Ingleside Wastewater Treatment System

Certificate of Approval No. 8524-5JFP5F Works No. 120000140

- 2021 Annual Performance Report –

Prepared by:

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1.0 Introduction

This Annual Performance Report is submitted to satisfy the requirements of the Sewage Certificate of Approval issued to the Ingleside WWTP (Amended C of A No. 8524-5JFP5F, February, 2003).

This report corresponds with the period of January to December, 2021, and provides:

- an overview of the wastewater treatment plant performance;
- a summary and interpretation of all monitoring data and analytical results collected during the reporting period, including quality and quantity;
- a summary of the system operation, including calibration; information on operating problems encountered in the reporting period and modifications to the works to correct the problems; and
- a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated over the next reporting period, and an outline of the sludge handling methods and disposal areas to be utilized over the next reporting period.

2.0 Wastewater Treatment Performance

The current treatment system for Ingleside is extended aeration process with screening of the raw influent, grit removal, aeration, chemically-assisted flocculation and sedimentation of solids and phosphorous, chlorination and discharge to Lake St. Lawrence.

Overall, the Ingleside wastewater treatment facility has operated efficiently and has proven to provide consistent removal efficiencies for the design parameters during the reporting period.

Appendix A contains monthly wastewater quantity and quality values.

Please note that the data contained in Appendix A represents all of the acquired data throughout the year, including laboratory and "in-house" testing at the plant.

There were no bypasses within the facility for the reporting year.

2.1 Raw Wastewater Characteristics

The average process wastewater flow rate was 3,614 m^3/d (89% of the average daily design flow of 4,045 m^3/d). The plant is rated at 10,027 m^3/d (peak daily flow) and the maximum daily influent flow was 9,544 m^3 . Appendix A contains the monthly quantity and quality values for the influent and effluent.

Treatment Performance

Table 2.2 outlines the annual average treatment efficiencies of the treatment process within the facility for the reporting year.

Table 2.2 System Heatment Length	Table 2.2 Sv	ystem Treatment	Performance
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Constituent	Raw Influent mg/L	Final effluent mg/L	Final effluent C of A mg/L	Average Loading kg/d	Final effluent C of A kg/d	Average Removal Efficiency (%)		
BOD (mg/L)	96	2.52	25	9.09	101	98		
SS (mg/L)	202	7.06	25	25.52	101	96		
TP (mg/L)	13.53	0.54	1	1.97	4	96		
E. Coli (cnts/100ml)		6	200					

Maximum daily effluent TAN concentrations were 6.81 mg/L and occurred on December 2, 2021. Maximum daily effluent TAN loadings were 27.7 kg/day and occurred on December 2, 2021.

3.0 Effluent Monitoring

Per the C of A, composite influent samples are collected and analyzed weekly for Suspended Solids, Total Phosphorous, Dissolved Reactive Phosphorous, Total Kjeldahl Nitrogen, Ammonia + Ammonium Nitrogen, Nitrite + Nitrate Nitrogen, Alkalinity, Chlorides, Conductivity, and BOD_{5.} Also, per the C of A, a grab sample of the influent is taken and tested weekly for pH.

Per the C of A, composite final effluent samples are collected and analyzed weekly for Suspended Solids, Total Phosphorous, Dissolved Reactive Phosphorous, Total Kjeldahl Nitrogen, Ammonia + Ammonium Nitrogen, Nitrite + Nitrate Nitrogen, Alkalinity, Conductivity, Chlorides, and BOD₅. Also, per the C of A, grab samples of Total Coliform, Fecal Coliform/E. Coli, and Fecal Streptococcus are collected weekly in the final effluent.

Per the C of A, on-site testing of pH, Temperature and Total Chlorine Residual is performed three times per week.

In addition to the routine sampling program required by the C of A, on site testing of the final effluent is performed at least weekly for Total Phosphorous, Dissolved Reactive Phosphorous, Total Suspended Solids and Conductivity.

Please refer to Appendix A for the monthly quantity and quality results and rolling averages.

3.1 Effluent Quality

In accordance with the C of A:

In compliance

• Non-compliance with respect to concentrations of BOD₅ in the effluent is deemed to have occurred when the annual average concentration exceeds 25 mg/L.

