

ANNUAL REPORT

SHELBURNE WASTEWATER TREATMENT SYSTEM

**FOR THE PERIOD:
JANUARY 1, 2019 – DECEMBER 31, 2019**

*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 8,900 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, CBOD₅ 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 580m³, 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 m³ 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
BOD ₅	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	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	0.5
Oct 01 to May 31	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	0.8	2.7
Oct 01 to May 31	2.4	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, CBOD₅, BOD₅, 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.

	CBOD₅					
	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	3.00	Yes	Yes	7.30	n/a	Yes
February	11.75	No	No	29.33	n/a	No
March	11.25	No	No	21.86	n/a	No
April	62.00	No	No	237.74	n/a	No
May	48.57	No	No	180.78	n/a	No
June	20.75	No	No	58.35	n/a	No
July	5.00	No	Yes	12.07	n/a	Yes
August	2.50	Yes	Yes	4.84	n/a	Yes
September	3.25	Yes	Yes	5.69	n/a	Yes
October	2.20	Yes	Yes	3.65	n/a	Yes
November	2.50	Yes	Yes	5.39	n/a	Yes
December	2.00	Yes	Yes	4.54	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	4.20	No	Yes	10.22	n/a	Yes
February	7.00	No	No	17.47	n/a	No
March	9.75	No	No	18.95	n/a	No
April	49.64	No	No	190.33	n/a	No
May	56.29	No	No	209.49	n/a	No
June	16.25	No	No	45.70	n/a	No
July	5.40	No	No	13.04	n/a	Yes
August	2.50	Yes	Yes	4.84	n/a	Yes
September	3.25	Yes	Yes	5.69	n/a	Yes
October	3.00	Yes	Yes	4.98	n/a	Yes
November	2.50	Yes	Yes	5.39	n/a	Yes
December	2.00	Yes	Yes	4.54	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	0.100	Yes	Yes	0.244	n/a	Yes
February	0.173	No	Yes	0.431	n/a	Yes
March	0.224	No	Yes	0.435	n/a	Yes
April	0.430	No	No	1.649	n/a	No
May	0.585	No	No	2.178	n/a	No
June	0.303	No	No	0.852	n/a	Yes
July	0.131	No	Yes	0.316	n/a	Yes
August	0.073	Yes	Yes	0.141	n/a	Yes
September	0.106	Yes	Yes	0.186	n/a	Yes
October	0.076	Yes	Yes	0.126	n/a	Yes
November	0.061	Yes	Yes	0.130	n/a	Yes
December	0.047	Yes	Yes	0.107	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	0.64	n/a	Yes	n/a	Yes	1.56	n/a	n/a	n/a	Yes
February	12.98	n/a	No	n/a	No	32.39	n/a	n/a	n/a	No
March	8.38	n/a	No	n/a	No	16.27	n/a	n/a	n/a	No
April	16.63	n/a	No	n/a	No	63.76	n/a	n/a	n/a	No
May	16.59	n/a	No	n/a	No	61.73	n/a	n/a	n/a	No
June	16.70	No	n/a	No	n/a	46.97	n/a	n/a	No	n/a
July	5.26	No	n/a	No	n/a	12.70	n/a	n/a	No	n/a
August	0.10	Yes	n/a	Yes	n/a	0.193	n/a	n/a	Yes	n/a
September	0.15	Yes	n/a	Yes	n/a	0.263	n/a	n/a	Yes	n/a
October	0.10	n/a	Yes	n/a	Yes	0.166	n/a	n/a	n/a	Yes
November	0.10	n/a	Yes	n/a	Yes	0.216	n/a	n/a	n/a	Yes
December	0.22	n/a	Yes	n/a	Yes	0.499	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	3.53	Yes	Yes
February	458.95	No	No
March	129.40	No	No
April	56932.52	No	No
May	2192.94	No	No
June	176.12	No	Yes
July	2.00	Yes	Yes
August	2.00	Yes	Yes
September	2.00	Yes	Yes
October	2.00	Yes	Yes
November	1.68	Yes	Yes
December	2.30	Yes	Yes

Table 12. Effluent Monitoring Parameter Summary as required by ECA 6413-ABLQQS for Shelburne Treatment Plant, 2019

Parameters	Average	Minimum	Maximum	Average Annual Loading
CBOD ₅	20.41	2.00	139.00	47.63
Total Suspended Solids	18.62	2.00	93.00	44.22
Total Phosphorus	0.231	0.003	0.829	0.566
Total Ammonia Nitrogen	7.69	0.10	25.80	19.73
E.Coli	63.03	0	160000	n/a
pH	7.99	7.28	8.34	n/a
Temperature	13.05	5.40	22.30	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, 2018

Parameter	Average	Minimum	Maximum
BOD ₅ * (mg/L)	354.75	149.00	969.00
Total Suspended Solids* (mg/L)	424.42	185.00	979.00
Total Phosphorous* (mg/L)	7.53	2.71	30.70
Total Kjeldahl Nitrogen* (mg/L)	41.76	15.60	83.40

