Winchester Wastewater System

Sewage Works # 110001202

Annual Report

Prepared for: Township of North Dundas

Reporting Period of January 1st – December 31st 2023

Issued: March 28, 2024

Revision: 0

Operating Authority:

OCWA

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

This report has been prepared to meet the requirements set out in:

Document	Document #	Issue Date	Issue Number
Facility CofA (revoked)	5312-88TK5R	October 22, 2010	n/a
Facility ECA	A-500-1199362894	October 13, 2023	1.0
ECA for Municipal Sewage Collection System	180-W601	October 27, 2022	1

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1 Revision History

Date	Rev#	Revisions	Revised By
2024-03-28	0	Annual Report Issued	PCT – Caroline Lamarche

2 Operations and Compliance Reliability Indices

Compliance Event	# of Events
Environment Canada Inspections	1
Ministry of Environment Inspections	1
Ministry of Labour Inspections	0
Non-Compliance	0
Community Complaints	8
Spills	5
Overflows	1
Bypasses	0
Sewer Main Blockages	2

3 System Process Description

Winchester's wastewater system consists of a gravity fed sanitary sewage collection system, four pumping stations and a wastewater treatment lagoon. The main sewage pumping station is located on Ottawa Street and discharges directly to the lagoons. There are also two pumping stations located on Main Street and one on St. Lawrence Street which pump wastewater to the Ottawa St. SPS. In 2023, Main St. W. (Tim's) SPS was upgraded to increase the pumping capacity of the station from 6 L/s to 44 L/s, the force main from Main St W. (Tim's) SPS to the maintenance hole #8 (on corner of main St. W and Louise St) was upgraded from 100 mm to 200 mm and the gravity sewer from the maintenance hole #8 to #6 was upgraded from 250 mm to 375 mm.

The wastewater treatment system consists of a seasonally discharged five cell lagoon system with a rated capacity of 2,220 m^3/d. The three primary facultative treatment cells are operated in parallel (Cells 1, 2 and 3). Wastewater flows from the primary cells to the polishing cell (Cell No. 4), and finally to the post-aeration cell (Cell No. 5). Aeration within Cell No. 5 is supplied by centrifugal air blowers to control odours and strip hydrogen sulphide (H_2S) prior to discharge. Aluminum sulphate is dosed continuously for phosphorus control as wastewater is pumped to the lagoons. Seasonal discharge of effluent from the lagoons is permitted at specified times during the spring and fall each year. Effluent is pumped from Cell No. 5 over a distance of 7.3 kilometers to an outlet in the South Nation River.

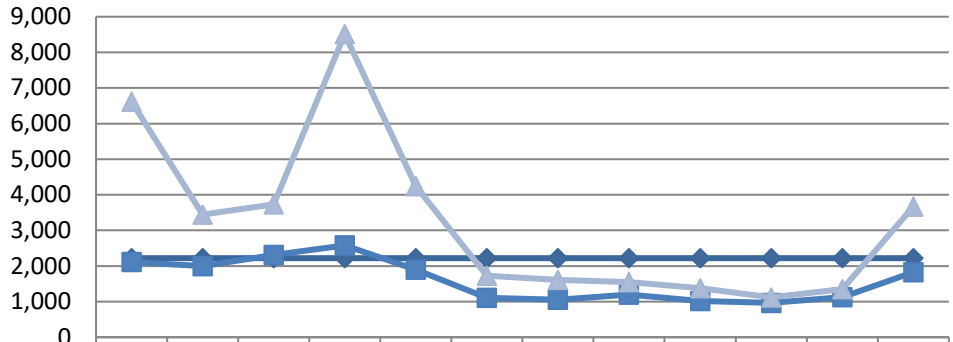
The Township of North Dundas initiated a Class Environmental Assessment of Winchester's wastewater treatment system in 2017 to address various operational challenges, such as hydraulic capacity, discharge constraints and treatment capabilities in order to ensure that increased wastewater flows from future growth can be effectively accommodated. To date, the EA process has been completed and the SAGR treatment system was selected. Construction of the SAGR system commenced in 2023. The new treatment system is expected to be in operation and reach substantial completion in spring 2025.

4 Wastewater System Flows

The hydraulic flows reaching the sewage lagoons in 2023 averaged 1,599 m^3/day which represents 72.0% of the 2,220 m^3/day design capacity.

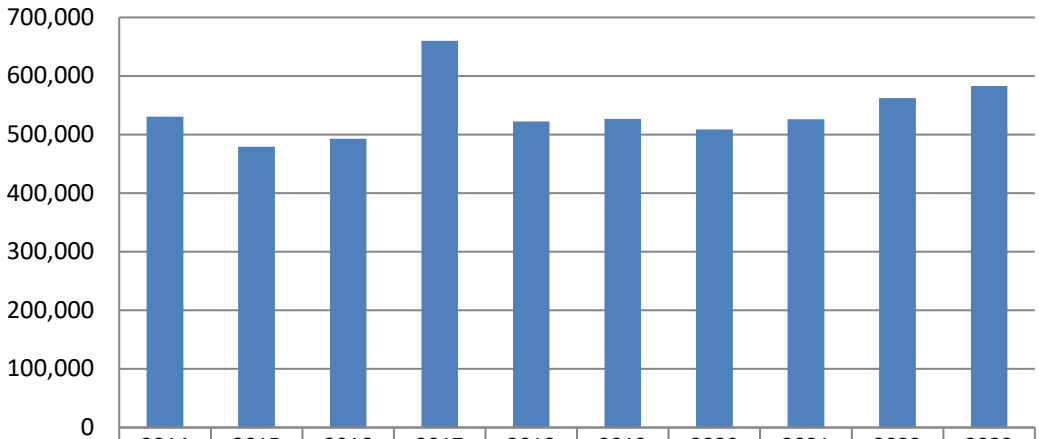
4.1 Raw Flows

2023 Raw Flows (m^3/d):



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Design Capacity (m^3/d)	2220	2220	2220	2220	2220	2220	2220	2220	2220	2220	2220	2220
Avg Flow (m^3/d)	2114	1995	2310	2578	1897	1110	1058	1194	1018	965	1121	1826
Max Flow (m^3/d)	6620	3443	3728	8508	4240	1731	1614	1550	1376	1120	1350	3665

Annual Raw Flow Comparison (m^3):



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Annual Flow (m^3)	530,649	479,407	493,104	659,787	522,507	526,483	508,868	526,193	562,461	582,970

