

Bayshore Village Sewage Works

Annual Wastewater Performance Report

Prepared For: The Township of Ramara

Reporting Period of January 1st – December 31st, 2021

Issued: March 25, 2022

Revision: 0

Operating Authority:



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Background:

The Ontario Clean Water Agency (OCWA) operates and maintains the Bayshore Village Sewage Works behalf of the Township of Ramara. During the reporting period January 1st, 2021-December 31st, 2021 the Ontario Clean Water Agency was the operating authority.

The facility is a Class 1 Wastewater Treatment Plant.

The facility's average daily flow is 399m³/day. The average day raw flow for the year 2021 was 370.47 m³/day.

The Bayshore Village Sewage Works complies with all requirements of the regulating authorities and operates under:

- Certificate of Approval (C of A) No. 3-1337-81-968 issued July 17, 1996

Certificate of Approval (C of A) No. 3-1337-81-968 issued July 17, 1996 Section 4(2) requires the Performance Report to contain the following:

- a) A summary of all monitoring data, including an overview of the success and adequacy of the sewage treatment program;*
- b) a tabulation of all monitoring and analytical results obtained during the reporting period, including sampling/monitoring location and date;*
- c) a record of the operation of the spray irrigation system, including dates and hours of operation, irrigation system, including dates and hours of operations, irrigation areas utilized, rates of effluent application, and volumes of effluent applied;*
- d) an account of any environmental and operating problems encountered at the site and the mitigative measures taken during the reporting period.*

Bayshore Sewage Works consists of two irrigation spray field where the effluent from the lagoons is sprayed at a maximum rate of 55 m³/ha/day from May 18 to September 28 for each calendar year. The timeframe of the spray irrigation may be extended each year upon written request until October 28th.

This report will show that the Ontario Clean Water Agency has made every attempt to achieve its goals through its operational performance. This performance was enhanced through the use of an electronic process data collection database, an electronic maintenance and work order database, an electronic operational excellence database, a training program focused on providing the right skills to staff - also captured and tracked by the use of an electronic database and a multi-skilled, flexible workforce.

This report will show that the requirements of the facility C of A including effluent monitoring and reporting requirements were consistently met and that effluent quality was consistently within C of A requirements.

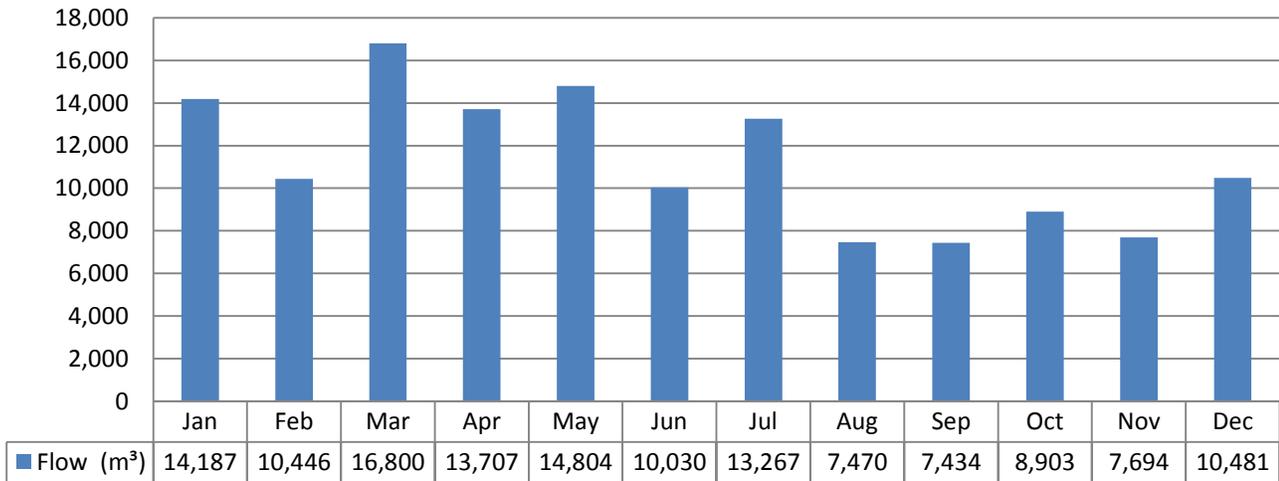
Summary of Influent Flow Data

Condition 1.1 of the (C of A) No. 3-1337-81-968 indicates *“The Owner Shall ensure that the flow of sewage into the sewage treatment plant does not exceed the average daily flow of 399 m³/day for any part of time greater than one (1) calendar year.”* The annual average daily influent flow was 370.47 m³/day or 92.8 % of the rated capacity in 2021.

The total Influent flow in 2021 was 135 221.95 m³

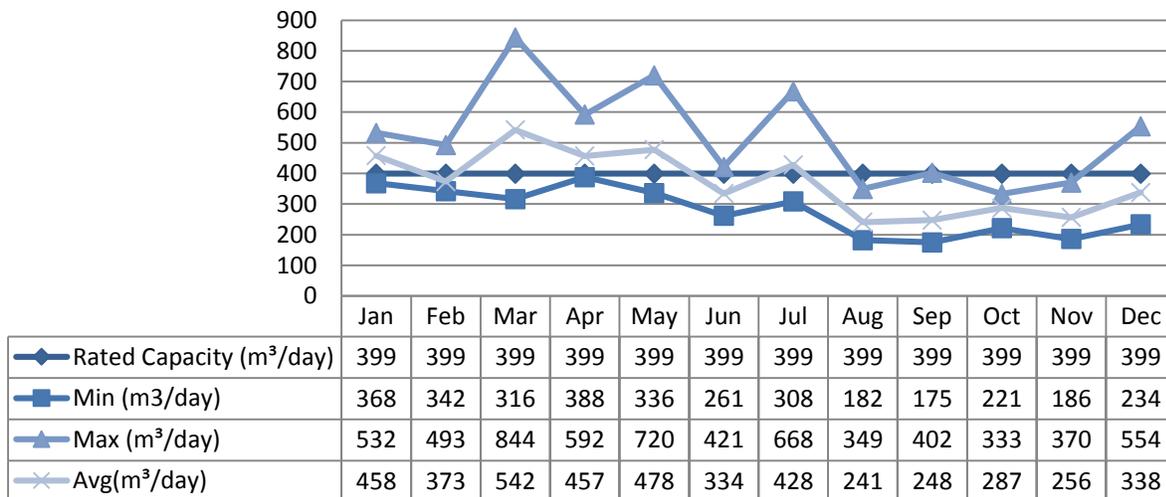
The extended spray season was requested in 2021. During the month of July, the weather conditions were consistently poor for spray irrigation to be carried out. Due to the factor mentioned above, a request was put in to extend the spray season to bring down the level in the lagoons to accommodate the flows expected in the winter months.

