ANNUAL REPORT

SHELBURNE

WASTEWATER TREATMENT SYSTEM

FOR THE PERIOD:
JANUARY 1, 2020 – DECEMBER 31, 2020

Prepared for the Town of Shelburne
by the Ontario Clean Water Agency

A People Place, A Change of Pace
SHELBURNE
ONTARIO, CANADA

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

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1. System Description

The Town of Shelburne is a community of approximately 9,265 people located approximately 100 kilometers northwest of Toronto. The community first obtained a waste disposal system in 1968 with the construction of a 5.5 ha lagoon and associated gravity collection and pumping system. The Town grew consistently over the years and eventually overloaded the lagoon system. In July 1981 construction was completed on a wastewater treatment system located at the present location. This expansion consisted of a new trunk sewer, pumping facilities, secondary and tertiary treatment and modifications to the existing lagoons which now provide storm and effluent holding during excess storm flows and plant upsets and maintenance.

The facility consisted of a wet well, a manual screen, grit channels, an oxidation ditch, one secondary clarifier, four effluent sand filters and a chlorine contact chamber. The oxidation ditch used two brush rotors. The facility operated as an extended aeration plant in this configuration from 1981 until December 1999.

A major expansion (Phase 1) took place at the Shelburne WWTP in 1999, changing the configuration of the plant and the method of treating wastewater. The plant went under construction starting in April 1999 with the start-up of the new process in December of 1999. The Shelburne WWTP is still an extended aeration plant. As an extended aeration plant it is designed to remove suspended solids, $CBOD_5$ and phosphorus from the wastewater. Major improvements were two aeration tanks constructed with fine bubble diffusers. The sludge treatment system consists of a two stage aerobic sludge digestion system with a total storage volume of 580m^3, equipped with coarse bubble aeration system and supernatant decanting. The former oxidation ditch was converted to a sludge storage facility with approximately six months storage.

Sludge loading facilities provide for transfer of digested aerobic sludge to trucks. Digested sludge is land-applied as farm fertilizer.

Two ultra-violet radiation banks replaced the sodium hypochlorite disinfection system.

In March 2006 the Ministry of the Environment issued an amended Certificate of Approval # 9046-6GAJUM for the Phase 2 extension and upgrading including;

- Construction of a hauled sewage receiving station;
- Replacement of the raw sewage pumping station - two submersible pumps;
- Replacement of the inlet works;
- Construction of a secondary clarifier ;
- Replacement of the clarifier effluent pump system; and
- Reconfiguration of the stormwater and effluent holding ponds.

In 2017 the Ministry of the Environment and Climate Change issued an amended Environmental Compliance Approval #6413-ABLQQS for upgrading of the filtration and standby power which included;

- Two cloth-filter treatment units with a design capacity of 4,400 m^3 each
- One 650 kW standby power diesel generator and 9000L diesel tank with double-walled containment

This facility receives residential, commercial, institutional and industrial wastewater and provides a level of treatment to meet the amended "Environmental Compliance Approval - # 6413-ABLQQS" for discharging into the Beasley Drain a minor tributary of the Boyne River. The Boyne Creek empties into the Nottawasaga River, ultimately meeting Georgian Bay.

A “Process Flow Schematic” is included in Appendix D of this report.

An overview of Shelburne Wastewater Treatment Plant can be found in Table 1:

Table 1. Shelburne Wastewater Treatment Plant Overview

Facility Name	Shelburne Wastewater Treatment Plant
Facility Type	Extended Air STP with Tertiary Treatment
Plant Classification	WWT III
Works Number	110000659
Design Capacity	3,420 m^3/day
Receiving Water	Besley Drain to Boyne Creek to Nottawasaga River
Certificate of Approval	6413-ABLQQS

2. Monitoring Data and Comparison to Effluent Limits

As per Section 6a of ECA 6413-ABLQQS, *a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Effluent Limits of Condition 7, including an overview of the success and adequacy of the Works* is required.

2.1 Sampling Frequency

Hauled sewage, raw sewage, and final effluent are sampled on a regular basis. The sampling types and frequencies are summarized in Tables 2, 3 and Table 4. The sampling frequencies meet the requirements set out in Section 9 of ECA 6413-ABLQQS.

Table 2. Hauled Sewage Monitoring – Sampling Frequencies

Parameter	Sample Type	Frequency
BOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phophorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly

Table 3. Raw Sewage Monitoring – Sampling Frequencies

Parameter	Sample Type	Frequency
BOD_5*	Composite	Monthly
Total Suspended Solids*	Composite	Monthly
Total Phosphorous*	Composite	Monthly
Total Kjeldahl Nitrogen*	Composite	Monthly

*Refer to Appendix A for monthly sample results.

Table 4. Effluent Sampling Monitoring – Sampling Frequencies

Parameters	Sample Type	Frequency
$CBOD_{5*}$	Composite	Weekly
Total Suspended Solids*	Composite	Weekly
Total Phosphorous*	Composite	Weekly
Total Ammonia Nitrogen*	Composite	Weekly
E. Coli*	Grab	Weekly
pH	Grab/Probe	Weekly
Temperature	Grab/Probe	Weekly

*Refer to Appendix A for monthly sample results.

2.2 Effluent Objectives and Effluent Limits

The effluent objectives as per Section 6 of ECA 6413-ABLQQS for the Shelburne Wastewater Treatment Plant are:

Table 5. Effluent Objectives as per Section 6 of ECA 6413-ABLQQS

Effluent Parameter	Concentration Objective (mg/L)
$CBOD_5$	4.0
Total Suspended Solids	4.0
Total Phosphorous	0.12
Total Ammonia Nitrogen June 01 to Sept 30 Oct 01 to May 31	 0.5 2.0
E-coli	150 CFU /100 mL (monthly Geometric Mean Density)
pH of the effluent to be maintained between 6.5 to 8.5, inclusive, at all times	

The effluent limits that are to be met as per Section 7 of ECA 6413-ABLQQS for the Shelburne Wastewater Treatment Plant are found in Table 5. Any exceedance with the limits found in Table 5 constitutes a non-compliance with ECA 6413-ABLQQS.

Table 6. Effluent Limits as per Section 7 of ECA 6413-ABLQQS

Effluent Parameter	Average Concentration Limit (mg/L)	Average Waste Loading Limit (kg/day)
$CBOD_5$	5.0	17.1
Total Suspended Solids	5.0	17.1
Total Phosphorous	0.25	0.86
Total Ammonia Nitrogen Jun 01 to Sep 30 Oct 01 to May 31	 0.8 2.4	 2.7 8.2
E-coli	200 CFU /100 mL (monthly Geometric Mean Density)	n/a
pH of the effluent to be maintained between 6.0 to 9.5, inclusive, at all times		

2.3 Comparison of Data to Effluent Objectives and Effluent Limits

Analytical and monitoring data for the Shelburne Wastewater Treatment Facility is stored in OCWAs data management system (WISKI). Annual and monthly averages for flows, $CBOD_5$, BOD_5, Suspended Solids, Total Phosphorous, Nitrogen-series and E.coli can be found in Appendix A. A comparison of analytical data from effluent samples to the effluent objectives and effluent limits shown in the below Tables 7-11:

Table 7.

	$CBOD_5$					
	Monthly Average Concentration (mg/L)	Within Objectives (4.00 mg/L)	Within Limits (5.00 mg/L)	Monthly Average Loading (kg/d)	Within Objectives (kg/d)	Within Limits (17.10 kg/d)
January	2.50	Yes	Yes	6.04	n/a	Yes
February	3.25	Yes	Yes	7.15	n/a	Yes
March	2.25	Yes	Yes	6.25	n/a	Yes
April	2.00	Yes	Yes	5.15	n/a	Yes
May	2.00	Yes	Yes	4.35	n/a	Yes
June	2.00	Yes	Yes	4.11	n/a	Yes
July	2.25	Yes	Yes	4.98	n/a	Yes
August	2.00	Yes	Yes	4.61	n/a	Yes
September	2.00	Yes	Yes	4.15	n/a	Yes
October	2.00	Yes	Yes	4.28	n/a	Yes
November	2.75	Yes	Yes	5.91	n/a	Yes
December	2.60	Yes	Yes	6.32	n/a	Yes

Table 8.