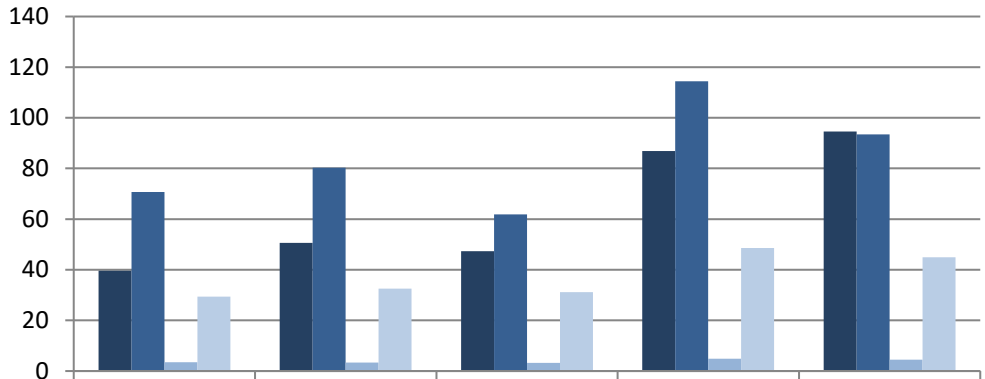
4.2 Effluent Flow

Discharge Period	Start Date	End Date	Volume Discharged (m^3)
Spring Discharge	April 3, 2023	April 30, 2023	239,923
Fall Discharge	November 2, 2023	December 11, 2023	313,029
		Total Flow Discharged	552,952

5 Raw Sewage Quality

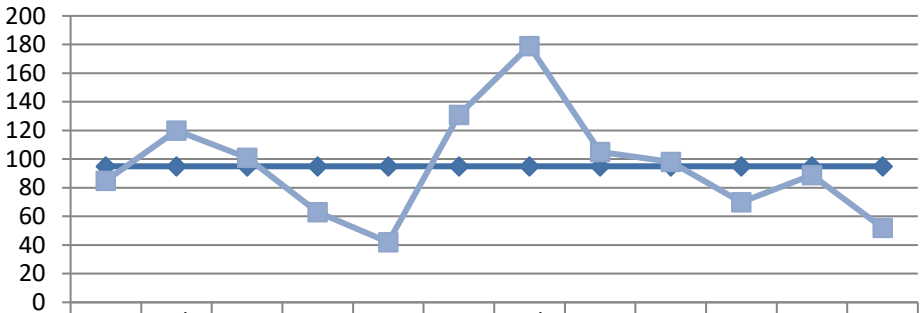
2023 monthly results are available in Appendix A – Performance Assessment Reports.

Annual Comparison (mg/L):



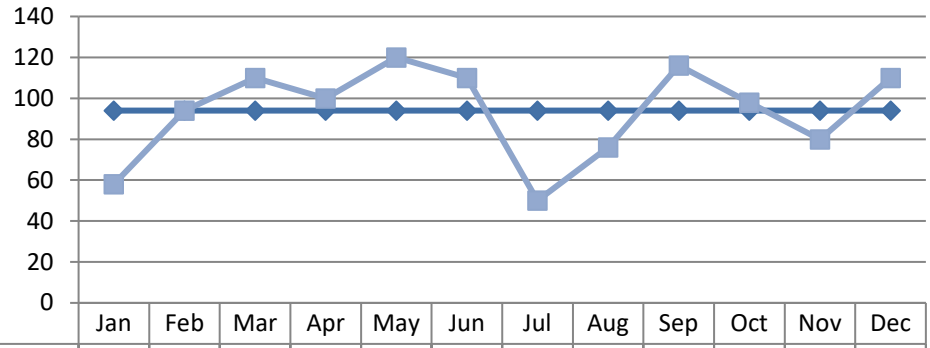
	2019	2020	2021	2022	2023
BOD5 Annual Average	40	51	47	87	95
TSS Annual Average	71	80	62	114	94
TP Annual Average	3.4	3.4	3.2	4.9	4.5
TKN Annual Average	29	33	31	49	45

5.1 Biochemical Oxygen Demand (5-Day)



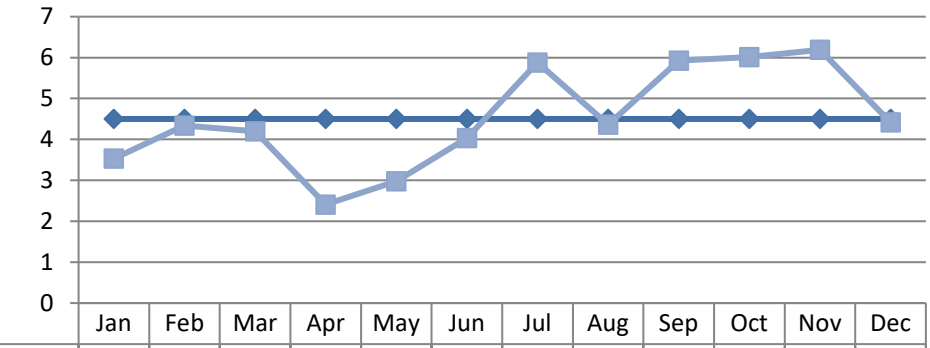
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Average (mg/L)	95	95	95	95	95	95	95	95	95	95	95	95
Monthly Results (mg/L)	85	120	101	63	42	131	179	105	98	70	89	52

5.2 Total Suspended Solids



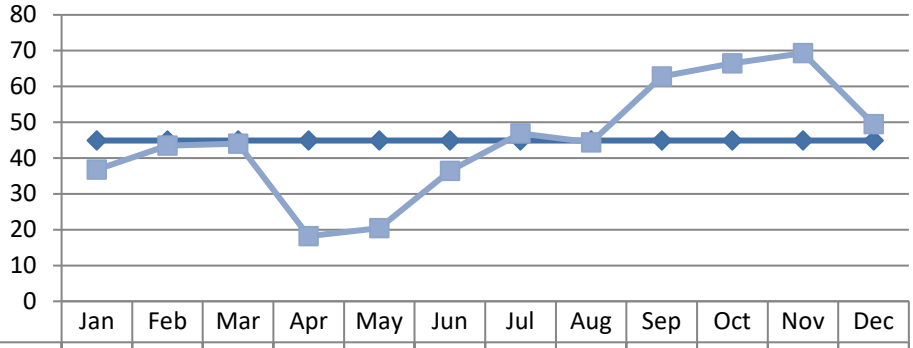
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Average (mg/L)	94	94	94	94	94	94	94	94	94	94	94	94
Monthly Results (mg/L)	58	94	110	100	120	110	50	76	116	98	80	110

5.3 Total Phosphorus



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Average (mg/L)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Monthly Results (mg/L)	3.5	4.3	4.2	2.4	3.0	4.0	5.9	4.4	5.9	6.0	6.2	4.4

5.4 Total Kjeldahl Nitrogen



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Average (mg/L)	45	45	45	45	45	45	45	45	45	45	45	45
Monthly Results (mg/L)	37	44	44	18	20	36	47	44	63	67	69	50

6 Effluent Quality

During the reporting period, the average concentrations of carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS) and total phosphorus (TP) remained below the effluent limits and objectives outlined in the ECA. In addition, the Dissolved Oxygen (D.O.) measured above the allowable minimum concentration throughout the spring discharge period. The new ECA issued on October 13, 2023 removed the D.O. minimum concentration requirement for the fall 2023 discharge period and all future discharges. The 25% and 75% fall discharge effluent samples were non-lethal to Rainbow Trout and Daphnia Magna.

