Williamsburg Wastewater System

Waterworks # 120002013

Annual Report

Prepared For: Municipality of South Dundas

Reporting Period of January 1st – December 31st 2022

Issued: March 9th, 2023

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 the facility Certificate of Approval #3-0456-84-887.

Table of Contents

1 Revision History

Date	Rev#	Revisions	Revised By
2023-03-09	0	Annual Report Issued	Kurtis Winkenweder, OCWA

2 Operations and Compliance Reliability Indices

Compliance Event	# of Events
Ministry of Environment Inspections	0
Ministry of Labour Inspections	0
Non-Compliance	0
Community Complaints	0
Spills	0
Overflows	0
Bypass	0
Sewer Main Blockages	- 1 blockage referenced in emergency repairs

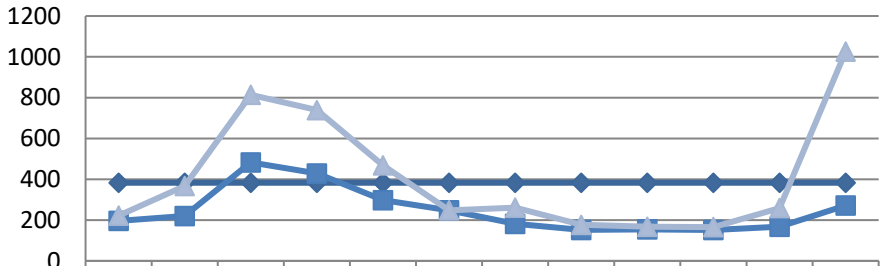
3 Process Description

Williamsburg's wastewater system is owned and operated by the Municipality of South Dundas. It consists of a gravity fed collection system, two sewage pumping stations and a wastewater treatment lagoon. The two-cell facultative lagoon system is a Class I wastewater treatment system. Effluent from the lagoon is discharged annually to the McMartin Drain between March 15th and April 21st in accordance with the facility's Certificate of Approval.

4 Treatment Flows

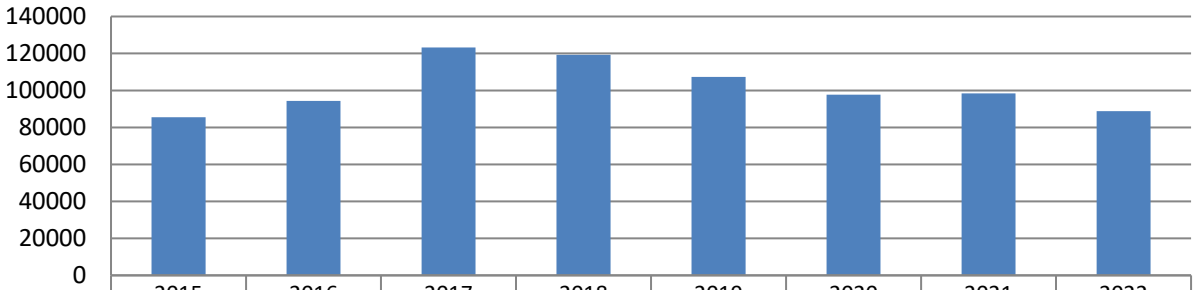
The hydraulic flows reaching the sewage lagoons in 2022 averaged 246 m3/day which represents 64% of the 383 m3/day design capacity.

4.1 Raw Flow (m3/d)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Limit	383	383	383	383	383	383	383	383	383	383	383	383
Average Daily Flow (m3/d)	196	220	483	428	298	248	182	152	155	152	168	271
Maximum Daily Flow (m3\d)	222	367	814	739	468	248	261	177	167	165	259	1026

