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Wingham Sewage Treatment Plant

2023 Annual Report

Owned by the Corporation of the Township of North Huron and Operated by Veolia Water Canada

Wingham Sewage Treatment Plant 2023 Annual Report

Wingham STP ECA 1040-9HAN94 issued May 30, 2014 and #3557-7UNPUR (Aug 11, 2009-Air) & (DRAFT CLI ECA 090-W601)

The Following is a summary and discussion of the 2023 Wingham Sewage treatment plant operation and summary of compliance limits as set forth in the Wingham STP ECA 1040-9HAN94 Issued May 30 2014.

The Rated Capacity of the Treatment Unit is 3,400m3 average daily flow

Based on Raw Sewage Flows, the 2023 annual average daily flow was 1975m3/day which represents 58% of the 3400m3/day capacity. The maximum Peak flow of 7712m3 occurred in April which represents 227% of the capacity.

Bypass Events

There were no bypass or overflow events that occurred during 2023 from the Wingham sewage treatment plant

Compliance limits

The plant consistently removed 96.9% Biological Oxygen demand, 93.6% total suspended solids, 87.2% phosphorous and 92% total kjeldahl nitrogen which is well within the range of removals for a secondary sewage plant and consistent with previous yearly operations.

Operational problems

Aeration Arm- Corrective action- we had a new shaft fabricated and installed and will get a plan to check the condition of the other shafts in the other aeration cell as well

Maintenance

Routine maintenance was performed throughout the year, such as oil changes in gear drives and cleaning UV lights.

Security/ Health and safety Improvements- locks, door knobs and Lighting

2 Couplers on return pump motor

Purchased new level sensor

New battery for Sewage pump station Generator

Repaired Aeration Mixing Shaft

3 slide gate valves replaced

Quality Control Monitoring

Monitoring includes an online dissolved oxygen sensor which indicates loading and raw sewage quality, aeration basin solids content and proper operations of the aerators. Secondary clarifiers effluent is monitored for dissolved phosphorous to determine adequate ferric chloride dosage in aeration basins as well as general clarity and surface debris which indicates proper solids removal. Adequate solids return to the aeration and wasting rates.

The raw sewage flowmeter measures the flow going to the treatment plant and is used to base dosages and treatment plant capacity. The final effluent flow meter measures flow to the UV lights and does not represent the hydraulic loading of the plant but rather is a sum of the flow through the plant and any lagoon discharge. Results of monitoring activities can be viewed on the monthly spreadsheets.

Calibration and Maintenance

There are two flowmeters, raw sewage in and the final effluent discharge volumes. The flowmeters are calibrated yearly this year raw sewage was calibrated by Advanced meter Services as well as the final effluent, the certificates are stored at the PUC Office. The pH analyzer is calibrated monthly and recorded in the log books.

Efforts to meet effluent objectives

As described in the quality control monitoring section, analytic and visual parameters are used as indicators of process efficiency and should fall within the critical control points. A summary of these values was developed and is in the Wingham sewage treatment facility operations manual for reference and historically have been adequate to maintain compliance.

Biosolids Generated

A total of 3034 cubic meters were removed from cell 1 in 2023. Approximately 1138m3 of sludge went into the lagoon in 2023, we would estimate approximately the same amount will go into the lagoon for 2024. We do plan on Hauling more Biosolids from the Lagoon in 2024 and this amount will be roughly 4000m3 based on information from our hauler on what was left in the lagoon and what we typically add into the lagoon in a year. Our estimate for 2024 is based on no foreseen increase or decrease in flows, Estimating the solids volume in a lagoon situation is nearly impossible when there are no terms of reference for the % solids concentration. Many factors go into the volume such as how well the sludge compacts, water depth in the lagoon, temperature, wind action, solids quality, etc.

Complaints

There were no complaints received as results of the operation of the sewage treatment facility.