The objective level of non-detectable was exceeded for undissociated hydrogen suphide (H_2S) during both discharge periods, although the measured concentrations remained below the limit. The pH exceeded the objective in one out of five of the samples collected during the spring discharge and two out of five of the samples collected during the fall dischage but all samples remained below the ECA limit. Total ammonia nitrogen (TAN) remained below the effluent limit during the reporting period but exceeded the objective during the spring and fall discharges. Please refer to the 'Operating Issues' section of this report for details.

Effluent during both the spring and fall discharge periods remained essentially free of floating or settleable solids and did not contain substances that would cause a film, sheen, foam or discoloration to the receiving stream.

The results from the spring and fall discharge periods are tabulated below. Please refer to the Performance Reports in Appendix A and the 'Operational Issues' section of this report for further information.

6.1 Effluent Quality Assurance or Control Measures

This system is part of the Ontario Clean Water Agency's Nation Valley Cluster. The cluster is supported by the Eastern Regional Hub and corporate resources. Operational Services are provided by OCWA staff that work in the community. The system is operated to meet compliance with applicable regulations. The system has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents and are updated as required. These documents are also part of OCWA's Quality & Environmental Management System.

Effluent control measures include pre-discharge sampling and testing of lagoon cell contents prior to seasonal discharges. The samples are collected by OCWA's competent and licensed staff using approved methods and protocols for sampling including those 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 "*Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater*" and the publication "*Standard Methods for the Examination of Water and Wastewater*".

All effluent samples collected during the reporting period to meet legislated sampling requirements were submitted to Caduceon Environmental Laboratories in Ottawa for analysis, with the exception of pH, temperature and unionized ammonia. Caduceon Environmental is accredited by the Canadian Association for Laboratory Accreditation (CALA). Accredited labs must meet strict provincial guidelines including an extensive quality assurance/quality control program. By choosing these laboratories, OCWA is ensuring appropriate control measures are undertaken during laboratory testing. The pH and temperature of samples are analyzed in the field at the time of sample collection by certified operators to ensure accuracy

and precision of the results obtained. Un-ionized ammonia was calculated using the total ammonia nitrogen concentration, pH and temperature as required by the facility's ECA.

OCWA uses several computer systems which include:

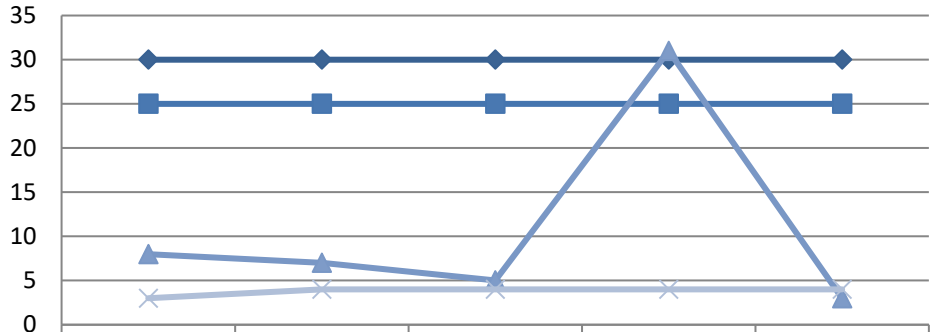
- Process Data Management (PDM)
  - This database consolidates all operational data from a variety of sources including field data, online instrumentation, and electronically uploaded lab test results for reporting, tracking and analysis.
- Maximo – OCWA's Work Management System (WMS)
  - This program is used to track and schedule maintenance activities for all equipment in the system. It is also used to assign specific operational tasks to staff.
- Wonderware (OUTPOST5)/SCADA
  - OCWA's SCADA system allows for process automation, process adjustments, data logging, trending review and remote alarming.

The operations team also has access to a network of compliance and process specialists to assist with process issues.

6.2 Carbonaceous Biochemical Oxygen Demand (5-Day)

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	10.8	25	N	30	N
Fall	3.8	25	N	30	N

Effluent $CBOD_5$ Results:

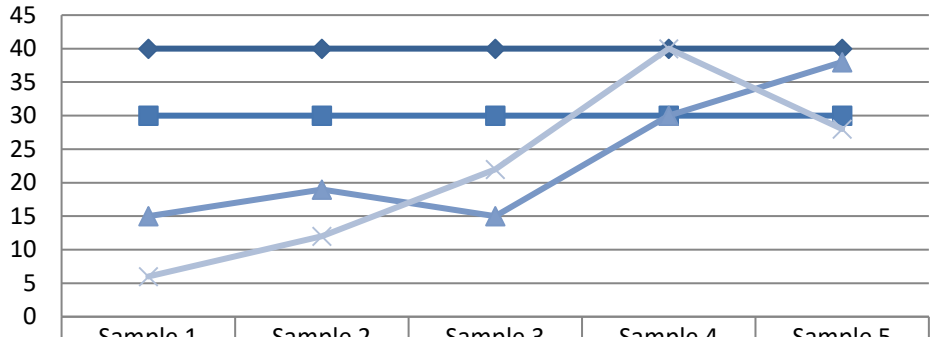


	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Limit (mg/L)	30	30	30	30	30
Objective (mg/L)	25	25	25	25	25
Result - Spring (mg/L)	8	7	5	31	3
Result- Fall (mg/L)	3	4	4	4	4

6.3 Total Suspended Solids

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	23.4	30	N	40	N
Fall	21.6	30	N	40	N

Effluent TSS Results:

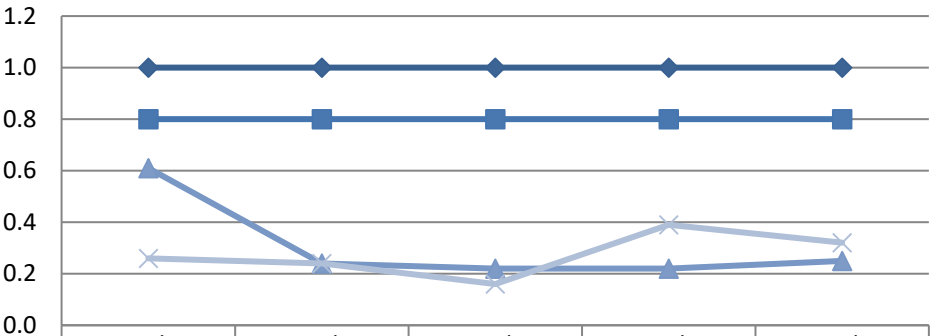


	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Limit (mg/L)	40	40	40	40	40
Objective (mg/L)	30	30	30	30	30
Result - Spring (mg/L)	15	19	15	30	38
Result - Fall (mg/L)	6	12	22	40	28