*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)	3338.77	624.00	6060.00
Total Suspended Solids (mg/L)	12210.77	4980.00	23800.00
Total Phosphorous (mg/L)	83.62	11.50	230.00
Total Kjeldahl Nitrogen (mg/L)	419.08	76.00	1010.00

2.5 Overview of Success and Adequacy of the Works;

The annual average effluent CBOD₅ concentration was 14.56 mg/L with a removal efficiency of >80.49%. The annual average effluent TSS concentration was 13.48 mg/L with a removal efficiency of >80.39%. The annual average effluent Total Phosphorus concentration was 0.192 mg/L with a removal efficiency of >85.22%.

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 2019 was 28.48 CFU per 100 mL, indicating adequate effluent disinfection for the majority of the year.

The total raw sewage volume of wastewater treated in 2019 was 949,111.70 m³. The annual average daily flow of raw sewage was 2,602.68 m³/day was 76.1 % of the design flow (3,420 m³/day). The maximum peak flow of 5848.10 m³/day occurred in April due to higher precipitation, snow melt, and a planned bypass event. This represents a peak flow of 1.7 times the rated capacity. The wastewater treatment plant operated within the rated capacity 88% of the time (321 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.

During the period of April 10, 2019 to July 2, 2019, the Shelburne Wastewater Treatment Plant had been undergoing a bypass of the filters (half of the effluent was receiving full treatment through the active filters). During this time, all treated effluent was receiving Ultraviolet (UV) disinfection. This bypass period was due to various mechanical and process issues starting in January 2019. This included mechanical issues with the clarifiers requiring major maintenance, dissolved oxygen deficiencies from failing jet aspirators, and filter performance issues. A timeline of events may be found in Appendix F

All repairs/maintenance for the reporting period may be found in Section 4.

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 2019.

For 2019, major maintenance activities that occurred include:

- HMI rewiring and maintenance
- PLC battery replacement
- Annual Backflow Prevention inspection
- Hour Meter installation
- Raw Sewage Pump replacement
- North Clarifier Bull Gear and Gear Box replacement
- North Clarifier Sludge Scraper, Plastic Skirting and Isolation Valve repair
- Storm Pump #1 Repairs
- Filter #2 HMI replacement
- Backwash Pumps Gauge replacements
- UV Sensor replacement
- UV Lamp and Sleeve replacements
- Alum Inlet Pipe repair
- Grit Auger repair
- Grit Auger Vortex repair
- Aeration Cells Air Line Headers Weldolet installations
- Aeration Cells Acid Injection cleaning
- Primary and Secondary Digesters cleanout
- North and South Aeration Cells cleanout
- Aeration Cells Diffusers replacement
- Annual Gas Sensor calibrations
- Rag Auger Cold Water Line installation
- North Clarifier Sweeper Arm repair
- Annual Flow Meter calibrations
- South Clarifier Sweeper Arm repair
- South Clarifier Scum Trough repair
- South Clarifier cleanout

- Secondary Digester Pump repair
- Headworks Wet Well cleanout
- Biosolids Tank Manhole cleanout
- North Clarifier Roof replacement

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 2019 with current certified classification, certificate numbers and certificate expiry dates.

Table 15.

Operator	Level	Certificate #	Expiry Date
Alex Solomonov	WWT 2	49144	Jul 31, 2021
	WWC 2	16652	Jan 31, 2021
Curtis Parker	WWT 4	79166	Mar 31, 2022
	WWC 3	79167	Jul 31, 2021
Emanuel Castro	WWT 1	95067	Oct 31, 2022
	WWC 1	102934	Nov 30, 2021
Monika Kowalska	OIT	OT98204	Aug 31, 2020
		OT98205	Aug 31, 2020
Juliet Ouellette	OIT	OT61203	Nov 30, 2022
		OT61212	Nov 30, 2022

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.

Flowmetrix Technical Services Inc. was contracted to calibrate flow measuring equipment on September 16, 2019. 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. Due to the Bypass that occurred between April and July, effluent quality was negatively impacted for a portion of the year, thereby exceeding parameter objectives. However, objectives were achieved after unscheduled corrective maintenance and repairs were completed; There was a significant and maintained improvement of effluent quality from August onwards, meeting objectives for all reportable parameters.

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 2019, 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 2019. (Certificate of Approval - Waste Management System # 1603-4LGJBN)

The following certified sites were utilized in 2019:

Table 16. Volume of Sludge Generated from Shelburne Wastewater Treatment Plant in 2019

Site	Site Location	Volume of Biosolids (m ³)	Hauler
NASM Submission ID: 23748	D2001	3544.0	Wessuc
NASM Submission ID: 23730	W1007	311.5	Wessuc
NASM Submission ID: 23828	S5049	53.4	Wessuc
NASM Submission ID: 23913	S5008	132.5	Wessuc
NASM Submission ID: 22508	S2004	179.5	Wessuc
NASM Submission ID: 23344	D2002	4005.0	Wessuc
NASM Submission ID: 24059	W2001	222.0	Wessuc
NASM Submission ID: 23570	W1006	133.0	Wessuc

A total volume of 8,580.9 m³ of sludge was applied to the above fields from the Shelburne WWTP in 2019.