Graph 1: 2021 Influent Flow Monthly Totals



Note: The above flows are calculated based upon manual flow meter readings and was averaged.

Graph 2: Influent Daily Minimum, Maximum and Average Flows



Note: Seasonally a significant fluctuation in flow trends shows higher sewage flows which indicates there is ongoing infiltration into the sewer systems. The Ontario Clean Water Agency has maintenance schedules/programs to inspect service laterals, new connections and manholes.

Bayshore Village Sewage Works Historical Flows

Historical sewage flows and sewage generation rates for Bayshore Village Sewage Works are summarized in Table 1.

Table 1: Historical Sewage Flows and Generation Rates

Year	Number of Connections	Average Daily Flow (m ³ /day)	Sewage Generation Rate (L/cap/day)
2012	318	259	313
2013	319	315	379
2014	319	334	402
2015	320	338	406
2016	322	358	428
2017	328	387	454
2018	335	365	419
2019	340	374	423
2020	342	401	451
2021	342	370	416
3 Year Average		382	430

*Based on 2.6 people per dwelling

Note: This calculation was completed based on current connections in the system, growth within the collection system has not been considered.

System Reserve Capacity

In accordance with the MECP Procedure D-5-1, the hydraulic reserve capacity is calculated by the following formula:

Hydraulic Reserve Capacity= Design Flow- Committed Flow

The design flow is equal to the maximum permissible flow approved by the Certificate of Approval. (C of A) No. 3-1337-81-968 maximum permissible flow is: 399 m³/day. The committed flow is equal to the total expected flow by the existing and proposed connections based on the previous 3-year average daily flow.

The built-out service area of the Bayshore Village Sewage Works has a total of 382 units. The three-year (2019-2021) average sewage generation rate is: 430 L/cap/day. With the committed population of 993 there is a projection of 427 m³/day of sewage at full build out. This exceeds the system's rated capacity by 28 m³/day.

As a result, there is no reserve capacity at this system.

Effluent Spray Irrigation

Effluent spray irrigation was carried out between May 18 and October 31, 2021. Each day while utilizing the spray irrigation system logs were kept for: weather conditions, which field was being utilized and the volume of effluent that was applied each day. During the spray irrigation season approximately 26 ha from the North and South fields were utilized over 67 days. A total effluent volume of 128,966 m³ was applied to the spray fields. The average application rate for the reporting period was 74.03 m³/ha/day, which exceeds the Certificate of Approval limit of 55 m³/ha/day, having a large amount of rain in July would of had an impact on

the average application rate for 2021 due to the amount of days the spray irrigation could be operated to be within compliance of the C of A would have been limited.

The operation of the spray irrigation system consists of the following seasonally:

- Seasonal spray irrigation piping and spray nozzles are installed and pressure tested prior to the beginning of the spray season.
- The spray irrigation fields are inspected daily along with weather conditions (i.e. no rain and wind velocity less than 15 km/hr) to determine if conditions are favourable for spray irrigation.
- If spray irrigation is favourable, the operator starts the effluent pump. The operator verifies the sprinkler heads are operational. If issues arise such as broken pipes, clogged sprinkler heads, surface ponding and aerosol drift, then the spray operation is modified, discontinued or repaired as required.
- Operations staff maintains daily logs during the spray irrigation operation.

Summary of Sampling Frequency

(C of A) No. 3-1337-81-968 Condition 2.1 (b) describes the requirement for sample collection at the following locations, frequencies and by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 2: Minimum Raw Sewage Sampling Requirements

Influent Sampling Point		
Parameters	Sample Type	Frequency
BOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly

Table 3: Minimum Lagoon Effluent Sampling Requirements

Influent Sampling Point		
Parameters	Sample Type	Frequency
BOD5	Grab	Annually
Total Suspended Solids	Grab	Annually
Total Phosphorus	Grab	Annually
Total Kjeldahl Nitrogen	Grab	Annually
(Ammonia + Ammonium) Nitrogen	Grab	Annually

Note: The annual sampling of the lagoons effluent shall take place at the beginning of each spray irrigation season.

Table 4: Minimum Surface Water Parameter Sampling Requirements

Final Effluent Sampling Point		
Parameters	Sample Type	Frequency
BOD5	Grab	3 per season
Total Suspended Solids	Grab	3 per season
Total Phosphorus	Grab	3 per season
Total Kjeldahl Nitrogen	Grab	3 per season
(Ammonia + Ammonium) Nitrogen	Grab	3 per season
Nitrates	Grab	3 per season
Nitrites	Grab	3 per season
pH	Grab	3 per season
Temperature	Grab	3 per season

Note: The surface water sampling shall take place prior to, in the middle, and after each spray irrigation season, provided that there is flow in the stream.

Table 5: Minimum Soil Parameter Sampling Requirements

Final Effluent Sampling Point		
Parameters	Sample Type	Frequency
Total Organic Carbon	Core	Annually
Total Phosphorus	Core	Annually
Total Kjeldahl Nitrogen	Core	Annually
(Ammonia + Ammonium) Nitrogen	Core	Annually
Nitrite and Nitrate Nitrogen	Core	Annually
Chlorides	Core	Annually
Sodium	Core	Annually
Conductivity	Core	Annually
pH	Core	Annually

Note: The annual soil sampling shall take place prior to each spray irrigation season.

