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The Municipality of Trent Hills

ANNUAL REPORT

Warkworth Waste Stabilization Ponds and Collection System 2021

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 Flow 2021												
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Flow Avg. (m3/d)	179	177	227	215	212	168	192	160	245	230	245	290
Flow Min. (m3/d)	140	149	195	186	169	145	149	133	160	186	213	218
Flow Max. (m3/d)	218	209	286	258	277	201	311	249	632	349	303	389
Flow Total (m3)	5534	4969	7039	6453	6580	5042	5961	4961	7359	7127	7358	8982

The chart below summarizes the Monthly Influent Monitoring.

Warkworth - Monthly Average Influent Monitoring 2021												
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Raw BOD5	308	461	154	116	130	229	No Samp.	145	115	213	112	180
Raw Phosphorous	4.99	7.91	4.24	2.8	2.29	3.57	No Samp.	3.43	1.49	4.84	3.05	4.82
Raw Suspended Solids	416	540	108	132	154	174	No Samp.	167	58	395	82	205
Raw TKN	51.9	57.9	41	27	22.5	28.5	No Samp.	40.6	34.5	28.4	30.2	37.6

Note: There was a missed sample for the month of July 2021. It was reported immediately to the MECP on August 10/21. As a result, there were two raw samples taken in August 2021

Section 2 – ECA Condition 11 (4) (b)

In 2021, there was no spring release due to adequate lagoon levels in the spring. As a result, both lagoons were released in the fall and the effluent was compliant during the entire release. No issues were encountered during the release.

Effluent quantity and quality criteria stipulated in ECA Condition 7(1) Schedule C are summarized as follow:

Fall Release

East Cell

East CELL	2021		2020		East CELL		DISCHARGE		TOTAL PHOS.	Total AMMONIA	pH	Lab Samples		On Site				Comments
	MONTH/DATE	WEATHER	C ^o	OPERATOR	DEPTH	M ₃	IN."	M ₃				CBOD5 mg/L	un-ionized ammonia	TSS	Sol.P	pH	Temp	
Oct. 18/21	Clear/cool		AF	45.0	33,750	0.5	365	0.03	0.1	7.74	5	0.003	14	0.06	7.98	15.7	Discharge start 12:00, sample collected samples	
Oct. 19/21			AF	44.5	33,375	0.5	365							0.04	7.66	13.8		
Oct. 20/21	Clear/cool	13	TS	44.0	32,120	1.0	730							0.05	7.62	14.7	Shut off release 0900 (117 hours)	
Oct. 21/21	Rain	12	TS	43.0	31,390	1.3	913							0.05	8.12	15.1		
Oct. 22/21	Overcast		AF	41.8	30,477	1.8	1,278							0.06	8.14	13.6	Start release 0800, samples collected	
Oct. 23/21	Sunny		AF	40.0	29,200									0.04	8.17	12.3		
Oct. 24/21																	Shut off release 0900 (121 hours)	
Oct. 25/21	Rain		AF	40.0	29,200			0.03	0.1	8.2	4	0.002	8	0.02	8.2	11.2		
Oct. 26/21	Rain	5	SM	38.0	27,740	2.0	1,460							0.04	8.2	11.1	Started release 0800, samples collected	
Oct. 27/21	Sunny	12	SM	35.5	25,915	2.5	1,825							0.07	7.9	10		
Oct. 28/21	Sunny		AF	33.0	24,090	2.5	1,825							0.03	7.85	10.1	Shut off release 0800 (120 hours)	
Oct. 29/21	Sunny		AF	30.0	21,900	3.0	2,190							0.04	7.84	10		
Oct. 30/21	Rain		AF	29.0	21,170	1.0	730							0.05	7.9	10		
Oct. 31/21																	Start release 0805, collect samples, End release of East lagoon 1620 (8.75 hours)	
Nov. 1/21	Sunny	5	SM	29.5	21,535			0.04	0.1	7.94	5	0.001	3			9		
Nov. 2/21	Sunny	0	SM	28.5	21,024	1.0	730							0.07	7.94	9	19 days	
Nov. 3/21	Sunny	1	SM	26.0	18,980	2.5	1,820							0.08	8.03	9.5		
Nov. 4/21	Sunny	-2	SM	23.0	16,790	3.0	2,190							0.07	7.87	7.4	Shut off release 0800 (120 hours)	
Nov. 5/21	Overcast	-4	TS	20.0	14,600	3.0	2,190							0.06	7.94	3.7		
Nov. 6/21	Clear/cool	-1	TS	18.0	13,140	2.0	1,460							0.23	7.99	3.3		
Nov. 8/21	Sunny	4	SM	17.5	12,775	0.5	365	0.05	0.6	7.75	4	0.023	6	0.05	7.75	10		
TOTAL				27.5	20,435												Total release hours : Oct - 238 hrs - 9490 m3 Nov - 128.75 hrs - 10945 m3 366.75 hrs - 20435 m3	
-4 MINIMUM				17.5	0.5	365	0.03	0.1	7.74	4	0.001	3	0.02	7.62	3.30			
13 MAXIMUM				45	3.0	2,190	0.05	0.6	8.2	5.0	0.023	14	0.23	8.2	15.7			
4.1 AVERAGE					1.8	1,075	0.037	0.22	8	4.5	0.007	7.8	0.06	7.95	10.6			

