



CITY OF BROCKVILLE WATER POLLUTION CONTROL CENTRE

2022 ANNUAL REPORT

Peter Raabe, P. Eng., Director of Engineering and Infrastructure
Brandon Goddard, Supervisor – Wastewater Systems Division

DATE: January 23, 2023

EXECUTIVE SUMMARY

The enclosed 2022 Annual Report is prepared in accordance with the Environmental Compliance Approval (ECA) for the City of Brockville's Water Pollution Control Centre (WPCC) for submission to the Ontario Ministry of the Environment, Conservation and Parks (MECP). A copy of this report is also made available at City Hall and on the City's website for public viewing. Included with this report are analytical data, plant flow, plant bypasses, plant overflow events and spills, biosolids data, as well as a process flow schematic of the facility.

In all cases, the City of Brockville's WPCC sampling and analysis program met or surpassed the requirements outlined in the plant's ECA. The annual report will discuss the level of performance with regard to effluent limits specified in the ECA. In 2022 the monthly and annual plant averages for loading and discharge effluent were compliant with the limits set out in our ECA. In 2022 there were no plant bypass events to report.

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1. INTRODUCTION

We are pleased to present the 2022 Water Pollution Control Centre Annual Report. The purpose of this report is to provide a performance summary on the facility for the period January 1st to December 31st, 2022, and is a legal requirement under Section 10 (6) of Environmental Compliance Approval (ECA) number 7875-9Q7JVZ, made under section 20.2 of Part II.1 of the Environmental Protection Act R.S.O. 1990, c. E19 (Environmental Protection Act). This Annual Report must be forwarded to the Ontario Ministry of the Environment, Conservation and Parks (MECP) no later than March 31st, 2023.

2. FACILITY DESCRIPTION

Brockville's wastewater treatment facility is a Class IV Secondary Treatment Plant with an average daily flow (ADF) rating of 21,800 m³/day and a peak design of 62,500 m³/day. The plant is classified as a conventional secondary treatment process inclusive of screening, grit removal, primary clarification, activated sludge process with nitrification, secondary clarification, ultraviolet disinfection, with phosphorus removal, anaerobic digestion of sludge, centrifuge dewatering of sludge, centrate return to the primary clarifiers and sludge cake recycling. The main plant was built in the 1960's, and was upgraded in several phases, the most recent in 1991, 1995 and 2010 with the Secondary Treatment Upgrade. These works also included a major upgrade to the Main Pumping Station on Water Street in 1994. **Appendix A: WPCC Process Flow Schematic** is provided.

The wastewater treatment plant services a population of approximately 22,000 as well as nearby Elizabethtown-Kitley Township retirement homes (2), the Brockville Mental Health Centre and the St. Lawrence Valley Correctional and Treatment Centre. There are 12 pumping stations located throughout the community to transfer wastewater to the treatment facility. The treated effluent receiver is the St. Lawrence River.

3. APPROVALS AND CERTIFICATION

3.1 Environmental Compliance Approval

The City of Brockville's WPCC (Works #120000122) operates under Environmental Compliance Approval (ECA) Number 7875-9Q7JVZ which includes Limited Operational Flexibility (Reference # 6247-9NYK5V). The facility is a Class IV facility in accordance with the Licensing of Sewage Works Operators Regulation (O. Reg. 129/04) made under the Ontario Water Resources Act.

The ECA for Brockville's WPCC establishes final effluent compliance limits and objective limits for 5-day Carbonaceous Biochemical Oxygen Demand (CBOD₅), Total Suspended Solids (TSS), Total Ammonia Nitrogen (TAN), Total Phosphorus (TP), pH and E. Coli. The compliance limits, with the exception of pH, are based on

monthly averages and apply to concentration as well as total daily loading. The pH compliance limit is based on all samples collected being within a range. The compliance limits are used to determine compliance with the ECA. The objective limits are based on monthly averages and apply only to concentration. The objective limits represent the design objectives of the plant. The compliance limits and objective limits are found in the lower area below the monthly data of **Appendix B: 2022 WPCC Performance Assessment Report**.

Additionally, our ECA requires monitoring of the final effluent for Acute Lethality to Rainbow Trout and Daphnia Magna (Toxicity Testing) on a quarterly basis. The plant is currently meeting or exceeding all MECP effluent discharge requirements for toxicity testing. MECP Regulations regard $\leq 50\%$ mortality to be a pass.

The ECA also establishes the rating of the facility for average daily flow (ADF). The ADF is the cumulative total flow of sewage to the sewage works during the year divided by the number of days of flow. A rating is also determined for peak flow (the maximum rate of sewage flow for which the plant was designed). The rated ADF for the WPCC is 21,800 m³/day and the peak flow rating is 62,500 m³/day.

3.2 Operator Certification

The Licensing of Sewage Works Operators Regulation (O. Reg. 129/04) requires owners to ensure that every operator employed in the facility holds a license applicable to that type of facility (s. 14 (1)). The City continues to ensure all operators employed at the WPCC hold a valid license for its facility.

O. Reg. 129/04 also requires the designation of an overall responsible operator (ORO) for the facility and that the ORO holds a license applicable to and of the same class as or higher than the class of the facility or one level below for no more than 150 days in a twelve month period. Brandon Goddard, Supervisor of Wastewater Systems, is the designated ORO holding a Class 4 Wastewater Treatment License and Class 3 Wastewater Collection License.