Sewage and Effluent Quality

Raw Sewage Characteristics

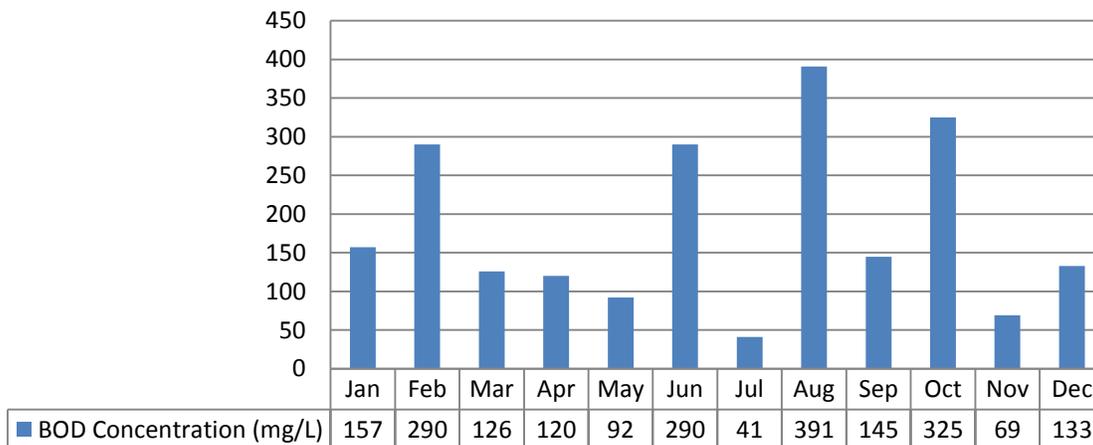
Detailed below are raw sewage characteristics for the 2021 reporting period.

A summary of the 2021 Raw Sewage monitoring data is contained in Appendix I of this report.

Biochemical Oxygen Demand (BOD5)

BOD5 Monthly Average Concentration

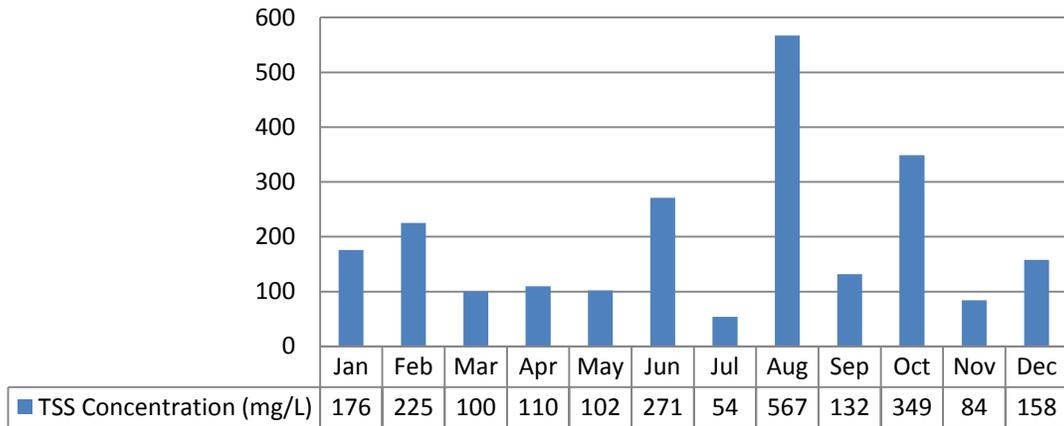
Graph 3: 2021 Monthly BOD5 Raw Sewage Concentration



Total Suspended Solids (TSS)

Total Suspended Solids Monthly Average Concentration

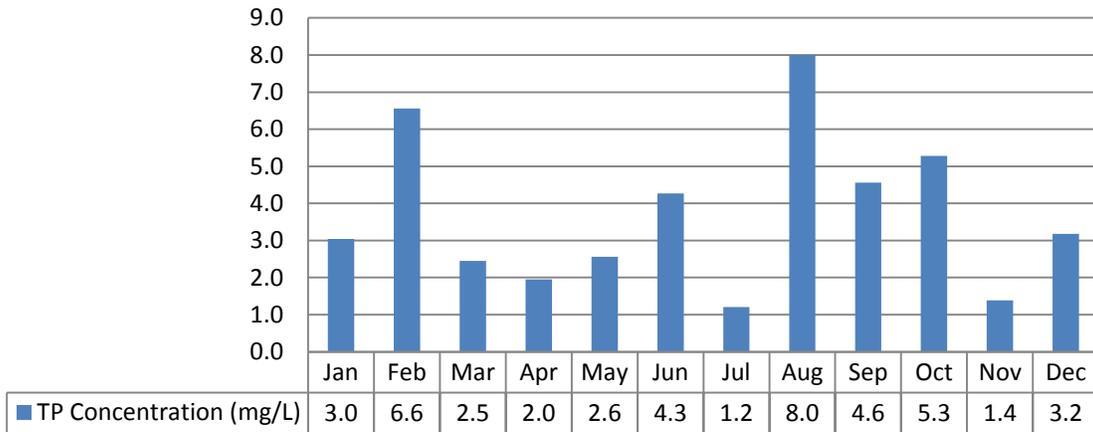
Graph 4: 2021 Monthly TSS Raw Sewage Concentration



Total Phosphorus (TP)