West Cell

West CELL	2021		2020		East CELL		DISCHARGE		TOTAL PHOS.	Total AMMONIA	pH	Lab Samples		On Site				Comments
	MONTH/DATE	WEATHER	C ^o	OPERATOR	DEPTH	M ₃	IN."	M ₃				CBOD5 mg/L	un-ionized ammonia	TSS	Sol.P	pH	Temp	
November 8/21	Sunny	6	SM	63.0	45,990	2	1460										1630-Start Release - No odour	
November 9/21	Sunny	4	SM	61.0	44,530	0.5	365	0.05	0.5	7.94	3	0.012	3	0.1	7.94	10	Collect first set of samples	
November 10/21	Sunny	2	SM	60.5	44,165	3.5	2,555							0.09	7.66	9.6	Reduce flow, close gate 1/2 inch	
November 11/21	Sunny	2	SM	57.0	41,610	3.5	2,555							0.06	7.66	9.6		
November 12/21	Sunny	8	TS	54.5	39,785	2.5	1,825							0.06	7.72	9.8	0700 - Shut off release	
November 13/21	Overcast	3	TS	52.0	37,960	-	-							0.37	7.63	7.6		
November 14/21																	0830 - Start release - collect second set of samples	
November 15/21	Overcast	1	TS	52.0	37,960	4.0	2,920	0.04	0.2	8.02	7	0.007	10	0.11	8.02	9.3		
November 16/21	Sunny	2	TS	48.0	35,040	3.0	2,190							0.06	7.75	7.1	0725 - Stop release	
November 17/21	Overcast	1	SM	45.0	32,850	2.0	1,460							0.08	7.93	8.1		
November 18/21	Rain	4	SM	42.0	30,660	4.0	2,920							0.01	7.78	8.4	0800 - Start release, collect third set of samples	
November 19/21	Sunny	3	SM	38.0	27,740	3.0	2,190							0.08	7.66	8.3		
November 20/21	Overcast	-2	SM	35.0	25,550	-	-							0.07	8.1	1.5		
November 21/21																	0820 - Stop release, collect fourth set of samples	
November 22/21	Sunny	0	SM	35.0	25,550	4.0	2,920	0.04	0.3	8.13	6	0.007	28	0	8.13	5.3		
November 23/21	Sunny	0	SM	31.0	22,630	4.0	2,920							0.04	7.63	5.4		
November 24/21	Sunny	2	SM	27.0	19,710	1.0	730							0.07	7.87	5.1		
November 25/21	Overcast	3	SM	26.0	18,980	-	-	0.04	0.4	7.27	4	0.01	7	0.08	7.77	6.3		
TOTAL				37	27,010												Total release hours : 302.16	
MINIMUM				0.5	0.5	365	0.04	0.2	7.27	3	0.007	3	0	7.63	1.50			
MAXIMUM				4	4.0	2,920	0.05	0.5	8.1	7.0	0.012	28	0.37	8.13	10			
AVERAGE				2.8	2.8	2,078	0.042	0.35	8	5.0	0.009	12.0	0.09	7.82	7.4			

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

There were no operating issues encountered during 2021.

Section 4 – ECA Condition 11(4) (d)

Normal maintenance occurred on all pumps and no emergency repairs had to be completed. All valves were replaced at George St. Pumping Station.

Section 5 – ECA 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. Because 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 2021 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 2021 reporting period.

Warkworth - Monthly Flow Monitoring 2021												
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Average Daily Flow m3/d	179	177	227	215	212	168	192	160	245	230	245	290
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 2021. The Annual Average Daily Influent Flow of 212 m³/day is 54% of the Rated Capacity of the Sewage Treatment Plant of 390 m³/d.

Section 8 – ECA Condition 11 (4) (h)

During the 2021 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 was completed in the August of 2020 as per ECA # 6023-BDQR6H.

