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The Municipality of Trent Hills

ANNUAL REPORT

Warkworth Waste Stabilization Ponds 2024

Prepared by

Wastewater Operations Department

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Section 11(4) of the Environmental Compliance Approval No. 8118-BL2SC6, 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.

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 Monitoring - 2024												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Flow Total (m3)	6314	5766	6883	10193	8509	5133	4980	4584	4279	4168	3868	4369
Flow Average(m3/d)	204	199	222	340	274	171	161	148	143	134	129	141
Flow Minimum (m3/d)	158	167	173	191	194	131	116	114	113	92	90	100
Flow Maximum (m3/d)	310	256	279	530	350	224	283	195	177	159	155	210

The chart below summarizes the Monthly Influent Monitoring.

Warkworth - Monthly Influent Monitoring - 2024												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Raw cBOD5	57	113	239	209	97	73	56	76	380	179	65	60
Raw Phosphorous	2.33	1.27	4.9	2.22	1.47	2.77	2.64	2.81	9.3	2.46	2.36	2.08
Raw Total Suspended Solids	47	253	462	165	76	60	111	41	509	276	53	41
Raw Total Kjeldahl Nitrogen	24.3	16.7	50.7	28.4	14.8	34	28.8	32	56	32.1	32.1	25.6

Section 2 – ECA Condition 11 (4) (b)

In 2024, the spring release was delayed to allow more time for Ammonia levels to lower to within compliant limits. There were no issues encountered in the spring release.

In the fall alum was required to be added to aid in settling, otherwise no issues were encountered. By releasing both lagoons in the fall and by addressing areas of infiltration in the system it is expected that a spring release may not be required to avoid further issues with the Ammonia levels.

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

Spring Discharge East Cell April 2024

East CELL	2023		2023		East CELL		DISCHARGE		Lab Samples						On Site			Comments
	MONTH/DATE	WEATHER	C°	OPERATOR	DEPTH	M ₁	IN."*	M ₂	TOTAL PHOS.	Total AMMONIA	pH	CBOD5 mg/L	un-ionized ammonia	TSS	Sol.P	pH	Temp	
April 23/24	Sunny	11	TS	36.0	26,280	1	730	0.03	4.4	8.1	4	0.122	10	0.08	8.1	10.6	Start release 0900, Collect first sample	
April 24/24	Overcast		AF	35.0	25,550	1.0	730							0.04	8	11.1		
April 25/24	Sunny		AF	34.0	24,820	1.0	730							0.13	8.1	12.8		
April 26/24	Sunny	-3	TS	33.0	24,090	1.0	730							0.08	8.1	11.2		
April 27/24	Clear	7	TS	32.0	23,360	1.0	730							0.03	8.2	11.4		
April 28/24	Sunny	9	TS	31.0	22,630	1.0	730							0.07	8	12.2		
April 29/24	Rain	6	SM	32.0	23,360	1.0	730	0.03	3.3	8.2	4	0.087	7	0.05	8.2	12.3		
April 30/24	Overcast	10	SM	31.0	22,630	1.0	730							0.11	8.2	12.3		
			TOTAL			8.0	5,840											
			MINIMUM			1.0	730											April release hours : 183
			MAXIMUM			1.0	730											
			AVERAGE			1.0	730	0.030	3.85	8	4.0	0.105	8.5	0.07	8.11	11.7		

