven Trembley	Class 2 (#9724/10822)
Operator	Dave Sparrow	Class 2 (#14085)
Operator	Chris Graham	Class 1 (#54612)
Operator	Justin Laquerre	Class 1 (#54614)
Maintenance Electrician	Shawn Cormier	OIT (#OT75486/OT75490
Maintenance Millwright	George Papapetrou	

All operators received the required 40 hours training in the year 2012.

8. Requirements to Report

A) A summary of all monitoring data and analytical data collected relative to the works during the reporting period;

B) A comprehensive interpretation of all monitoring data and analytical data collected relative to the works during the reporting period and a comparison to the effluent quality and quantity criteria;

See attached forms.

C) A tabulation and description of any bypass or upset condition which occurred during the period being reported upon;

D) A summary of any effluent quality assurances or control measures undertaken in the reporting period;

E) A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism, or thing forming a part of the works;

F) Description of any operating problems encountered and corrective actions taken during the reporting period;

G) A summary of any proposed alteration, extension or replacement in the process or operation of the works to be completed over the next reporting period which may require approval under the Ontario Water Resources Act;

H) An evaluation of the calibration and maintenance procedures conducted on all monitoring equipment;

See attached.

Appendices

Appendix 'a': Cookstown 2012 Influent Flow Totals

Appendix 'b': Cookstown 2012 Effluent Loading

Appendix 'c': Cookstown 2012 Raw/Final Lab Analysis

Appendix 'd': Instrumentation Calibration Report

Appendix 'e': 2012 Operator Training

Appendix 'f': Parameter Exceedance letter to MOE

COOKSTOWN WPCP ANNUAL FLOWS (IN m3)

2012

DATE	January	February	March	April	May	June	July	August	September	October	November	December
1	800	637	440	453	340	465	334	387	330	412	650	472
2	800	486	775	427	420	465	334	345	359	254	601	472
3	534	575	775	432	892	466	225	341	359	334	602	400
4	548	575	775	444	641	361	320	342	408	336	602	465
5	495	576	475	404	641	315	340	385	353	346	470	318
6	543	493	500	405	641	371	335	385	340	346	460	422
7	543	400	920	428	565	415	335	279	448	350	425	592
8	544	579	980	429	574	393	335	349	448	350	400	592
9	526	323	641	429	601	394	225	350	448	314	481	592
10	466	480	642	362	519	394	300	471	360	333	482	388
11	509	480	642	383	488	412	290	471	341	311	482	456
12	706	480	575	384	488	378	270	471	337	384	500	494
13	508	372	870	385	489	337	378	422	397	384	420	451
14	508	372	640	386	477	370	378	420	406	384	463	463
15	508	546	570	386	457	357	379	358	407	383	439	463
16	597	389	578	347	431	358	335	369	407	371	437	463
17	519	374	578	353	424	358	290	344	340	380	438	507
18	521	374	579	356	403	279	355	344	534	395	438	419
19	521	445	495	350	404	325	260	344	285	439	390	468
20	481	445	490	418	449	353	341	361	391	439	400	518
21	481	395	385	419	449	394	342	327	431	440	400	500
22	481	483	630	419	350	326	342	353	432	249	355	500
23	561	433	633	498	424	326	360	300	432	468	426	501
24	531	462	633	548	338	326	220	353	368	492	427	474
25	485	462	634	425	362	284	700	353	389	306	427	474
26	658	463	535	439	362	310	617	354	341	623	370	475
27	568	479	475	431	362	345	371	377	360	624	365	409
28	569	404	367	431	385	388	372	347	367	624	430	472
29	569	486	533	431	457	208	372	372	367	616	320	472
30	368		452	544	251	334	342	275	368	714	471	472
31	717		453		420		491	330		802		361
Total	17165	13468	18670	12546	14504	10807	10888	11279	11553	13203	13571	14525
Avg.	554	464	602	418	468	360	351	364	385	426	452	469
Max.	800	637	980	548	892	466	700	471	534	802	650	592
Min.	368	323	367	347	251	208	220	275	285	249	320	318
YEARLY TOTAL		162,179	444	ADF								