4. **REPORTING REQUIREMENTS**

4.1 Reporting Requirements

As a requirement of Environmental Compliance Approval (ECA) Number 7875-9Q7JVZ, Section 10. (6), a performance report, on an annual basis, within ninety days following the end of the period being reported upon shall be submitted to the MECP Director and the MECP Water Supervisor. The report shall contain, but shall not be limited to, the following information:

- (a) ***A summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7 (of ECA # 7875-9Q7JVZ), including an overview of the success and adequacy of the Works;***

A summary of the analysis results of the compliance sampling at the WPCC are shown by month in **Appendix B: 2022 WPCC Performance Assessment Report** for both the raw influent and final effluent samples.

Compliance with the final effluent limits was achieved in both concentration and loading for CBOD₅, TSS, TP and TAN.

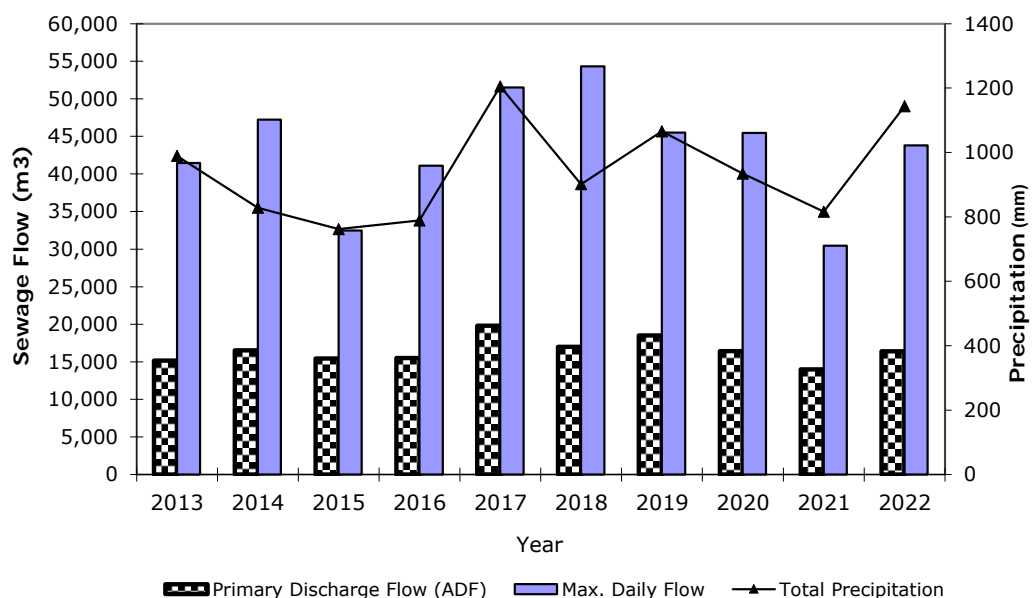
Compliance with the final effluent E. coli limit was also achieved.

The compliance limit requirement for pH of the final effluent is 6.0 to 9.5, inclusive, at all times. In 2022 the final effluent pH ranged from 6.80 to 7.20. The compliance limit for pH was met.

Quarterly toxicity tests for 2022 were all 0% mortality confirming a non-toxic final effluent.

The wastewater flow during the reporting period is outlined in **Appendix C: 2022 WPCC Flow Summary Report**. The total flow received during the 2022 reporting period was 5,984,679.70 m³ with an annual ADF of 16,396 m³ or 75.2 % of the plant's current rated capacity of 21,800 m³/day. The maximum daily flow of 43,804.90 m³ occurred on March 19th, and the minimum daily flow of 10,856.50 m³ occurred on July 17th. The ADF at the WPCC for 2022 compared to 2021 showed an increase of 17%. **Figure 1** shows the primary discharge flow vs precipitation graphically.

**Figure 1: Brockville WPCC
Annual Average Primary Discharge Daily Flow
vs Total Precipitation
2013 - 2022**



(b) *A description of any operating problems encountered, and corrective actions taken;*

Nothing to report

The use of an operational log book, as required under the Licensing of Sewage Works Operators Regulation (O. Reg. 129/04, s. 19 (1)), to record departures from normal operating procedures, unusual or abnormal conditions, and equipment that was taken out of service, ceased to operate, underwent maintenance or repair, is kept by the facility.

(c) *A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;*

Appendix H: 2022 Capital Program contains the 2022 Capital projects, as well as some previous Capital projects that were carried over to 2022 for the WPCC, pumping stations and collection system. In 2022 the City allocated \$418,000 in Capital to replace various pieces of equipment at the WPCC and pumping stations that were nearing the end of their life cycle. These projects have been integral to refurbishing or replacing aging assets in order to maintain efficient operation and redundancy. This program utilizes risk analysis, maintenance costs and replacement analysis to give the best 10 year model possible. As always, not all risks are known and sometimes unforeseen breakdowns do occur. Excellent coordination between staff and various contractors and suppliers allows the work to be assessed and performed while keeping on track from a budget standpoint.

Additional preventative maintenance summary is available via the City's WorkTech maintenance program.

(d) *A summary of any effluent quality assurance or control measures undertaken in the reporting period;*

WPCC staff maintains a schedule of sampling raw influent and final effluent weekly as per the ECA for compliance testing, as well as operational process sampling of the head of the primary clarifiers, primary clarifier effluent, primary raw sludge, digested sludge, activated sludge, return activated sludge, waste activated sludge and centrifuge samples. The frequency of sampling and the testing performed on compliance samples met or exceeded the minimum requirement in the ECA. The samples collected, testing performed and frequency of testing for compliance and operational process samples are outlined in the charts below and demonstrate the "best efforts" applied in meeting the effluent objectives and effluent limits prescribed by the ECA.

