The Municipality of Trent Hills

ANNUAL REPORT

Warkworth Waste Stabilization Ponds and Collection System 2019

Prepared by

Wastewater Operations Department

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Section 11(4) of the Environmental Compliance Approval no.6023-BDQR6H, for the Warkworth Waste Stabilization Ponds states, “The owner shall prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The reports shall contain, but shall not be limited to, the following information pertaining to the reporting period:

(a) A summary and interpretation of all Influent monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
(b) A summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this approval, including an overview of the success and adequacy of the Works;
(c) A summary of all operating issues encountered and corrective actions taken;
(d) A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
(e) A summary of any effluent quality assurance or control measures taken;
(f) A summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
(g) A summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality
ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;
(h) A tabulation of the volume of sludge generated, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed; a tabulation of the measured volume of sludge accumulated in the lagoon cells in five year intervals and the estimated volume in the interim years and when sludge was disposed of during the reporting period, a summary of disposal locations and volumes of sludge disposed at each location;
(i) A summary of any complaints received and any steps taken to address the complaints;
(j) A summary of all By-passes, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
(k) A summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report status of implementation of all modification.
(l) A summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the following year following that for which the report is submitted.

Note: This annual report is combined with ECA #0672-BFNR7G Warkworth Collection System Section 8 (3)(a-g)

Section 1 – ECA Condition 11 (4) (a)

A summary of all monitoring data collected at the Warkworth Stabilization Ponds during the reporting period can be found in Appendix I. The summary, or Performance Report provides Flow data, Raw sewage and Final effluent analytical results and an Effluent loadings summary.

Below is a summary of the Influent Data. During the spring and winter months in the reporting year flows are elevated due to infiltration and inflow, which historically is consistent. The flushing and CCTV program is being followed up immediately with repairs and problem areas of infiltration are being identified.

Warkworth - Monthly Average Influent Flows - 2019												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Flows												
Average Daily Flow	173	183	210	307	387	219	170	157	161	155	174	210
Minimum Daily Flow	116	149	167	187	282	179	150	125	135	101	154	165
Maximum Daily Flow	239	310	360	494	521	303	217	214	199	239	198	276
Total Monthly Flow	5375	5115	6499	9209	11993	6563	5280	4872	4819	4812	5231	6509

The chart below summarizes the Monthly Influent Monitoring.

Warkworth - Monthly Average Influent Monitoring - 2019												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
BOD5	223	448	265	175	104	328	235	223	187	344	345	160
Total Phosphorous	4.32	4.52	6.62	2.99	2.38	2.32	7	4.3	3.87	6.9	5.73	3.12
Total Suspended Solids	139	570	262	113	176	151	236	525	160	374	51	343
Total Kjeldahl Nitrogen	49.6	30.7	59.3	29.2	28.3	15.6	61.2	35.4	39.2	59.3	62.6	35.5

Section 2 – ECA Condition 11 (4) (b)

The spring and fall releases both went without any issues or concerns. Note that the fall release was under the new ECA 6023-BDQR6H which was issued on Oct. 7, 2019. There were no difficulties with respect to maintaining compliance with the Environmental Compliance Approval (ECA) effluent quality requirements.
Effluent quantity and quality criteria stipulated in ECA Condition 7(1) Schedule C are summarized as follow;