MONTHLY EFFLUENT LOADING 2012										
Month	**Total Discharge**	**TOTAL "P"**		**NH3 + NH4 as N**		**E. Coli**	**B.O.D.**		**Suspended Solids**	
	m^3	Monthly Avg. *1.0 mg/L*	Loading *Kg/month*	Monthly Avg. *4.0 mg/L*	Loading *Kg/month*	Monthly Avg.	Monthly Avg. *25 mg/L*	Loading *Kg/month*	Monthly Avg. *25 mg/L*	Loading *Kg/month*
January	20,481	0.03	0.61	1.20	24.58	2400	6.0	122.9	2.0	41.0
February	19,224	0.03	0.58	0.90	17.30	2	4.0	76.9	2.0	38.4
March	18,303	0.04	0.73	1.80	32.95	68	2.0	36.6	3.0	54.9
April	20,860	0.04	0.83	0.20	4.17		5.0	104.3	7.0	146.0
May	0		0.00		0.00			0.0		0.0
October	19,605	0.06	1.18	3.60	70.58	38	2.0	39.2	2.0	39.2
November	18,634	0.07	1.30	5.40	100.62	58	6.0	111.8	3.0	55.9
December	21,123	0.03	0.63	6.20	130.96	8	2.0	42.2	2.0	42.2
Total/year	**138,230**	**0.04**	**5.92**	**2.76**	**381.16**	**429**	**3.86**	**533.95**	**3.00**	**417.7**

COOKSTOWN WASTEWATER TREATMENT PLANT LAB RESULTS
2012

RAW INFLUENT														FINAL EFFLUENT														
2012	pH	Alk.	CBOD	B.O.D.	T.S.S.	tot.P	PO4	TKN	NH3+	Cl	NO2	NO3	NO2+NO3	pH	Alk.	CBOD	B.O.D.	T.S.S.	tot.P	PO4	TKN	NH3+	Cl	NO2	NO3	NO2+NO3	T.Coli	E.Coli	Fec.
DATE									NH4				as Nitrogen									NH4				as Nitrogen			
19-Jan-12	7.87	386	194	150	182	3.48	1.80	26.20	26.1	150	0.13	0.39	0.52	8.06	190	2.0	6.0	2.0	0.03	0.03	3.90	1.20	180	0.34	6.64	6.98	400	2400	6
8-Feb-12	7.91	435	110	206	210	6.89	2.71	52.40	34.9	160	0.08	0.12	0.2	8.19	196	2.0	2.0	2.0	0.03	0.04	0.80	0.90	200	0.56	7.16	7.72	44	2	2
7-Mar-12	7.76	459	93	274	214	7.31	2.22	46.00	39.2	160	0.17	0.32	0.49	7.83	217	2.0	4.0	3.0	0.04	0.03	1.50	1.80	210	0.62	6.28	6.9	420	68	2
4-Apr-12	7.78	418	151	269	271	1.68	4.73	41.80	35.6	150	0.06	0.05	0.06	7.96	135	2.0	7.0	5.0	0.03	0.03	0.50	0.20	210	0.06	5.24	5.24	142		20
11-Apr-12														8.01	123	2.0	3.0	8.0	0.04	0.03	0.50	0.10	210	0.06	4.35	4.35	70		212
23-May-12	7.83	412	196	150	214	5	3.05	43.90	42.4	160	0.06	0.05	0.06																
6-Jun-12	7.75	416	178	178	188	8.01	1.32	50.20	36.7	380	0.06	0.05	0.06																
18-Jul-12	7.83	427	247	310	272	5.18	3.25	49.80	38.2	140	0.06	0.05	0.06																
15-Aug-12	7.96	403	166	200	206	4.82	1.94	47.00	46.0	220	0.06	0.05	0.06																
5-Sep-12	8.00	435	99	196	282	5.82	3.80	67.30	38.8	130	0.06	0.05	0.06																
3-Oct-12	7.78	403	224	224	261	7.81	4.01	61.80	50.7	140	0.06	0.05	0.06	8.13	171	2.0	2.0	2.0	0.06	0.06	3.30	3.60	220	0.11	0.37	0.48	46	38	4
22-Nov-12	7.89	409	192	161	244	5.22	3.06	50.40	52.2	240	0.06	0.05	0.06	8.07	196	2.0	6.0	3.0	0.07	0.03	5.60		220	0.06	1.26	1.26	280	58	4
20-Dec-12	7.78	447	212	223	210	5.02	4.04	42.40	41.4	140	0.06	0.05	0.06	8.14	218	2.0	2.0	2.0	0.03	0.03	7.30	5.40	210	0.08	1.89	1.97	1040	8	170
																						6.20							