Total Phosphorus Monthly Average Concentration

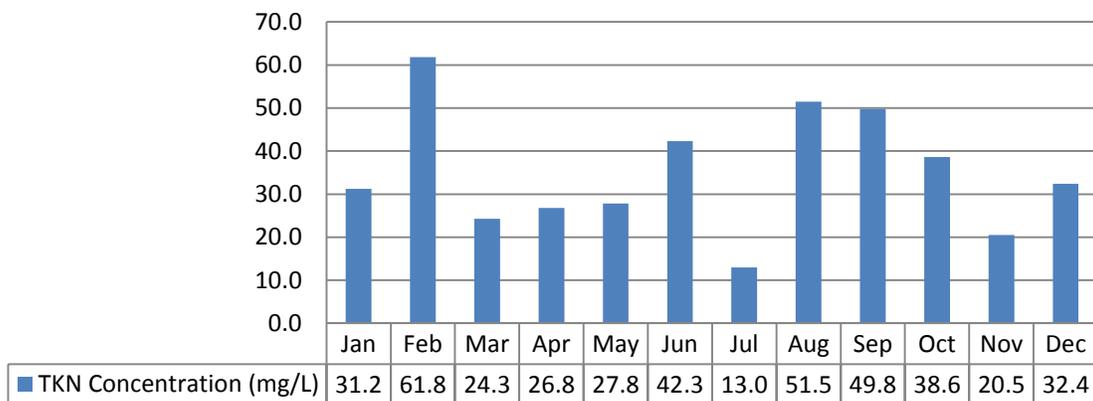
Graph 5: 2021 Monthly Total Phosphorus Raw Sewage Concentration



Total Kjeldahl Nitrogen TKN (mg/L)

Total Kjeldahl Nitrogen (TKN) Monthly Raw Average Concentration

Graph 6: 2021 Monthly Total Kjeldahl Nitrogen (TKN) Monthly Raw Sewage Concentration Comparison



Effluent Quality

Grab samples were collected from each lagoon prior to the start of the spray irrigation season on April 27, 2021. Another set of grab samples were collected in the middle of the spray irrigation season on August 11, 2021 and at the end of the spray irrigation season on November 02, 2021. The samples were collected as per the Certificate of Approval No. 3-1337-81-968 Condition 2.1 (b). The laboratory results are summarized in Table 6.

There are no effluent limits or objectives in the Certificate of Approval.

Table 6: Lagoon Content Characteristics

Parameter	April			August		November	
	<i>Large Lagoon (Cell A- West Location)</i>	<i>Large Lagoon (Cell A- Dock Location)</i>	<i>Small Lagoon (Cell B)</i>	<i>Large Lagoon (Cell A- West Location)</i>	<i>Large Lagoon (Cell A- Dock Location)</i>	<i>Large Lagoon (Cell A- West Location)</i>	<i>Large Lagoon (Cell A- Dock Location)</i>
BOD5 (mg/L)	12	10	18	<4	<4	11	10
Total Suspended Solids (mg/L)	49	35	27	8	4	208	27
Total Phosphorus (mg/L)	0.95	1.00	3.52	1.41	1.51	0.18	0.14
TKN (mg/L)	4.6	4.8	27.2	3.2	3.8	3.4	3.3
TAN (mg/L)	2.0	2.3	23.9	1.9	2.4	2.1	2.0

Effluent Spray Irrigation

Groundwater Monitoring

Groundwater samples were collected in April, August and November for groundwater monitoring in six boreholes in and around the North and South spray irrigation fields. The results for the ground water monitoring samples are summarized below in Tables 7-12. The results were compared with the Ontario Drinking Water Standards, Objectives and Guidelines (ODWS). Chloride concentrations ranged from 6 mg/L to 160 mg/L, which is similar to levels measured in 2020 with one exception to one sample result of 790 mg/L in April 2021. Nitrate levels were low, comparable to samples collected in 2020, with one exception to one sample results being slightly higher taken in April 2021. Most other parameters measured (nitrogen, TKN and TAN) were undetectable. The results received indicate the low impact the spray irrigation fields are having on the groundwater.

Table 7: Groundwater Monitoring - 1-1 (East South Field)

Parameter	Location	April 27	August 10	November 02
Diss. Organic Carbon (mg/L)	1-1 (East South Field)	2	2	2
Nitrite (mg/L)	1-1 (East South Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-1 (East South Field)	<0.06	<0.06	<0.06
Chloride (mg/L)	1-1 (East South Field)	140	160	150
TKN (mg/L)	1-1 (East South Field)	<0.5	<0.5	<0.5
TAN (mg/L)	1-1 (East South Field)	<0.1	<0.1	<0.1
Total Phosphorus (mg/L)	1-1 (East South Field)	<0.03	0.04	<0.03

Table 8: Groundwater Monitoring - 1-3 (South Field)

Parameter	Location	April 27	August 10	November 02
Diss. Organic Carbon (mg/L)	1-3 (South Field)	2	6	6
Nitrite (mg/L)	1-3 (South Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-3 (South Field)	<0.06	<0.06	<0.06
Chloride (mg/L)	1-3 (South Field)	110	95	140
TKN (mg/L)	1-3 (South Field)	<0.5	<0.5	0.7
TAN (mg/L)	1-3 (South Field)	0.2	0.2	<0.1
Total Phosphorus (mg/L)	1-3 (South Field)	0.08	0.08	0.18

Table 9: Groundwater Monitoring - 1-4 (North Field)

Parameter	Location	April 27	August 10	November 02
Diss. Organic Carbon (mg/L)	1-4 (North Field)	1	2	3
Nitrite (mg/L)	1-4 (North Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-4 (North Field)	<0.06	<0.06	0.07
Chloride (mg/L)	1-4 (North Field)	36	21	31
TKN (mg/L)	1-4 (North Field)	<0.5	<0.5	<0.5
TAN (mg/L)	1-4 (North Field)	0.1	<0.1	<0.1
Total Phosphorus (mg/L)	1-4 (North Field)	<0.03	<0.03	<0.03

Table 10: Groundwater Monitoring - 1-5 (North Field)

Parameter	Location	April 27	August 10	November 02
Diss. Organic Carbon (mg/L)	1-5 (North Field)	2	3	2
Nitrite (mg/L)	1-5 (North Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-5 (North Field)	<0.06	<0.06	0.09
Chloride (mg/L)	1-5 (North Field)	5	8	16
TKN (mg/L)	1-5 (North Field)	<0.05	<0.5	<0.5
TAN (mg/L)	1-5 (North Field)	<0.1	<0.1	<0.1
Total Phosphorus (mg/L)	1-5 (North Field)	<0.03	<0.3	<0.03

Table 11: Groundwater Monitoring - 1-7 (North Field)