	Total Suspended Solids					
	Monthly Average Concentration (mg/L)	Within Objectives (4.00 mg/L)	Within Limits (5.00 mg/L)	Monthly Average Loading (kg/d)	Within Objectives (kg/d)	Within Limits (17.10 kg/d)
January	3.50	Yes	Yes	8.45	n/a	Yes
February	5.00	No	Yes	11.00	n/a	Yes
March	3.00	Yes	Yes	8.33	n/a	Yes
April	2.20	Yes	Yes	5.66	n/a	Yes
May	3.00	Yes	Yes	6.53	n/a	Yes
June	2.00	Yes	Yes	4.11	n/a	Yes
July	3.00	Yes	Yes	6.64	n/a	Yes
August	3.00	Yes	Yes	6.91	n/a	Yes
September	2.80	Yes	Yes	5.80	n/a	Yes
October	2.50	Yes	Yes	5.35	n/a	Yes
November	2.50	Yes	Yes	5.37	n/a	Yes
December	2.80	Yes	Yes	6.80	n/a	Yes

Table 9.

	Total Phosphorus					
	Monthly Average Concentration (mg/L)	Within Objectives (0.120 mg/L)	Within Limits (0.250 mg/L)	Monthly Average Loading (kg/d)	Within Objectives (kg/d)	Within Limits (0.860 kg/d)
January	0.085	Yes	Yes	0.206	n/a	Yes
February	0.101	Yes	Yes	0.222	n/a	Yes
March	0.062	Yes	Yes	0.173	n/a	Yes
April	0.030	Yes	Yes	0.078	n/a	Yes
May	0.055	Yes	Yes	0.119	n/a	Yes
June	0.049	Yes	Yes	0.100	n/a	Yes
July	0.051	Yes	Yes	0.113	n/a	Yes
August	0.049	Yes	Yes	0.112	n/a	Yes
September	0.047	Yes	Yes	0.097	n/a	Yes
October	0.037	Yes	Yes	0.079	n/a	Yes
November	0.043	Yes	Yes	0.092	n/a	Yes
December	0.034	Yes	Yes	0.084	n/a	Yes

Table 10.

	Total Ammonia Nitrogen (Ammonia Nitrogen + Ammonium Nitrogen)									
	Monthly Average Concentration (mg/L)	Within Objectives (Jun 01-Sept 30 0.50 mg/L)	Within Objectives (Oct 01-May 31 2.00 mg/L)	Within Limits (Jun 01-Sept 30 0.80 mg/L)	Within Limits (Oct 01-May 31 2.4 mg/L)	Monthly Average Loading (kg/d)	Within Objectives (Dec 01-Apr 30 kg/d)	Within Objectives (May 01-Nov 30 kg/d)	Within Limits (June 01-Sept 30 2.70 kg/d)	Within Limits (Oct 01-May 31 8.20 kg/d)
January	0.10	n/a	Yes	n/a	Yes	0.242	n/a	n/a	n/a	Yes
February	0.10	n/a	Yes	n/a	Yes	0.220	n/a	n/a	n/a	Yes
March	0.13	n/a	Yes	n/a	Yes	0.347	n/a	n/a	n/a	Yes
April	0.14	n/a	Yes	n/a	Yes	0.360	n/a	n/a	n/a	Yes
May	0.10	n/a	Yes	n/a	Yes	0.218	n/a	n/a	n/a	Yes
June	0.10	Yes	n/a	Yes	n/a	0.206	n/a	n/a	Yes	n/a
July	0.10	Yes	n/a	Yes	n/a	0.221	n/a	n/a	Yes	n/a
August	0.10	Yes	n/a	Yes	n/a	0.230	n/a	n/a	Yes	n/a
September	0.10	Yes	n/a	Yes	n/a	0.207	n/a	n/a	Yes	n/a
October	0.20	n/a	Yes	n/a	Yes	0.428	n/a	n/a	n/a	Yes
November	0.10	n/a	Yes	n/a	Yes	0.215	n/a	n/a	n/a	Yes
December	0.12	n/a	Yes	n/a	Yes	0.292	n/a	n/a	n/a	Yes

Table 11.

	E.coli		
	Monthly Geometric Mean Density (CFU/100mL)	Within Objectives (100 CFU/100mL)	Within Limits (200 CFU/100mL)
January	2.00	Yes	Yes
February	2.00	Yes	Yes
March	1.68	Yes	Yes
April	1.74	Yes	Yes
May	2.00	Yes	Yes
June	1.74	Yes	Yes
July	1.68	Yes	Yes
August	2.00	Yes	Yes
September	2.00	Yes	Yes
October	2.00	Yes	Yes
November	2.00	Yes	Yes
December	1.74	Yes	Yes

Table 12. Effluent Monitoring Parameter Summary as required by ECA 6413-ABLQQS for Shelburne Treatment Plant, 2020

Parameters	Average	Minimum	Maximum	Average Annual Loading
$CBOD_5$	2.30	2.00	3.25	5.27
Total Suspended Solids	2.94	2.20	5.00	6.75
Total Phosphorus	0.054	0.030	0.101	0.123
Total Ammonia Nitrogen	0.115	0.10	0.20	0.265
E.Coli	1.88	1.68	2.00	n/a
pH	8.20	8.06	8.55	n/a
Temperature	16.11	10.90	24.80	n/a

2.4 Additional Monitoring Parameters

The following parameters in Table 13 do not have limits or objectives but are monitored on a regular basis (see Section 2.1 for sampling frequency) as required by ECA 6413-ABLQQS. Table 13 summarizes the monitoring data for the reporting period.

Raw Sewage Quality:

Table 13. Raw Sewage Monitoring Parameters as required by ECA 6413-ABLQQS for Shelburne Wastewater Treatment Plant, 2020

Parameter	Average	Minimum	Maximum
BOD_5* (mg/L)	281.08	108.00	418.00
Total Suspended Solids* (mg/L)	556.00	118.00	2150.00
Total Phosphorous* (mg/L)	5.82	3.32	9.05
Total Kjeldahl Nitrogen* (mg/L)	39.88	18.90	79.40

*Refer to Appendix A for monthly sample results.

The following parameters in Table 14 do not have limits or objectives but are monitored as needed when septage is received at the facility. Table 14 summarizes the monitoring data for the reporting period.

Table 14. Hauled Sewage Monitoring

Parameter	Average	Minimum	Maximum
BOD_5 (mg/L)	4251.33	1210.00	6760.00
Total Suspended Solids (mg/L)	12838.57	2450.00	23200.00
Total Phosphorous (mg/L)	78.20	26.90	130.00
Total Kjeldahl Nitrogen (mg/L)	399.07	114.00	848.00

2.5 Overview of Success and Adequacy of the Works;

The annual average effluent $CBOD_5$ concentration was 2.30 mg/L with a removal efficiency of >97.77%. The annual average effluent TSS concentration was 2.94 mg/L with a removal efficiency of >97.63%. The annual average effluent Total Phosphorus concentration was 0.054 mg/L with a removal efficiency of >98.49%.

The bacteriological quality of the effluent complied with the certificate of approval requirement of <200 Colony Forming Units (CFU) per 100 mL sample. The annual geometric mean density for 2020 was 1.88 CFU per 100 mL, indicating adequate effluent disinfection for the majority of the year.

The total raw sewage volume of wastewater treated in 2020 was 1,010,182.80 m^3. The annual average daily flow of raw sewage was 2,758.02 m^3/day was 80.64 % of the design flow (3,420 m^3/day). The maximum peak flow of 3,823.10 m^3/day occurred in March due to higher precipitation and snow melt. This represents a peak flow of 1.1 times the rated capacity. The wastewater treatment plant operated within the rated capacity 92% of the time (335 out of 365 days of the year)

3. Operating Problems and Corrective Actions

As per Section 6b of ECA 6413-ABLQQS, *a description of any operating problems encountered and corrective actions taken* is required.

There were no operating problems encountered or corrective actions required at the Shelburne Wastewater Pollution Control Plant during 2020 that affected the quality of the effluent leaving the plant.

All repairs/maintenance can be found in Section 4 of this report.

4. Major Maintenance Activities

As per 6c of ECA 6413-ABLQQS, *a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanisms or thing forming part of the works* is required.