Based on the design flow, average wastewater quantity and a linear regression with an R² value of 91.42%, the anticipated volume of sludge generated for 2020 will be approximately 8,833.3 m³.

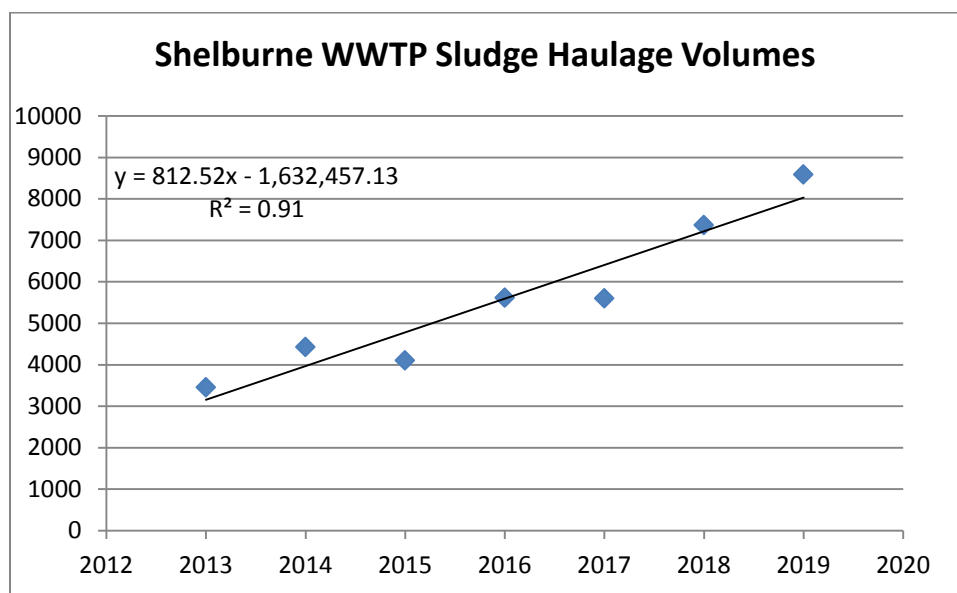


Figure 1. Shelburne Wastewater Treatment Plant Haulage Volumes (2013 to 2019)

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 "OPEX". This system contains all the required information and history of all complaints.

One complaint was received during the reporting period in regards to alleged odour production from the plant interfering with outdoor activities of a resident. Details are attached in Appendix E.

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.

As described in Section 3, during the period of April 10, 2019 to July 2, 2019, the Shelburne Wastewater Treatment Plant had been undergoing a partial tertiary bypass of the filters (half of the effluent was receiving full treatment through the active filters). During this time, all treated effluent was receiving Ultraviolet (UV) disinfection. This bypass period was due to various mechanical and process issues starting in January 2019. This included mechanical issues with the clarifiers requiring major maintenance, dissolved oxygen deficiencies from failing jet aspirators, and filter performance issues. There was a total of **83 days** of bypassing in 2019. A timeline of the bypass may be found in Appendix F

Please see below for a discharge summary:

Table 17. Bypass Flow Summary at the Shelburne Wastewater Treatment Plant in 2019

April 2019		May 2019		June 2019		July 2019	
Day	Effluent Bypass Volumes (m ³)	Day	Effluent Bypass Volumes (m ³)	Day	Effluent Bypass Volumes (m ³)	Day	Effluent Bypass Volumes (m ³)
10	1332.50	1	2161.60	1	2178.35	1	1493.75
11	1754.70	2	1867.50	2	2070.80	2	1389.5
12	1862.10	3	2460.35	3	1894.95		
13	1494.50	4	2537.05	4	1537.95		
14	1478.35	5	2665.95	5	1360.45		
15	1905.30	6	2166.90	6	1329.80		
16	1834.00	7	2066.15	7	1421.85		
17	1731.30	8	2280.30	8	1367.20		
18	1530.80	9	2422.85	9	1549.05		
19	2215.65	10	1913.15	10	1525.60		
20	2525.10	11	1826.10	11	1349.10		
21	2534.70	12	1738.80	12	1483.40		
22	2417.25	13	1845.40	13	1409.85		
23	2526.35	14	1440.30	14	447.25		
24	2798.95	15	1813.45	15	1169.45		
25	2463.60	16	1827.15	16	1115.25		
26	3147.85	17	1589.80	17	1452.00		
27	2604.90	18	1611.65	18	1559.00		
28	2382.55	19	1634.40	19	1116.15		
29	2010.60	20	1810.85	20	1363.95		
30	2076.40	21	1697.45	21	1420.75		
		22	1788.40	22	1301.50		
		23	1648.15	23	1292.80		
		24	1698.35	24	1409.90		
		25	1764.05	25	1453.40		
		26	1662.10	26	1549.80		
		27	1271.25	27	1263.30		
		28	1593.10	28	553.05		
		29	1511.20	29	1659.75		
		30	1523.75	30	1563.45		
		31	1852.50				

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.