6.4 Total Phosphorus

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	0.31	0.8	N	1.0	N
Fall	0.27	0.8	N	1.0	N

Effluent TP Results:



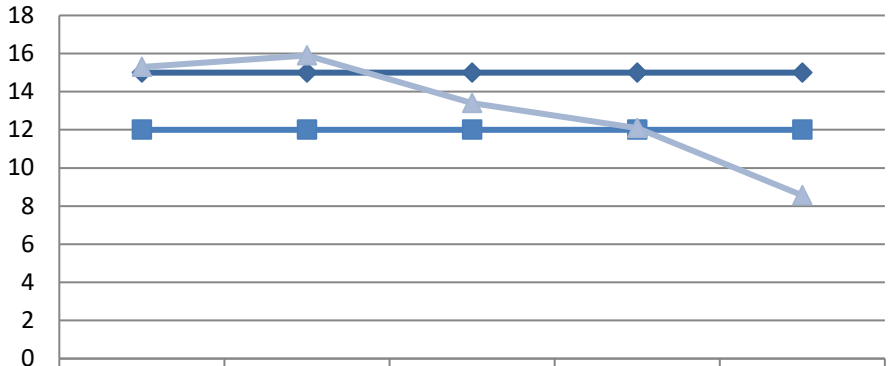
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Limit (mg/L)	1.0	1.0	1.0	1.0	1.0
Objective (mg/L)	0.8	0.8	0.8	0.8	0.8
Result - Spring (mg/L)	0.61	0.24	0.22	0.22	0.25
Result - Fall (mg/L)	0.26	0.24	0.16	0.39	0.32

6.5 Total Ammonia Nitrogen

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	13.1	12	Y*	15	N
Fall	6.2	4	Y*	7	N

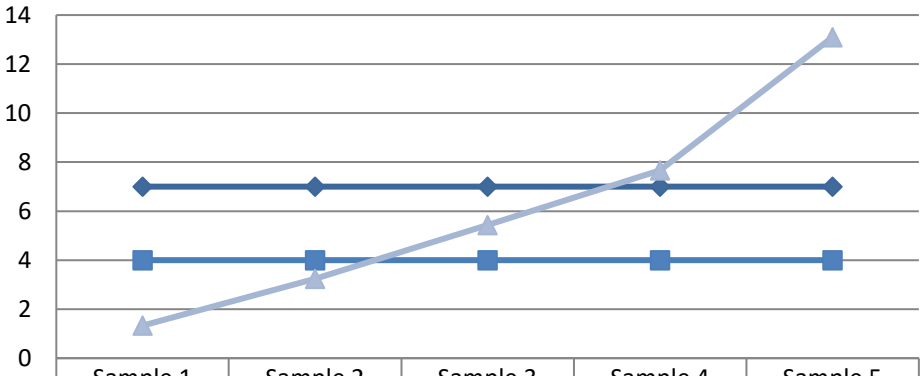
**Please refer to the 'Operating Issues' section of this report for details.*

Effluent TAN Results for Spring Discharge Period:



	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Limit - Spring (mg/L)	15	15	15	15	15
Objective - Spring (mg/L)	12	12	12	12	12
Result - Spring (mg/L)	15.3	15.9	13.4	12.1	8.56

Effluent TAN Results for Fall Discharge Period:



	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Limit - Fall (mg/L)	7	7	7	7	7
Objective - Fall (mg/L)	4	4	4	4	4
Result - Fall (mg/L)	1.33	3.24	5.43	7.66	13.1

6.6 Undissociated Hydrogen Sulphide

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Objective Exceedance (Y/N)	Limit (mg/L)	Limit Exceedance (Y/N)
Spring	0.0063	Non-Detectable	Y*	0.02	N
Fall	0.0044	Non-Detectable	Y*	-	N

**Please refer to the 'Operating Issues' section of this report for details.*

Effluent Undissociated H_2S Results for Spring Discharge Period:

	03-Apr	11-Apr	14-Apr	20-Apr	30-Apr	Average
S^{2-} (mg/L)	0.04	0.07	0.04	< 0.1	< 0.1	0.05
pH	7.78	8.00	7.90	8.60	8.1	N/A
Temp	5.0	9.9	12.7	12.5	11.6	N/A
% Undissociated H_2S (from table)	22.71	13.6	15.2	3.5	10.465	N/A
Undissociated H_2S (mg/L)	0.009	0.010	0.006	0.002	0.005	0.0063

Effluent Undissociated H_2S Results for Fall Discharge Period:

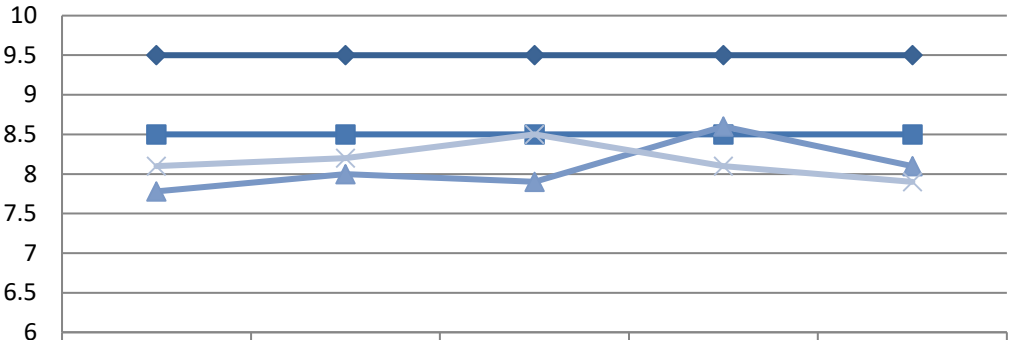
	02-Nov	14-Nov	24-Nov	04-Dec	11-Dec	Average
S^{2-} (mg/L)	0.01	< 0.01	< 0.08	< 0.16	< 0.08	0.035
pH	8.1	8.2	8.5	8.1	7.9	N/A
Temp	8.1	5.4	6	3	5.9	N/A
% Undissociated H_2S (from table)	11.621	10.473	5.337	13.799	18.329	N/A
Undissociated H_2S (mg/L)	0.001	0.001	0.002	0.011	0.007	0.0044