Spring Discharge East Cell May 2024

East CELL	2023		2023		East CELL		DISCHARGE		Lab Samples						On Site			Comments		
	MONTH/DATE	WEATHER	C°	OPERATOR	DEPTH	M ₁	IN."*	M ₂	TOTAL PHOS.	Total AMMONIA	pH	CBOD5 mg/L	un-ionized ammonia	TSS	Sol.P	pH	Temp			
May 1/24	Sunny	9	SM	29.5	21,535	1.5	1095								0.04	8.2	13.4	Collect Samples		
May 2/24	Sunny	12	SM	28.0	20,440	1.5	1095								0.08	8.3	15.5			
May 3/24	Sunny	16	SM	26.0	18,980	2.0	1460								0.06	8.1	18.6			
May 4/24	Sunny	20	SM	24.5	17,885	1.5	1095								0.08	8.5	22.4			
May 5/24	Overcast	18	SM	23.0	16,780	1.5	1095								0.07	8.7	20.5			
May 6/24	Sunny	16	SM	22.0	16,000	1.0	730	0.03	0.9	8.4	4	0.044	3	0.04	8.6	18.2				
May 7/24	Sunny	20	SM	20.5	14,965	1.5	1095								0.11	9	22.5			
May 8/24	Cloudy	13	SM	19.5	14,235	1.0	730								0.02	8.7	19.2			
May 9/24	Sunny	9	SM	18.5	13,505	1.0	730								0	8.5	14.9			
May 10/24	Cloudy	3	SM	17.5	12,775	1.0	730								0.08	8.8	15.2			
May 11/24	Sunny	14	SM	16.5	12,045	1.0	730								0.15	9.1	19.4			
May 12/24	Sunny	12	SM	15.5	11,315	1.0	730								0.18	9.5	18.3			
May 13/24	Overcast	12	SM	14.5	10,585	1.0	730	0.03	0.1	9.3	4	0.005	10	0.04	9.3	15.7	Stop Release at 0940			
			TOTAL			12,045														
			MINIMUM			730														May release hours : 297.5
			MAXIMUM			1,460														
			AVERAGE			1.3	927	0.030	0.50	9	4.0	0.025	6.5	0.07	8.72	18.0				