Compliance Sampling & Testing

Sampling Point	Sample Type	ECA Testing Requirement	ECA Sampling Frequency	WPCC Sampling Frequency
Raw Influent	24 hr Composite	BOD ₅ , TSS & TP	Quarterly – Jan, Apr, July & Oct	Twice per week
	24 hr Composite	TKN	Quarterly – Jan, Apr, July & Oct	Quarterly – Jan, Apr, July & Oct
Final Effluent	24 hr Composite	CBOD ₅ , TSS & TP	Weekly	Twice per week
	24 hr Composite	TAN	Weekly	Weekly
	Grab	E. coli., pH & Temperature	Weekly	Weekly
	Grab	Acute Lethality to Rainbow Trout and Daphnia Magna	Quarterly – Jan, Apr, July & Oct	Quarterly – Jan, Apr, July & Oct
	Calculation	Un-ionized ammonia	Weekly	Weekly

Operational Process Control Sampling & Testing

Sampling Point	Sample Type	Testing Performed	WPCC Sampling Frequency
Raw Influent	24 hr Composite	DRP & pH	Weekly
	24 hr Composite	COD	Twice per week
	24 hr Composite	Nitrate	Monthly
Final Effluent	24 hr Composite	DRP & pH	Weekly
	24 hr Composite	BOD ₅	Twice per week
	24 hr Composite	Nitrate	Monthly
Head of the Primary Clarifiers	24 hr Composite	BOD ₅ , TSS, TP, DRP, pH & COD	Twice per week
Primary Effluent	24 hr Composite	BOD ₅ , TSS, TP, DRP, pH & COD	Twice per week
Primary Raw Sludge	Grab	%TS, %VS & pH	Twice per week
Digested Sludge	Grab	%TS, %VS, pH, Volatile Acids & Alkalinity	Weekly
Centrifuge Samples	Grab	%TS, %VS & TSS	Weekly
Return Activated Sludge & Waste Activated Sludge	Grab	TSS	Twice per day – Monday to Friday
Aeration Tank Mixed Liquor	Grab	MLSS, MLVSS, Temperature, pH, SS5, SS30, SVI & microscope slides	Three times per week

WPCC staff performs analysis on the samples collected and also sends out samples to an outside lab that is accredited with the Canadian Association for Laboratory Accreditation (CALA).

WPCC staff maintains an Excel operational process worksheet that provides operational process control calculations and trending to assist in the operational control of the biological/activated sludge process. This operational process worksheet provides WPCC staff with the following operational control parameters: Mixed Liquor Suspended Solids (MLSS), Mixed Liquor Volatile Suspended Solids (MLVSS), Sludge Age, Food:Microorganism Ratio (F:M), Solids Retention Time (SRT) and Wasting and Forming Loading.

Ultraviolet radiation is the control measure used for final effluent disinfection to ensure compliance with our ECA for E. coli.

Aluminum sulfate (Alum) is the control measure used to aid in phosphorus removal. The consumption of chemicals that aid in achieving effluent criteria are tracked by the treatment facility and are outlined in **Appendix E: 2022 WPCC Chemical Summary Report**.

WPCC staff use the web-based software Watertrax to manage our operational process and compliance data. An alerting function within Watertrax is used as a control measure to alert Operational staff of any data results that may indicate an operational trend and allow for any process changes that may be required to ensure the quality of our effluent.

As an additional control measure to ensure the quality of our final effluent, Abatement staff continued to monitor and work with local industry in 2022. Industry Waste Survey Reports continue to be updated and reviewed by Abatement staff.

(e) *A summary of the calibration and maintenance carried out on all effluent monitoring equipment;*

The City of Brockville uses the WorkTech preventative maintenance program to coordinate and track all plant maintenance as recommended by the original equipment manufacturer (OEM). Inspection, testing and calibration of electrical, instrumentation and SCADA equipment is performed and documented by fully trained and qualified contractors. The equipment includes process digester gas systems, overhead cranes and gantries, fall protection devices, heating, ventilation and air conditioning (HVAC) systems, standby generator equipment and high voltage switchgear, to name a few. Critical process equipment found to be malfunctioning is repaired or replaced immediately. The City employs an Industrial Mechanic Millwright who repairs and maintains process and mechanical equipment.

Instrumentation equipment is maintained in accordance with OEM recommendations, or better. Historical calibration sheets are completed each time, and if the instrument is out of calibration, corrective action is implemented along with the contractor performing the calibration. In 2022 all instrumentation equipment passed calibration.

The summary equipment list is included in **Appendix G: 2022 Annual Flow Meter Calibrations Reports**. Various programs are in place to ensure we are current with new technologies, replace end-of-life equipment and maintain a high level of quality assurance.

(f) ***A description of efforts made, and results achieved in meeting the Effluent Objectives of Condition 6 (of ECA # 7875-9Q7JVZ);***

The summary of the analysis results of the compliance sampling at the WPCC are shown by month in **Appendix B: 2022 WPCC Performance Assessment Report** for both the raw influent and final effluent samples. Compliance with the final effluent objectives was achieved in concentration for CBOD₅, TSS, TP and TAN.