6.7 pH

Discharge Period	Seasonal Average	Objective	Objective Exceedance (Y/N)	Limit	Limit Exceedance (Y/N)
Spring	8.08	6.5 – 8.5	Y*	6.0 – 9.5	N
Fall	8.16	6.5 – 8.1	Y*	6.0 – 9.5	N

**Please refer to the 'Operating Issues' section of this report for details.*

Effluent pH Results:

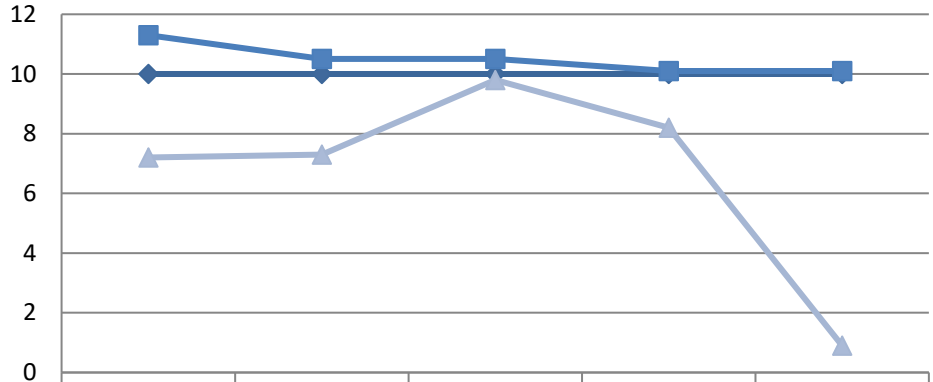


	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Top Limit	9.5	9.5	9.5	9.5	9.5
Top Objective	8.5	8.5	8.5	8.5	8.5
Result - Spring	7.8	8.0	7.9	8.6	8.1
Result - Fall	8.1	8.2	8.5	8.1	7.9

6.8 Dissolved Oxygen

Discharge Period	Seasonal Average Concentration (mg/L)	Objective (mg/L)	Limit (mg/L)	Compliant
Spring	10.5	n/a	10	Yes
Fall	6.7	n/a	n/a	n/a

Effluent D.O. Results:



	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Min. D.O. (mg/L)	10	10	10	10	10
Result (mg/L) - Spring	11.3	10.5	10.5	10.1	10.1
Result (mg/L) - Fall	7.2	7.3	9.8	8.2	0.9

6.9 Acute Lethality

Based on the ammonia concentration of the 2023 fall pre-discharge sample, as a precautionary measure, two samples were collected and tested for acute lethality to Rainbow Trout and Daphnia Magna. Results are displayed as % mortality. An adverse result is a >50% mortality rate.

Sample Date	Rainbow Trout	Daphnia Magna
November 14, 2023	0 %	0 %
December 4, 2023	0 %	0 %

7 Operating Issues

Total ammonia nitrogen (TAN) remained below the effluent limit during the 2023 reporting period but exceeded the objective during the spring and fall discharges. During the spring discharge, the first two samples were above the limit but as the temperature was increasing, the TAN concentration decreased. During the fall discharge, the last two samples were above the limit. In this case, as the temperature was decreasing the TAN concentration increased. Nitrifying bacteria activity is very temperature dependant in a lagoon treatment system, colder temperatures tend to yield higher TAN concentrations. To address this ongoing issue, the wastewater treatment system is currently undergoing treatment upgrades, with the construction of a new SAGR system that specifically targets the reduction of total ammonia nitrogen. The construction began in 2023 and is expected to meet substantial completion in spring 2025.

A new ECA was issued on October 13, 2023 to include the new SAGR treatment system. The ECA 'top'

objective required for the fall discharge, prior to completion of construction, reduced from 8.5 to 8.1. Given the more restrictive range, the pH exceeded the objective in two out of five samples collected during the fall discharge. Upon completion of construction, the pH objectives will be increased to 8.8. During the spring discharge, the pH exceeded the objective from the previous ECA in one out of five of the samples.

The objective level of non-detectable was exceeded for undissociated hydrogen suphide (H_2S) during both discharge periods, although the measured concentrations remained below quite low. The blowers are operated during the spring and fall discharge periods to maintain dissolved oxygen in the final lagoon cell thereby reducing H_2S concentrations in the effluent.

7.1 Effluent Quality Non-Compliance Summary

Date	Exceedance of	Limit	Value	Corrective Action
Spring 2023	TAN Objective	12 mg/L	13.1 mg/L	Started construction of SAGR wastewater treatment system.
Fall 2023	TAN Objective	4 mg/L	6.2 mg/L	Started construction of SAGR wastewater treatment system
April 20, 2023	pH Objective	6.5-8.5	8.6	4 out of 5 samples collected during spring discharge remained below the objective
November 14, 2023	pH Objective	6.5-8.1	8.2	New ECA pH 'top' objective
November 23, 2023	pH Objective	6.5-8.1	8.5	New ECA pH 'top' objective
Spring 2023	Undissociated H_2S	Non-Detectable	0.0063	Lagoon aeration during discharge
Fall 2023	Undissociated H_2S	Non-Detectable	0.0044	Lagoon aeration during discharge

7.2 Summary of Abnormal Sewage Discharge Events

Abnormal discharge events include bypasses, overflows, and spills of sewage. No bypasses, 1 overflow and 5 spills of sewage occurred during the 2023 reporting period. A summary of these events is included in Appendix B.

7.3 Spills (Other than Sewage)

Date	Location	Details	Volume (m^3)	Start Date and Time	End Date and Time
None to report.					

8 Maintenance

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer's and/or industry standards. Maintenance is completed using various tools and operational supports.

OCWA uses a Workplace Management System (WMS). WMS is a maintenance tracking system that can

generate work orders as well as provide summaries of completed and scheduled work. During the year, the operating authority generates scheduled work orders on a planned frequency. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is added to the system and completed as required.

Routine planned maintenance activities scheduled in WMS include:

- Inspecting, adjusting and calibrating process control equipment to ensure proper operation of sewage collection systems, pumps, chemical feeders, and all other equipment installed at the facilities.
- Carrying out a routine maintenance program including greasing and oiling as specified in the lubrication schedule.

Planned maintenance activities are communicated to the individuals responsible for completing the task through the issuance of WMS work orders. Work orders are generated automatically on a schedule based on the manufacturer's recommendations and/or site specific operational and maintenance needs, and are assigned directly to the appropriate operations personnel. Work orders are electronically completed in WMS by the person responsible for completing the task. Unplanned maintenance is carried out as needed.

Suggested capital projects and major maintenance recommendations are provided to the Municipality of North Dundas annually by OCWA. This list is developed the operations team and provides recommendations for facility components requiring upgrading or improvement.