In compliance

 Non-compliance with respect to concentrations of Suspended Solids in the effluent is deemed to have occurred when the annual average concentration exceeds 25 mg/L during any twelve consecutive calendar months.

In compliance

• Non-compliance with respect to concentration of total phosphorus (TP) in the effluent is deemed to have occurred when the monthly average concentration exceeds 1 mg/L.

In compliance

• Non-compliance with respect to loading of BOD₅ in the effluent is deemed to have occurred when the annual average loading exceeds 101 kg/d during any twelve consecutive calendar months.

In compliance

 Non-compliance with respect to total loading of Suspended Solids in the effluent is deemed to have occurred when the annual average loading exceeds 101 kg/d during any twelve consecutive calendar months.

In compliance

 Non-compliance with respect to total loading of Total Phosphorus in the effluent is deemed to have occurred when the annual average loading exceeds 4 kg/d during any twelve consecutive calendar months.

Please refer to Appendix A for a detailed look at the analytical results and rolling averages.

4.0 Plant Operations

A preventive maintenance program is in effect at this treatment facility. Preventive maintenance is scheduled on a weekly basis and records are maintained of completed activities.

In 2001, Caneau had a computerized maintenance program installed to ensure that preventative maintenance is performed on all equipment in accordance with the manufacturer's specifications.

The MOECC last performed an inspection of the Ingleside WWTP on March 31, 2021.

The influent and effluent flow meters were calibrated on May 21, 2021, by Can-Am Instruments.

4.1 Operational Problems

A logbook of operational activities and problems is maintained at the treatment facility. There were no significant operational problems encountered in 2021.

4.2 Maintenance

The following is a list of the repairs, calibrations and upgrades which took place at the Ingleside WWTP in the reporting period:

- January 5 Marleau HVAC on site for heating maintenance.
- January 6 Marleau HVAC on site for heating maintenance.
- January 7 Marleau HVAC on site for heating maintenance.
- January 8 Marleau HVAC on site for heating maintenance.
- January 11 Marleau on site to wire up emergency lights.
- January 12 Marleau on site to replace burnt lighting ballasts in basement.
- January 14 Bergeron on site to install photocells for exterior light posts.
- February 1 Capital Controls on site at sewage pumping station to review settings in data recorder.
- February 2 DBC on site with vac truck to remove rags and scum from pre-aeration channel.
- February 19 Pyro Pro on site at WWTP and sewage pumping station to inspect/service fire extinguishers.
- February 23 Cogeco and Township on site to upgrade and configure internet.
- February 24 Received delivery of sodium thiosulphate (Captor) pump panel from Metcon.
- February 25 Eastern Welding on site to inspect Captor panel prior to installation.
- February 26 EVB on site with Hydro One as part of WWTP expansion project.
- February 26 Capital Controls on site to back up SCADA system.
- March 2 Third High Farms on site to haul 40m³ from the secondary.
- March 10 Third High Farms on site to haul 40m³ from the secondary.
- March 10 Genrep on site to conduct semi-annual generator inspections/tests at WWTP and SPS.
- March 10 Marleau on site to replace two GFIs at effluent channel.
- March 11 CDTEC on site to conduct calibrations on gas monitoring equipment.
- March 15 Eastern Welding on site to install dechlorination panel.
- March 15 Genrep and Marleau on site at SPS to troubleshoot generator transfer switch issue.
- March 16 Third High Farms on site to haul 40m³ from the secondary.
- March 16 Eastern Welding and Township on site to run lines for dechlorination job.
- March 17 Eastern Welding and Marleau on site to continue dechlorination job.
- March 17 Third High Farms on site to haul 40m³ from the secondary.
- March 18 Eastern Welding on site to continue dechlorination job.
- March 19 DBC on site to clean out pre-aeration channel.
- March 22 Marleau on site to run electrical for dechlorination job.
- March 23 Third High Farms on site to haul 40m³ from the secondary.
- March 24 Marleau on site to continue dechlorination job.
- March 25 Marleau on site to unblock drain at centrifuge building.
- March 29 Third High Farms on site to haul 40m³ from the secondary.
- March 30 EVB on site to take pictures as part of expansion project.
- March 31 EVB on site to take pictures of alum building as part of expansion project.
- April 5 Marleau on site to replace emergency lights in centrifuge building.
- April 6 Third High Farms on site to haul 40m³ from the secondary.
- April 8 Genrep and Marleau on site at sewage pumping station to supply and install a rental transfer switch.
- April 9 Capital Controls on site at sewage pumping station.
- April 12 Capital Controls on site to troubleshoot RTU-2 communication fault.