Appendix 'd'

Instrumentation Calibration Reports

V.Nowik Instrumentation & Controls

51 Fourth St.
Angus, ON
L0M 1B3
Tel: (705) 440-7331
Fax: (705) 423-9327

Calibration Report for Innisfil STP 2012

Location	**Cookstown STPSTP**	**Manufacturer**	ABB
Process	Influent	**Transmitter Model:**	Magmaster 3013
Calibration Date:	Oct. 17 2012	**Transmitter SN:**	P/64099/1/1
Technician	V. Nowik	**Tag:**	Raw Sewage Inflow

Input	**(Test)**	**Output**	**(Signal)**	**(Process)**
Type:	ABB Simulator	**Type or EGU:**	mA	Liter/Sec
Min:	0.00	**Min:**	4.00	0.00
Max:	3.5412	**Max:**	20.00	100.00
DN (mm):	150			
Velocity Range:	5.658829			
Constant:	0.0007854			
Sensor Factor 1:	1.598			

			Before Calibration		**After Calibration**	
Input (m/s)	**Flowrate l/s**	**Calc. O/P**	**Output**	**%Error**	**Output**	**%Error**
0.00	0.00	4.00	3.98	-0.13%	3.98	-0.13%
0.20	6.74	5.08	5.07	-0.05%	5.07	-0.05%
0.50	15.08	6.41	6.41	-0.02%	6.41	-0.02%
1.00	29.00	8.64	8.62	-0.13%	8.62	-0.13%
2.00	56.70	13.07	13.07	-0.01%	13.07	-0.01%

Calibration Equipment

Type:	Simulator	DMM	**Calibration performed as per manufacturers recommended equipment and procedure.**
Manufacturer:	ABB	Fluke	
Model:	Magmaster Velocity Simulator	787 ProcessMeter	
Serial No.:	ST1A 0080	8249038	
Last Cal. Date:		Jan. 2012	V. Nowik

Comments:

V.Nowik Instrumentation & Controls

51 Fourth St.
Angus, ON
L0M 1B3
Tel: (705) 440-7331
Fax: (705) 423-9327

Calibration Report for Innisfil STP 2012

Location	**Cookstown STP**	**Manufacturer**	ABB
Process	Effluent	**Transmitter Model:**	Magmaster MS/E000 SPECIAL
Calibration Date:	Oct. 17 2012	**Transmitter SN:**	P/75121/2/10
Technician	V. Nowik	**Tag:**	Effluent Flow
		Primary Model#:	MS/F201 SPECIAL
		Primary SN:	P/71186/5/1

Input	**(Test)**	**Output**	**(Signal)**	**(Process)**
Type:	ABB Simulator	**Type or EGU:**	mA	Liter/Sec
Min:	0.00	**Min:**	4.00	0.00
Max:	1.2528	**Max:**	20.00	70.00
DN (mm):	200			
Velocity Range:	2.228164			
Constant:	0.0007854			
Sensor Factor 1:	1.7786			