**2019 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS**

Appendix A

Performance Assessment Report

2019

Ontario Clean Water Agency
Performance Assessment Report Wastewater/Lagoon

From: 01/01/2019 to 31/12/2019

Report extracted 03/24/2020 18:24

Facility: [5773] SHELBURNE WASTEWATER TREATMENT FACILITY

Works: [110000659]

	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	<-Total-->	<-Avg-->	<-Max-->	<-Criteria-->
Flows:																
Raw Flow: Total - Raw Sewage (m³)	75415.80	69889.20	75072.00	126012.70	103015.50	88183.70	74168.50	61143.30	58501.60	62642.70	75164.70	79902.00	949111.70			
Raw Flow: Avg - Raw Sewage (m³/d)	2432.77	2496.04	2421.68	4200.42	3323.08	2939.46	2392.53	1972.36	1950.05	2020.73	2505.49	2577.48		2602.68		3420.0
Raw Flow: Max - Raw Sewage (m³/d)	3027.80	4351.50	3458.80	5848.10	4655.10	4253.00	2854.80	2316.20	2275.40	2457.10	2766.20	2963.30			5848.10	
Eff. Flow: Total - Final Effluent (m³)	75415.80	69889.20	60239.70	115035.10	115380.00	84368.20	74846.30	59958.00	52529.90	51478.90	64706.20	70295.10	894142.40			
Eff. Flow: Avg - Final Effluent (m³/d)	2432.77	2496.04	1943.22	3834.50	3721.94	2812.27	2414.40	1934.13	1751.00	1660.61	2156.87	2267.58		2452.11		
Eff. Flow: Max - Final Effluent (m³/d)	3027.80	4351.50	3318.00	6295.70	5331.90	4386.70	2987.50	2370.60	2263.90	2159.50	2554.50	2631.30			6295.70	
Carbonaceous Biochemical Oxygen Demand: CBOD:																
Raw: Avg CBOD5 - Raw Sewage (mg/L)	69.000	433.000	269.000	322.000	249.000	352.000	353.000	278.000	233.000	192.000	363.000	252.000		280.417	433.000	
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)	< 3.000	11.750	> 11.250	62.000	48.571	20.750	5.000	< 2.500	3.250	< 2.200	< 2.500	< 2.000	< 2.000	< 14.564	62.000	5.0
Eff: # of samples of CBOD5 - Final Effluent (mg/L)	5	4	4	11	7	4	5	4	4	5	4	5	62			
Loading: CBOD5 - Final Effluent (kg/d)	< 7.298	29.329	> 21.861	237.739	180.780	58.355	12.072	< 4.835	5.691	< 3.653	< 5.392	< 4.535	< 47.628	237.739		
Percent Removal: CBOD5 - Final Effluent (mg/L)	95.652	97.286	95.818	80.745	80.493	94.105	98.584	99.101	98.605	98.854	99.311	99.206			99.311	
Biochemical Oxygen Demand: BOD5:																
Raw: Avg BOD5 - Raw Sewage (mg/L)	149.000	339.000	340.000	357.000	226.000	427.000	423.000	298.000	229.000	281.000	969.000	219.000		354.750	969.000	
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)	3.500	8.750	> 15.750	> 66.273	40.714	26.333	6.000	2.000	5.000	3.000	3.000	< 2.000	> 15.193	66.273		
Loading: BOD5 - Final Effluent (kg/d)	8.515	21.840	> 30.606	> 254.123	151.536	74.057	14.486	3.868	8.755	4.982	6.471	< 4.535	> 48.648	254.123		
Percent Removal: BOD5 - Final Effluent (mg/L)	97.651	97.419	95.368	81.436	81.985	93.833	98.582	99.329	97.817	98.932	99.690	99.087			99.690	
Total Suspended Solids: TSS:																
Raw: Avg TSS - Raw Sewage (mg/L)	185.000	490.000	788.000	427.000	287.000	413.000	322.000	281.000	363.000	326.000	979.000	232.000		424.417	979.000	
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)	4.200	7.000	9.750	49.636	56.286	16.250	5.400	2.500	3.250	3.000	2.500	2.000		13.481	56.286	5.0
Eff: # of samples of TSS - Final Effluent (mg/L)	5	4	4	11	7	4	5	4	4	5	4	5	62			
Loading: TSS - Final Effluent (kg/d)	10.218	17.472	18.946	190.331	209.492	45.699	13.038	4.835	5.691	4.982	5.392	4.535	44.219	209.492		
Percent Removal: TSS - Final Effluent (mg/L)	97.730	98.571	98.763	88.376	80.388	96.065	98.323	99.110	99.105	99.080	99.745	99.138			99.745	
Total Phosphorus: TP:																
Raw: Avg TP - Raw Sewage (mg/L)	2.710	3.090	8.230	2.910	5.860	6.230	7.760	6.220	6.150	6.530	30.700	3.990		7.532	30.700	
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)	0.100	0.173	0.224	0.430	0.585	0.303	0.131	0.073	0.106	0.076	0.061	0.047		0.192	0.585	0.25
Eff: # of samples of TP - Final Effluent (mg/L)	5	4	4	11	7	4	5	4	4	5	4	5	62			
Loading: TP - Final Effluent (kg/d)	0.244	0.431	0.435	1.649	2.178	0.852	0.316	0.141	0.186	0.126	0.130	0.107		0.566	2.178	
Percent Removal: TP - Final Effluent (mg/L)	96.303	94.417	97.278	85.223	90.015	95.136	98.314	98.830	98.276	98.836	99.803	98.812			99.803	
Nitrogen Series:																
Raw: Avg TKN - Raw Sewage (mg/L)	15.600	23.100	62.900	36.400	49.100	40.800	50.400	45.200	34.800	35.100	83.400	24.300		41.758	83.400	
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)	0.640	12.975	8.375	16.627	16.586	16.700	5.260	< 0.100	0.150	< 0.100	< 0.100	< 0.220	< 6.486	16.700	- 2.4 - 0.8 - 0.0	
Eff: # of samples of TAN - Final Effluent (mg/L)	5	4	4	11	7	4	5	4	4	5	4	5	62			
Loading: TAN - Final Effluent (kg/d)	1.557	32.386	16.274	63.757	61.731	46.965	12.700	< 0.193	0.263	< 0.166	< 0.216	< 0.499	< 19.726	63.757		
Eff: Avg NO3-N - Final Effluent (mg/L)	6.776	< 0.970	< 1.227	< 0.071	< 0.067	< 0.665	10.672	29.850	32.625	23.900	22.625	21.920	< 12.614	32.625		
Eff: # of samples of NO3-N - Final Effluent (mg/L)	5	4	4	11	7	4	5	4	4	5	4	5	62			
Eff: Avg NO2-N - Final Effluent (mg/L)	0.234	0.175	< 0.223	< 0.057	< 0.059	< 0.385	< 0.078	< 0.033	0.068	< 0.056	< 0.038	< 0.086	< 0.124	0.385		
Eff: # of samples of NO2-N - Final Effluent (mg/L)	5	4	4	11	7	4	5	4	4	5	4	5	62			
Disinfection:																
Eff: GMD E. Coli - Final Effluent (cfu/100mL)	3.525	458.952	129.398	56932.517	2192.941	176.120	2.000	2.000	2.000	2.000	1.682	2.297		4992.119	56932.517	200.0
Eff: # of samples of E. Coli - Final Effluent (cfu/100mL)	6	4	4	6	4	4	5	4	4	5	4	5	55			