Reports

Attached in the report is a data summary,

compliance summary,

sludge metals summary,

bypass and overflow summary

Wingham Sewage Treatment Plant **2023**

Flows Incoming	Jan	February	March	April	May	June	July	August	September	October	November	December	Total(m3)	Avg(m3)	Max(m3)	% Cap
Flows	83959	73212	85689	92695	61388	47952	43960	41001	34579	44688	47401	64491	721015	1975	92695	58
Average	2708	2615	2764	3090	2040	1598	1418	1323	1153	1442	1580	2080				
Max/d	6183	5174	4790	7712	3189	2443	3028	2429	1906	2331	2042	3573			7712	227

Raw Sewage													Avg	Max.	%Removal
BOD	44	12	78	29	31	160	105.5	82	65	88	49	74	68	160	96.9
SS	41	23	80	38	34	102	116	60	49	44	39	74	58	116	93.6
Alkalinity	329	327	331	323	328	336	335.5	347	330	355	346	315			
TP	1	0.64	1.75	1	1	3	2.525	3	2	2	2	1	1.77	3.40	87.2
TKN	13	9.70	14.10	13	13	25	24.40	24	22	20	21	13	17.66	24.90	92.0
pH	7.72	7.70	7.70	7.57	7.56	7.50	7.57	7.55	7.51	7.51	7.62	7.82	7.61	7.82	
Final Effluent															
E. Coli	38	520	15	24	8	2	10	51	8	2	17	20	59.71	520	
CBOD	2	2	2	2	2	3	2	2	2	2	2	3	2.13	3.00	
SS	3	2	4	5	4	3	6	5	3	6	3	3	3.72	6.00	
Alkalinity	257	258	270	217	216	204	251	191	156	176	216	237	221	270	
Ammonia	0.10	0.30	0.10	0.3	0.4	0.3	0.32	0.4	0.23	0.20	0.11	0.16	0.23	0.37	
TKN	0.97	2.00	0.50	1.60	0.95	1.25	3.00	1.77	0.50	0.80	2.55	1	1.42	3.00	
TP	0.19	0.28	0.18	0.27	0.37	0.30	0.32	0.35	0.10	0.10	0.11	0.16	0.23	0.37	
NO2	0.05	0.12	0.03	0.04	0.05	0.06	0.03	0.03	0.03	0.03	0.32	0.12	0.07	0.32	
NO3	11.18	6.03	9.95	6.15	9.01	17.05	8.21	17.6	24	19	16.00	13	13.01	23.50	
pH	7.78	7.75	7.72	7.77	7.87	7.56	7.66	7.58	7.56	7.56	7.43	7.47	7.64	7.87	
H2S>	0.02			0.02			0.02			0.02			0.02	0.02	

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Wingham STP Compliance Summary **2023**

Yellow highlights are Objectives not limits

	January	February	March	April	May	June	July	August	September	October	November	December
Max/day m3	6183	5174	4790	7712	3189	2443	3028	2429	1906	2331	2042	3573
Av Day Flow	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**	**3400**
Actual	2708	2615	2764	3090	2040	1598	1418	1323	1153	1442	1580	2080
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CBOD&TSS	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**
CBOD	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.5
TSS	3.0	2.0	4.3	4.5	3.5	3.0	6.0	5.3	2.5	5.5	2.5	2.5
Loading Kg	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**
CBOD Kg	5.42	5.23	5.53	6.18	4.08	4.80	2.84	2.65	2.31	2.88	3.16	5.20
TSS Kg	8.13	5.23	11.98	13.90	7.14	4.80	8.51	7.05	2.88	7.93	3.95	5.20
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tot P	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Actual	0.19	0.28	0.18	0.27	0.37	0.30	0.32	0.35	0.10	0.10	0.11	0.16
TP Load Kg	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**
Act. TP Kg	0.51	0.73	0.50	0.82	0.75	0.48	0.45	0.46	0.12	0.14	0.17	0.33
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
H2S	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Actual(<)	0.02			0.02			0.02			0.02		
Comp. Y/N	Y			Y			Y			Y		
pH	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**	**6.5 - 9.0**
Min	7.64	7.61	7.64	6.48	7.61	7.45	7.46	7.49	7.42	7.41	7.25	7.13

Max	7.88	7.87	7.89	8.48	9.53	7.68	7.86	7.87	7.69	7.69	7.61	7.62
Average	7.78	7.75	7.72	7.77	7.87	7.56	7.66	7.58	7.56	7.56	7.43	7.47
Comp. Y/N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y

E. Coli	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**
Actual GMD	38	520	15	24	8	2	10	51	8	2	17	20
Comp. Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