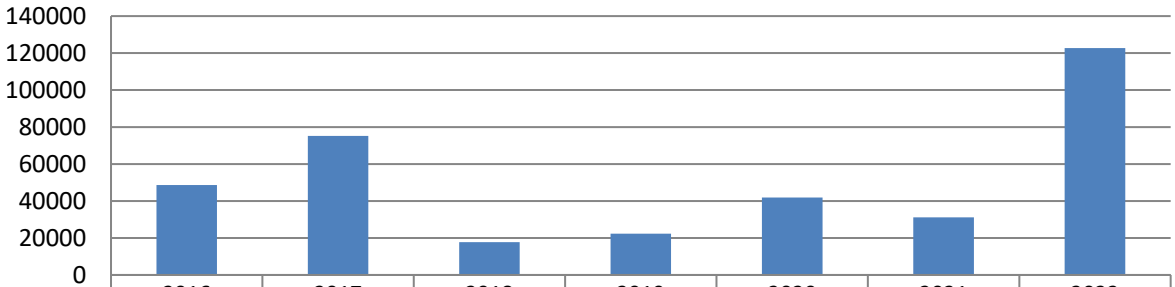
Annual Comparison (m3)



	2015	2016	2017	2018	2019	2020	2021	2022
Total Annual Flow	85551	94371	123285	119305	107288	97682	98409	88766

4.2 Effluent Flow (m3)

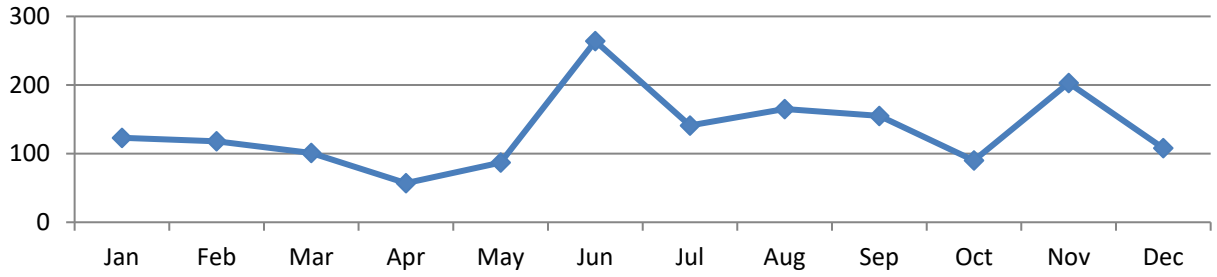
Annual Comparison (m3)



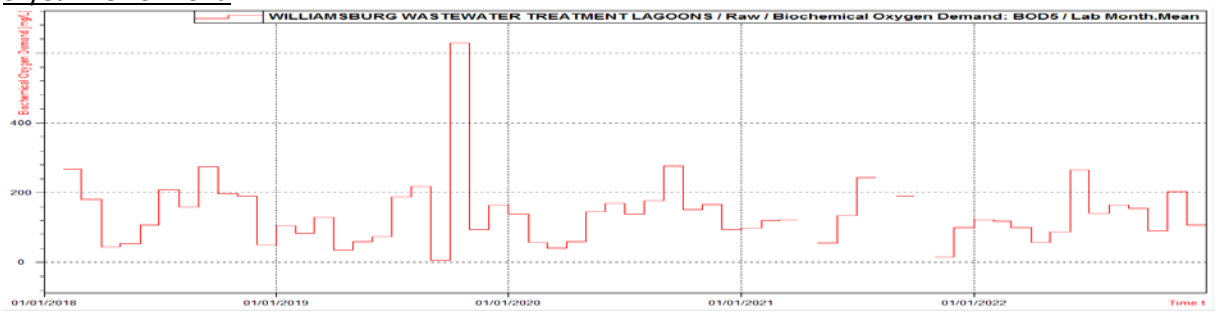
	2016	2017	2018	2019	2020	2021	2022
Total Annual Flow	48641	75223	17708	22354	41847	31157	122691

5 Raw Sewage Quality

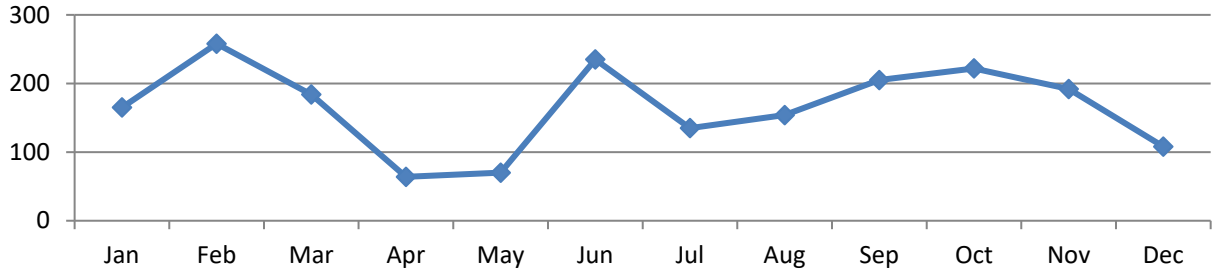
5.1 BOD_5 (mg/L)