- April 13 Goodkey Mechanical was on site to inspect air units in office, alum building and basement as part of plant expansion project.
- April 14 Third High Farms on site to haul 45m³ from the secondary.
- April 16 Third High Farms on site to haul 40m³ from the secondary.
- April 20 Marleau on site to replace light fixture in PLC cabinet at sewage pumping station and inspect VFD fault issue.
- April 21 Third High Farms on site to haul 40m³ from the secondary.
- April 22 Capital Controls remotely connected to SCADA to troubleshoot issues.
- April 22 Third High Farms on site to haul 40m³ from the secondary.
- April 23 Third High Farms on site to begin mixing long term storage tank in preparation for sludge hauling.
- April 23 Capital Controls on site to work on SCADA.
- April 26 Third High Farms on site to haul from long term storage.
- April 27 Third High Farms on site to haul from long term storage.
- April 27 Marleau on site to complete AC job.
- April 27 EVB on site as part of plant expansion project.
- April 28 Third High Farms on site to haul from long term storage.
- April 29 Third High Farms on site to haul from long term storage.
- April 29 EVB on site as part of plant expansion project.
- April 29 Surgeson Electric on site to troubleshoot wasting timers.
- April 29 DBC on site to dump water flushed through WTP train #1's new membranes as part of Zeeweed replacement capital project.
- May 3 Capital Controls connected remotely to troubleshoot SCADA.
- May 4 Eastern Welding on site to inspect decant arm in long term storage.
- May 6 Marleau HVAC on site at sewage pumping station to troubleshoot exterior lights.
- May 7 Eastern Welding on site to work on decant arm in long term storage.
- May 12 Surgeson on site to replace wasting valve timers.
- May 14 Marleau HVAC on site to repair/replace sump pump and alum lines.
- May 19 DBC on site to offload wastewater from LS WTP train #3 Zeeweed membrane flush.
- May 20 DBC on site to retrieve hoses from LS WTP job.
- May 20 Marleau HVAC on site for spring HVAC maintenance.
- May 21 Can-Am Instruments on site at WWTP, sewage pumping station and Lactalis to calibrate flow meters.
- May 25 Bergeron on site at sewage pumping station to troubleshoot smoke detector.
- May 26 Bergeron on site at sewage pumping station to replace smoke detector.
- May 26 Capital Controls connected remotely to SCADA to explore scaling on flow meter signals.
- June 1 Marleau on site to replace relief valve for hot water tank and supply new UPS for the sewage pumping station.
- June 1 Capital Controls on site to troubleshoot Cl₂ tank level transmitter.
- June 1 DBC on site to vacuum sediment from effluent stilling well.
- June 2 Eastern Welding on site to work on decant arm in long term storage.
- June 7 Marleau on site to flush drain line from centrifuge building and long-term storage decant line.
- June 8 Township on site to install new valve at long term storage tank.
- June 8 Bergeron Electric on site to repair conduits and wires at long term storage tank.
- June 8 Township on site to install new desktop computer.
- June 10 Capital Controls on site to troubleshoot issues with MCP PLC hardware fault and to transfer programs to new SCADA.