Spring Release

East CELL	2019		2019	CELL		DISCHARGE		TOTAL	FILTERED			CBOD	un-ionized		On Site			
MONTH/DATE	WEATHER	C^0	OPERATOR	DEPTH	M_3	IN."	M_3	PHOS.	AMMONIA	BOD_5		mg/L	ammonia	TSS	Sol.P	pH	Temp	COMMENTS
April 23/19	Sunny	10	S. Mahoney	52.0	37,960	6	4380	0.03	0.8	5		5	0.027	8	0.16	8.37	12.4	Begin discharge at 0830. Collect first and second portion of composite sample
April 24/19	Overcast	4	S. Mahoney	46.0	33,580	2.0	1,460								0.14	8.05	10.7	Collect third portion of Composite sample
April 25/19	Sunny	4	S. Mahoney	44.0	32,120	4.0	2,920								0.11	8.08	11.1	
April 26/19	Rain	11	T. Stephens	40.0	29,200	3.0	2,190								0.2	8.11	13.1	
April 27/19	Overcast	2	T. Stephens	37.0	27,010	3.0	2,190								0.19	8.02	9.9	
April 28/19	Sunny	5	T. Stephens	34.0	24,820	3.0	2,190								0.12	8.01	9.1	
April 29/19	Overcast	5	A. Firth	31.0	22,630	1.0	730								0.1	8.09	10.7	
April 30/19	Overcast	6	A. Firth	30.0	21,900	1.0	730								0.18	7.97	10.7	Collect 1st and 2nd parts of middle composite sample
			TOTAL for April			23.0	16790											Total hours for April 183.5
May 1/19	Rain	7	A. Firth	29.0	21,170	3.0	2,190	0.06	1.8	5		5	0.047	8	0.02	8.09	11	Collect third portion of composite sample
May 2/19	Overcast	5	A. Firth	26.0	18,980	3.0	2,190								0.03	7.96	10.2	
May 3/19	Rain	5	A. Firth	23.0	16,790	3.0	2,190								0.15	8.16	10.3	
May 4/19	Overcast	5	A. Firth	20.0	14,600	1.0	730								0.17	8.28	11.4	
May 5/19	Sunny	10	A. Firth	19.0	13,870	3.5	2,555								0.11	8.2	13.2	
May 6/19	Sunny	8	S. Mahoney	15.5	11,315	2.5	1,825								0.07	7.95	10	Collect 1st and 2nd portion of end composite sample
May7/19	Overcast	13	T. Stephens	13.0	9,490	4.0	2,920	0.04	0.5	5		4	0.016	5	0.24	7.86	15.7	Collect third portion of composite sample
May 8/19	Sunny	8	S. Mahoney	8.0	5,840	1.0	730								0.05	8.05	12.9	Stop release 0845, install plugs
			Total for May			21.0	15,330											Total hours for May 176.75
			TOTAL			53.0	38,690											
			MINIMUM			1.0	730	0.03	0.5	5		4	0.016	5	0.02	7.86	9.10	Total release 360.25 hours (April 183.50 hrs, May 176.75 hrs)
			MAXIMUM			4.0	2,920	0.06	1.8	5.0		5.0	0.047	8	0.24	8.37	15.7	
			AVERAGE			2.3	1,679	0.043	1.03	5		5	0.030	7.0	0.13	8.08	11.4	