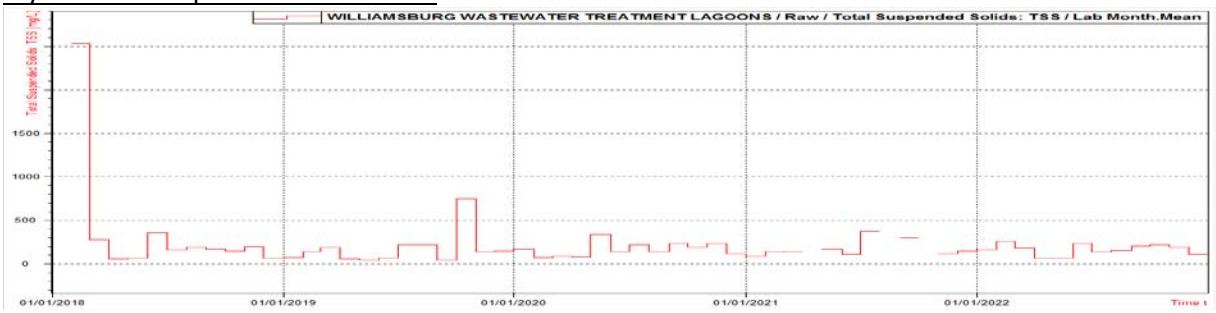
5-year BOD5 Trend



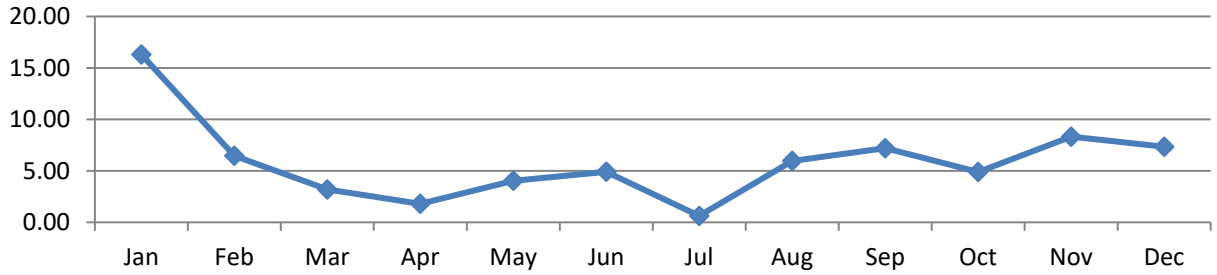
5.2 Total Suspended Solids (mg/L)