**2019 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS**

Appendix B

**Sludge Haulage Summary, Sludge Quality, and
Septage Receiving**

2019

Shelburne WWTP - Daily Haulage Summary			
Date	Site	NASM #	Sludge Hauled (m³)
May			
05/21/2019	D2001	23748	1028.0
05/22/2019	D2001	23748	1256.0
05/23/2019	D2001	23748	1260.0
June			
06/06/2019	W1007	23730	311.5
July			
07/05/2019	S5049	23828	53.4
07/09/2019	S5008	23913	132.5
August			
08/08/2019	S2004	22508	89.5
08/09/2019	S2004	22508	90.0
September			
09/12/2019	D2002	23344	356.0
09/18/2019	D2002	23344	1201.5
09/19/2019	D2002	23344	1246.0
09/20/2019	D2002	23344	1201.5
October			
10/07/2019	W2001	24059	89.0
10/08/2019	W2001	24059	133.0
10/10/2019	W1006	23570	133.0
		Total	8,580.9

**SHELBURNE WASTEWATER TREATMENT PLANT
SLUDGE QUALITY DATA**

2019

Nutrients

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVERAGE
TS	(mg/L)	29900	34300	39700	32600	37700	21500	21800	21500	24500	25900	21700	20900	27667
Ammonia+Ammonium	(mg/L)	236.0	260.0	263.0	268.0	293.0	202.0	294.0	389.0	420.0	104.0	127.0	141.0	249.8
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)	236.3	260.3	263.3	268.3	293.3	202.3	294.3	389.3	420.3	104.3	127.3	141.3	250.1
TKN	(mg/L)	1560	1780	1930	1590	1910	824	1110	1160	1340	1010	1180	1150	1379
Phosphorus	(mg/L)	560	560	630	610	610	380	320	100	440	440	350	350	446