- June 11 Capital Controls connected remotely to test Win911 software on old and new SCADA.
- June 14 Eastern Welding on site to install decant arm in long term storage.
- June 14 Surgeson on site to troubleshoot blower 4 overload.
- June 15 Township and DBC on site to use camera to locate where pressure washer line is stuck in drain line from centrifuge and long-term storage.
- June 17 Capital Controls on site to disable Win911 in PLC programming and troubleshoot Lactalis flow meter communication issue.
- June 17 Capital Controls on site at SPS and WWTP to troubleshoot flow meters.
- June 18 Eastern Welding on site to install new decant arm with swivel joint in long term storage.
- June 18 Capital Controls on site to compare raw flow meter and forcemain at headworks using a clampon meter.
- June 21 Ranguard on site to troubleshoot alarm communication between plants and alarm center.
- June 21 RComm on site to troubleshoot radio communication between Lactalis sampler, Ingleside Tower and SPS.
- June 22 Marleau on site at SPS to troubleshoot pump 3 faulting issues.
- June 22 Capital Controls on site to work on new SCADA.
- June 23 Eastern Welding on site to supply and install chain for long term storage decant arm.
- June 23 Capital Controls on site to work on new SCADA.
- June 24 Capital Controls on site to work on new SCADA and test alarms.
- June 28 Eastern Welding on site to install support bracket for long term storage decant arm.
- July 8 Capital Controls on site to disassemble old SCADA.
- July 9 Cameron Networks and Township on site to assess requirements for cell phone signal boosters.
- July 14 Genrep on site with ASCO at SPS to replace transfer switch.
- July 16 Stinson on site to fill generator fuel tank.
- July 22 Capital Controls and Optimus Tech connected remotely to work on SCADA.
- July 26 Capital Controls on site to troubleshoot air flow meter for digesters.
- July 27 Marleau on site to rebuild backflow preventer at headworks.
- July 28 Surgeson on site to troubleshoot VFD for RAS pump 1.
- August 3 Surgeson on site to supply and install VFD adjuster for RAS pump #1.
- August 3 Genrep and Marleau on site at SPS to disconnect rental transfer switch and reconnect repaired original transfer switch.
- August 4 Cameron Networks on site to install cell phone boosters.
- August 6 Cameron Networks on site to install cell phone boosters.
- August 10 Hach on site to conduct annual calibrations.
- August 13 DBC on site to remove rags and grit from pre-aeration and bar screen bypass channels.
- August 17 DBC on site at SPS to vacuum out rags and scum and use pressure washer.
- August 24 Bergeron on site to troubleshoot fire alarm system.
- August 27 Capital Controls on site to troubleshoot Lactalis flow meter.
- August 30 Surgeson on site at SPS to replace fan in VFD cabinet.
- September 7 Marleau on site at SPS.
- September 9 Surgeson on site to change out pump #1 at SPS.
- September 9 CDTEC on site at SPS for annual inspection of gas monitor.
- September 21 NDT on site for inspections of all lifting equipment.
- September 28 Genrep on site to load test generator.
- October 5 DBC on site with EVB to hydrovac on east side of plant as part of Ingleside expansion project.
- October 5 Genrep on site at SPS to conduct annual maintenance and load test.

- October 6 DBC on site with EVB to hydrovac on east side of plant as part of Ingleside expansion project.
- October 6 Endress & Hauser on site at WWTP and SPS to conduct annual calibrations.
- October 13 DBC on site to remove rags from pre-aeration channel and bar screen bypass.
- October 13 Eastern Welding on site to repair bar screen scraper.
- October 18 Genrep on site to troubleshoot generator code 262 warning.
- October 28 R. Flaro on site to do pressure washing.
- October 29 R. Flaro on site to do pressure washing.
- November 4 Eastern Welding on site to repair broken skimmer in east clarifier.
- November 4 MacGregor Crane on site to assist Eastern Welding with clarifier.
- November 5 Eastern Welding on site to work on east clarifier.
- November 5 MacGregor Crane on site to assist Eastern Welding with clarifier.
- November 9 Third High Farms on site to haul sludge from long term storage.
- November 10 Surgeson on site at SPS to change out pump #3.
- November 10 DBC on site at SPS for pump change.
- November 10 Third High Farms on site to haul sludge from long term storage.
- November 11 Third High Farms on site to haul sludge from long term storage.
- November 12 DBC on site to clean air lines in primary digester.
- November 12 Third High Farms on site to haul sludge from long term storage.
- November 15 Capital Controls on site to troubleshoot issue with SPS PLC.
- November 15 Eastern Welding on site to repair bar screen scraper.
- November 16 Capital Controls on site to repair PLC at SPS.
- November 23 EVB on site to take samples from clarifier.
- November 26 Marleau on site to repair leak in Cl₂ line.
- November 29 Marleau on site at SPS to troubleshoot supply fan.
- November 30 Eastern Welding on site to work on west clarifier.
- December 1 Eastern Welding on site to repair bar screen scraper.
- December 8 St. Lawrence Insulation on site to install new blankets for fluidizing valve at teacup.
- December 22 St. Lawrence Insulation on site to wrap influent pipe at headworks.