Plant maintenance, including non-scheduled maintenance is monitored using Maximo Workplace Management System. All routine and preventative maintenance was conducted as scheduled in 2020.

For 2020, major maintenance activities that occurred include:

- Foam filter on splitter box gates replaced
- Filter #1 drained and cleaned
- Pump #3 removal and motor repair
- Clarifier sweeper arm repair
- Mechanical bar screen repair

- Blower air filter replacements
- Auger repair, installed new relay
- Heater inspection, maintenance and repairs
- North clarifier inspection/cleaning
- Mixing pump 1 repairs
- Digester decant valve repair
- Filter 1 and 2 drained and cleaned
- Clarifier scrapper arm repair
- RAS pit float replacement
- Grit vortex system repair/maintenance
- Annual Backflow Prevention inspection
- Blower hour meter replacement
- UV Lamp and Sleeve replacements
- Annual Gas Sensor calibrations
- North Clarifier Sweeper Arm repair
- Annual Flow Meter calibrations
- South Clarifier Sweeper Arm repair
- Headworks Wet Well cleanout

5. Effluent Quality Assurance and Control

As per 6d of ECA 6413-ABLQQS, *a summary of any effluent quality assurance or control measures undertaken in the reporting period* is required:

All laboratory analyzed raw sewage and effluent samples (Section 2.1) are analyzed by SGS Canada Inc., which is an ISO 17025 accredited laboratory. In-house tests are conducted for monitoring purposes by licensed operators using standardized methods. The results from in-house tests are used to determine treatment efficiency and to effectively maintain process control. Calibrations and preventative maintenance are performed on facility equipment and monitoring equipment, see Section 4 for more details. In addition to sample analysis, preventative maintenance is scheduled for equipment at the sewage treatment plant and pumping stations at regular frequency (frequency depends on the equipment and type of maintenance). Maintenance activities are scheduled in the work management system Maximo.

Operation by Licensed Operators: This sewage system is operated and maintained by the OCWA's licensed staff. The mandatory licensing program for operators of sewage treatment facilities in Ontario is regulated under the Ontario Water Resources Act (OWRA) Ontario Regulation 129/04. A licensed individual meets the education and experience requirements and has successfully passed the licensing exam.

The following are certified operators who operated this facility during 2020 with current certified classification, certificate numbers and certificate expiry dates.

Table 15.

Operator	Level	Certificate #	Expiry Date
Alex Solomonov	WWT 2 WWC 2	49144 16652	Jul 31, 2021 Jan 31, 2024
Curtis Parker	WWT 4 WWC 3	79166 79167	Mar 31, 2022 Jul 31, 2021
Emanuel Castro	WWT 1 WWC 1	95067 102934	Oct 31, 2022 Nov 30, 2021
Monika Kowalska	WWT 1 WWC 1	109143 109134	Dec 31, 2023 Oct 31, 2023
Juliet Ouellette	OIT	OT61203 OT61212	Nov 30, 2022 Nov 30, 2022
Jenna Porter	WWT 4 WWC 2	61948 108856	Mar 31, 2023 Jan 31, 2023

6. Calibration and Maintenance Procedures

As per 6e of ECA 6413-ABLQQS, *a summary of the calibration and maintenance carried out on all effluent monitoring equipment* is required.

All in-house monitoring equipment is calibrated/verified as per manufacturer's recommendations. Monitoring and metering equipment is also calibrated by a third party on an annual basis. Preventative maintenance is scheduled for all equipment at the sewage treatment plant and pumping stations at regular frequency (frequency depends on the equipment and type of maintenance). Maintenance activities are scheduled within the work management system Maximo, upon completion, Operators set the work order to complete. On a monthly basis, preventative work orders are reviewed for completion.

Indus Controls was contracted to calibrate flow measuring equipment on September 2, 2020. Copies of these calibration reports can be found in Appendix C of this report.

7. Efforts and Results Achieved in Meeting Effluent Objectives

As per 6f of ECA 6413-ABLQQS, *a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6* is required.

Condition 6 is imposed "to establish non-enforceable effluent quality objectives which the Owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliances limits of Condition 7 are exceeded."

OCWA as the Operating Authority (on behalf of the Owner) has made best efforts to stay within the Effluent Objectives in the ECA. These efforts are supported through:

- Continuous monitoring equipment
- Regular plant inspections/checks
- In-house sampling and testing
- Laboratory (3rd party) analysis of influent and effluent samples
- Data review
- Process optimization and adjustments (as required)
- Scheduled/preventative maintenance

- Repairs as necessary

A summary of the effluent quality in comparison to the effluent objectives can be found in Tables 7-11 of section 2.3 of this report. These results show that sewage treatment operations for 2020 provided effluent quality that was within all effluent objectives outlined in the ECA and minimized environmental impairment.

8. Sludge Generation

As per 6g of ECA 6413-ABLQQS, *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* is required.

Digested sludge produced at the Shelburne WWTP is land-applied in accordance with the Nutrient Management Act 2002 and Ontario Regulation 267/03.

Grab samples of digested (aerobic) sludge are collected and tested as per these requirements. In 2020, sludge sample analysis was carried out by SGS Lakefield Research Limited. A summary of sludge sample results is provided in Appendix B of this report, along with septage data for the reporting period.

Wessuc Environmental Services Inc. was contracted to haul and spread sludge from the Shelburne plant in 2020. (Certificate of Approval - Waste Management System # 1603-4LGJBN)

The following certified sites were utilized in 2020:

Table 16. Volume of Sludge Generated from Shelburne Wastewater Treatment Plant in 2020

Site	Site Location	Volume of Biosolids (m^3)	Hauler
NASM Submission ID: 23166	D2001	2473.00	Wessuc
NASM Submission ID: 24208	D2007	2899.00	Wessuc
NASM Submission ID: 23344	D2003	2983.00	Wessuc
NASM Submission ID: 24382	W2002	571.00	Wessuc
NASM Submission ID: 24433	W1004	134.00	Wessuc

A total volume of 9,060.00 m^3 of sludge was applied to the above fields from the Shelburne WWTP in 2020.

Based on the design flow, average wastewater quantity and a linear regression with an R^2 value of 94.27%, the anticipated volume of sludge generated for 2021 will be approximately 9,800 m^3.

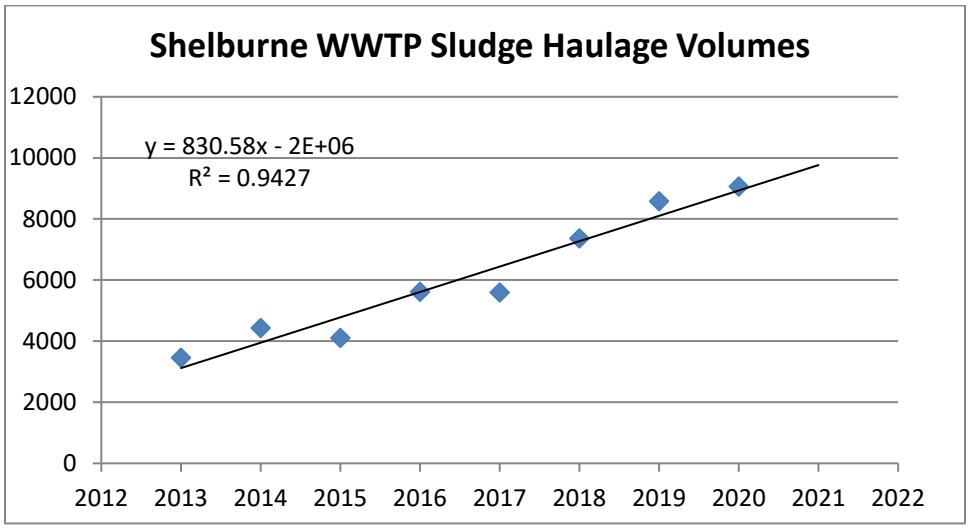

Figure 1. Shelburne Wastewater Treatment Plant Haulage Volumes (2013 to 2020)

9. Complaints

As per 6h of ECA 6413-ABLQQS, *a summary of any complaints received during the reporting period and any steps taken to address the complaints* is required.