The objective requirement for pH of the final effluent is 6.5 to 8.5, inclusive, at all times. In 2022 the final effluent pH ranged from 6.80 to 7.20. The objective limits were met.

The objective requirement for E. coli is a Monthly Geometric Mean Density of 100 organisms/100 ml. The objective limit for the final effluent E. coli was met in 2022.

(g) ***A tabulation of the volume of sludge generated in the reporting period, 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;***

The City of Brockville processed the digested sludge through our centrifuge and produced a dry biosolids product (cake). A tabulation of the volumes produced and disposal methods is outlined in **Appendix F: 2022 WPCC Centrifuge Sludge Feed and Cake Disposal Summary Report**. In 2022 our cake was hauled to GFL Environmental Inc. in Iroquois, Ontario for recycling. GFL Environmental Inc. has a C of A to receive this material.

No significant change in the volume of digested sludge or dry biosolids is anticipated for 2023.

(h) ***A summary of any complaints received during the reporting period and any steps taken to address the complaints;***

Nothing to report

- (i) ***A summary of all Bypass, Plant Overflow, Spill or abnormal discharge events;***

The occurrence of a bypass, plant overflow or spill event results in the generation of an event report and entry into the operational log.

There were no plant bypasses, overflow or spill events in 2022. See **Appendix D: 2022 WPCC Bypass/Plant Overflow/Spill Summary Report**.

- (j) ***A copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1 (to ECA # 7875-9Q7JVZ), with a status report on the implementation of each modification;***

A Notice of Modification to Sewage Works for a Newterra Pilot System for a Wastewater Treatment Facility was submitted to the Water Supervisor on June 2nd, 2020. See **Appendix I: Notice of Modification to Sewage Works**. Pilot system is still currently installed and operational.

- (k) ***A report summarizing all modifications completed as a result of Schedule B, Section 3 (to ECA # 7875-9Q7JVZ); and***

Nothing to report

- (l) ***Any other information the Water Supervisor requires from time to time.***

Nothing to report

5. KEY CONTACTS AND REFERENCES

For further information on this report, enquiries on a related topic, or to arrange a plant tour of the wastewater treatment facilities, please contact:

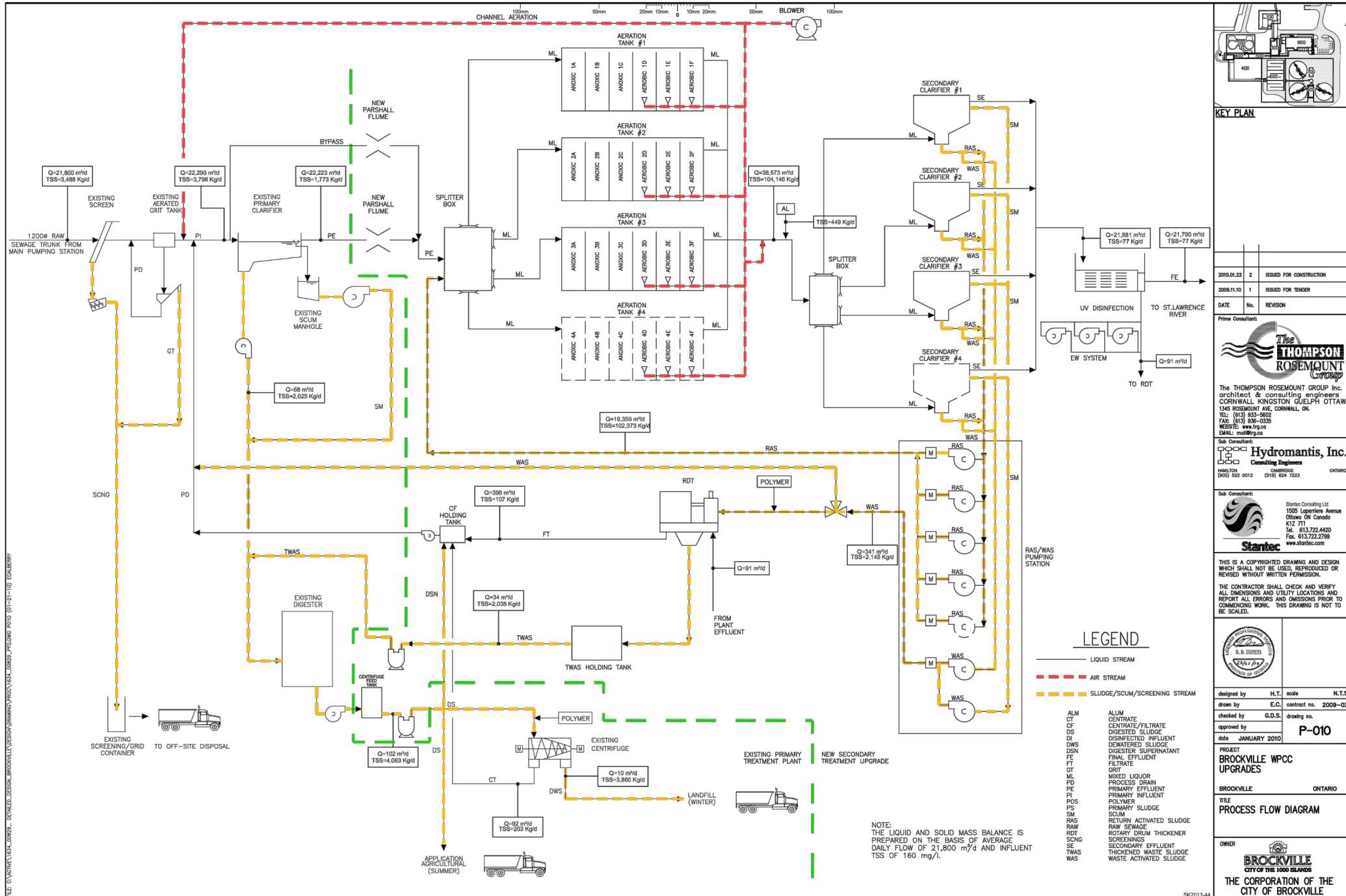
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Ministry of the Environment, Conservation and Parks
Ontario Water Wastewater Certification Office
Water Environment Federation
Water Environment Association of Ontario
Ministry of Ontario Agriculture, Food and Rural Affairs