Metal Concentrations

Arsenic	(mg/L)	0.40	0.40	0.50	0.50	0.40	0.20	0.20	0.10	0.30	0.30	0.30	0.30	0.33
Cadmium	(mg/L)	0.027	0.031	0.031	0.027	0.028	0.018	0.018	0.005	0.024	0.016	0.014	0.014	0.02
Cobalt	(mg/L)	0.11	0.11	0.13	0.11	0.120	0.07	0.07	0.02	0.10	0.07	0.08	0.07	0.09
Chromium	(mg/L)	1.10	1.20	1.30	1.20	1.10	0.86	0.83	0.24	1.10	0.92	0.77	0.77	0.95
Copper	(mg/L)	8.80	9.60	10.00	8.90	9.90	6.30	5.90	1.80	8.60	6.90	5.90	5.60	7.35
Mercury	(mg/L)	0.020	0.024	0.028	0.028	0.0290	0.0290	0.012	0.004	0.0220	0.014	0.018	0.014	0.020
Potassium	(mg/L)	94	83.0	91.0	100.0	100.0	72.0	54.0	70.0	57.0	58.0	51.0	52.0	74
Molybdenum	(mg/L)	0.24	0.27	0.33	0.29	0.34	0.27	0.28	0.08	0.36	0.24	0.20	0.19	0.26
Nickel	(mg/L)	0.65	0.67	0.70	0.64	0.66	0.44	0.41	0.12	0.51	0.44	0.42	0.40	0.51
Lead	(mg/L)	0.80	0.90	0.90	0.80	0.90	0.60	0.60	0.20	0.80	0.60	0.40	0.40	0.66
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)	13.00	15.00	15.00	14.00	15.00	11.00	10.00	2.90	14.00	11.00	8.90	8.50	11.53

Bacti

E. coli (cfu/1g dried wgt)	177,258	139,942	148,615	266,871	212,202	418,605	23,394	22,609	13,878	96,525	271,889	162,679	162,872
E. coli (cfu/100mL)	530,000	480,000	590,000	870,000	800,000	900,000	51,000	26,000	34,000	250,000	590,000	340,000	455,083

Metal/Solids Concentration

Arsenic [170]	(mg/kg)	13	12	13	15	11	9	9	5	12	12	14	14	12
Cadmium [34]	(mg/kg)	1	1	1	1	1	1	1	0	1	1	1	1	1
Cobalt [340]	(mg/kg)	4	3	3	3	3	3	3	1	4	3	4	3	3
Chromium [2800]	(mg/kg)	37	35	33	37	29	40	38	11	45	36	35	37	34
Copper [1700]	(mg/kg)	294	280	252	273	263	293	271	84	351	266	272	268	264
Mercury [11]	(mg/kg)	1	1	1	1	1	1	1	0	1	1	1	1	1
Molybdenum [94]	(mg/kg)	8	8	8	9	9	13	13	4	15	9	9	9	9
Nickel [420]	(mg/kg)	22	20	18	20	18	20	19	6	21	17	19	19	18
Lead [1100]	(mg/kg)	27	26	23	25	24	28	28	9	33	23	18	19	24
Selenium [34]	(mg/kg)	3	3	3	3	3	5	5	5	4	4	5	5	4
Zinc [4200]	(mg/kg)	435	437	378	429	398	512	459	135	571	425	410	407	416

Ontario Clean Water Agency
Time Series Info Report

Report extracted 03/26/2020 16:18

From: 01/01/2019 to 31/12/2019

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

	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	Total	Avg	Max	Min
Septage / Biochemical Oxygen Demand: BOD5 - mg/L																
Count Lab	0	0	2	1	1	2	2	3	0	1	0	1	13			
Max Lab			3400	3220	624	3920	3650	3710		6060		4000			6060	
Mean Lab			3075	3220	624	3420	3335	3280		6060		4000		3338.769		
Min Lab			2750	3220	624	2920	3020	2750		6060		4000				624
Septage / Carbonaceous Biochemical Oxygen Demand: CBOD5 - mg/L																
Count Lab	0	0	2	1	1	2	2	3	0	1	0	1	13			
Max Lab			3930	3330	551	3760	2840	4980		5480		4010			5480	
Mean Lab			2705	3330	551	3335	2485	3130		5480		4010		3062.385		
Min Lab			1480	3330	551	2910	2130	1880		5480		4010				551
Septage / Septage Received - m³																
Count IH	0	0	2	30	31	30	31	31	0	1	0	1	157			
Total IH			14.547	4.546	4.546	13.638	9.092	14.56		9.092		4.546	74.567			
Max IH			9.092	4.546	4.546	9.092	4.546	5.46		9.092		4.546			9.092	
Mean IH			7.274	0.152	0.147	0.455	0.293	0.47		9.092		4.546		0.475		
Min IH			5.455	0	0	0	0	0		9.092		4.546				0
Septage / Total Kjeldahl Nitrogen: TKN - mg/L																
Count Lab	0	0	2	1	1	2	2	3	0	1	0	1	13			
Max Lab			586	126	76	290	418	1010		710		549			1010	
Mean Lab			491	126	76	226	277.5	666		710		549		419.077		
Min Lab			396	126	76	162	137	470		710		549				76
Septage / Total Phosphorus: TP - mg/L																
Count Lab	0	0	2	1	1	2	2	3	0	1	0	1	13			
Max Lab			111	46.9	11.5	71.4	74.2	230		113		81.2			230	
Mean Lab			88.6	46.9	11.5	70.9	47.55	140.1		113		81.2		83.615		
Min Lab			66.2	46.9	11.5	70.4	20.9	72.3		113		81.2				11.5
Septage / Total Suspended Solids: TSS - mg/L																
Count Lab	0	0	2	1	1	2	2	3	0	1	0	1	13			
Max Lab			12200	12500	4980	13800	14900	23800		15400		9790			23800	
Mean Lab			10060	12500	4980	13800	12035	14760		15400		9790		12210.77		
Min Lab			7920	12500	4980	13800	9170	5580		15400		9790				4980