Parameter	Location	April 27	August 10	November 02
Diss. Organic Carbon (mg/L)	1-7 (North Field)	12	5	19
Nitrite (mg/L)	1-7 (North Field)	<0.03	<0.03	<0.03
Nitrate (mg/L)	1-7 (North Field)	0.92	<0.06	<0.06
Chloride (mg/L)	1-7 (North Field)	790	61	83
TKN (mg/L)	1-7 (North Field)	3.5	0.6	4.3
TAN (mg/L)	1-7 (North Field)	2.6	1.9	3.1
Total Phosphorus (mg/L)	1-7 (North Field)	0.56	0.44	0.75

Table 12: Groundwater Monitoring - 1-1 (West North Field)

Parameter	Location	April 27	August 10	November 02
Diss. Organic Carbon (mg/L)	1-1 (West North Field)	2	6	2
Nitrite (mg/L)	1-1 (West North Field)	<0.03	0.18	<0.03
Nitrate (mg/L)	1-1 (West North Field)	0.07	<0.06	<0.06
Chloride (mg/L)	1-1 (West North Field)	45	100	78
TKN (mg/L)	1-1 (West North Field)	<0.5	1.5	<0.5
TAN (mg/L)	1-1 (West North Field)	<0.1	0.8	<0.1
Total Phosphorus (mg/L)	1-1 (West North Field)	0.04	0.67	<0.03

Surface Water Monitoring

The surface water monitoring takes place at Wainman Creek, upstream and downstream of the spray fields. Samples were taken in April/May, August and November of 2021. All samples were taken as per (C of A) No. 3-1337-81-968 Condition 2.1 (b).

The sample results from Wainman's Creek are shown in Tables 13 and 14. The upstream and downstream sample location results show water quality is consistent, signifying little to no impact from the spray irrigation process.

Table 13: Surface Water Monitoring- Wainman's Creek (Upstream)

Parameter	Location	April 27 & May 04	August 11	November 02
BOD5 (mg/L)	Wainman's Creek (Upstream)	<4	<4	<4
Total Suspended Solids (mg/L)	Wainman's Creek (Upstream)	6	2	4
pH	Wainman's Creek (Upstream)	8.00	7.69	7.71
Total Kjeldahl Nitrogen (as N mg/L)	Wainman's Creek (Upstream)	1.0	0.8	1.0
Ammonia+Ammonium (N) (as N mg/L)	Wainman's Creek (Upstream)	<0.1	<0.1	<0.1
Nitrite (mg/L)	Wainman's Creek (Upstream)	<0.03	<0.03	<0.3
Nitrate (mg/L)	Wainman's Creek (Upstream)	0.74	<0.06	1.66
Nitrite + Nitrate (mg/L)	Wainman's Creek (Upstream)	0.74	<0.06	1.66
Phosphorus (total) (mg/L)	Wainman's Creek (Upstream)	<0.03	0.034	0.018
E.coli (cfu/100mL)	Wainman's Creek (Upstream)	240	14	200
Total Coliforms (cfu/100mL)	Wainman's Creek (Upstream)	20000	2600	3500

Table 14: Surface Water Monitoring- Wainman's Creek (Downstream)

Parameter	Location	April 27, May 04	August 11	November 02
BOD5 (mg/L)	Wainman's Creek (Downstream)	<4	<4	<4
Total Suspended Solids (mg/L)	Wainman's Creek (Downstream)	6	2	3
pH	Wainman's Creek (Downstream)	7.95	7.65	7.69
Total Kjeldahl Nitrogen (as N mg/L)	Wainman's Creek (Downstream)	1.0	1.0	0.9
Ammonia+Ammonium (N) (as N mg/L)	Wainman's Creek (Downstream)	<0.1	<0.1	<0.1
Nitrite (mg/L)	Wainman's Creek (Downstream)	<0.03	<0.03	<0.03
Nitrate (mg/L)	Wainman's Creek (Downstream)	0.74	<0.06	1.66
Nitrite + Nitrate (mg/L)	Wainman's Creek (Downstream)	0.74	<0.06	1.66
Phosphorus (total) (mg/L)	Wainman's Creek (Downstream)	<0.03	0.037	0.027
E.coli (cfu/100mL)	Wainman's Creek (Downstream)	260	24	220
Total Coliforms (cfu/100mL)	Wainman's Creek (Downstream)	16000	460	3300

Soil Core Monitoring

The soil core monitoring samples are taken in the North and South spray fields. All samples were taken as per (C of A) No. 3-1337-81-968 Condition 2.1 (b) during the 2021 reporting period.

Table 15: Soil Core Monitoring- North Field Upper

Parameter	Location	April 27
pH	North Field Upper	7.26
Conductivity (μ S/cm)	North Field Upper	117
Chloride (μ g/g)	North Field Upper	6.2
Nitrate + Nitrite as N (μ g/g)	North Field Upper	0.3
TKN (μ g/g)	North Field Upper	0.15
TAN (μ g/g)	North Field Upper	<0.01
Total Organic Carbon (μ g/g)	North Field Upper	2.1
Phosphorus (μ g/g)	North Field Upper	460
Sodium (μ g/g)	North Field Upper	460

Table 16: Soil Core Monitoring-- North Field Lower

Parameter	Location	April 27
pH	North Field Lower	6.19
Conductivity (µS/cm)	North Field Lower	56
Chloride (µg/g)	North Field Lower	19
Nitrate + Nitrite as N (µg/g)	North Field Lower	<0.2
TKN (µg/g)	North Field Lower	0.13
TAN (µg/g)	North Field Lower	<0.01
Total Organic Carbon (µg/g)	North Field Lower	2.0
Phosphorus (µg/g)	North Field Lower	380
Sodium (µg/g)	North Field Lower	320

Table 17: Soil Core Monitoring- South Field

Parameter	Location	April 27
pH	South Field	7.05
Conductivity (µS/cm)	South Field	199
Chloride (µg/g)	South Field	12
Nitrate + Nitrite as N (µg/g)	South Field	<1
TKN (µg/g)	South Field	0.17
TAN (µg/g)	South Field	<0.01
Total Organic Carbon (µg/g)	South Field	2.3
Phosphorus (µg/g)	South Field	370
Sodium (µg/g)	South Field	230