Fall Release

West CELL	2019		2019	CELL		DISCHARGE		TOTAL	FILTERED			CBOD	un-ionized		On Site			
MONTH/DATE	WEATHER	C^0	OPERATOR	DEPTH	M_3	IN."	M_3	PHOS.	AMMONIA	BOD_5		mg/L	ammonia	TSS	Sol.P	pH	Temp	COMMENTS
October 21/19	Sunny	12	S.Mahoney	38.5	28,105	0	0	0.04	0.2	<4		LE	0.009	11	0.18	8.87	13.2	1345 Start Release, collect first portion of comp. sample, no odor present when release
October 22/19	Rain	12	S.Mahoney	38.5	28,105	0.5	365								0.24	8.61	12	Collect second and third portion of comp. sample
October 23/19	Sunny	6	S.Mahoney	38.0	27,740	1.5	1,095								0.11	7.5	8.9	
October 24/19	Rain	8	T.Stephens	36.5	26,645	2.0	1,460								0.15	8.11	10.5	
October 25/19	Overcast	12	S.Mahoney	34.5	25,185										0.31	7.96	10.4	Stop release 1445(97 hrs.)
October 28/19	Sunny	8	S.Mahoney	34.5	25,185	0.5	365								0.24	7.73	8.4	Restart release no odor 0800
October 29/19	Sunny	6	T.Stephens	34.0	24,820	1.0	730								0.35	7.85	8.7	
October 30/19	Overcast	9	S.Mahoney	33.0	24,090	2.0	1,460								0.23	7.89	12.3	
October 31/19	Drizzle	6	S.Mahoney	31.0	22,630	1.0	730								0.17	8.06	10.4	
			TOTAL for October			8.5	6205											Total hours for October 185.0
November 1/19	Windy	4	S.Mahoney	30.0	21,900										0.17	8.04	7.7	Stop Release 1430
November 4/19	Drizzle	3	S.Mahoney	30.0	21,900	1.0	730	0.05	0.4	<4		<4	0.012	11	0.09	8.06	4.4	Restart release 0800, no odor, collect first and second portion of middle comp. sample
November 5/19	Overcast	7	S.Mahoney	29.0	21,170	1.5	1,095								0.39	8.09	6.9	Collect third portion of comp. sample
November 6/19	Overcast	-3	S.Mahoney	27.5	20,075	2.0	1,460								0.29	8.25	2.8	
November 7/19	Snow	1	S.Mahoney	25.5	18,615	2.5	1,825								0.18	8.2	3.3	
November 8/19	Sunny	-1	T.Stephens	23.0	16,790										0.14	8.35	4.6	Stop Release 1430
November 11/19	Overcast	0	S.Mahoney	23.0	16,790	3.5	2,555								0.26	8.41	6.2	Restart release 0835, no odor
November 12/19	Sunny	2	S.Mahoney	19.5	14,235	3.0	2,190								0.23	8.36	1.6	
November 13/19	Sunny	-18	A.Firth	16.5	12,045	3.0	2,190	0.05	0.3	<2		4	0.009	8	0.26	8.6	2.9	Collect first and second portion of end comp. sample
November 14/19	Snow	-1	S.Mahoney	13.5	9,490	3.0	2,190								0.23	8.7	4.5	Collect third portion of comp. sample
November 15/19	Overcast	2	T.Stephens	10.5	7,665										0.22	8.45	4.2	Stop release 1435
			Total for November			19.5	14,235											Total hours for November 212.0
			TOTAL			28.0	20,440											
			MINIMUM			0.0	0	0.04	0.2	<4		<4	0.009	8	0.09	7.5	1.60	Total release 397 hours (October 185 hrs, November 212 hrs)
			MAXIMUM			3.5	2,555	0.05	0.4	<2		4.0	0.012	11	0.39	8.87	13.2	
			AVERAGE			1.4	1,022	0.047	0.30	3		4	0.010	10.0	0.22	8.20	7.2	

Note: For the fall release in October for CBOD LE means Lab Error because CBOD was not tested as it was overlooked on the Chain of Custody.

Section 3 - ECA Condition 11(4) (c)

There were no operating issues encountered during the 2019 reporting year

Section 4 – ECA Condition 11(4) (d)

Normal maintenance occurred on all pumps and no emergency repairs had to be completed. The generator was replaced at East St. PS in December 2019 due to TSSA variance for fuel code

Section 5 – EC A Condition 11 (4) (e)

Effluent control measures and quality assurance include taking pre-release samples beginning at least one month before the scheduled release. If all parameters are compliant then a release is started and as a contingency, alum can be added to the lagoon prior to release for pre-treatment. This has not been required in recent years. As a result of the ongoing collection CCTV and flushing program, flows have decreased enough to use one lagoon per season and allow the other to remain idle for half of the year, giving more time for treatment. Operators also do in house testing during releases. In house testing provides real time results, which enhance process and operational performance. All in house sampling and analysis is performed by certified operators utilizing methods and protocols for sampling, analysis and recording as specified in the Ministry's Procedure F–10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", the Ministry's publication, "Standard Methods for the Examination of Water and Wastewater".