A standard operating procedure (SOP) is in place for addressing complaints received from the community. All complaints are addressed and documented in the facility logbook. Community complaint information is entered in OCWA's electronic database system "WMS Maximo". This system contains all the required information and history of all complaints.

There were no complaint registered in 2020 for the reporting period.

10. By-pass, Spill or Abnormal Discharge Events

As per 6i of ECA 6413-ABLQQS, *a summary of all By-pass, spill or abnormal discharge events* is required.

There were no by-passes, spills, abnormal discharge events, over flows or other situations outside Normal Operating Conditions that occurred during this reporting period with regard to the Shelburne Wastewater Treatment Plant.

11. Notice of Modifications

As per 6j of ECA 6413-ABLQQS, *a copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report on the implementation of each modification* is required.

There were no modifications at the Shelburne Wastewater Treatment Plant during the reporting period.

12. Summary of Completed Modifications

As per 6k of ECA 6413-ABLQQS, *a report summarizing all modifications completed as a result of Schedule B, Section 3* is required.

There were no modifications at the Shelburne Wastewater Treatment Plant during the reporting period.

13. Additional Information

As per 6l of ECA 6413-ABLQQS, *any other information the Water Supervisor requires from time to time* is required.

There were no requests from the Water Supervisor for any other information during the reporting period.

2020 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS

Appendix A

Performance Assessment Report

2020

Ontario Clean Water Agency
Performance Assessment Report Wastewater/Lagoon

Report extracted 02/05/2021 14:44 **From: 01/01/2020 to 31/12/2020**

Facility: [5773] SHELBURNE WASTEWATER TREATMENT FACILITY

Works: [110000659]

		01/2020		02/2020		03/2020		04/2020		05/2020		06/2020		07/2020		08/2020		09/2020		10/2020		11/2020		12/2020		<--Total-->		<--Avg.-->		<--Max.-->		<--Criteria-->
Flows:																																
Raw Flow: Total - Raw Sewage (m³)		88846.60		74252.10		101284.60		89360.50		84568.80		75613.90		81055.50		87755.30		76541.70		80886.00		78924.70		91093.10		1010182.80								
Raw Flow: Avg - Raw Sewage (m³/d)		2866.02		2560.42		3267.25		2978.68		2728.03		2520.46		2614.69		2830.82		2551.39		2609.23		2630.82		2938.49				2758.02				3420.0
Raw Flow: Max - Raw Sewage (m³/d)		3241.10		3019.30		3823.10		3695.90		3132.10		2829.60		3297.00		3480.40		2914.20		2849.20		2904.80		3397.70						3823.10		
Eff. Flow: Total - Final Effluent (m³)		74870.10		63790.10		86053.40		77216.50		67433.80		61684.70		68646.00		71422.70		62176.50		66306.90		64459.10		75328.50		839388.30						
Eff. Flow: Avg - Final Effluent (m³/d)		2415.16		2199.66		2775.92		2573.88		2175.28		2056.16		2214.39		2303.96		2072.55		2138.93		2148.64		2429.95				2292.04				
Eff. Flow: Max - Final Effluent (m³/d)		2910.90		2584.60		3455.90		3336.50		2607.30		2420.50		2846.20		2907.90		2412.90		2402.70		2429.80		2848.10						3455.90		
Carbonaceous Biochemical Oxygen Demand: CBOD:																																
Raw: Avg cBOD5 - Raw Sewage (mg/L)		374.000		269.000		101.000		150.000		325.000		339.000		241.000		276.000		323.000		285.000		338.000		119.000				261.667		374.000		
Raw: # of samples of cBOD5 - Raw Sewage (mg/L)		1		1		1		1		1		1		1		1		1		1		1		1		12						
Eff: Avg cBOD5 - Final Effluent (mg/L)	<	2.500	<	3.250	<	2.250	<	2.000	<	2.000	<	2.000	<	2.250	<	2.000	<	2.000	<	2.000	<	2.750	<	2.600			<	2.300	<	3.250		5.0
Eff: # of samples of cBOD5 - Final Effluent (mg/L)		4		4		4		5		4		5		4		4		5		4		4		5		52						
Loading: cBOD5 - Final Effluent (kg/d)	<	6.038	<	7.149	<	6.246	<	5.148	<	4.351	<	4.112	<	4.982	<	4.608	<	4.145	<	4.278	<	5.909	<	6.318			<	5.274	<	7.149		
Percent Removal: cBOD5 - Final Effluent (mg/L)		99.332		98.792		97.772		98.667		99.385		99.410		99.066		99.275		99.381		99.298		99.186		97.815						99.410		
Biochemical Oxygen Demand: BOD5:																																
Raw: Avg BOD5 - Raw Sewage (mg/L)		319.000		349.000		108.000		147.000		418.000		347.000		289.000		223.000		293.000		382.000		332.000		166.000				281.083		418.000		
Raw: # of samples of BOD5 - Raw Sewage (mg/L)		1		1		1		1		1		1		1		1		1		1		1		1		12						
Eff: Avg BOD5 - Final Effluent (mg/L)	<	2.000		3.000		2.000	<	2.000	<	2.000	<	2.000	<	2.000	<	2.000	<	2.000		3.000	<	2.000	<	2.000			<	2.167		3.000		
Loading: BOD5 - Final Effluent (kg/d)	<	4.830		6.599		5.552	<	5.148	<	4.351	<	4.112	<	4.429	<	4.608	<	4.145		6.417	<	4.297	<	4.860			<	4.946		6.599		
Percent Removal: BOD5 - Final Effluent (mg/L)		99.373		99.140		98.148		98.639		99.522		99.424		99.308		99.103		99.317		99.215		99.398		98.795						99.522		
Total Suspended Solids: TSS:																																
Raw: Avg TSS - Raw Sewage (mg/L)		304.000		459.000		140.000		140.000		452.000		587.000		777.000		430.000		504.000		2150.000		611.000		118.000				556.000		2150.000		
Raw: # of samples of TSS - Raw Sewage (mg/L)		1		1		1		1		1		1		1		1		1		1		1		1		12						
Eff: Avg TSS - Final Effluent (mg/L)		3.500		5.000		3.000	<	2.200		3.000	<	2.000		3.000	<	3.000	<	2.800	<	2.500	<	2.500		2.800			<	2.942		5.000		5.0
Eff: # of samples of TSS - Final Effluent (mg/L)		4		4		4		5		4		5		4		4		5		4		4		5		52						
Loading: TSS - Final Effluent (kg/d)		8.453		10.998		8.328	<	5.663		6.526	<	4.112		6.643	<	6.912	<	5.803	<	5.347	<	5.372		6.804			<	6.747		10.998		
Percent Removal: TSS - Final Effluent (mg/L)		98.849		98.911		97.857		98.429		99.336		99.659		99.614		99.302		99.444		99.884		99.591		97.627						99.884		
Total Phosphorus: TP:																																
Raw: Avg TP - Raw Sewage (mg/L)		8.410		9.050		4.110		3.380		7.730		4.920		5.250		3.580		5.470		8.580		6.020		3.320				5.818		9.050		
Raw: # of samples of TP - Raw Sewage (mg/L)		1		1		1		1		1		1		1		1		1		1		1		1		12						
Eff: Avg TP - Final Effluent (mg/L)		0.085		0.101		0.062		0.030		0.055		0.049		0.051		0.049		0.047		0.037		0.043	<	0.034			<	0.054		0.101		0.25
Eff: # of samples of TP - Final Effluent (mg/L)		4		4		4		5		4		5		4		4		5		4		4		5		52						
Loading: TP - Final Effluent (kg/d)		0.206		0.222		0.173		0.078		0.119		0.100		0.113		0.112		0.097		0.079		0.092	<	0.084			<	0.123		0.222		
Percent Removal: TP - Final Effluent (mg/L)		98.986		98.884		98.485		99.107		99.292		99.008		99.029		98.638		99.141		99.572		99.286		98.964						99.572		
Nitrogen Series:																																
Raw: Avg TKN - Raw Sewage (mg/L)		79.400		37.600		32.400		27.000		57.800		34.400		51.400		18.900		38.800		36.800		39.600		24.500				39.883		79.400		
Raw: # of samples of TKN - Raw Sewage (mg/L)		1		1		1		1		1		1		1		1		1		1		1		1		12						
Eff: Avg TAN - Final Effluent (mg/L)	<	0.100	<	0.100	<	0.125	<	0.140	<	0.100	<	0.100	<	0.100	<	0.100	<	0.100	<	0.200	<	0.100	<	0.120			<	0.115	<	0.200		- 2.4 - 0.8 - 0.8 - 0.8 - 0.8 - 2.
Eff: # of samples of TAN - Final Effluent (mg/L)		4		4		4		5		4		5		4		4		5		4		4		5		52						
Loading: TAN - Final Effluent (kg/d)	<	0.242	<	0.220	<	0.347	<	0.360	<	0.218	<	0.206	<	0.221	<	0.230	<	0.207	<	0.428	<	0.215	<	0.292			<	0.265	<	0.428		
Eff: Avg NO3-N - Final Effluent (mg/L)		18.900		12.785		15.075		13.536		20.975		21.980		16.748		12.070		15.760		14.238		17.160		12.368				15.966		21.980		
Eff: # of samples of NO3-N - Final Effluent (mg/L)		4		4		4		5		4		5		4		4		5		4		4		5		52						
Eff: Avg NO2-N - Final Effluent (mg/L)	<	0.030		0.080	<	0.035	<	0.044	<	0.030	<	0.036	<	0.030	<	0.030	<	0.030	<	0.053	<	0.030	<	0.042			<	0.039		0.080		
Eff: # of samples of NO2-N - Final Effluent (mg/L)		4		4		4		5		4		5		4		4		5		4		4		5		52						
Disinfection:																																
Eff: GMD E. Coli - Final Effluent (cfu/100mL)		2.000		2.000		1.682		1.741		2.000		1.741		1.682		2.000		2.000		2.000		2.000		1.741				1.882		2.000		200.0
Eff: # of samples of E. Coli - Final Effluent (cfu/100mL)		4		4		4		5		4		5		4		4		5		4		4		5		52						