Description of Operating Problems

The following details describe all operating problems encountered during the reporting period and the corrective actions taken:

Table 18: Bayshore Village Sewer Works Operational Challenges

Month	Challenges	Corrective Actions
June	East Pumping Station leaking decommissioned check valve on pump one.	Remove decommissioned check valves and replace piping.
July	Low output on East Pumping Station pumps.	Pumps pulled and inspected, damaged impeller located in one pump. Pump impeller replaced/ In service check valves restricting flow, valves replaced.
	Weather was not ideal during spray irrigation season, ongoing challenge.	Monitor weather, utilize good weather conditions days. Request longer spray irrigation season.
August	Loss of a phase due to vegetation on Hydro Pole.	Hydro One contacted, cleared out vegetation and restored full hydro.

September	Communication issue at West Pump Station- Alarm failed due to Bell Line issue.	Bell repaired line, restored communication.
December	Raw inlet blockage and overflow.	Clear blockage, berm to be installed in spring 2022.

Summary of Maintenance

Routine maintenance and operation of the Bayshore Village Sewer Works and Sewage Pumping Stations in 2021 consisted of the following:

- Attended Hydro failures
- Collected samples as per the C of A
- Installed seasonal piping
- Exercised generator
- Monitored levels in lagoons
- Monitored weather conditions
- Performed routine maintenance and repair of pumps

Summary of Effluent Quality Assurance or Control Measures Undertaken

All final effluent samples collected during the reporting period to meet C of A sampling requirements were submitted to SGS Lakefield Research Ltd. laboratory for analysis. SGS Lakefield Research 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 Ontario Clean Water Agency is ensuring appropriate control measures are undertaken during sample analysis.

Effluent quality assurance is maintained in several ways. Laboratory samples are sent to an accredited laboratory (SGS Canada Inc. - Lakefield) for analysis of all effluent parameters. Sampling calendars issued to the operator which denote frequency of sampling. Calendars are used as a tracking mechanism throughout the month to ensure all required samples are collected. These calendars are submitted to the Process Compliance Technician at the end of each month for review. Raw and effluent samples are collected as per the Amended C of A and the results are reviewed on a regular basis to ensure compliance.

Work orders illustrating all scheduled and preventative maintenance to be completed are issued to the operator and/or mechanic. OCWA conducts internal audits of the facility and develops Action Plans to ensure deficiencies are identified.

Summary of Calibration and Maintenance

Calibrations on effluent monitoring equipment were performed by Flowmetrix Technical Services Inc. on June 08, 2021 for equipment located at the Bayshore Village Sewage Works. Please see Appendix II: Calibration Report.

Table 19: Calibration and Maintenance Dates on the Influent/Effluent Monitoring Equipment

Table 19: Bayshore Village Sewer Works – Summary of Raw and Final Effluent Monitoring Equipment – 2021	
Influent Monitoring Equipment	Date of Completion
Influent Flow Meter	June 08, 2021
Final Effluent Monitoring Equipment	Date of completion
Final Effluent Spray Fields Flow Meter	June 08, 2021

Sludge Accumulation

Sludge measurements were completed on the small and large lagoons in 2013 & 2014. It is budgeted for testing in 2022 for more accurate volume estimations.

Community Complaints

During the 2021 reporting period there was no community complaints received.

Summary of Bypass, Spills or Abnormal Discharge Events

Table 20 summarizes all Bypasses, spills and abnormal discharge events that occurred in 2021. All were reported to MOH and MECP. Copies of these reports are provided in Appendix III.

Table 20: 2021 Summary of Events:

Date 2021	Type of Event	Total Estimated Volume (m ³)	Disinfect (Y/N)	Samples Collected (Y/N)	Reason
December 03	Spill	~19	N	Y <i>Representative samples collected after the spill had ended</i>	A blockage in the crock/ inlet to the first lagoon
December 03-06	Bypass	~922	N	N <i>Bypass directed flow to the second lagoon, where the sewage will remain until the 2022 spray season</i>	A blockage in the crock/inlet to the first lagoon caused a spill, until larger equipment could be brought in to clear the blockage the bypass of the first lagoon was started to stop the spill from continuing

Appendix I

Performance Assessment Report

**Ontario Clean Water Agency
Performance Assessment Report Wastewater/Lagoon**

Facility: [1616] BAYSHORE VILLAGE LAGOONS
From: 01/01/2021 to 31/12/2021

	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Total	Avg.	Max.
Flows:															
Raw Flow: Total - Raw Sewage (m³)	14186.70	10446.05	16799.70	13706.50	14804.20	10030.30	13267.10	7469.90	7434.00	8902.60	7694.20	10480.70	135221.95		
Raw Flow: Avg - Raw Sewage (m³/d)	457.64	373.07	541.93	456.88	477.55	334.34	427.97	240.96	247.80	287.18	256.47	338.09		369.99	
Raw Flow: Max - Raw Sewage (m³/d)	531.90	492.50	843.60	592.00	720.00	421.00	668.20	349.30	401.80	333.00	370.00	554.00			843.60
Eff. Flow: Total - Final Effluent (m³)	0.00	0.00	0.00	0.00	1981.00	24882.00	18776.00	37623.00	28208.00	17496.00	0.00	0.00	128966.00		
Eff. Flow: Avg - Final Effluent (m³/d)	0.00	0.00	0.00	0.00	660.33	1914.00	1877.60	1980.16	2350.67	1749.60	0.00	0.00		1170.26	
Eff. Flow: Max - Final Effluent (m³/d)	0.00	0.00	0.00	0.00	1339.00	2534.00	2512.00	3010.00	3177.00	2829.00	0.00	0.00			3177.00
Biochemical Oxygen Demand: BOD5:															
Raw: Avg BOD5 - Raw Sewage (mg/L)	157.00	290.00	126.00	120.00	92.00	290.00	41.00	391.00	145.00	325.00	69.00	133.00		181.58	391.00
Raw: # of samples of BOD5 - Raw Sewage (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12		
Total Suspended Solids: TSS:															
Raw: Avg TSS - Raw Sewage (mg/L)	176.00	225.00	100.00	110.00	102.00	271.00	54.00	567.00	132.00	349.00	84.00	158.00		194.00	567.00
Raw: # of samples of TSS - Raw Sewage (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12		
Total Phosphorus: TP:															
Raw: Avg TP - Raw Sewage (mg/L)	3.04	6.56	2.45	1.95	2.56	4.27	1.21	8.00	4.56	5.28	1.39	3.18		3.70	8.00
Raw: # of samples of TP - Raw Sewage (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12		
Nitrogen Series:															
Raw: Avg TKN - Raw Sewage (mg/L)	31.20	61.80	24.30	26.80	27.80	42.30	13.00	51.50	49.80	38.60	20.50	32.40		35.00	61.80
Raw: # of samples of TKN - Raw Sewage (mg/L)	1	1	1	1	1	1	1	1	1	1	1	1	12		