**2019 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS**

Appendix C
Calibration Reports
2019



FLOWMETRIX | METCON | PROCESS

**FLOW, PRESSURE and LEVEL
INSTRUMENTATION
Verification / Calibration
REPORT**

**OCWA West Highlands Hub
Shelburne**

September 2019



October 15, 2019

OCWA – West Highlands Hub - Shelburne
David Jorge
Process Compliance Technician
Shelburne, Ontario
L0N 1J0
T: 519-925-1938 ext 225
C: 519-938-6909
E: djorge@ocwa.com

**RE: OCWA – West Highlands Hub - Shelburne
September 13,16-20, 23-24, 2019**

Dear Mr. Jorge,

SCG Flowmetrix appreciates the opportunity to complete your instrument verification/calibration services. This letter of transmittal confirms completion of this service project.

The following service report contains the individual instrument reports for all verification/calibrations as well as an Equipment List Summary.

Note: Equipment List Summary is only included where 5 or more instruments are verified/calibrated for the same client/area. Otherwise, only individual reports are provided.

In addition to the base report, relevant information related to standard approach and methodologies for various instruments verified and/or calibrated, and a statement of qualifications for all verification/calibrations completed by trained, knowledgeable and experienced personnel is found in the section Quality Assurance and Quality Control.

If you have any additional questions or concerns with regards to this report, please do not hesitate to contact me directly.

Kind Regards,

A handwritten signature in black ink, appearing to read 'J Stevens'.

Jeremy Stevens
Technical Services Manager
#3, 15 Connie Crescent
Concord, ON L4K 1L3
c. 416-427-8483
jstevens@flowmetrix.ca



Quality Assurance / Quality Control

Flowmetrix adheres to a rigid scope of service and deliverables for each client and instrument verified, calibrated and reported. We follow a standard guideline while performing verification and calibration procedures for each instrument; using original equipment manufacturer (OEM) tools, where possible. The values are field reported and entered into a standard report format for client review. A digital report is completed for each instrument and collated into a single document for client record.

Approach & Methodology

Flowmetrix conducts verification of each instrument and subsequent calibrations on instruments that are outside the expected tolerance of the instrument response, where possible. Manufacturers OEM suggested testing guidelines are used to verify and/or calibrate each instrument. Where, unable to perform the verification or calibration as suggested by the manufacturer, a best management practice is performed to validate the performance of such instruments.

REPORTING

Flowmetrix report is divided into (2) sections. Section (i) identifies an equipment summary of all instruments verified during this service project including instruments that PASS or FAIL; section (ii) identifies individual equipment reports for client review and record and identifies any comments and deficiencies that should be noted for client review and possible response.

Section (i) - Equipment Summary

An equipment summary sheet identifying all instruments; both PASSING and FAILING verification and/or calibration while completed during this service project.

The Summary Equipment List is only included where 5 or more instruments are verified/calibrated for the same client/area. Otherwise, only individual reports are provided.

Section (ii) - Individual Equipment Reports

Individual equipment reports are completed for easy review and are found in Appendix B. These reports outline all specific information pertaining to the equipment be tested; noted as meter under test (MUT). Date, time, location, meter make, model and serial number accompany this report for tracking and identification. Each report identifies a PASS or FAIL comment 'as found' and 'as left' upon completion of the verification and/or calibration.

Where possible, a verification is performed prior to calibration, if the OEM testing procedures allow, otherwise an 'as left' report is provided for such equipment.

Note: If a meter under test (MUT) is (AS FOUND) to be operating outside of the allowable tolerance, the report will indicate "NA". The "NA" statement is NOT suggesting the MUT, or a component of the MUT is not functional or has failed; but simply indicates at the time the test was conducted the verification reported values are found outside the allowable tolerance.