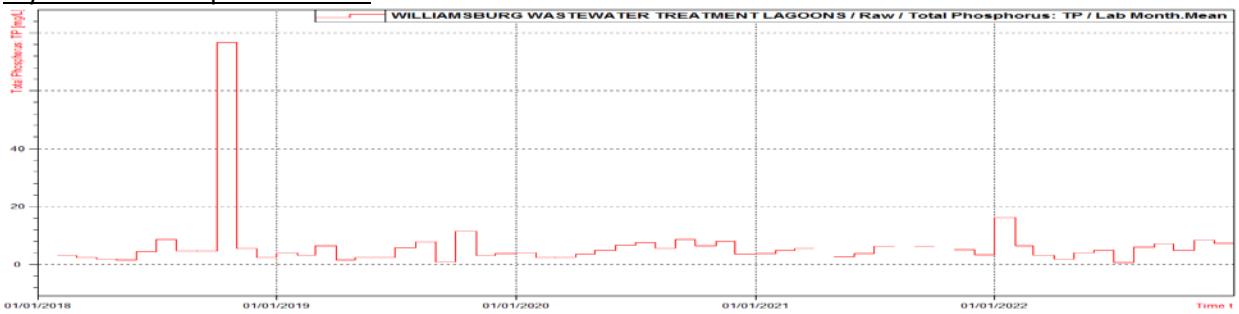
5-year Total Suspended Solids Trend



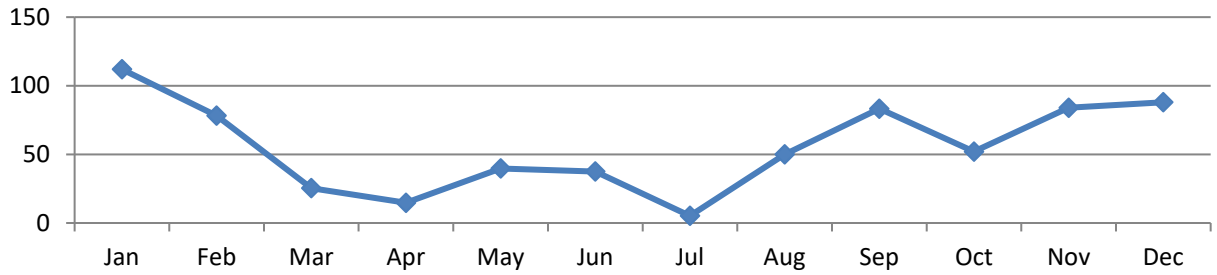
5.3 Total Phosphorus (mg/L)



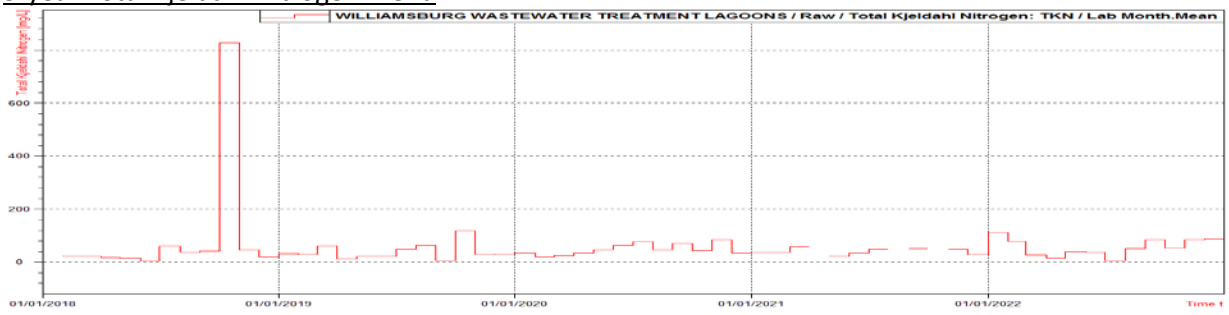
5-year Total Phosphorus Trend



5.4 Total Kjeldahl Nitrogen (mg/L)



5-year Total Kjeldahl Nitrogen Trend



6 Effluent Quality

There were no exceedances of the concentration limits outlined in the facility's Certificate of Approval during the 2022 discharge period. The results from the spring discharge can be found tabulated in the

Performance Assessment Reports attached in Appendix A.

6.1 Effluent Quality Assurance and Control Measures Taken

This system is part of the Township of South Dundas. The Township's compliance is supported by the Eastern Regional Hub, and corporate resources. Operational Services are delivered by Township staff that live and work in the community. The systems are 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.

The process is reviewed and maintained by certified operators. These operator's complete in-house rounds and testing to monitor the process. All Sampling and analysis follow approved 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, "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the publication, "Standard Methods for the Examination of Water and Wastewater".

All final effluent samples collected during the reporting period to meet legislated sampling requirements are submitted to Caduceon Ottawa for analysis, with the exception of pH and temperature. Caduceon Ottawa has been deemed accredited by the Canadian Association for Laboratory Accreditation (CALA), meeting strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, the Township of South Dundas is ensuring appropriate control measures are undertaken during sample analysis. The pH and temperature parameters are analyzed in the field at the time of sample collection by certified operators, to ensure accuracy and precision of the results obtained.

The Township is using a data management system provided by OCWA:

- Process Data Management (PDM)
    - This database program consolidates all operational data from a variety of sources including field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.