Appendix II

Calibration Reports



VeriMaster - Flow Meter Verification Report

Customer Information		Meter Information	
Customer	Lagoon city	Meter Owner	Bayshore PS
Verification Download	Tue, Jun 08, 2021	Meter Type	WaterMaster
		Sensor Size	DN150
		Pipe Status	Fluid Present
		Sensor Type	Fullbore
		Sensor Serial No	3K620000157278
		Transmitter Serial No	3K620000157278
		Tag	EAST PUMP
		Location	BSV EAST SPS

Overall Status: Pass

The flowmeter has passed its internal continuous verification and automatic self calibration. It is working within +/-1% of its original factory calibration

Summary of Results		Verification History	
Coil Group	Passed	OIML Accuracy Alarms	0
Electrode Group	Passed	Totaliser Information	
Sensor Group	Passed	Forward	924353.88 m3
Transmitter Signal	Passed	Reverse	10347.92 m3
Transmitter Driver	Passed	Net	914012.28 m3
Output Group	Passed	Sensor Data	
Configuration	Passed	Coil Current	179.9 mA
		Coil Inductance	157.6 mH
		Coil Inductance Shift	-0.2%
		Coil / Loop Resistance	35.5 ohm
Sensor Information		Transmitter Data	
Q3	175.00 l/s	Tx Gain - Adjustment	0.1%
Calibration Accuracy	OIML Class 2	VeriMaster Information	
Sensor Calibration Factors	136.2%; 0.00 mm/s; 11	Version	01.00.03
Date of Manufacture	08 Feb 2014	Limit Version	01.00.01
Run Hours	2445days 19hrs 55mins	Pulse Output	
Transmitter Information		Output 1: 1200.0Hz	Pass : 1200.000 Hz ; 0.00%
Application Version	V01.05.00 12/07/12	Output 1: 600.0Hz	Pass : 600.000 Hz ; 0.00%
MSP Version	00.00.04	Output 2: 1200.0Hz	Pass : 1200.000 Hz ; 0.00%
Date of Manufacture	08 Feb 2014	Output 2: 600.0Hz	Pass : 600.000 Hz ; 0.00%
Run Hours	3203days 17hrs 38mins		
Current Output			
4mA Value	Pass : 4.000 mA ; 0.00%		
12mA Value	Pass : 12.000 mA ; 0.00%		
20mA Value	Pass : 20.000 mA ; 0.00%		

Installation Comments / Equipment used:	Configuration Settings
Verified with Verimaster	Mains Frequency
	60 Hz
	Qmax
	166.68 l/s
	Pulses/Unit
	30.000000
	Pulses Limit Frequency
	1200.0 Hz
	Sensor User Span/Zero
	100.0%; 0.00 mm/s
	User Flow Cutoff/Hysteresis
	1.00%; 20%
	Meter Mode
	Normal operation

Date Tue, Jun 08, 2021

Operator Signature

Print Name

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AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER OCWA – Kawartha Lakes Hub
 CONTACT Nick Leroux
 Senior Operations Manager
 123 East St S
 Bobcaygeon ON, K0M 1A0
 P: 705-623-7278
 E: nleroux@ocwa.com

[MUT] MANUFACTURER
 MODEL
 CONVERTER SERIAL NUMBER

EQUIPMENT DETAIL

Greyline
 DFM-IV
 23437

PLANT ID Bayshore Village
 METER ID Bayshore Spray Fields
 FIT ID NA
 CLIENT TAG NA
 OTHER NA
 GPS COORDINATES N 44°33.467 W 079°12.436

VER. BY - FM Michael Jorin

Quality Management Standards Information -
 Reference equipment and instrumentation used
 to conduct this verification test is found in our AC-

VERIFICATION DATE June 8th 2021
 CAL. FREQUENCY Annual
 CAL. DUE DATE June 2022

Chart Recorder/Data Recorder Details

Manufacturer Greyline
 Model DFM-IV
 Converter S/N: 23437
 Channel Number used [Y or N]

1	2	3	4
y	n	n	n

Comparative Readings Check [Y/N] y
 Display Readings Check [Y/N] y
 Chart Readings Check [Y/N] y

CHANNEL INFORMATION

CHANNEL 1

Meter Input Raw Flow
 Engineering Parameter M3/Day
 Display Max. Range 19240.00
 Chart Max. Range 19240.00

COMPARATIVE READINGS

CHANNEL 1

Meter Input Reading 0.00
 Chart/ Recorder Display Reading 0.00
 Difference Reading 0.00
 PASS/FAIL PASS

DISPLAY READINGS		CHANNEL 1			mA OUTPUT READINGS		CHANNEL 1		
Test No.	% Max. Range	Calc.	Actual	% Error	Test No.	% Max. Range	Calc.	Actual	% Error
1	0%	0	0	n/a	1	0%	4.000	4.000	n/a
2	25%	4810.00	4810.00	0.00	2	25%	8.000	8.000	0.00
3	50%	9620.00	9620.00	0.00	3	50%	12.000	11.996	-0.03
4	75%	14430.00	14430.00	0.00	4	75%	16.000	15.995	-0.03
5	100%	19240.00	19240.00	0.00	5	100%	20.000	19.998	-0.01
Average % Error				0.00	Average % Error				-0.02
PASS/FAIL				PASS	PASS/FAIL				PASS

This verification sheet either identifies exact 0 - 100% signal input comparison or a comparative review between a calibrated field instrument [i.e. flow meter] readings and the chart recorder/data recorder readings.