2020 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS

Appendix B

Sludge Haulage Summary, Sludge Quality, and Septage Receiving

2020

Shelburne WWTP - Daily Haulage Summary			
Date	**Site**	**NASM #**	**Sludge Hauled (m^3)**
May			
13-May-20	D2007	24208	1044.00
14-May-20	D2007	24208	1247.00
21-May-20	D2007	24208	608.00
June			
29-Jun-20	D2003	23344	848.00
30-Jun-20	D2003	23344	944.00
July			
2-Jul-20	D2003	23344	1191.00
August			
31-Aug-20	W2002	24382	89.00
September			
1-Sep-20	W2002	24382	482.00
4-Sep-20	D2001	23166	919.00
11-Sep-20	D2001	23166	1052.00
15-Sep-20	D2001	23166	502.00
October			
15-Oct-20	W1004	24433	134.00
		Total	**9060.00**

SHELBURNE WASTEWATER TREATMENT PLANT
SLUDGE QUALITY DATA

2020

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVERAGE
Nutrients														
TS	(mg/L)	20600	20900	34800	34400	29300	27200	38000	27700	21500	30900	23000	23600	27658
Ammonia+Ammonium	(mg/L)	155.0	182.0	180.0	217.0	262.0	297.0	143.0	399.0	378.0	86.1	187.0	220.0	225.5
Nitrate	(mg/L)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Ammonia + Nitrate	(mg/L)	155.3	182.3	180.3	217.3	262.3	297.3	143.3	399.3	378.3	86.4	187.3	220.3	225.8
TKN	(mg/L)	1240	1090	1990	1880	1890	1640	1970	1580	1350	1330	1190	1190	1528
Phosphorus	(mg/L)	350	350	670	680	570	410	660	440	360	270	310	340	451
Metal Concentrations														
Arsenic	(mg/L)	0.30	0.30	0.50	0.50	0.50	0.30	0.50	0.30	0.20	0.20	0.30	0.20	0.34
Cadmium	(mg/L)	0.012	0.011	0.024	0.022	0.020	0.016	0.032	0.021	0.017	0.013	0.017	0.014	0.02
Cobalt	(mg/L)	0.06	0.06	0.11	0.11	0.100	0.07	0.12	0.10	0.08	0.07	0.09	0.09	0.09
Chromium	(mg/L)	0.67	0.67	1.30	1.30	1.10	0.81	1.60	1.20	0.87	0.82	0.89	0.98	1.02
Copper	(mg/L)	5.40	5.90	11.00	9.90	9.30	5.70	11.00	8.30	5.70	4.80	5.70	5.50	7.35
Mercury	(mg/L)	0.011	0.013	0.018	0.023	0.0160	0.0110	0.018	0.022	0.0110	0.006	0.010	0.011	0.014
Potassium	(mg/L)	62	60.0	83.0	78.0	270.0	60.0	75.0	55.0	56.0	86.0	56.0	61.0	84
Molybdenum	(mg/L)	0.19	0.19	0.38	0.32	0.34	0.21	0.35	0.27	0.20	0.17	0.22	0.23	0.26
Nickel	(mg/L)	0.38	0.39	0.68	0.68	0.61	0.42	0.84	0.58	0.44	0.41	0.46	0.48	0.53
Lead	(mg/L)	0.40	0.30	0.60	0.50	0.60	0.40	0.70	0.60	0.50	0.50	0.60	0.70	0.53
Selenium	(mg/L)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Zinc	(mg/L)	8.00	8.00	13.00	13.00	12.00	7.00	18.00	13.00	9.00	7.00	9.00	9.00	10.50
Bacti														
E. coli (cfu/1g dried wgt)		169,903	148,325	97,701	72,674	102,389	106,618	789,474	39,711	65,116	87,379	91,304	72,034	153,552
E. coli (cfu/100mL)		350,000	310,000	340,000	250,000	300,000	290,000	3,000,000	110,000	140,000	270,000	210,000	170,000	478,333
Metal/Solids Concentration														
Arsenic [170]	(mg/kg)	15	14	14	15	17	11	13	11	9	6	13	8	12
Cadmium [34]	(mg/kg)	1	1	1	1	1	1	1	1	1	0	1	1	1
Cobalt [340]	(mg/kg)	3	3	3	3	3	3	3	4	4	2	4	4	3
Chromium [2800]	(mg/kg)	33	32	37	38	38	30	42	43	40	27	39	42	37
Copper [1700]	(mg/kg)	262	282	316	288	317	210	289	300	265	155	248	233	264
Mercury [11]	(mg/kg)	1	1	1	1	1	0	0	1	1	0	0	0	1
Molybdenum [94]	(mg/kg)	9	9	11	9	12	8	9	10	9	6	10	10	9
Nickel [420]	(mg/kg)	18	19	20	20	21	15	22	21	20	13	20	20	19
Lead [1100]	(mg/kg)	19	14	17	15	20	15	18	22	23	16	26	30	20
Selenium [34]	(mg/kg)	5	5	3	3	3	4	3	4	5	3	4	4	4
Zinc [4200]	(mg/kg)	388	383	374	378	410	257	474	469	419	227	391	381	379

Ontario Clean Water Agency
Time Series Info Report

Report extracted 02/05/2021 14:49

From: **01/01/2020 to 31/12/2020**

Facility Org Number: 5773
Facility Works Number: 110000659
Facility Name: SHELBURNE WASTEWATER TREATMENT FACILITY
Facility Owner: Corporation/Company: The Corporation of the Town of Shelburne
Facility Classification: Class 3 Wastewater Treatment
Receiver: Besley Drain to Boyne Creek
Service Population: 7900.0
Total Design Capacity: 3420.0 m3/day