www.ene.gov.on.ca
www.owwco.ca
www.wef.org
www.weao.org
www.omafra.gov.on.ca

Appendix A



Appendix B

BROCKVILLE WATER POLLUTION CONTROL CENTRE PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: BROCKVILLE
PROJECT: BROCKVILLE
WORKS NUMBER: 120000122

DESCRIPTION: A Secondary Treatment Facility, complete with two anaerobic digesters,
two centrifuges for sludge thickening and two RDT's for sludge co-thickening and utilizing
Alum for phosphorus removal and UV for effluent disinfection

YEAR: 2022
WATER COURSE: ST. LAWRENCE RIVER
DESIGN CAPACITY: 21.800 x 1000m3/day
PEAK DESIGN CAPACITY: 62.500 X 1000m3/day

MONTH	FLOWS			BOD/CBOD			SUSPENDED SOLIDS				PHOSPHORUS				TOTAL AMMONIA NITROGEN		PH (GRAB)		E. COLI
	TOTAL FLOW 1000M3	AVG DAY FLOW 1000M3	MAX DAY FLOW 1000M3	AVG RAW BOD (mg/L)	AVG EFF CBOD (mg/L)	TOTAL LOADING EFF CBOD (kg/day)	AVG RAW SS (mg/L)	AVG EFF SS (mg/L)	TOTAL LOADING EFF SS (kg/day)	PERCENT REMOVAL	AVG RAW PHOS. (mg/L)	AVG EFF PHOS. (mg/L)	TOTAL LOADING EFF PHOS. (kg/day)	PERCENT REMOVAL	AVG EFF TAN (mg/L)	TOTAL LOADING EFF TAN (kg/day)	MIN	MAX	E. Coli (Org/100 ml) (GEOMEAN)
DEC 22	566.82	18.285	41.369	127.00	2.20	40.23	145.00	6.00	109.71	95.9	2.78	0.31	5.67	88.8	0.46	8.41	7.1	7.1	2
NOV 22	460.88	15.363	32.911	163.00	2.80	43.02	169.00	6.00	92.18	96.4	2.62	0.38	5.84	85.5	0.56	8.60	6.8	7.2	2
OCT 22	395.60	12.761	16.007	177.00	2.80	35.73	203.00	6.00	76.57	97.0	2.84	0.46	5.87	83.8	0.16	2.04	6.9	7.2	1
SEP 22	449.60	14.987	23.663	159.00	2.10	31.47	186.00	4.20	62.95	97.7	3.37	0.35	5.25	89.6	0.14	2.10	7.0	7.1	0
AUG 22	418.09	13.487	20.040	174.00	2.70	36.41	191.00	5.00	67.44	97.4	3.50	0.47	6.34	86.6	0.59	7.96	6.9	7.1	3
JUL 22	459.76	14.831	29.727	171.00	3.40	50.43	203.00	6.00	88.99	97.0	2.94	0.39	5.78	86.7	0.86	12.75	6.8	7.1	2
JUN 22	478.97	15.966	20.583	187.00	3.10	49.49	209.00	6.00	95.80	97.1	3.11	0.45	7.18	85.5	0.63	10.06	6.9	7.1	2
MAY 22	517.31	16.687	21.372	149.00	3.30	55.07	188.00	7.00	116.81	96.3	2.84	0.41	6.84	85.6	0.63	10.51	6.8	7.0	8
APR 22	655.16	21.839	34.532	117.00	3.20	69.88	139.00	7.00	152.87	95.0	2.15	0.45	9.83	79.1	2.82	61.59	6.9	7.1	12
MAR 22	772.45	24.918	43.805	94.00	3.20	79.74	113.00	6.00	149.51	94.7	2.02	0.25	6.23	87.6	4.64	115.62	7.0	7.1	4
FEB 22	435.43	15.551	41.895	159.00	3.90	60.65	180.00	7.00	108.86	96.1	3.12	0.36	5.60	88.5	4.79	74.49	6.8	6.9	8
JAN 22	374.61	12.084	13.448	169.00	3.30	39.88	193.00	5.00	60.42	97.4	3.48	0.33	3.99	90.5	0.68	8.22	6.8	6.9	2
AVG		16.397		153.83	3.00	49.33	176.58	5.93	98.51	96.51	2.90	0.38	6.20	86.49	1.41	26.86			4
MAX			43.805	187.00	3.90	79.74	209.00	7.00	152.87	97.74	3.50	0.47	9.83		4.79	115.62			
Objective Limit					15.00			15.00				0.80			12.0 (Nov. 1 to Apr. 30) 8.0 (May 1 to Oct. 31)		6.5 - 8.5		100
Compliance Limit		21.800			25.00	545.00		25.00	545.00			1.00	21.80		18.0 (Nov. 1 to Apr. 30) 16.0 (May 1 to Oct. 31)	392 (Nov. 1 to Apr. 30) 349 (May 1 to Oct. 31)	6.0 - 9.5		200