Appendix III

Bypass and Spill Event Reporting

West Cluster Operations Event Form

Project: Bayshore Spray Irrigation System

Location: 3820 Side Road 20, Ramara

Date: December 03, 2021

Nature of Event: Spill

Details of Event: While completing regular checks the operator in charge discovered a spill occurring located at the inlet/crock to the first lagoon (Cell B) at the Bayshore Village Spray Irrigation system. The spill was occurring due to a blockage in the crock/ inlet to the first lagoon (Cell B).

Call SAC: 1-800-268-6060

Time SAC notified: 12:39

SAC Incident Number: 1-1GEVU1

Name of Person at SAC: A. Kaiser

MECP District Manager Barrie Notified 705-309-5874 (time): December 03/21 @ 14:10

District Health Unit Notified (time): 12:29

Name of Person at Health Unit: Steve Borgh

All Other Phone calls placed (Managers, Client, MECP, MOH): Emailed Sr. Operations Manager N. Leroux, Owner Township of Ramara, appropriate OCWA staff, MECP Barrie District Manager.

Volume of Spill: Estimated volume based upon averaged flow meter readings: ~19 m³

Start: December 3/21 @ ~11:30 **Finish:** December 3/21 @ ~12:45 **Duration:** ~1 hour, 15 minutes

-MOH updated via email (by request) with a summary of the event and duration of the event on December 03/21 @ 13:47

-SAC contacted at end of event on December 03/21 @ 15:26 spoke with Mark provided estimated volume, duration of event.

Samples Taken: Representative samples collected after spill was contained- BOD, TSS, Total Phos, TKN, TAN, NH₃, NH₄ & E. Coli

Corrective Action Taken:

-Divert flow into lagoon/started bypassing the first lagoon (Cell B)

-Attempt clearing blockage in pipe/crock

-Representative samples collected after the spill had ended

Prepared By: Christine Craig



SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2H0
Phone: 705-652-2000 FAX: 705-652-6365

Works #: NR-120002264

Project : PO#017018

13-December-2021

OCWA-Kawartha West (Bayshore Village WWT)

Attn : Christine Craig

PO Box 279, Boyd St. E
Bobcaygeon, ON
K0M 1A0, Canada

Phone: 705-887-3596
Fax:

Date Rec. : 03 December 2021

LR Report: CA12158-DEC21

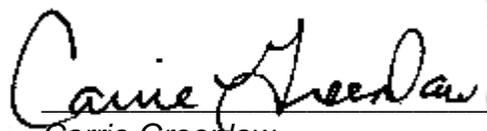
Reference: SAC Incident #:1-1GEVU1

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1:	2:	3:	4:	5:
	Analysis Start Date	Analysis Start Time	Analysis Completed Date	Analysis Completed Time	Raw Raw-Raw Sewage-East SPS
Sample Date & Time					03-Dec-21 14:00
Temperature Upon Receipt [°C]	---	---	---	---	11.0
Biochemical Oxygen Demand (BOD5) [mg/L]	06-Dec-21	16:20	13-Dec-21	10:27	128
Total Suspended Solids [mg/L]	06-Dec-21	09:37	07-Dec-21	14:03	138
Phosphorus (total) [mg/L]	06-Dec-21	17:38	07-Dec-21	10:55	2.39
Total Kjeldahl Nitrogen [as N mg/L]	06-Dec-21	17:36	07-Dec-21	09:38	19.0
Ammonia+Ammonium (N) [as N mg/L]	06-Dec-21	20:25	07-Dec-21	16:17	14.4
E. Coli [cfu/100mL]	04-Dec-21	12:35	06-Dec-21	13:42	1480000



Carrie Greenlaw
Project Specialist,
Environment, Health & Safety

West Cluster Operations Event Form

Project: Bayshore Spray Irrigation System

Location: 3820 Side Road 20, Ramara

Date: December 03, 2021- December 06, 2021

Nature of Event: Bypass

Details of Event: To prevent a continued spill (see SAC incident number 1-1GEVU1) a bypass of the first lagoon (Cell B) was started until the blockage in the inlet/crock can be cleared. The bypass directed flow to the second lagoon (Cell A), where the sewage will remain until the 2022 spray season.

Call SAC: 1-800-268-6060

Time SAC notified: 15:50

SAC Incident Number: 1-1GFXYI

Name of Person at SAC: Aaron Daya

MECP District Manager Barrie Notified 705-309-5874 (time): Sr. Operations Manager called @ 15:26. Sent a follow up email @ 16:14.

District Health Unit Notified (time): 15:47

Name of Person at Health Unit: Steve Borgh

All Other Phone calls placed (Managers, Client, MECP, MOH): Emailed Sr. Operations Manager N. Leroux, Owner Township of Ramara, appropriate OCWA staff, MECP Barrie District Manager.

Volume of Spill: Estimated volume based upon averaged flow meter readings: ~922 m³

Start: December 3/21 @ ~13:00 **Finish:** December 6/21 @ ~12:57 **Duration:** ~71 hour, 57 minutes

-MOH updated via email (by request) with a summary of the event December 03/21 @ 16:14. Another update was provided at the end of the event on December 06/21 with the duration of the event.

-SAC contacted at end of event on December 06/21 @ 15:21 spoke with Stephanie McGill, provided estimated volume, duration of event.

Corrective Action Taken:

-Attempt clearing blockage in pipe/crock

-Blockage in the inlet/crock to Cell B was cleared after receiving larger equipment to clear blockage

Prepared By: Christine Craig