Below is the summary of the last measured volume of the sludge levels in 2020. It will be measured next within the 5 year interval as stated in ECA # 6023-BDQR6H prior to 2025.

Warkworth WPC - Biosolids Summary 2020			
	Average Sludge Depth inches	m ³ /Inch	Volume of Biosolids m ³
East Lagoon	8.69	730	6344
West Lagoon	12.8	730	9344
	Total		15 688

Section 9 – ECA Condition 11 (4) (i)

There were no community complaints received during the 2021 reporting period.

Section 10 – ECA Condition 11 (4) (j)

There were no by-pass, spills or abnormal discharge events during the 2020 reporting period.

Section 11 – ECA Condition 11 (4) (k)

There were no Notice of Modification to Sewage Works forms completed during the 2020 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

2021 Warkworth Performance Report

Warkworth WPC 2021 Performance Summary

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Average	Min	Max
Flow Total (m3)	5534	4969	7039	6453	6580	5042	5961	4961	7359	7127	7358	8982	77365			
Flow Avg. (m3/d)	179	177	227	215	212	168	192	160	245	230	245	290		212		
Flow Min. (m3/d)	140	149	195	186	169	145	149	133	160	186	213	218			133	
Flow Max. (m3/d)	218	209	286	258	277	201	311	249	632	349	303	389				632
Raw BOD5	308	461	154	116	130	229	No Samp.	145	115	213	112	180		196	116	461
Raw Phosphorous	4.99	7.91	4.24	2.8	2.29	3.57	No Samp.	3.43	1.49	4.84	3.05	4.82		3.94	1.49	7.91
Raw Suspended Solids	416	540	108	132	154	174	No Samp.	167	58	395	82	205		221	58	540
Raw TKN	51.9	57.9	41	27	22.5	28.5	No Samp.	40.6	34.5	28.4	30.2	37.6		36.4	22.5	57.9
Raw # Samples	1	1	1	1	1	1	0	2	1	1	1	1	12			
Total Effluent Release										9490	37955		47445			
Cell										East	East/West					
Flow Duration Hours										238	430.91		668.91			
CBOD										4.5	4.8		4.65			
TSS										11	9.5		10.25			
Total Ammonia										0.1	0.35		0.225			
Unionized Ammonia										0.002	0.01		0.006			
TKN										0.9	1.15		1.025			
Nitrate										0.08	0.53		0.305			
Nitrite										0.03	0.06		0.045			
E.Coli										309.83	297.18		303.51			
pH										8.06	7.84		7.95			
Total Phos										0.03	0.04		0.035			

APPENDIX II

2021 Warkworth WWTF Calibration Report

Tower Electronics Canada Inc. Calibration Certificate

Customer:

Troy Stephens
 Wastewater Collection/Treatment Plant Head Operator
 Municipality of Trent Hills
 705-653-1870

Meter Information

Date of Test: 5/26/2021
 Location: Warkworth SPS
 Meter Under Test: Raw Flow
 Client Tag: n/a
 Manufacturer: Greyline
 Model: DFM 5.1
 Serial Number: 17048
 Totalizer As Found: 34033857L
 Totalizer As Left: 34039251L

Calibration by:

Dan Matchett

Programming Parameters:

DN Size: 6.04" ID
 Cal Factor: 0.975
 Zero Cal: 0
 Allowable Error: 15%
 Calibration Due: May 2022

Standards:

Fluke 289 S/N 96220182 NIST Cal Due 3-15-22

Instrument Type

Clamp-on Doppler Flow

Method of verification

Volumetric verification

Units: LPS
Zero: 0.00
Span: 50.00
Totalizer: n/a

Flow Test					
Sim Setting	Sim Flow LPS	Meter Display	SCADA	Disp Error%	SCADAErr%
0.000	0.000	0.000	0.000	0.000	0.000
12.500	12.500	12.500	12.520	0.000	0.040
25.000	25.000	25.000	25.020	0.000	0.040
37.500	37.500	37.500	37.540	0.000	0.080
50.000	50.000	50.000	50.050	0.000	0.100
Average Error%				0.00	0.05
Result:				PASS	PASS

Draw Down Test

Chamber Volume Pumped	4113.000	L
Start Totalizer	34033873.000	L
End Totalizer	34037459.000	L
Volume Recorded By Meter	3586.000	L
Volume Difference	3864.000	
Error%	14.696	
Result:	PASS	

Comments:

Unit passes verification,
 Volumetric/Draw down test using wet well chamber 2.4m Circ(10cm depth = 0.49M3)