MONTH	TOTAL LOADINGS		
	TOTAL RAW BOD (kg/day)	TOTAL RAW SS (kg/day)	TOTAL RAW PHOS. (kg/day)
DEC 22	2,322	2,651	51
NOV 22	2,504	2,596	40
OCT 22	2,259	2,590	36
SEP 22	2,383	2,788	51
AUG 22	2,347	2,576	47
JUL 22	2,536	3,011	44
JUN 22	2,986	3,337	50
MAY 22	2,486	3,137	47
APR 22	2,555	3,036	47
MAR 22	2,342	2,816	50
FEB 22	2,473	2,799	49
JAN 22	2,042	2,332	42
AVG	2,436	2,806	46
MAX	2,986	3,337	51

COMMENTS:

2022 WPCC Flow Summary Report

Sampling Point: 012 Primary Effluent

Daily Flow(Inline Instrument)

# samples:	365	min:	10,856.50	m ³ /d
# detects:	365	max:	43,804.90	m ³ /d
# non-detects:	0	avg:	16,396.38	m ³ /d (based on 365 numerical results)
# exceedances:	0	total:	5,984,679.70	m ³

Water Pollution Control Centre Bypass/Plant Overflow/Spill

ECA Number: 7875-9Q7JVZ

Facility Name: WPCC Report Year: 2022

Bypass/Plant Overflow/Spill Monthly Summary

MONTH	Bypass			Plant Overflow		
	No. of Days (days)	Duration (hours)	Volume (1,000 m ³)	No. of Days (days)	Duration (hours)	Volume (1,000 m ³)
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
TOTAL	0	0	0	0	0	0
Volume of Bypass as % of * Average Daily Flow (ADF)			#DIV/0!	Volume of Plant Overflow as % of * Average Daily Flow (ADF)		

ADF = (m³/d) 0 (1,000 m³/d)

Note: % = Volume of Bypass divided by ADF divided by 365

Comments:

Nothing to Report in 2022

Bypass:

Means diversion of sewage around one or more unit processes within the sewage treatment plant with the diverted sewage flows being returned to the Sewage Treatment Plant train upstream of the Final Effluent sampling location, and discharging to the environment through Sewage Treatment Plant outfall.

Plant Overflow:

Means a discharge to the environment from the Sewage Treatment Plant at a location other than the plant outfall or into the plant outfall downstream of the final effluent sampling location.

Spill:

Any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment.

Water Pollution Control Centre Bypass/Plant Overflow/Spill

ECA Number: 7875-9Q7JVZ

Facility Name: WPCC Report Year: 2022

Bypass/Plant Overflow/Spill Monthly Summary

MONTH	Spill		
	No. of Occurences		Volume (1,000 m ³)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
TOTAL	0		0

Comments:

Nothing to Report in 2022

- Bypass:** Means diversion of sewage around one or more unit processes within the sewage treatment plant with the diverted sewage flows being returned to the Sewage Treatment Plant train upstream of the Final Effluent sampling location, and discharging to the environment through Sewage Treatment Plant outfall.
- Plant Overflow:** Means a discharge to the environment from the Sewage Treatment Plant at a location other than the plant outfall or into the plant outfall downstream of the final effluent sampling location.
- Spill:** Any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment.

2022 WPCC Annual Chemical Summary

	011 Chemicals		
	062 Alum use (kg/day) (kg)	063 Alum use (L/d) (L)	064 Alum dose (mg/L)
Totals			
Average	879.78	665.50	58.56
Minimum	39.22*	29.67*	2.21*
Maximum	1,047.62	792.45	92.99
Count	365	365	365
Total	321,118.80	242,909.05	

* Totalizer Error

2022 WPCC Centrifuge Sludge Feed and Cake Disposal Summary Report

	221 Centrifuge - Digested Sludge Feed			222 Centrifuge - Cake	27 Cake Weight
	Sludge Volume to Centrifuge (m³)	% Volatile Solids (%)	% Total Solids (%)	% Total Solids (%)	Cake Weight to Recycling - GFL Environmental Inc (kg)
Totals					
Average	88.81	57.01	1.99	24.94	9,319
Minimum	48.00	41.82	1.30	22.54	5,070
Maximum	177.40	67.56	3.16	28.38	13,310
Count	365	51	51	77	183
Total	32,414.08				1,705,350

September 21, 2022

Patrick Brown
Chief Operator – Wastewater Systems
City of Brockville
1807 County Rd #2 East
Brockville, ON K6V 5T1

RE: Annual Flowmeter Calibrations

Mr. Brown,

Please find attached annual calibration reports for all regulatory and operational devices calibrated on September 1-2, 2022. An overview of the devices calibrated by Tower Electronics Canada (TEC) is included on Page 2 of this report.

An overview of the work completed is as follows:

- Devices were calibrated using NIST traceable standards,
- All instruments are operating within acceptable regulatory tolerances, and

Individual calibration reports are attached, with all calibration specifics identified. If there are any questions or concerns regarding the reports, please contact me and your earliest convenience.