Fall Discharge East and West Cell October – December 2024

East CELL	2024		East CELL				Lab Samples					On Site			Comments			
	MONTH/DATE	WEATHER	C ^o	OPERATOR	DEPTH	M ₁	IN." M ₂	TOTAL PHOS.	Total AMMONIA	pH	CBOD5 mg/L	un-ionized ammonia	TSS	So.P		pH	Temp	
October 21/24		14	SM	46.0	33,580	2.5	1825	0.03	0.1	8.3	4	0.002	2	0.08	8.3	13.4	Start Release - collect first sample 0900	
October 22/24		14	SM	43.5	31,755	1.0	730							0.08	8	15.8		
October 23/24	Clear	20	TS	42.5	31,025	0.5	365							0.06	8	15.7		
October 24/24	Clear	2	SM	42.0	30,660	2.0	1460							0.1	7.9	13		
October 25/24	Clear	-2	TS	40.0	29,200	2.0	1460							0.06	7.5	10.3		
October 26/24	Clear	5	TS	38.0	27,740	1.0	730							0.14	8	12		
October 27/24	Clear	-1	TS	37.0	27010	1.5	1095							0.05	7.8	9.5		
October 28/24	Cloudy	1	SM	35.5	25,915	2.0	1460	0.03	0.3	8	4	0.005	3	0.09	8	9.3	Collect second sample	
October 29/24	Overcast	-2	SM	33.5	24,455	0.5	365							0.03	8.2	6.5		
October 30/24	Cloudy	12	SM	33.0	24,090	2.0	1460							0.04	8	10.9		
October 31/24	Sunny	18	SM	31.0	22,630	2.0	1460							0.17	8.1	14.5		
November 1/24	Overcast		AF	29.0	21,170	2	1460							0.07	7.9	13.9		
November 2/24	Sunny/Cool		AF	27.0	19,710	2.0	1460							0.09	8.1	11.2		
November 3/24	Sunny/Cool		AF	25.0	18,250	1.5	1095							0.09	8.1	9.4		
November 4/24	Coudy	9	SM	23.5	17,155	1.5	1095	0.04	0.9	8	4	0.029	6	0.05	8	10.3	Collect Samples	
November 5/24	Sunny	20	SM	22.0	16,060	1.0	730							0.07	7.8	14		
November 6/24	Sunny	9	SM	21.0	15,330	2.0	1460							0.01	7.9	14.2		
November 7/24			SM	19.0	13070	1.0	730							0.02	7.9	15.2		
November 8/24	Clear	9	TS	18.0	13,140	1.0	730							0.03	7.9	11.5		
November 9/24	Clear	0	TS	17.0	12,410	1.0	730							0.01	8.1	6.5		
November 10/24	Clear	-1	TS	16.0	11,680	1.0	730							0.02	8.1	5.5		
November 11/24	Overcast	11	TS	15.0	10,950	0.0	0	0.07	2.7	7.8	6	0.023	4	0.01	7.8	9	Collect Samples	
November 12/24	Sunny	4	SM	15.0	10,950	3.0	2190							0.04	8	9.5		
November 13/24	Clear	-8	SM	12.0	8,760	3.0	2190							0	8.4	8.7		
November 14/24	Overcast	6	SM	9.0	6,570	0.5	365							0.04	8.6	7.9	Stop East release and start West release 1220	
November 15/24	Overcast	1	SM	52.0	37,960	1.5	1095							0.06	8.8	4.4		
November 16/24	Sunny	4	SM	50.5	36,865	1.5	1095							0.11	8.8	6.7		
November 17/24	Overcast	4	SM	49.0	35,770	0.5	365							0.06	9.2	6.2		
November 18/24	Sunny	4	SM	48.5	35,405	2.0	1460	0.04	0.1	8.5	21	0.001	9	0.09	8.5	8.3	Collect Samples	
November 19/24	Sunny	-1	SM	46.5	33,945	1.5	1095							0.05	9	3.4		
November 20/24	Cloudy	7	SM	45.0	32,850	2.0	1460							0.04	8.7	6.9		
November 21/24	Sunny	2	SM	43.0	31,390	1.0	730							0.08	9	6.3		
November 22/24	Rain	4	SM	42.0	30,660	1.5	1095							0.04	8.8	7.5		
November 23/24	Overcast	4	SM	40.5	29,565	1.5	1095							0.1	9.1	9.4		
November 24/24	Cloudy	5	SM	38.5	28,105	1.5	1095							0.11	9.1	8.4		
November 25/24	Sunny	-7	SM	37.0	27,010	1.5	1095	0.05	0.1	8.8	20	0.001	30	0.04	8.8	4.3	Collect Samples	
November 26/24	Drizzle	2	SM	35.5	25,915	2.5	1825							0	8.8	4.4		
November 27/24	Sunny	2	SM	33.0	24,090	1.5	1095							0.08	8.7	4.1		
November 28/24	Overcast		AF	31.5	22,630	2.5	1825							0.04	8.8	5.3		
November 29/24	Overcast	0	TS	29.0	21,170	2.0	1460							0.05	8.8	4.8		
November 30/24	Overcast	1	TS	27.0	19,710	1.0	730							0.06	8.7	4.6		
December 1/24	Clear	0	TS	26.0	18,980	1.5	1095							0.05	8.8	4.5		
December 2/24	Sunny	-9	SM	24.5	17,885	1.5	1095	0.1	0.1	9	26	0.001	40	0	9	3.7	Collect Samples	
December 3/24	Clear	-5	SM	23.0	16,790	2.0	1460							0.04	9.4	1.1		
December 4/24	Snow	-1	SM	21.0	15,330	1.5	1095							0.01	9	2.6		
December 5/24	Clear	-3	SM	19.5	14,235									0.01	8.9	0.7	0820 - Stop Release	
			TOTAL				50,735											Total release hours : 1079.5
			MINIMUM				0											
			MAXIMUM				2,190											
			AVERAGE				1,127	0.051	0.61	8	12.1	0.009	13.4	0.06	8.42	8.4		

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

There were no operating issues encountered during either release in 2024. In the spring staff delayed the release due to adequate liquid levels in the ponds to allow sufficient time after the ice cover disappeared. It is anticipated that by releasing from both lagoons in the fall season and attempting to get the level as low as possible in addition to the work being completed within the system dealing with infiltration a spring release may not be required to avoid issues with Ammonia in the future.

Municipal staff continue to complete manhole inspections and are able to locate areas of interest for infiltration. Grouting and sewer repairs are completed as a result of these investigations.

Section 4 – ECA Condition 11(4) (d)

Normal maintenance occurred on all pumps and no emergency repairs had to be completed. A list of repairs and replacements are below:

STI Grout various locations throughout town

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 2024 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 2024 reporting period.

Warkworth - Monthly Flow Monitoring - 2024												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Average Daily Flow m3/d	204	199	222	340	274	171	161	148	143	134	129	141
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 compliant for 12 out of 12 months. The Annual Average Daily Influent Flow of 189 m3/day is 48% of the Rated Capacity of the Sewage Treatment Plant of 390 m3/d.