4.3 Completed Modifications

In response to federal regulation, an effluent dechlorination system utilizing sodium thiosulphate was implemented and became operational in 2021.

4.4 Planned Modifications

There are no planned modifications for 2022.

5.0 Biosolids Management

WSP Canada Inc. was retained to coordinate the transfer and disposal via land application of sewage biosolids from the Ingleside Sewage Treatment Plant (STP) over the course of the spring and fall of 2021.

The beneficial use of the sewage biosolids for the purpose of improving the growth of agricultural crops was demonstrated through laboratory analysis in accordance with O. Reg. 267/03. Material application

rates were determined based on field conditions and agronomic and/or crop removal balances incorporating assessment of nutrients, metals and solids loading.

The stored biosolids were transferred by Terrapure Environmental/Third High Farms Limited (Terrapure) via tankers and hauled to Land Application Sites with active NASM Plans in accordance with ECA 0936-574KQF. Field markers delineating the required separation distances to sensitive features were placed by Terrapure at all land-application sites as per the setbacks shown on the appropriate NASM Plan field sketches. The material was land applied by direct injection and/or immediately incorporated to reduce odour and minimize runoff potential.

The total volume of biosolids transferred from the Ingleside STP in 2021 was **5,100 m³**. The receiving field locations and volumes applied are detailed in Table 1 below along with nutrient loadings.

Table 1: NASM Land Application Summary, Ingleside Wastewater Treatment Plan

DATE	NASM PLAN OWNER / ID	FIELD / AREA	MATERIAL SOURCE	TOTAL VOLUME (M³)	NITROGEN LOADING (KG/HA)	PHOSPHOROUS LOADING (KG/HA) [†]
April 27, 2021	Gallinger – 24102	Edwards Rd – Lot 31 and 32 Concession 4 and Lot 31 and 32 Concession 5	Ingleside	1,880	47	195
April 27, 2021	Rombough – 23325	Hollister Field – Lot 18 Concession 6	Ingleside	1,400	46	189
November 11, 2021	MacDonnell – 24845	Field County Rd 18B – Lots 25, 26, 27 Concession 7 – South Stormont	Ingleside	1,820	35	172

[†] Phosphorus as P2O5

Based on recent historical (2016 - 2021) annual volumes of biosolids transferred from the facility, the volume of biosolids generated by the Ingleside STP in 2022 is anticipated to be approximately 5,500 m³.

Metals of concern resulting from the land application of sewage biosolids include As, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Zn. Cumulative metal loadings for these fields range from 0% to 5% of the maximum metal loading limit for five (5) years.

Table 2 below provides a summary of the agricultural fields approved to receive Ingleside STP (these fields are also approved to receive Long Sault STP sewage biosolids) and, based on nutrient loadings resulting from current and past applications, the remaining capacity of the field to receive material. Please note this is an estimate as nutrient and metals loadings will vary based on material quality data and application rates established at the time of application.

Table 2: Inventory of Fields Approved Under a NASM Plan to Receive Ingleside and Long Sault Biosolids.