8.1 Maintenance and Repair Summary

Description
- Performed routine sewer flushing - Performed CCTV inpection in collection system - Repaired section of sewer main on Christie Ln. (added liner to section of pipe) - Unclogged sewer main blockage on Victoria St. - Unclogged sewer main blockage on Main St. – gravel from construction fell in manhole and blocked sewer flow - Unclogged sewer lateral blockage on Henderson - Performed routine wet well cleaning - Performed annual generator maintenance - Annual back flow preventer inspection completed at Ottawa St. - Annual Fire extinguisher inspections completed - Repaired fuel pump on generator at St. Lawrence St. SPS - Replaced battery generator Main St.. E. SPS - New pressure gauge and air relief on Pump #1, #2 & #3 at Ottawa St. SPS - Unclogged Pump #1 at Main St. W. (Tim's) SPS multiple time before upgrades - New seal, impeller and wear ring on Pump #1 – Main St. W. (Tim's) SPS before upgrades - Upgraded Main St. W. (Tim's) SPS o New generator with automatic transfer switch o New wet well o New pumps and VFDs (x2) o New control panels with miltronics for pumps o New UPS backups for control panels

- New AC unit
- Upgraded forcemain from Main St. W. (Tim's) SPS to maintenance access hole #8
- Upgraded gravity sewer from maintenance access hole #8 to #6
- Started construction of SAGR system at lagoon
  - Ongoing construction of two new SAGR units
  - Cell #5 offline for construction of SAGR system
  - Temporary discharge set up from Cell #4
  - Temporary aeration installation in Cell #4
  - New pipe & valve chamber from Cell #3 to Cell #4
  - New overflow pipe from Cell #2 to Cell #4

8.2 Flow Meter Calibration and Maintenance

Location	Date of Calibration	Additional Maintenance
Lagoon Effluent Flow Meter	April 18, 2023	n/a

8.3 Authorized Alterations in Collection System

Work Order	Details	Significant Drinking Water Threat (Y/N)
n/a	Force main from Main St W. (Tim's) SPS to maintenance hole #8 (on corner of main St. W and Louise St) upgraded from 100 mm to 200 mm	N
n/a	Gravity sewer from maintenance hole #8 to #6 upgraded from 250 mm to 375 mm	N
n/a	Main St. W. (Tim's) SPS upgraded to increase the pumping capacity of the station from 6 L/s to 44 L/s	N

8.4 Notice of Modifications

Date	Process	Modification	Status
Expected substantial completion spring 2025	Wastewater Treatment	Construction of SAGR treatment system	Ongoing

9 Sludge Generation

Sludge depth is monitored periodically, and plans for sludge removal are made as required for optimal operation of the lagoon system. Sludge levels in all ponds were measured in 2020. The measurements were as follows:

Lagoon Cell	Sludge Depth
Cell 1	1' – 2.5'
Cell 2	1' – 2'
Cell 3	1'
Cell 4	6" – 2'
Cell 5	1" – 4 "

9.1 Sludge Disposal Summary

Sludge from Cell 2 & Cell 3 was removed in the early 2000s. Sludge was last removed from Cell 5 in 2023 for construction of the new SAGR system. The sludge from Cell 5 was removed and stored onsite to dry in geotubes. Sludge will be hauled to the municipal landfill (Boyne Road) once dried.

10 Summary of Complaints

Location	Date	Nature of Complaint	Actions Taken
Victoria St.	February 10, 2023	Sewer main backup	Sewer main backup caused by sewer main debris blockage. Cleaned out debris and sewer line with vacuum truck.
423 Victoria St.	April 5, 2023	Sanitary Sewage Backup in private residence	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system.
482 Victoria St.	April 5, 2023	Sanitary Sewage Backup in private residence	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system.
446 May St.	April 5, 2023	Sanitary Sewage Backup in private residence	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system.
498 St. Lawrence St.	April 5, 2023	Sanitary Sewage Backup in private residence	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system.
584 St. Lawrence St.	April 5, 2023	Sanitary Sewage Backup in private residence	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system.
Christie Ln.	August 6, 2023	Sewer main backup	Sewer main backup caused by manhole filled with gravel from construction of sidewalks on Main St. Removed gravel and flushed sewers with vacuum truck.
Henderson Cres.	October 10, 2023	Sewer lateral backup	Sewer lateral was clogged (main sewer was flowing). Power flushed resident's sewer lateral with vacuum truck to unclog the line.

Appendix A – Performance Assessment Reports

ONTARIO CLEAN WATER AGENCY
PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: TOWNSHIP OF NORTH DUNDAS
PROJECT: WINCHESTER WASTEWATER TREATMENT PLANT
PROJECT NUM.: 5679
WORKS NUM.: 110001202
DESCRIPTION: A FIVE CELL LAGOON (#5 CELL POST AERATION) CELL #1 - 3.95 HA, CELL #2 - 2.75 HA, CELL #3 - 4.1 HA, CELL #4 - 6.3 HA, CELL #5 - 2.0 HA

YEAR: 2023
WATER COURSE: SOUTH NATION RIVER
DESIGN CAPACITY: 2220 m^3/day

MONTH	FLOWS						CBOD5			TOTAL SUSPENDED SOLIDS			PHOSPHORUS			TKN
	TOTAL FLOW m^3	AVG DAY FLOW m^3	MAX DAY FLOW m^3	EFFLUENT FLOW m^3	DISCHARGE DURATION (days)	Avg. Alum Dosage (mg/L)	AVG RAW BOD5 (mg/L)	AVG EFF CBOD5 (mg/L)	PERCENT REMOVAL (%)	AVG RAW TSS (mg/L)	AVG EFF TSS (mg/L)	PERCENT REMOVAL (%)	AVG RAW PHOS. (mg/L)	AVG EFF PHOS. (mg/L)	PERCENT REMOVAL (%)	AVG RAW TKN (mg/L)
JAN	65,549	2,114	6,620			116	85			58			3.53			36.8
FEB	55,867	1,995	3,443			115	120			94			4.34			43.5
MAR	71,606	2,310	3,728			115	101			110			4.20			44.0
APR	77,342	2,578	8,508	239,923	27	102	63	10.8		100	23.4		2.41	0.31		18.2
MAY	58,802	1,897	4,240			91	42			120			2.98			20.4
JUN	33,309	1,110	1,731			105	131			110			4.03			36.4
JUL	32,787	1,058	1,614			101	179			50			5.88			46.9
AUG	37,008	1,194	1,550			102	105			76			4.36			44.4
SEP	30,540	1,018	1,376			103	98			116			5.93			62.8
OCT	29,921	965	1,120			104	70			98			6.01			66.5
NOV	33,628	1,121	1,350	211,111	29	104	89	3.7		80	13.3		6.19	0.22		69.3
DEC	56,610	1,826	3,665	101,918	11	102	52	4.0		110	34.0		4.42	0.36		49.5
TOTAL	582,970		SPRING	239,923	27											
TOTAL			FALL	313,029	40											
AVG		1,599				105	95	7.3	92.3	94	22.5	75.9	4.52	0.29	93.6	44.9
MAX			8,508				179			120			6.19			69.3
CRITERIA		**2,220**		SPRING	**21**			**30**			**40**			**1**		
CRITERIA				FALL	**21**			**30**			**40**			**1**		