Section 8 – ECA Condition 11 (4) (h)

During the 2023 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 both lagoons were completed in the August of 2020 as per ECA # 6023-BDQR6H and the West lagoon was completed in 2023. In 2025 the Municipality of Trent Hills will begin to have the lagoons sonar imaged to get an accurate assessment of sludge levels and going forward this will be completed at minimum every 5 years.

Below is the summary of the last measured volume of the sludge levels of the East Cell in 2020 and the West Cell in 2023. It will be measured next annually if possible and within the 5 year interval as stated in ECA # 6023-BDQR6H prior to 2025.

Warkworth - Biosolids Summary 2023			
	Average Sludge Depth (inches)	m3/inch	Volume of Biosolids m3
East Lagoon 2020	8.69	730	6344
West Lagoon 2023	12.25	730	8942

Section 9 – ECA Condition 11 (4) (i)

There were no community complaints received during the 2024 reporting period.

Section 10 – ECA Condition 11 (4) (j)

There were no by-pass, spills or abnormal discharge events during the 2024 reporting period.

Section 11 – ECA Condition 11 (4) (k)

There were no Notice of Modification to Sewage Works forms completed during the 2024 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,
Manager of Water and Wastewater Services,
Municipality of Trent Hills

Appendix I

2024 Warkworth Performance Report

Warkworth WPC 2024 Performance Summary

Warkworth WWTF Performance Summary
2024

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Average	Min	Max
Flow Total (m3)	6314	5766	6883	10193	8509	5133	4980	4584	4279	4168	3868	4369	69046			
Flow Avg. (m3/d)	204	199	222	340	274	171	161	148	143	134	129	141		189		
Flow Min. (m3/d)	158	167	173	191	194	131	116	114	113	92	90	100			90	
Flow Max. (m3/d)	310	256	279	530	350	224	283	195	177	159	155	210				530
Water plant flow																
% increase																
Raw BOD5	57	113	239	209	97	73	56	76	380	179	65	60		134		
Raw Phosphorous	2.33	1.27	4.9	2.22	1.47	2.77	2.64	2.81	9.3	2.46	2.36	2.08		3.05		
Raw Suspended Solids	47	253	462	165	76	60	111	41	509	276	53	41		175		
Raw TKN	24.3	16.7	50.7	28.4	14.8	34	28.8	32	56	32.1	32.1	25.6		31.3		
Raw # Samples	1	1	1	1	1	1	1	1	1	1	1	1	12			
Total Effluent Release				5840	12045					12410	33580		63875			
Cell				East	East					East	East/West					
Flow Duration Hours				183	297.5					255	720		1455.5			
CBOD				4	4					4	12.8					
TSS				8.5	6.5					2.5	12.3					
Total Ammonia				3.85	0.5					0.2	0.95					
Unionized Ammonia				0.105	0.025					0.004	0.014					
TKN				4.9	1.35					1.15	2.02					
Nitrate				0.29	0.32					0.65	0.12					
Nitrite				0.17	0.13					0.05	0.04					
E.Coli				346	10.58					84	118					
pH				8.11	8.72					7.98	8.47					
Total Phos				0.03	0.03					0.03	0.05					

APPENDIX II

2024 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: 2024-05-13
 Location: Warkworth SPS
 Meter Under Test: Raw Flow
 Client Tag: n/a
 Manufacturer: Greyline
 Model: DFM 5.1
 Serial Number: 17048
 Totalizer As Found: 28610792L
 Totalizer As Left: 28619459L

Calibration by:

Dan Matchett

Standards:

Fluke 289 S/N 96220182 NIST Cal Due April 2025

Programming Parameters:

DN Size: 6.04" ID
 Cal Factor: 0.975
 Zero Cal: 0
 Allowable Error: 15%
 Calibration Due: May-25

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	0.010	0.000	0.020
12.500	12.500	12.500	12.520	0.000	0.040
25.000	25.000	25.000	25.030	0.000	0.060
37.500	37.500	37.500	37.530	0.000	0.060
50.000	50.000	50.000	50.060	0.000	0.120
Average Error%				0.00	0.06
Result:				PASS	PASS

Draw Down Test

Chamber Volume Pumped	3624.100	L
Start Totalizer	28615617.000	L
End Totalizer	28619459.000	L
Volume Recorded By Meter	3842.000	L
Error%	-5.672	
Result:	PASS	

Comments:

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