			Before Calibration		**After Calibration**	
Input (m/s)	**Flowrate l/s**	**Calc. O/P**	**Output**	**%Error**	**Output**	**%Error**
0.00	0.00	4.00	4.00	0.00%	4.00	0.00%
0.20	10.90	6.49	6.48	-0.07%	6.48	-0.07%
0.50	27.60	10.31	10.30	-0.05%	10.30	-0.05%
1.00	55.60	16.71	16.68	-0.18%	16.68	-0.18%

Calibration Equipment

Type:	Simulator	DMM	**Calibration performed as per manufacturers recommended equipment and procedure.**
Manufacturer:	ABB	Fluke	
Model:	Magmaster Velocity Simulator	787 ProcessMeter	
Serial No.:	ST1A 0080	8249038	
Last Cal. Date:		Jan. 2012	V. Nowik

Comments:

TOWN OF INNISFIL **WASTEWATER OPERATOR TRAINING** **2012**

COURSE	W.CYR	CHRIS GRAHAM	KEVEN TREMBLEY	JUSTIN LAQUERRE	DAVE SPARROW	GEORGE P.	SHAWN CORMIER
Purchasing Policy Training (Jan 30)	3						
Confined Space Refresher (Feb 28 @ WPCP)		2	2	2	2	2	2
New Incident/Accident Report-Critical Injuries Policy-Procedure Review-LY Feb 28	1	1	1	1	1	1	1
Emerging Leaders Training (March 6/April 10/May 15/June 12/Sep 11/Oct 9)	42						
New Communications System Training (Mar 14	1	1	1	1	1	1	1
Mandatory Customer Service Training (@Town Hall)	8	8	8	8	8	8	8
Wessuc NASM demo	1	1	1	1	1	1	1
Clear Communications (M. Newton, Apr 19)	1	1	1	1	1	1	1
I & I Course (XCG, Barrie May 23)				8	8		
Exam Prep WW WW II (June 11-15)		40					
Myers-Briggs (Oct 12)	3	3	3	3	3	3	3
Confined Space Hazard Assessment Training (Oct 23, 2012)	3.5		3.5	3.5	3.5	3.5	3.5
Measuremax - Level sensor demo (Nov. 9)			1		1		
Understanding PPE Requirements when working with Electrical Hazards (Oct 30/Nov 14, 2012)	4	4	4	4	4	4	4
MOAR Training (Nov 21, 2012)	1	1	1	1	1		
Survalent SCADA (Nov 23)		1.5	1.5	1.5	1.5		
Video inspection solutions (Dec 5)			3		3		
Review of existing operating procedures (average of 45 minutes each meeting x 10	7.5	7.5	6.75	6.75	7.5	7.5	7.5
Safety Training (review of policies, implementation of new Safe Operating Procedures) average15 minutes each meeting	2.5	2.5	2.25	2.25	2.5	2.5	2.5
TOTAL:	78.5	73.5	40	44	49	34.5	34.5

Appendix 'e'

Innisfil

WASTEWATER SERVICE

Date: January 4, 2013

Cookstown Water Pollution Control Plant – Town of Innisfil

Ministry of Environment
Attention: Cindy Hood

Re: Report of Effluent Ammonia Concentration Parameter Exceeded

Dear Ms. Hood,

The average ammonia concentration in the effluent for November 2012 exceeded the certificate of approval limitations of 4 mg/l with a monthly average of 6.2 mg/l. I have been in discussion with Brad Allen concerning this exceedance.

It is presumed that temperature fluctuations caused turnover of the lagoons resulting in abnormal concentrations of ammonia. It should be noted that the concentration of ammonia in the month of December was 5.4 mg/l. The annual arithmetic mean of ammonia was 2.43 mg/l for 2012.

If you have any questions or concerns, please feel free to contact me at your convenience.

Yours truly,

Town of Innisfil
Per:

Dave Sparrow
Wastewater Services
Town of Innisfil
dsparrow@innisfil.ca
705-456-6946