Note: PERCENT REMOVAL BASED ON 12 MONTHS OF RAW SEWAGE COMPOSITE SAMPLES

ONTARIO CLEAN WATER AGENCY
LAGOON PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: TOWNSHIP OF NORTH DUNDAS
PROJECT: WINCHESTER WASTEWATER TREATMENT LAGOONS
PROJECT NUM.: 5679
WORKS NUM.: 110001202
DESCRIPTION: A FIVE CELL LAGOON (#5 CELL POST AERATION) CELL #1 - 3.95 HA, CELL #2 - 2.75 HA CELL #3 - 4.1 HA, CELL #4 - 6.3 HA, CELL #5 - 2.0 HA

YEAR: 2023
WATER COURSE: SOUTH NATION RIVER
DESIGN CAPACITY: 2220 m^3/day

	SAMPLE RESULTS	SPRING						239,923 m^3	
	DATE	03-Apr	11-Apr	14-Apr	20-Apr	30-Apr	Average	C of A Objective	C of A Limit
SAMPLE 5X/DISCH. START, 25%, 50%, 75%, END	CBOD (mg/L)	8	7	5	31	< 3	10.8	**25**	**30**
	TSS (mg/L)	15	19	15	30	38	23.4	**30**	**40**
	TP (mg/L)	0.61	0.24	0.22	0.22	0.25	0.31	**0.8**	**1**
	DO (mg/L)	11.3	10.5	10.5	10.1	10.1	10.5	**-**	**10**
	N-NH_3 (mg/L)	15.3	15.9	13.4	12.1	8.56	13.1	**12**	**15**
	unionized NH3*	0.11	0.29	0.24	1.00	0.22	0.37		
	NO_2 (mg/L)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05			
	NO_3 (mg/L)	0.27	< 0.05	0.12	0.32	1.85			
	TKN (mg/L)	19.8	18.4	16.8	16.1	12			
	E.coli (cfu/100 mL)	< 10	600	76	30	50			

* un-ionized NH3 based on in-house calculation

	03-Apr	11-Apr	14-Apr	20-Apr	30-Apr	Average	Objective	Limit
S2- (mg/L)	0.04	0.07	0.04	< 0.1	< 0.1	0.05	N/A	N/A
pH	7.78	8.00	7.90	8.60	8.1	8.08	**6.5 - 8.5**	**6.0 - 9.5**
Temp	5.0	9.9	12.7	12.5	11.6	N/A	N/A	N/A
% Undissociated H2S	22.71	13.6	15.2	3.5	10.465	N/A	N/A	N/A
Undissociated H_2S	0.009	0.010	0.006	0.002	0.005	0.0063	**ND**	**0.02**

	21-Mar-23	Cell 1	Cell 2*	Cell 3	Cell 4	Cell 5
PRE-DISCHARGE RESULTS	CBOD (mg/L)	<3	-	13	4	4
	TSS (mg/L)	20	-	20	8	14
	TP (mg/L)	0.31	-	0.18	0.14	0.23
	NH_3 (mg/L)	1.69	-	16.2	11.1	2.20
	TKN (mg/L)	3.0	-	22.6	15.0	4.1
	H2S (mg/L)	0.02	-	1.32	0.03	0.02
	E.coli (cfu/100 mL)	4	-	910	110	5

*Cell 2 empty at time of sampling. It is not being discharged. Routing raw sewage to this cell during discharge

COMMENTS: H_2S, TP, *E.coli* sampled prior to discharge
Dilution ratio as per operations manual

TOTAL LOADING	SPRING	FALL	TOTAL	ECA LIMIT
CBOD (kg)	2,591	1,190	**3,781**	**24,309**
SS (kg)	5,614	6,761	**12,376**	**32,412**
TP (kg)	74	86	**160**	**810.3**
NH_3 (kg)	3,131	1,926	**5,057**	**-**

	SAMPLE RESULTS	FALL						313,029 m^3	
	DATE	02-Nov	14-Nov	24-Nov	04-Dec	11-Dec	Average	C of A Objective	C of A Limit
SAMPLE 5X/DISCH. START, 25%, 50%, 75%, END	CBOD (mg/L)	< 3	4	4	4	4	3.8	**25**	**30**
	TSS (mg/L)	6	12	22	40	28	21.6	**30**	**40**
	TP (mg/L)	0.26	0.24	0.16	0.39	0.32	0.27	**0.8**	**1**
	DO (mg/L)	7.2	7.3	9.8	8.2	0.90	6.7	**-**	**-**
	N-NH_3 (mg/L)	1.33	3.24	5.43	7.66	13.1	6.15	**4**	**7**
	unionized NH_3 (mg/L)	0.026	0.065	0.222	0.101	0.138	0.11		
	NO_2 (mg/L)	< 0.05	0.15	< 0.4	< 0.05	< 0.4			
	NO_3 (mg/L)	1.15	2.72	2.54	0.28	0.97			
	E.coli (cfu/100 mL)	430	270	78	3800	500			

** un-ionized NH3 based on in-house calculation

	02-Nov	14-Nov	24-Nov	04-Dec	11-Dec	Average	Objective	Limit
S2- (mg/L)	0.01	< 0.01	< 0.08	< 0.16	< 0.08	0.035	N/A	N/A
pH	8.1	8.2	8.5	8.1	7.9	8.16	**6.5 - 8.1**	**6.0 - 9.5**
Temp	8.1	5.4	6	3	5.9	N/A	N/A	N/A
% Undissociated H2S	11.621	10.473	5.337	13.799	18.329	N/A	N/A	N/A
Undissociated H_2S	0.001	0.001	0.002	0.011	0.007	0.0044	**ND**	**-**

	17-Oct-23	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5*
PRE-DISCHARGE RESULTS	CBOD (mg/L)	7	12	4	< 3	-
	TSS	32	32	4	11	-
	TP (mg/L)	0.54	0.44	0.35	0.45	-
	NH_3 (mg/L)	14.50	12.00	10.10	0.62	-
	TKN (mg/L)	20.2	18.4	12.6	2.1	-
	H_2S (mg/L)	< 0.08	< 0.4	< 0.01	< 0.01	-
	E.coli (cfu/100 mL)	910	1210	2500	830	-

*Cell 5 not sampled since it is under construction. It is not being discharged

COMMENTS: H_2S, TP, *E.coli* sampled prior to discharge
Dilution ratio as per operations manual