NH 3&4	**3**	**3**	**3**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**3**	**3**
Actual	0.10	0.30	0.10	0.01	0.01	0.30	0.32	0.35	0.23	0.20	0.11	0.16
NH 3&4 Load/d	0.27	0.78	0.28	0.02	0.01	0.48	0.45	0.46	0.27	0.29	0.17	0.33
Limit kg/d	10.7	10.7	10.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	10.7	10.7
Comp. Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

NH 3	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
Actual	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.01	0.00	0.00	0.01	0.001
Comp. Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- E. coli result of 520 Occurred in February during the Freezing period, therefore while it exceeded the 200 organisms per 100mL Monthly Geometric mean- it is not considered an exceedance
- A pH Result of 6.48 was recorded in April this is less than our Objective of 6.5 but not less than our regulated limit of 6 therefore we did not exceed our regulated limit in this instance
- A pH exceedance was recorded in May a result of 9.53 there were a few possible contributing factors- operators were cleaning the sludge out of the channels and the flow was turned off to the pH probe therefore it was likely not a true recording of effluent pH- this was reported to our MECP Inspector on June 2.

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Quarterly Metals Calculations Report 2023											Lagoon- Sludge	
Parameter												
Date		Jan 17-23		Apr 11-23		July 4-23	Jul 25-23	Aug 29-23	Oct 10-23	Average	May 29-23	AVE
Total Solids		3050		16800		11300	2600	34900	11800	8438	29700	29700
TKN		144		642		653	72	1140	536	378	891	891
NH 3&4		2.3		22.8		7.8	1.2	84.4	12.2	8.5	60	60
NO2		1.4		0.6	<	3	3	3	3	2.0	3.1	3.1
NO3		6.4	<	0.3	<	3	17	3	3	6.7	2	2
NO2+NO3		7.8		0.6	<	3	17	3	3	7.1	3.1	3.1
Arsenic	<	0.1	<	0.1	<	0.1	0.1	0.4	0.1	0.1	0.3	0.3
Cadmium	<	0.005		0.007		0.006	0.005	0.033	0.006	0.00575	0.029	0.029
Cobalt	<	0.01		0.02		0.03	0.01	0.13	0.04	0.0175	0.09	0.09
Chromium		0.1		0.42		0.56	0.08	3.2	0.9	0.29	2.2	2.2
Copper		1.3		5.2		6.4	0.6	34	6.3	3.375	31	31
Mercury		0.002		0.007		0.005	0.001	0.042	0.008	0.004	0.049	0.049
Potassium		14		45		34	12	22	34	26.25	24	24
Molybdenum	<	0.05		0.09		0.08	0.05	0.44	0.09	0.07	0.37	0.37
Nickel	<	0.04		0.2		0.24	0.05	1.1	0.33	0.1325	0.9	0.9
Phosphorous		44		174		208	26	910	265	113	1040	1040
Lead	<	0.1		0.2		0.2	0.1	1.1	0.2	0.2	1.1	1.1
Selenium	<	0.1	<	0.1	<	0.1	0.1	0.2	0.1	0.1	0.2	0.2
Zinc	<	1		4		5	1	27	5	3	21	21
Ecoli DW		1868852		1250000		2300885	2038462	2865	2542373	1864549.75	30303	30303

Ecoli /100 ml	570000	2100000	2600000	530000	10000	3000000	1450000	90000	90000	

Table 1 BYPASS AND OVERFLOW EVENTS

FACILITY NAME: Wingham Sewage **YEAR:** 2023

Date (dd/mm/yy)	Location	Type (see legend)	Start Time	Duration (hours)	Volume (1000m3)	M/E	Disinfection (Y/N)	Treatment (Y/N)	Reason Code*	Sample Results BOD5 (mg/L)	SS (mg/L)	TP (mg/L)	E.Coli (/100ml)

Legend

PB = Primary Bypass
SB = Secondary Bypass
STPO = Sewage Treatment Plant Overflow
CSO = Combined Sewer Overflow
SSO = Sanitary Sewer Overflow
STWO = Satellite Treatment Works Overflow

M = Measured
E = Estimated

Y = Yes
N = No

*Reason Codes:

1 = Heavy Precipitation
2 = Spring Runoff
3 = Infiltration
4 = Mechanical/Equipment Failure
5 = Pipe Failures(break/leak/plugged)
6 = Process Upsets
7 = Power Outages
8 = Unknown
9 = Other, please comment below.

Comments:

There were no Bypass or Overflow events in 2023

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