The operations team also has access to a network of operational compliance and process specialists to assist for emerging process issues. This aids in establishing additional control measures to ensure a quality effluent product.

Detailed individual sample results for both raw sewage and final effluent can be requested from the operating authority.

6.2 Effluent Quality Summary

Parameter	April Result (mg/L)	Limit (mg/L)	Exceedance
BOD	9.3	30	NO
Total Suspended Solids	22.3	30	NO
Total Phosphorus	0.98		NO LIMIT

Parameter	April Result (mg/L)	Limit (mg/L)	Exceedance
Total Ammonia Nitrogen	3.79		NO LIMIT
pH	7.84 – 9.52		NO LIMIT

7 Monitoring Schedule

The 2023 Calendar can be viewed in Appendix B

8 Operating Issues/Problems

There were no operating issues in the 2022 season.

8.1 Effluent Quality Non-Compliance Summary

Date	Exceedance of	Limit	Value	Corrective Action
No ECA limits were exceeded in 2022.				

8.2 Summary of Abnormal Sewage Discharge Events

Abnormal Discharge Events include Bypass', Overflows, Diversions and Spills of Sewage. Summary Details are included in Appendix C.

8.3 Spills (Other than Sewage)

Date	Location	Details	Volume (m3)	Start Date and Time	End Date and Time
No spills to report on in 2022.					

9 Maintenance

Routine planned maintenance activities:

- Inspect, adjust and calibrate process control equipment to ensure proper operation of water distribution systems, pumps, chemical feeders, and all other equipment installed at the facilities.
- Carry out a routine maintenance program including greasing and oiling as specified in the lubrication schedule.
- Perform day-to-day maintenance duties to equipment including checking machinery and electrical equipment when required.
- Maintain an equipment inventory
- Maintain accurate records of work conducted, activities, and achievements.

Unplanned maintenance is conducted as required.

9.1 Normal Maintenance and Repairs

Maintenance/Repair
- Wet wells cleaned every quarter - Annual generator load test - West lagoon bank was cleaned, weeds and cattails removed

9.2 Emergency Maintenance and Repairs

Maintenance/Repair	Details
February 10, 2022 Sewer backup	Aqua Drain on site to clear grease blockage on County Road 18, Community Living

9.3 Flow Meter Calibrations and Maintenance

Location	Date of Calibration	Additional Maintenance
FIT-01 Williamsburg SPS Flow	July 6, 2022	N/A

9.4 Authorized Alterations in Collection System

Alteration	Details	Significant Drinking Water Threat (Y/N)
No alterations were made in 2022.		

9.5 Notice of Modifications

Date	Process	Modification	Status
No modifications made in 2022.			

10 Sludge Generation

Sludge depth is monitored periodically across the lagoon, and plans for sludge removal are made as required for optimal operation of the wastewater system.

11 Summary of Complaints

Location	Date	Nature of Complaint	Actions Taken
No complaints in 2022			

Appendix A

Appendix A - Performance Assessment Report

MUNICIPALITY OF SOUTH DUNDAS
PERFORMANCE ASSESSMENT REPORT

PROJECT: WILLIAMSBURG SEWAGE
WORKS NUM.: 3-0456-84-887
DESCRIPTION: A TWO CELL LAGOON HAVING A TOTAL SURFACE AREA OF 7.1 HA
YEAR: 2022
WATER COURSE: MCMARTIN DRAIN
DESIGN CAPACITY: 383 m^3/day

MONTH	FLOWS					BIOCHEMICAL O_2 DEMAND			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 Raw BOD (mg/L)	Avg Eff BOD (mg/L)	Percent Removal	Avg Raw SS (mg/L)	Avg Eff SS (mg/L)	Percent Removal	Avg Raw PHOS. (mg/L)	Avg Eff PHOS. (mg/L)	Percent Removal	Avg Raw TKN
JAN	6079	196	222			123			165			16.30			112.0
FEB	6158	220	367			118			258			6.46			78.2
MAR	14964	483	814			101			184			3.19			25.4
APR	12855	428	739	122,691	11	57	9.3		64	22.3		1.80	0.98		14.7
MAY	9229	298	468			87			70			4.04			39.7
JUN	6389	248	248			264			235			4.91			37.5
JUL	5627	182	261			141			135			0.63			5.2
AUG	4700	152	177			165			154			5.97			50.0
SEPT	4636	155	167			155			205			7.20			83.3
OCT	4697	152	165			90			222			4.89			52.0
NOV	5026	168	259			203			192			8.32			84.0
DEC	8407	271	1026			108			108			7.34			88.0
TOTAL	88,766			122,691	11										
AVG		246				134	9.3	93.1	166	22.3	86.6	5.92	0.98	83.4	55.8
MAX			1026			264			258			16.3			
CRITERIA		383					30			30					
COMPLIANCE		YES					YES			YES					