	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	Total	Avg	Max	Min
Septage / Biochemical Oxygen Demand: BOD5 - mg/L																
Count Lab	0	0	2	2	4	2	0	0	2	1	1	1	15			
Max Lab			5920	5120	6760	4930			6180	3200	1210	2010			6760	
Mean Lab			4210	4995	5012.5	4380			5065	3200	1210	2010		4251.333		
Min Lab			2500	4870	2840	3830			3950	3200	1210	2010				1210
Septage / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	2	2	4	2	0	0	2	1	1	1	15			
Max Lab			6110	5800	4680	4430			5560	2170	1300	1510			6110	
Mean Lab			4160	5650	3382.5	4340			4790	2170	1300	1510		3759.333		
Min Lab			2210	5500	2340	4250			4020	2170	1300	1510				1300
Septage / Septage Received - m^3																
Count IH	0	0	2	3	4	2	0	0	2	1	1	1	16			
Total IH			12.683	19.54	22.728	9.092			9.092	4.546	4.546	4.546	86.773			
Max IH			6.819	7.27	9.09	4.546			4.546	4.546	4.546	4.546			9.09	
Mean IH			6.342	6.513	5.682	4.546			4.546	4.546	4.546	4.546		5.423		
Min IH			5.864	5.45	4.546	4.546			4.546	4.546	4.546	4.546				4.546
Septage / Total Kjeldahl Nitrogen: TKN - mg/L																
Count Lab	0	0	2	2	4	2	0	0	2	1	1	1	15			
Max Lab			422	352	514	490			573	848	352	114			848	
Mean Lab			271	337	413.25	394			507.5	848	352	114		399.067		
Min Lab			120	322	301	298			442	848	352	114				114
Septage / Total Phosphorus: TP - mg/L																
Count Lab	0	0	2	2	4	2	0	0	2	1	1	1	15			
Max Lab			82	93	105	101			130	112	71.5	54			130	
Mean Lab			54.45	68.8	74.65	92.6			102.6	112	71.5	54		78.2		
Min Lab			26.9	44.6	49	84.2			75.2	112	71.5	54				26.9
Septage / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	2	2	3	2	0	0	2	1	1	1	14			
Max Lab			12200	15400	20000	23200			13100	16700	8530	8160			23200	
Mean Lab			7325	13750	14266.67	19050			11650	16700	8530	8160		12838.57		
Min Lab			2450	12100	10800	14900			10200	16700	8530	8160				2450

2020 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS

Appendix C

Calibration Reports

2020

151 Superior Blvd, Unit #13
Mississauga, ON, L5T 2L1.
www.Indus-Control.com

VERIFICATION REPORT
PRESSURE MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information		Service Information	
Make:	Magnehelic	Date:	September 2nd,2020
Model:	2000 Series	Report No:	CO1150-2009-51
Order No:	NA	Job No:	CO1150-2009
Serial No:	NA		
Tag:	NA	**Details**	
Job Location:	To digester	Unit:	psi
Asset ID	0000062546	Range:	0-15
		Current Output:	NA
		4 mA Set Point	0
		20 mA Set Point	15

Inst. Reading	AS FOUND	AS LEFT
Pressure(psi)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Input (%)	Calculated Pressure (psi)	Calculated Flow(l/sec)	Measure Pressure (psi)	Display flow(l/sec)	Deviation (psi)
0.00	0.00	0.00	0.00	0.00	0.00
100.00	15.00	1,000.00	14.80	1000.00	0.20

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 2
Device Description:		Digital Pressure Gauge	
Manufacturer:		Martel Electronics	
Model No:		BG-PI-PRO-500G	

Overall Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

Version: 19-12

151 Superior Blvd, Unit #13
Mississauga, ON, L5T 2L1.
www.Indus-Control.com

VERIFICATION REPORT
PRESSURE MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information		Service Information	
Make:	Magnehelic	Date:	September 2nd,2020
Model:	2000 Series	Report No:	CO1150-2009-52
Order No:	NA	Job No:	CO1150-2009
Serial No:	NA		
Tag:	NA	**Details**	
Job Location:	Aeration flow	Unit:	psi
Asset ID	0000062546	Range:	0-15
		Current Output:	NA
		4 mA Set Point	0
		20 mA Set Point	15

Inst. Reading	AS FOUND	AS LEFT
Pressure(psi)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Input (%)	Calculated Pressure (psi)	Calculated Flow(l/sec)	Measure Pressure (psi)	Display flow(l/sec)	Deviation (psi)
0.00	0.00	0.00	0.00	0.00	0.00
100.00	15.00	1,000.00	14.80	1000.00	0.20

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 2
Device Description:		Digital Pressure Gauge	
Manufacturer:		Martel Electronics	
Model No:		BG-PI-PRO-500G	

Overall Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

Version: 19-12

151 Superior Blvd, Unit #13
Mississauga, ON, L5T 2L1.
www.Indus-Control.com

VERIFICATION REPORT - **KHRONE**
ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information		Service Information	
Make:	Khrone	Date:	September 2nd,2020
Model:	IFC 010D	Report No:	CO1150-2009-53
Order Code:	NA	Job No:	CO1150-2009
Serial No.:	A9915693		
Tag:	FIT01	**Flow Details**	
Job Location:	WAS Flow	Unit:	l/sec
Asset ID:	NA	Flow Range:	0-27.8
		Current Output:	4-20 mA
Sensor Details		4 mA Set Point	0
Line size:	3"	20 mA Set Point	27.8
GKL:	5.167		
Mounting:	Remote		

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	531608	531609
FLOW (l/sec)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Set-Point as Per Calibration KIT	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0	0.00	4.00	0.00	3.99	0.00
A	1.98	5.14	1.92	5.12	0.06
B	3.96	6.28	3.92	6.25	0.04
C	7.92	8.56	7.69	8.51	0.23
D	19.79	15.39	19.56	15.23	0.23

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Calibrator	Electrical Multimeter	N/A
Manufacturer:	Khrone	Fluke	N/A
Model No:	GS8B	179	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

Version: 19-12

INDUS CONTROL

151 Superior Blvd, Unit #13
Mississauga, ON, L5T 2L1.
www.Indus-Control.com

VERIFICATION REPORT - **KHRONE** ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information		Service Information	
Make:	Khrone	Date:	September 2nd,2020
Model:	IFC 010D	Report No:	CO1150-2009-54
Order Code:	NA	Job No:	CO1150-2009
Serial No.:	A9915978		
Tag:	FIT02		
Job Location:	Tank 1 RAS Flow		
Asset ID:	NA		

Sensor Details		Flow Details	
Line size:	4"	Unit:	l/sec
GKL:	5.243	Flow Range:	0-66.7
Mounting:	Remote	Current Output:	4-20 mA
		4 mA Set Point	0
		20 mA Set Point	66.7

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	8614487	8614490
FLOW (l/sec)	17.75	17.56

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Set-Point as Per Calibration KIT	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0	0.00	4.00	0.23	3.99	-0.23
A	3.14	4.75	3.11	4.56	0.03
B	6.28	5.51	6.25	5.26	0.03
C	12.55	7.01	15.25	6.98	-2.70
D	31.38	11.53	31.35	11.53	0.03
E	62.76	19.05	61.89	19.04	0.87

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Calibrator	Electrical Multimeter	N/A
Manufacturer:	Khrone	Fluke	N/A
Model No:	GS8B	179	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

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VERIFICATION REPORT - **KHRONE**
ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information	
Make:	Khrone
Model:	IFC 010D
Order Code:	NA
Serial No.:	A9915977
Tag:	FIT03
Job Location:	Tank 2 RAS Flow
Asset ID:	NA

Service Information	
Date:	September 2nd,2020
Report No:	CO1150-2009-55
Job No:	CO1150-2009

Sensor Details	
Line size:	4"
GKL:	5.318
Mounting:	Remote

Flow Details	
Unit:	l/sec
Flow Range:	0-66.7
Current Output:	4-20 mA
4 mA Set Point	0
20 mA Set Point	66.7

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	9023137	9023141
FLOW (l/sec)	17.75	17.56

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Set-Point as Per Calibration KIT	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0	0.00	4.00	0.32	3.99	-0.32
A	3.18	4.76	3.11	4.52	0.07
B	6.37	5.53	6.32	5.45	0.05
C	12.73	7.05	12.85	6.95	-0.12
D	31.83	11.63	31.78	11.52	0.05
E	63.65	19.27	63.58	19.02	0.07

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Calibrator	Electrical Multimeter	N/A
Manufacturer:	Khrone	Fluke	N/A
Model No:	GS8B	179	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

INDUS CONTROL
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VERIFICATION REPORT - **KHRONE**
ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information		Service Information	
Make:	Khrone	Date:	September 2nd,2020
Model:	IFC 010D	Report No:	CO1150-2009-56
Order Code:	NA	Job No:	CO1150-2009
Serial No.:	A9915979		
Tag:	FIT04		
Job Location:	Truck Fill Flow		
Asset ID:	NA		