All effluent samples collected during the reporting period to meet C of A sampling requirements were analyzed by SGS Lakefield, with the exception of pH and temperature. SGS Lakefield has been deemed by the Canadian Association for Laboratory Accreditation (CALA) to be an accredited laboratory, meeting strict provincial guidelines including an extensive quality assurance/quality control program.

Section 6 – ECA Condition 11(4) (f)

The Worktech system automatically generates work orders and schedules calibration and certification of Flowmeters and lab equipment.

These calibrations are carried out by a certified, third party qualified technician and performed on an annual basis. A copy of the 2019 Annual Calibration Record for the influent flow meter is located in Appendix II.

Section 7 – ECA Condition 11(4) (g)

Condition 6 – Effluent Objectives, subsection (1) (c) states, "The Owner shall design and undertake everything practicable to operate the Sewage Treatment Plant in accordance to the following objectives: c. Annual Average Daily Influent Flow is within the Rated Capacity of the Sewage Treatment Plant."

The following table provides a comparison of the rated capacity of the works to the actual flow data obtained during the 2019 reporting period.

Warkworth - Flow Monitoring - 2019												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Average Daily Flow m3/d	173	183	210	307	387	219	170	157	161	155	174	210
Rated Capacity m3/d	390	390	390	390	390	390	390	390	390	390	390	390

The above table shows that the Warkworth Wastewater Stabilization Lagoons ECA rated capacity was not exceeded during 2019. The Annual Average Daily Influent Flow of 208.83 m3/day is 53% of the Rated Capacity of the Sewage Treatment Plant of 390 m3/d.

Section 8 – ECA Condition 11 (4) (h)

During the 2019 reporting year there were zero biosolids removed from the lagoons and there will be no biosolids removed in the upcoming year. It is estimated that each lagoon has a thirty (30) year capacity for biosolids and they were dredged in 2012 (West lagoon) and 2013 (East lagoon). Operations staff have created work orders to tabulate the volume of sludge accumulated to date and this will be completed in the summer of 2020 as per ECA # 6023-BDQR6H.

Section 9 – ECA Condition 11 (4) (i)

There were no community complaints received during the 2019 reporting period.

Section 10 – ECA Condition 11 (4) (j)

There were no by-pass, spills or abnormal discharge events during the 2019 reporting period.

Section 11 – ECA Condition 11 (4) (k)

There were no Notice of Modification to Sewage Works forms completed during the 2019 reporting period.

Section 12 – ECA Condition 11 (4) (l)

The Warkworth collection system has not experienced Bypass/Overflow situations in recent years and the Sewer system is 100% separated. In efforts to eliminate the possibility of Overflow/Bypass events as well as Inflow and Infiltration in the system, the Municipality has a multi-year plan in place to flush and CCTV a portion of the system each year. This means that all areas of the wastewater collection systems in Trent Hills are flushed, and CCTV inspected over a seven (7) year maintenance cycle. Areas identified for repair, are completed immediately or in some situations are identified for future rehabilitation.
During periods of elevated flow, municipal staff complete flow monitoring to identify areas of concern.
The Municipal budget for CCTV and flushing will remain at $57,000 for the three (3) systems within the Municipality of Trent Hills and $23,000 for repairs.

Any questions regarding the information contained in this report should be directed to the undersigned at 705-653-7113

Troy Stephens,
Wastewater Treatment/Collection Head Operator,
Municipality of Trent Hills