COMMENTS: PERCENT REMOVAL BASED ON 12 MONTHS OF RAW COMPOSITE SAMPLES

MUNICIPALITY OF SOUTH DUNDAS
LAGOON PERFORMANCE ASSESSMENT REPORT

PROJECT: WILLIAMSBURG LAGOON
WORKS NUM.: 3-0456-84-887
DESCRIPTION: A TWO CELL LAGOON HAVING A TOTAL SURFACE AREA OF 7.1 HA
YEAR: 2022
WATER COURSE: MCMARTIN DRAIN
DESIGN CAPACITY: 383 m^3/day

	SAMPLE RESULTS	SPRING							122,691 m^3	
	DATE	06-Apr	07-Apr	12-Apr	14-Apr	14-Apr	19-Apr	20-Apr-22	Average	C of A Limit*
Minimum 2x per Week Sample Collection	BOD (mg/L)	10	9	12	10	8	13	3	9.3	30
	TSS (mg/L)	54	11	25	18	23	22	3	22.3	30
	TP (mg/L)	0.7	0.34	0.37	2.4	0.44	2.55	0.07	0.98	
	NH_3 (mg/L)	0.18	0.11	0.06	13.4	0.1	12.6	0.09	3.79	
	NO_2 (mg/L)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
	NO_3 (mg/L)	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
	TKN (mg/L)	3.8	3.1	3.7	17.1	4	19.3	0.9		
	S2- (mg/L)	<0.1	0.03	0.04	0.33	<0.1	0.06	<0.01		
					East Cell	West Cell				
	pH	9.52	8.6	8.06	7.72	8.15	8.7	7.48		
	Temp	8.7	8.5	12.7	12.6	13.2	9	13		
	S2- (mg/L)	<0.1	0.03	0.04	0.33	<0.1	0.06	<0.01		
	%	---	3.925	12.652	22.152	---	3.1	---		
	undissociated H2S	ND	0.0012	0.005	0.073	ND	0.0019	ND		

EFFLUENT FLOW		
DATE	Flow (m^3/d)	
06-Apr	26,100	West Cell
07-Apr	21,402	West Cell
08-Apr	9,396	West Cell
12-Apr	2,610	West Cell
13-Apr	13,050	West Cell
14-Apr	8,398	East Cell
15-Apr	8,398	East Cell
16-Apr	8,398	East Cell
17-Apr	8,398	East Cell
18-Apr	8,398	East Cell
19-Apr	8,143	East Cell

Appendix B

Appendix B - 2023 Sample Calendar

Williamsburg Sewage - 2023

	Raw Grab				
	Date	B.O.D.	S.S.	T.P.	TKN
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

* Discharge can occur between March 15 - April 21. Collect effluent samples as necessary

Appendix C

Appendix C - Details of Abnormal Sewage Discharge Events

11.1 Event Details Summary

11.1.1 Facility Bypass

Date	Location	Details	Volume (m3)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
No bypass's of Williamsburg Sewage Lagoon to report in 2022								

11.1.2 Facility Overflow

Date	Location	Details	Volume (m3)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
No facility overflows to report in 2022.								

11.1.3 Collection Overflow

Date	Location	Details	Volume (m3)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
No collection overflows to report in 2022.								

11.1.4 Spills of Sewage

Date	Location	Details	Volume (m3)	Start Time	End Time	Duration (h)	Discharge Receiver	Disinfection Provided
No spills of sewage to report in 2022.								

Appendix D

Appendix D - ECA Annual Report Requirements

Facility ECA # 3-0456-84-887	Section in Report
No section in the CofA references an annual report.	N/A