Thanks,

Dan Matchett, Owner
Tower Electronics Canada Inc.
613-847-7623

Meter	Process	Tag ID	Calibration Result	Comments
E&H Promag 53	Alum Flow	FIT 353	Pass	None
E&H Promag 50	-	FIT 367	Pass	None
Krohne SC 080AS	-	FIT 369	Pass	None
Krohne IFC 090	-	FIT 511	Pass	none
Krohne IFC 090	-	FIT 512	Pass	none
Krohne IFC 090	Boiler Effluent	FIT 561	Pass	none
Vega C21	Primary Discharge	FIT 602	Pass	none
Siemens Hydromag	Bypass	FIT 603	Pass	none
E&H Promag 53	-	FIT 713	Pass	none
E&H Promag 400	RAS	FIT 721	Pass	none
E&H Promag 53	RAS	FIT 722	Pass	none
E&H Promag 53	RAS	FIT 723	Pass	none
E&H Promag 53	RAS	FIT 724	Pass	none
E&H Promag 53	Effluent Water	FIT 834	Pass	none
E&H Promag 53	-	FIT 944	Pass	none
E&H Promag 53	-	FIT 953	Pass	none
E&H Promag 53	-	FIT 973	Pass	none
E&H Promag 53	Pump 972 Flow	FIT 975	Pass	none
E&H Promag 53	Septage Station	FIT 995	Pass	none
Krohne IFC 090	Raw Sludge 1	-	Pass	none
Krohne IFC 090	Raw Sludge 2	-	Pass	none
Krohne SC 080AS	Sludge Decanter North	FIT-366	Pass	none
E & H Promag 400	Leachate High Lift	-	Pass	None
E & H Promag 400	Leachate Overflow	-	Pass	None

Tower Electronics Canada Inc. Calibration Certificate

Customer:

Patrick Brown, Chief Opeator - Wastewater Systems
 City of Brockville
 1807 County Rd #2 East
 Brockville, ON K6V 5T1

Calibration by:

Dan Matchett

Standards:

Fluke 289 S/N 96220182 NIST Cal Due April 2023

Instrument Type

Magnetic Flow Meter

Method of verification

Endress Hauser Heartbeat Internal Verification

Units: M3/Hour

Zero: 0.00

Span: 9423.00

Totalizer: n/a

Meter Information

Date: 4/20/2022
 Location: Brockville WWTP
 Meter Under Test: FIT-721
 Client Tag: FIT-721
 Manufacturer: EnH
 Model: Promag 400
 Serial Number: T307DD16000
 Totalizer As Found: -
 Totalizer As Left: -

Programming Parameters:

DN Size: DN200
 Cal Factor: 1.096
 Zero: 1.8

Calibration Due: May 2023

Heartbeat Technology Test	Result
Shot Time Symmetry	PASSED
Hold Voltage Symmetry	PASSED
Coil Current Loss	PASSED
Coil Current Stability	PASSED
Coil Resistance	PASSED
Cable Defect 1	PASSED
Cable Defect 2	PASSED
Cable Defect 3	PASSED
External Reference Voltage	PASSED
Linearity of Electrode Circ	PASSED
Offset of Electrode Circuit	PASSED
Input Module	PASSED
Overall Verification Result	PASSED

Verification Completed according to DIN EN ISO 9001:2008 Section 7.6a

Output Test

Current Simulation mA	Reference Reading	Error%
4	4.001	0.006
8	8.001	0.006
12	12.001	0.006
16	15.999	-0.006
20	20.000	0.000
Average Error%		0.002
Result:		PASS

Comments:

Unit passes verification within 5% of actual values.

Appendix H

2022 CAPITAL PROGRAM

<u>PROJECT NAME:</u>		Water Pollution Control Centre Equipment Replacement Program	<u>YEAR PROPOSED</u> <u>ITEM NO:</u>	2022 6.2
<u>LOCATION:</u>		Sewage Treatment Plant, Pumping Stations & Collection System		
<u>HISTORY:</u>		LENGTH OF PROJECT: YEAR FIRST INTRODUCED:	Ongoing - through Sewer Rate Reserve 1997	
<u>SCOPE:</u>		Replacement of Capital Equipment for the Water Pollution Control Centre and associated structures and pumping stations. This is to be accomplished from the Sewer Rate Reserve Fund.		
Account #	Cost Centre	<u>WPCC BUILDINGS AND PROPERTY:</u>	Budget	
07-5-879395-2010/3010	22WW12	HVAC Systems 900 Admin - Upper - Re-Engineering & Balancing	40,000	
07-5-879395-2010/3010	22WW13	HVAC Systems - Bldg's 100, 700, 800	25,000	
		<u>Dewatering:</u>		
07-5-879395-2010/3010	22WW11	Cake Conveyor System Refurbishment	200,000	
07-5-879395-2010/3010	22WW14	Overhead Garage Door Replace Cake Bay (2)	15,000	
		<u>Septage:</u>		
07-5-864395-2010/3010	22WW07	Septage Hauler Recording System	25,000	
		<u>UV Building:</u>		
07-5-864395-2010/3010	22WW08	Hydraulic Ram System	30,000	
		<u>Pumping Stations:</u>		
07-5-864395-2010/3010	22WW09	Pump Station HMI & Control Software	18,000	
		<u>Fleet:</u>		
07-5-864395-2010/3010	22WW10	Purchase of 2500 Series Pick-up Truck	65,000	
			<hr/> <hr/> 418,000	