Acute Lethality	14-Nov	04-Dec
Rainbow Trout	0%	0%
Daphnia Magna	0%	0%

ONTARIO CLEAN WATER AGENCY
WINCHESTER SEWAGE LAGOON 2023

DETERMINATION OF UN-IONIZED AMMONIA (NH_3) IN WASTEWATER EFFLUENT

Sample Date	Temperature (°C)	Degrees Kelvin	Dissociation Constant pKa	Sample pH on-site	Fraction of Un-ionized Ammonia	Total Ammonia (mg/L) (NH_3 +NH_4+as N)	Un-ionized Ammonia (mg/L)
03-Apr	5.0	278.15	9.90	7.8	0.0074	15.3	0.114
11-Apr	9.9	283.05	9.73	8.0	0.0181	15.9	0.287
14-Apr	12.7	285.85	9.64	7.9	0.0179	13.4	0.239
20-Apr	12.5	285.65	9.65	8.6	0.0823	12.1	0.996
30-Apr	11.6	284.75	9.68	8.1	0.0258	8.6	0.221
02-Nov	8.1	281.25	9.80	8.1	0.0197	1.33	0.026
14-Nov	5.4	278.55	9.89	8.2	0.0200	3.24	0.065
24-Nov	6.0	279.15	9.87	8.5	0.0410	5.43	0.222
04-Dec	3.0	276.15	9.98	8.1	0.0131	7.66	0.101
11-Dec	5.9	279.05	9.87	7.9	0.0105	13.1	0.138

Appendix B – Details of Abnormal Sewage Discharge Events

Event Details Summary

Facility Bypass

Date	Location	Details	Volume (m^3)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
None to report.								

Facility Overflow

Date	Location	Details	Volume (m^3)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
None to report.								

Collection Overflow

Date	Location	Details	Volume (m^3)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
April 5, 2023	Ottawa St. SPS	High flows resulting from a storm event and snow melt caused raw sewage to overflow from the Ottawa St. SPS	121.3	19:25	20:29	1:04	Henderson Drain	n/a

Spills of Sewage

Date	Location	Details	Volume (m^3)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
April 5, 2023	423 Victoria St.	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system resulting in sanitary sewage backup in private residence	n/a	n/a	n/a	n/a	n/a	n/a
April 5, 2023	482 Victoria St.	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system resulting in sanitary sewage backup in private residence	n/a	n/a	n/a	n/a	n/a	n/a
April 5, 2023	446 May St.	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system resulting in sanitary sewage backup in private residence	n/a	n/a	n/a	n/a	n/a	n/a
April 5, 2023	498 St. Lawrence St.	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system resulting in sanitary sewage backup in private residence	n/a	n/a	n/a	n/a	n/a	n/a

April 5, 2023	584 St. Lawrence St.	High flows resulting from a storm event and snow melt caused hydraulic overloading in collection system resulting in sanitary sewage backup in private residence	n/a	n/a	n/a	n/a	n/a	n/a

Collection System Monitoring Data

Event Date	Event Location	Volume (m^3)	Parameter	mg/L	Source Loading (kg)	Any Adverse Impacts & Corrective Actions
April 5, 2023	Ottawa St. SPS	121.3	CBOD5 tested instead of BOD5	10	1.21	No adverse impacts. Contacted several haulers to prevent overflow but none were able to arrive on site on time. The wet well level, pumps and flows were monitored by OCWA staff on site.
			Total Suspended Solids	80	9.7	
			Total Phosphorus	0.47	0.06	
			Total Kjeldahl Nitrogen (TKN)	3.3	0.4	
			E.Coli	112,000		

Appendix C – ECA Annual Report Requirements

Facility CofA #5312-88TK5R (revoked October 13, 2023) **Section 11(6)**	**Section in Report**
6(a) A summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the Works;	Wastewater System Flows Raw Sewage Quality Effluent Quality Appendix A
6(b) A description of any operating problems encountered and corrective actions taken;	Operating Issues
6(c) A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works ;	Maintenance
6(d) A summary of any effluent quality assurance or control measures undertaken in the reporting period;	Effluent Quality
6(e) A summary of the calibration and maintenance carried out on all effluent monitoring equipment;	Maintenance
6(f) A description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6;	Effluent Quality Operating Issues
6(g) A summary of any complaints received during the reporting period and any steps taken to address the complaints;	Summary of Complaints
6(i) A summary of all By-pass , spill or abnormal discharge events; and	Operating Issues Appendix B
6(j) Any other information the District Manager requires from time to time.	n/a
Facility ECA #A-500-1199362894 (issued October 13, 2023) **Section 11(4)**	**Section in Report**
6.a. A summary and interpretation of all Influent, monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;	Wastewater System Flows Raw Sewage Quality Appendix A
6.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;	Wastewater System Flows Effluent Quality Appendix A
4.c. A summary of all operating issues encountered and corrective actions taken;	Operating Issues
4.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;	Maintenance
4.e. A summary of any effluent quality assurance or control measures undertaken;	Effluent Quality
4.f. A summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;	Maintenance
4.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: a. 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; b. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;	Wastewater System Flows Effluent Quality Operating Issues
4.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 and 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;	Sludge Generation
4.i. A summary of any complaints received and any steps taken to address the complaints;	Summary of Complaints
4.j. A summary of all Bypasses, Overflows, other situations outside Normal	Operating Issues

Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;	Appendix B
4.k. A summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification;	Maintenance
4.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 year following that for which the report is submitted;	Maintenance Operating Issues
4.m. Any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works;	Maintenance Operating Issues
Collection ECA #180-W601 **Schedule E**	
4.6.3 If applicable, includes a summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations.	Operating Issues
4.6.4 Includes a summary of any operating problems encountered and corrective actions taken.	Operating Issues
4.6.5 Includes a summary of all calibration, maintenance, and repairs carried out on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System.	Maintenance
4.6.6 Includes a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints.	Summary of Complaints
4.6.7 Includes a summary of all Alterations to the Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat.	Maintenance
4.6.8 Includes a summary of all Collection System Overflow(s) and Spill(s) of Sewage, including: a) Dates; b) Volumes and durations; c) If applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E.coli; d) Disinfection, if any; and e) Any adverse impact(s) and any corrective actions, if applicable.	Operating Issues Appendix B
4.6.9 Includes a summary of efforts made to reduce Collection System Overflows, Spills, STP Overflows, and/or STP Bypasses, including the following items, as applicable: a) A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted. b) Details of the establishment and maintenance of a PPCP, including a summary of project progresses compared to the PPCP's timelines. c) An assessment of the effectiveness of each action taken. d) An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives. e) Public reporting approach including proactive efforts.	Maintenance Operating Issues