Sensor Details		Flow Details	
Line size:	4"	Unit:	l/sec
GKL:	5.045	Flow Range:	0-75
Mounting:	Remote	Current Output:	4-20 mA
		4 mA Set Point	0
		20 mA Set Point	75

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	64510	64511
FLOW (l/sec)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Set-Point as Per Calibration KIT	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0	0.00	4.00	0.03	3.99	-0.03
A	3.02	4.64	3.25	4.65	-0.23
B	6.04	5.29	6.12	5.27	-0.08
C	12.08	6.58	12.01	6.52	0.07
D	30.19	10.44	29.96	10.41	0.23
E	60.39	16.88	60.25	16.69	0.14

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Calibrator	Electrical Multimeter	N/A
Manufacturer:	Khrone	Fluke	N/A
Model No:	GS8B	179	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

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VERIFICATION REPORT - **OCM III**
OPEN CHANNEL FLOW MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information	
Make:	Milltronics
Model:	OCM III
Tag:	FIT05
Job Location:	Effluent Flow

Service Information	
Date:	September 2nd,2020
Report No:	CO1150-2009-57
Job No:	CO1150-2009

Flow Details	
Unit:	l/sec
Flow Range:	0-105
Current Output:	4-20 mA
4 mA Set Point	0
20 mA Set Point	105

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	17074454	17074463
FLOW (l/sec)	40	56

Maintenance Checklist				Remarks
Visual Inspection:	☑	OK	☐ NOT OK	
Electrical Inspection:	☑	OK	☐ NOT OK	

Programming Parameter of Instrument

Parameter	Discription	Value	Parameter	Discription	Value
F0	Access Code	2.71828	P7	Height of Max. Head	34.48
P1	Dimension Unit (cm)	0	P32	Totalizer Multiplier	6*1000
P3	Exponential Device	0	P42	Head by OCM III	0
P4	Cal. Method -Ratiometric	1	P45	Low Flow Cut-off	0
P5	Flow Unit - l/sec	0	P46	Range at Zero Head	85.6672 cm
P6	Max Flow rate	105 l/sec	P47	Blanking Distance	30.4864 cm

Test Point Report

Reference Distance (cm)	Measured Distance (cm)	Calculated Flow (l/sec)	UUT Flow Display (l/sec)	Calculated (mA)	Measured (mA)	Deviaiton Full Scale (l/sec)
17.00	17.52	37.26	37.26	9.60	9.67	0.00

Calculations

Flow Calculations

$Q = q_{cal} (h/h_{cal})^{Exp}$ Where, Q= Discharge Flow, qcal = max flow, h = head, hcal = max head

Exp = 1.53 , Hence,

$Q = 105 (17.52/34.48)^{1.53}$

Q = 5631.47

Instrument Test Information and Results

Input (%)	Calculated Flow(l/sec)	Calculated Input (mA)	Flow on UUT (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0	0.00	4.00	0.02	3.99	-0.02
25	26.25	8.00	26.25	7.99	0.00
50	52.50	12.00	52.00	11.99	0.50
75	78.75	16.00	78.00	15.99	0.75
100	105.00	20.00	104.50	19.99	0.50

Information of Tools used for Verification of the Instruments

Device Description:	Manufacturer	Model	
Electrical Multimeter	Fluke	179	

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Program parameters verified. Single point verification done

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

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VERIFICATION REPORT - **ROSEMOUNT** ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information		Service Information	
Make:	Rosemount	Date:	September 2nd,2020
Model:	8712	Report No:	CO1150-2009-58
Order Code:	NA	Job No:	CO1150-2009
Serial No.:	860188157		
Tag:	FIT06		
Job Location:	Raw sewage flow		
Asset ID:	NA		

Sensor Details		Flow Details	
Line size:	8"	Unit:	l/sec
Flow Cal Tube No.:	1025505911000010	Flow Range:	0-150
Mounting:	Remote	Current Output:	4-20 mA
		4 mA Set Point	0
		20 mA Set Point	150

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	887116288	887116291
FLOW (L/SEC)	0	

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Test-Point as Per Calibration KIT	Calculated Flow (FPS)	Calculated O/P (mA)	UUT Display (FPS)	UUT Measured Output (mA)	Deviation (FPS)
0.00	0.00	4.00	0.00	3.99	0.00
3.00	3.00	5.60	3.00	5.59	0.00
10.00	10.00	9.33	10.00	9.32	0.00
30.00	30.00	20.00	30.00	20.00	0.00

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Calibrator	Electrical Multimeter	N/A
Manufacturer:	Rosemount	Fluke	N/A
Model No:	8714D	179	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks: Measurement Works within Specification.

Service Technician : Sagar Patel

Printed Date: September 2nd,2020

Stamp/Signature

End of Report

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VERIFICATION REPORT - **KHRONE**
ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information		Service Information	
Make:	Khrone	Date:	September 2nd,2020
Model:	IFC 100W	Report No:	CO1150-2009-59
Order Code:	NA	Job No:	CO1150-2009
Serial No.:	C16501184		
Tag:	FIT014(UPPER)		
Job Location:	upper filter		
Asset ID:	NA		

Sensor Details		Flow Details	
Line size:	10"	Unit:	l/sec
GKL:	8.6872	Flow Range:	0-200
Mounting:	Remote	Current Output:	4-20 mA
		4 mA Set Point	0
		20 mA Set Point	200

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	2037378.46	2037380.12
FLOW (l/sec)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Set-Point as Per Calibration KIT	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0	0.00	4.00	0.00	3.99	0.00
A	32.49	6.60	32.56	6.59	-0.07
B	64.99	9.20	64.25	9.21	0.74
C	129.98	14.40	129.59	14.26	0.39

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Calibrator	Electrical Multimeter	N/A
Manufacturer:	Khrone	Fluke	N/A
Model No:	GS8B	179	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

Version: 19-12

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VERIFICATION REPORT - **KHRONE**
ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne	Site/Plant Address:	300 Centennial rd,
Plant Name:	Shelburne WWTP		Shelburne,ON L0N1S4

Device Information		Service Information	
Make:	Khrone	Date:	September 2nd,2020
Model:	IFC 100W	Report No:	CO1150-2009-60
Order Code:	NA	Job No:	CO1150-2009
Serial No.:	C16501544		
Tag:	FIT014(LOWER)		
Job Location:	Lower filter		
Asset ID:	NA		

Sensor Details		Flow Details	
Line size:	10"	Unit:	l/sec
GKL:	8.2852	Flow Range:	0-200
Mounting:	Remote	Current Output:	4-20 mA
		4 mA Set Point	0
		20 mA Set Point	200

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	1955599.24	1955602.36
FLOW (l/sec)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Set-Point as Per Calibration KIT	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0	0.00	4.00	0.00	3.99	0.00
A	30.99	6.48	30.56	6.12	0.43
B	61.98	8.96	60.52	8.92	1.46
C	123.96	13.92	123.56	12.89	0.40

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Calibrator	Electrical Multimeter	N/A
Manufacturer:	Khrone	Fluke	N/A
Model No:	GS8B	179	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

Version: 19-12

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VERIFICATION REPORT - **ABB**
ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne
Plant Name:	Shelburne WWTP
Site/Plant Address:	300 Centennial rd, Shelburne,ON L0N1S4

Device Information

Make:	ABB
Model:	MagMaster
Order Code:	NA
Serial No.:	3K620000015306
Tag:	FIT07
Job Location:	Storm Flow
Asset ID:	NA

Sensor Details

Line size:	10"
Mounting:	Remote

Service Information

Date:	September 2nd,2020
Report No:	CO1150-2009-61
Job No:	CO1150-2009

Flow Details

Unit:	l/sec
Flow Range:	0-200
Current Output:	4-20 mA
4 mA Set Point	0
20 mA Set Point	200

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	668750	668753
FLOW (l/sec)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Flow Input (%)	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0.00	0.00	4.00	0.00	3.99	0.00
25.00	50.00	8.00	50.00	7.99	0.00
50.00	100.00	12.00	100.00	11.99	0.00
75.00	150.00	16.00	150.00	15.99	0.00
100.00	200.00	20.00	200.00	19.99	0.00

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Electrical Multimeter	N/A	N/A
Manufacturer:	Fluke	N/A	N/A
Model No:	179	N/A	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks: Measurement Works within Specification.