<u>Account #</u>		Water Pollution Control Centre	<u>Year Proposed</u>	<u>Budget</u>	
				(Remaining)	(Original)
		<u>WPCC BUILDING AND PROPERTY:</u>			
07-5-898502-2010	21WW01	Concrete Structure @ Entry to River (Rebuild)	2016	211,016	120,000
07-5-858676-2010	21WW60	Roof Maintenance & Spot Repairs - Miscellaneous Buildings	2021	2,422	15,000
		<u>Primary Clarifiers:</u>			
07-5-858676-2010	21WW63	Replace Long (8), Cross (4) Chain & Flight	2021	4,236	68,000
07-5-858676-2010	21WW64	Replace Chain Drive & Idler Sprockets	2021	7,948	25,000
		<u>Digester Operations:</u>			
07-5-858676-2010	21WW65	Digester #1 Clean out	2021	70,000	70,000
		<u>WPCC GENERAL EQUIPMENT:</u>			
07-5-898502-2010	21WW03	Wireless communication Systems (4 additional stations)	2019	2,377	28,000
07-5-858676-2010	21WW54	ARC Flash Assessment - CSA, Regulatory	2020	0	20,000
		<u>PUMPING STATIONS:</u>			
07-5-858576-2010	21WW58	WEST END PS - Standby Generator & Switchgear Refurbishment	2020	17,500	95,000
07-5-898502-2010	21WW05	PUMP STN'S - SCADA/Instru./Elect. Upgrades	2021	3,857	65,000
07-5-858576-2010	21WW06	Main Pump Station Design	2016	400,000	400,000
		<u>OTHER PROJECT:</u>			
07-5-858676-2010	21WW68	Engineering - Rated Capacity Study	2021	2,100	20,000
07-5-892012-2010	21VW02	New Vehicle Purchase (3/4 Ton)	2021	57,600	57,600

PREPARED BY (PROJECT MANAGER):

Brandon Goddard

DATE:

March 15, 2022



Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL) OR DISTRICT MANAGER (FOR NON-MUNICIPAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility		
<i>(Insert the ECA's owner, number and issuance date and notice number, which should start with '01' and consecutive numbers thereafter)</i>		
ECA Number 7875-9Q7JVZ	Issuance Date (mm/dd/yy) 11/19/14	Notice number (if applicable) -
ECA Owner THE CORPORATION OF THE CITY OF BROCKVILLE	Municipality BROCKVILLE	

Part 2: Description of the modifications as part of the Limited Operational Flexibility
<i>(Attach a detailed description of the sewage works)</i>
<ul style="list-style-type: none"> • Please See Attached • PILOT SYSTEM FOR WASTEWATER TREATMENT FACILITY BY NEWTERRA • ANTICIPATED ENVIRONMENTAL EFFECTS ARE NEGLIGIBLE
<p>Description shall include:</p> <ol style="list-style-type: none"> 1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.) 2. Confirmation that the anticipated environmental effects are negligible. 3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer	
<p>I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:</p> <ol style="list-style-type: none"> 1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario; 2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA; 3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations. <p>I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate</p>	
Name (Print) Jeff Kempson	PEO License Number 90550328
Signature <i>Jeff Kempson</i>	Date (mm/dd/yy) 05/14/20
Name of Employer Newterra	

Part 4 – Declaration by Owner	
<p>I hereby declare that:</p> <ol style="list-style-type: none"> 1. I am authorized by the Owner to complete this Declaration; 2. The Owner consents to the modification; and 3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA. 4. The Owner has fulfilled all applicable requirements of the <i>Environmental Assessment Act</i>. <p>I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate</p>	
Name of Owner Representative (Print) Phil Wood	Owner representative's title (Print) SUPERVISOR - WASTEWATER SYSTEMS
Owner Representative's Signature <i>Phil Wood</i>	Date (mm/dd/yy) 06/01/20



Description of Modifications of the Sewage Works

The proposed system falls under the Pilot system definition as per Brockville's Wastewater Treatment Plant ECA:

"1.5 Pilot Systems

- a. Installation of pilot systems for new or existing technologies provided that:
 - i. any effluent from the pilot system is discharged to the inlet of the sewage treatment plant or hauled off-site for proper disposal,
 - ii. any effluent from the pilot system discharged to the inlet of the sewage treatment plant or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
 - iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and District Manager three months after completion of the pilot project."

A new Lift Station pump is to be added in to the existing Sewage Pumping Station. As per Section 1.1.a, this new pump will not change the facility Rated Capacity as it will feed the newterra system as a side stream, which will be returned to the same Sewage Pumping Station after treatment.

The Pilot System will consist on a packaged newterra MBR system, housed inside a 45'x8' High-cube modified shipping container. The system will consist of fine screening followed by an Aerobic only configuration, with three (3) membrane trains running in parallel. Sodium Hydroxide and Aluminum Sulphate are to be added to the Aerobic Tank periodically to achieve both pH and Total Phosphorous control. The permeate discharge will run through an absorption media to further reduce Total Phosphorous concentration. This discharge would be combined with the waste activated sludge from the Aerobic Tank and with the overflow from the Screen Tank, to be sent back to the Sewage Pumping Station. Details on flowrates can be found on the P&ID.

The discharged water quality will be monitored to prevent alteration of the composition of the inlet sewage to the Brockville Waste Water Treatment Plant. The pilot plant is not expected to exceed a duration of operation of more than two years and a report will be compiled and sent to the Director and District Manager within three months of the completion of the pilot system's operation.