APPENDIX I

2019 Warkworth Performance Report

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Average	Min	Max
Flow Avg. (m3/d)	173	183	210	307	387	219	170	157	161	155	174	210		208.83		
Flow Min. (m3/d)	116	149	167	187	282	179	150	125	135	101	154	165			101	
Flow Max. (m3/d)	239	310	360	494	521	303	217	214	199	239	198	276				521
Flow Total (m3)	5375	5115	6499	9209	11993	6563	5280	4872	4819	4812	5231	6509	76277	6356.42		
Water plant flow	4361	4018	4673	4184	5082	4723	6382	5067	5132	5215	4340					
% increase	23	27.3	39.07	120	136	39	-17	-3.84	-6.09	-7.72	20.52					
Raw Filtered Ammonia	46.1	23	52.7	30.4	21	10	52.8	27.2	30.6	50.8	50.1	21.8		34.71		
Raw BOD5	223	448	265	175	104	328	235	223	187	344	345	160		253.08		
Raw Phosphorous	4.32	4.52	6.62	2.99	2.38	2.32	7	4.3	3.87	6.9	5.73	3.12		4.51		
Raw Suspended Solids	139	570	262	113	176	151	236	525	160	374	51	343		258.33		
Raw TKN	49.6	30.7	59.3	29.2	28.3	15.6	61.2	35.4	39.2	59.3	62.6	35.5		42.16		
Raw # Samples	1	1	1	1	1	1	1	1	1	1	1	1	12			
Total Effluent Release				16790	15330					6205	14235		52560			
Cell				East	East					West	West					
Flow Duration Hours				183.5	176.75					185	212		757.25			
BOD				5	5					<4	<2					
CBOD				5	4.5					LE	4					
TSS				8	6.5					11	9.5					
Filtered Ammonia				0.8	1.15					0.2	0.35					
Unionized Ammonia				0.027	0.031					0.009	0.01					
Total Phos				0.03	0.05					0.04	0.05					

APPENDIX II

2019 Warkworth WWTF Calibration Report

Greyline Doppler
Verification/Calibration Report

SCG FLOWMETRIX

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER Campbellford WWTP
CONTACT Troy Stephens
Wastewater Department Head Operator
Municipality of Trent Hills
66 Front St. South
P.O. Box 1030
Campbellford , Ont
K0L 1L0

LOCATION
VER. BY - FM *Tyler McNally*

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL

[MUT] MANUFACTURER	Greyline
MODEL	DFM 5.1
CONVERTER SERIAL NUMBER	17048
PLANT ID	Warkworth PumpingStation
METER ID	Discharge
FIT ID	N/A
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	44.2006911 -77.8817163
VERIFICATION DATE	5/21/19
CAL. FREQUENCY	Annual
CAL. DUE DATE	May 2020

PROGRAMMING PARAMETERS

PIPE INTERNAL DIAMETER	Inches	6.04
F.S. RANGE - O/P	LPS	50.0

TOTALIZER

AS FOUND	n/a	M3
AS LEFT	n/a	M3
DIFFERENCE	n/a	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
ALLOWABLE [%] ERROR	15

COMPONENTS TESTED

CONVERTER DISPLAY	Yes
SCADA	Yes
TOTALIZER	No
ACCURACY BASED ON [% o.r.]	Yes

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

Ultrasonic sensor installed to ensure full scale flow condition

AS FOUND TEST RESULTS

		0.0	25.0	50.0	75.0	100.0	% Max. Flow
		0.000	12.500	25.000	37.500	50.000	LPS
REF. FLOW RATE		0.000	12.500	25.000	37.500	50.000	LPS
MUT [Reading]		0.000	12.500	25.000	37.500	50.000	LPS
MUT [Difference]		0.000	0.000	0.000	0.000	0.000	LPS
MUT [% Error]		N/A	0.00	0.00	0.00	0.00	%
SCADA		0.000	12.500	25.000	37.500	50.000	SCADA
MUT [Reading]	min. 0.000 SCADA	0.001	12.500	25.010	37.520	50.003	SCADA
MUT [Difference]	max. 50.000 SCADA	0.001	0.000	0.010	0.020	0.003	SCADA
MUT [% Error]		N/A	0.00	0.04	0.05	0.01	%
TOTALIZER - REF. FLOW RATE							
TOTALIZER [MUT]							
TEST TIME							
CALC. TOTALIZER							
ERROR							

COMMENTS

Verification was performed with onboard simulator.

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD	n/a
PROCESS METER	PM	n/a
STOP WATCH	SW	n/a

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.00	PASS
SCADA	0.02	PASS
TOTALIZER	N/A	N/A

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.