Service Technician : Sagar Patel

Printed Date: September 2nd,2020

Stamp/Signature

End of Report

151 Superior Blvd, Unit #13
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VERIFICATION REPORT - **ABB**
ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne
Plant Name:	Shelburne WWTP
Site/Plant Address:	300 Centennial rd, Shelburne,ON L0N1S4

Device Information

Make:	ABB
Model:	MagMaster
Order Code:	NA
Serial No.:	3K620000015305
Tag:	FIT08
Job Location:	Storm return Flow
Asset ID:	NA

Sensor Details

Line size:	8"
Mounting:	Remote

Service Information

Date:	September 2nd,2020
Report No:	CO1150-2009-62
Job No:	CO1150-2009

Flow Details

Unit:	l/sec
Flow Range:	0-100
Current Output:	4-20 mA
4 mA Set Point	0
20 mA Set Point	100

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	697870	697883
FLOW (l/sec)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Flow Input (%)	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0.00	0.00	0.25	0.25	3.99	-0.25
25.00	25.00	24.56	24.56	7.99	0.44
50.00	50.00	49.89	49.89	11.99	0.11
75.00	75.00	75.00	75.00	15.99	0.00
100.00	100.00	100.00	100.00	19.99	0.00

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Electrical Multimeter	N/A	N/A
Manufacturer:	Fluke	N/A	N/A
Model No:	179	N/A	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks:	Measurement Works within Specification.

Service Technician :	Sagar Patel	Stamp/Signature	
Printed Date:	September 2nd,2020		

End of Report

151 Superior Blvd, Unit #13
Mississauga, ON, L5T 2L1.
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VERIFICATION REPORT - **ABB**
ELECTRO-MAGNETIC FLOW MEASUREMENT

Customer Name:	Town of Shelburne
Plant Name:	Shelburne WWTP
Site/Plant Address:	300 Centennial rd, Shelburne,ON L0N1S4

Device Information

Make:	ABB
Model:	MagMaster
Order Code:	NA
Serial No.:	3K620000015302
Tag:	FIT09
Job Location:	Sludge transfer Flow
Asset ID:	NA

Sensor Details

Line size:	8"
Mounting:	Remote

Service Information

Date:	September 2nd,2020
Report No:	CO1150-2009-63
Job No:	CO1150-2009

Flow Details

Unit:	l/sec
Flow Range:	0-80
Current Output:	4-20 mA
4 mA Set Point	0
20 mA Set Point	80

Inst. Reading	AS FOUND	AS LEFT
TOTALIZER (m3)	97590	97593
FLOW (l/sec)	0	0

Maintenance Checklist			Remarks
Visual Inspection:	☑ OK	☐ NOT OK	
Electrical Inspection:	☑ OK	☐ NOT OK	
Sensor Installation:	☑ OK	☐ NOT OK	
Transmitter Installation:	☑ OK	☐ NOT OK	

Instrument Test Information and Results

Flow Input (%)	Calculated Flow (l/sec)	Calculated O/P (mA)	UUT Display (l/sec)	UUT Measured Output (mA)	Deviation (l/sec)
0.00	0.00	4.00	0.00	3.99	0.00
25.00	20.00	8.00	20.00	7.99	0.00
50.00	40.00	12.00	40.00	11.99	0.00
75.00	60.00	16.00	59.90	15.99	0.10
100.00	80.00	20.00	80.00	19.99	0.00

Information of Tools used for Verification of the Instruments

Details	Tool/Kit 1	Tool/Kit 2	Tool/Kit 3
Device Description:	Electrical Multimeter	N/A	N/A
Manufacturer:	Fluke	N/A	N/A
Model No:	179	N/A	N/A

* Refer Calibration Tools Certificates submittal for more Information

Verification Test Result:	☑ Passed	☐ Fail	☐ Not Verified

Overall Remarks: Measurement Works within Specification.

Service Technician : Sagar Patel

Printed Date: September 2nd,2020

Stamp/Signature

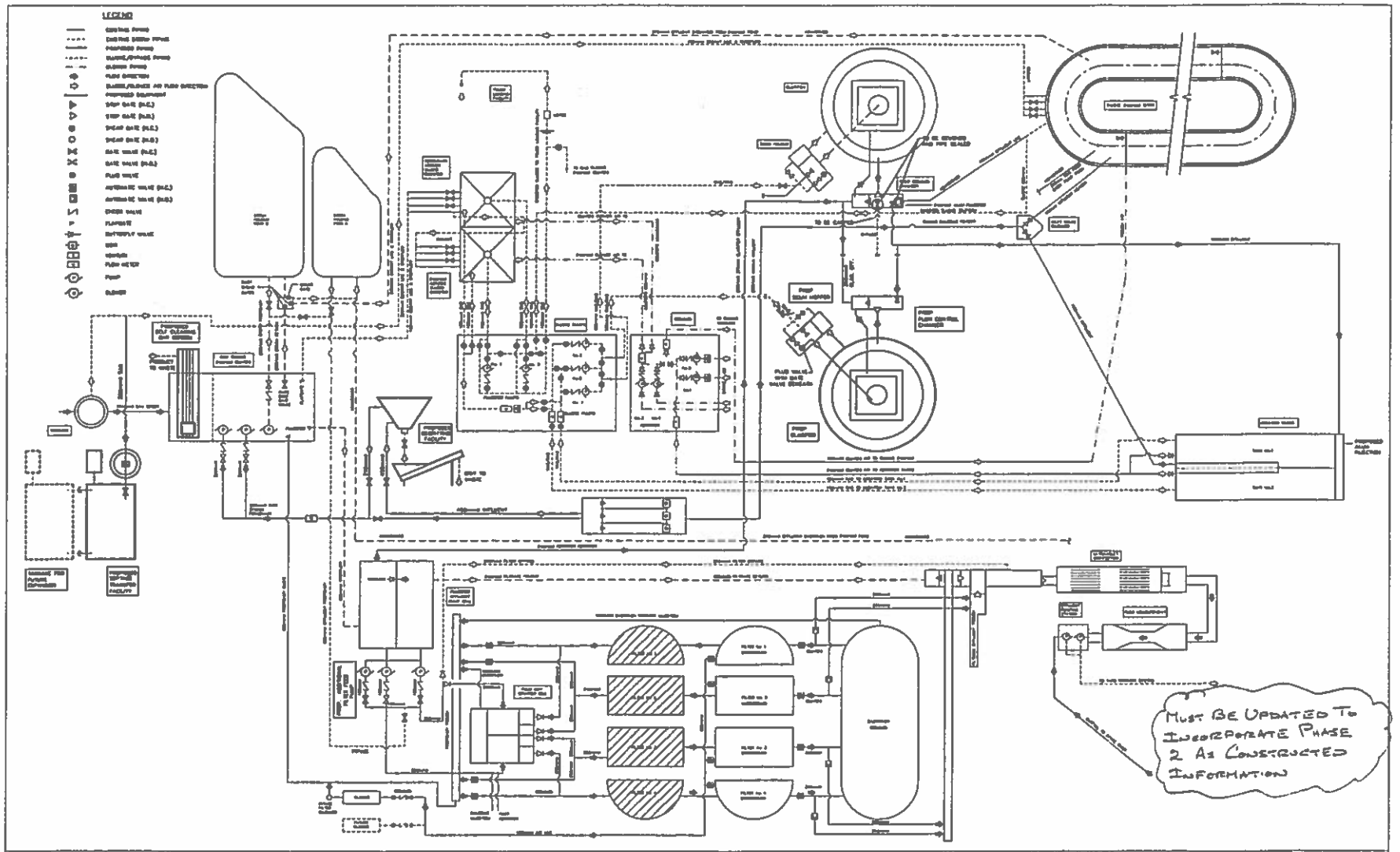
End of Report

2020 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS

Appendix D

Process Flow Schematic

2020



EXPANSION OF WATER POLLUTION CONTROL FACILITIES PHASE 2	TOWN OF SHELBURNE	BURNSIDE	
	GENERAL PLANS PROCESS FLOW SCHEMATIC	K.R.K.	MO-02-4264-05
		RCo	N.T.S.
		JANUARY 2005	