FIELD	NASN PLAN OWNER/ID	AREA AVAILABLE FOR NASM (HA)	COMMENT							
Rombough North	Rombough – 23325	9	Unavailable – Maximum five-year Phosphorous loading reached.							
Rombough South	Rombough - 23325	27	Unavailable – Maximum five-year Phosphorous loading reached.							
Hollister Rd.	Rombough - 23325	16	Available - Field has received material under this NASM plan but could receive another application of either Long Sault or Ingleside.							
Neville Rd Home	Rombough - 23325	13	Available – Part of the field is available (C).							
Neville Rd South East	Rombough - 23325	3	Available - Field has received material under this NASM plan but could receive another application of Long Sault.							
Neville Rd South West	Rombough - 23325	2	Available - Field has received material under this NASM plan but could receive another application of Long Sault.							
Habers Field B + C	Habers - 23973	7.1	Unavailable – Maximum five-year Phosphorous loading reached.							
Habers Field D + E	Habers - 23973	11.5	Unavailable – Maximum five-year Phosphorous loading reached.							
Habers Field F	Habers - 23973	9.8	Could receive approximately 500 m ³ of Long Sault material at a low application rate							
Habers Field G + H	Habers - 23973	9	Unavailable – Maximum five-year Phosphorous loading reached.							
Gallinger Edwards Rd	Gallinger - 24012	21	Available – can still receive Long Sault.							
Gallinger Home Field	Gallinger - 24012	28	Unavailable – Maximum five-year Phosphorous loading reached.							
Gallinger County Rd 18 & 11	Gallinger – 24012	28	Unavailable – Maximum five-year Phosphorous load reached.							
MacDonell – County Rd 18	MacDonell – 24845	26	Available – can still receive Long Sault.							
MacDonell – Maloney Rd	MacDonell – 24845	16	Available – Field has not received material under this NASM.							
MacDonell – Myers Rd	MacDonell – 24845	14.5	Available – Field has not received material under this NASM.							

Fields have been identified for spring 2022 land application of the Ingleside material and will be confirmed closer to land application dates based on field availability and weather conditions.

Appendix A Wastewater Data & Rolling Averages

Year	Month	Flow	BOD₅	Rollling Ave.	Exceed.	Rolling Exceed.	BOD _{5 (effl.)}	Rollling Ave.	Exceed.	Rolling Exceed.	TSS (effl.)	Rollling Ave.	Exceed.	Rolling Exceed.	TSS (effl.)	Rollling Ave.	ed. Rolling Exceed	TP (effl.)	Monthly Exceed.	TP (effl.)	Rollling Ave.	Exceed.	Rolling Exceed.
u	nits	m³/day	mę	g/l			kg	/d			m	g/l			kg	/d		mg/l		kg	/d		
2021	January	3365	1.50	1.96		0	5.05	6.50		0	5.33	5.78		0	17.95	19.85		0.57		1.92	1.98		0
	February	2710	7.88	2.39		0	21.34	7.56		0	23.33			0	63.22	21.16		0.81		2.19	1.92		C
	March	4787	3.13	2.53		0	14.96	8.09		0	11.07	6.95		0	53.00	22.81		0.43	3	2.06	1.89		C
	April	3916	1.50	2.53		0	5.87	8.11		0	4.32	6.84		0	16.92	22.40		0.34		1.34	1.85		0
	May	4006	1.88	2.56		0	7.51	8.34		0	4.38	6.80		0	17.57	22.64		0.64		2.58	1.95		C
	June	3472	1.50	2.56		0	5.21	8.43		0	4.18	6.83		0	14.51	22.94		0.52	2	1.79	1.97		0
	July	3683	1.88	2.57		0	6.91	8.60		0	4.33	6.79		0	15.96	23.22		0.44		1.61	1.96		0
	August	2839	1.50	2.33		0	4.26	7.91		0	4.46	6.67		0	12.66	22.85		0.44		1.25	1.90		C
	September	2830	1.50	2.33		0	4.24	7.94		0	5.83	6.77		0	16.50	23.21		0.59		1.67	1.89		0
	October	3370	1.50	2.29		0	5.05	7.80		0	3.84	6.70		0	12.94	23.00		0.61		2.04	1.83		C
	November	4298	4.25	2.48		0	18.26	8.82		0	6.08	6.95		0	26.12	24.36		0.67	'	2.90	1.91		C
	December	4035	2.20	2.52		0	8.88	8.96		0	7.59	7.06		0	30.62	24.83		0.48	3	1.94	1.94		C
ceedan	ces in Calend	dar Year			0				0				0				0	_	0			0	