Only if the MUT is failed due to equipment failure and not verification/calibration tolerances, the report will indicate "FAIL" (AS FOUND) and will be commented on in the individual equipment report.

STATEMENT OF QUALIFICATIONS

To comply with our clients DWQMS standards, Flowmetrix adheres to a rigid approach to conducting our equipment verification/calibration services including the training received by our company and our personnel conducting service. A Statement of Qualifications outlining Flowmetrix qualifications to conduct this level of service is available in a separate document upon request.

dP Pressure Transmitter

Verification Report



AS FOUND CERTIFICATION

PASS

CLIENT DETAIL			EQUIPMENT DETAIL		
CUSTOMER	OCWA - West Highlands Hub		[MUT] MANUFACTURER	Magnehelic	
CONTACT	David Jorge		MODEL	2000 Series	
	Process Compliance Technician		CONVERTER SERIAL NUMBER	n/a	
	p: 519-925-1938 x 225				
	c: 519-938-6909				
	e: djorge@ocwa.com		PLANT ID	Shelburne WWTP	
			METER ID	Digester Flow	
			FIT ID	N/A	
			CLIENT TAG	N/A	
			OTHER	OCWA# 62546	
VER. BY - FM	Paris Machuk		GPS COORDINATES	N44 05.063	W080 11.535
Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.			VERIFICATION DATE	September 17, 2019	
			CAL. FREQUENCY	Annual	
			CAL. DUE DATE	September, 2020	

PRIMARY DEVICE			TEST CRITERIA		
MANUFACTURER	unknown		AS FOUND CERTIFICATION TEST	yes	
PRIMARY ELEMENT	Venturi		ALLOWABLE [%] ERROR	5	
DIAMETER	inches	?	ERROR, represented as % F.S.	Yes	

TRANSMITTER INFORMATION			COMPONENTS TESTED		
LSL (Lower Sensor Limit)	PSI	0.00	CONVERTER DISPLAY	yes	
USL (Upper Sensor Limit)	PSI	15.00	mA OUTPUT	NO	
SCALING INFORMATION			Flow (F) or Pressure (P)	F	
LVL (Lower Value Limit)	PSI	0.00	OUTPUT - Linear (L) or SQRT (S)	S	
UVL (Upper Value Limit)	PSI	0.92			
Full-scale Diff. Pressure	PSI	0.92			
Full-scale Flow Rate	LPS	1000.00			

COMPARISON TESTING				0.02	0.06	0.23	0.52	0.92	Target Press.
				0.00	6.51	24.97	56.46	99.89	% dP F.S.
REF. PRESSURE, actual				0.00	0.06	0.23	0.52	0.92	PSI
REF. FLOW RATE, calculated					255.24	499.73	751.40	999.46	LPS
MUT [Reading]				0.00	240.00	490.00	730.00	990.00	LPS
MUT [Difference]				0.00	-15.24	-9.73	-21.40	-9.46	LPS
MUT [% Error], PRESSURE				n/a	n/a	n/a	n/a	n/a	% F.S.
MUT [% Error], FLOWRATE					-1.52	-0.97	-2.14	-0.95	% F.S.
mA OUTPUT									
MUT [Reading]	min.	4.000	mA						
MUT [Difference]	max.	20.000	mA						
MUT [% Error]									

ZERO Balance/Equalization Test			QUALITY MANAGEMENT STANDARDS INFO.		
[AF]	PSI	? LPS	[QMS] INFORMATION	IDENT.	ID #
[AL]	PSI	? LPS	[REFERENCE]	CRYS	1
			PROCESS METER	PM	N/A

COMMENTS

Note: Poor resolution on gauge at lower flows.
Flows estimated based on visual observation.

Note possible leak on unit - had to maintain pressure on unit to get test points
Would recommend budget for replacement.

TESTING RESULTS

TEST	AVG % O.R.	PASS FAIL
DISPLAY	-1.40	PASS
mA OUTPUT	N/A	N/A

A reference pressure gauge was used to verify the overall reading accuracy of this device to within the tolerance limits as define above in this report.

Serving Ontario in Calibration Services

For Service Call 519-870-3569

dP Pressure Transmitter

Verification Report



AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER OCWA - West Highlands Hub
 CONTACT David Jorge
 Process Compliance Technician
 p: 519-925-1938 x 225
 c: 519-938-6909
 e: djorge@ocwa.com

[MUT] MANUFACTURER Magnehelic
 MODEL 2000 Series
 CONVERTER SERIAL NUMBER n/a

PLANT ID Shelburne WWTP
 METER ID Aeration Flow
 FIT ID N/A
 CLIENT TAG N/A
 OTHER OCWA# 62544
 GPS COORDINATES N44 05.063 W080 11.535

VER. BY - FM Paris Machuk

Quality Management Standards Information -
 Reference equipment and instrumentation used to
 conduct this verification test is found in our AC-QMS
 document at the time this test was conducted.

VERIFICATION DATE September 17, 2019
 CAL. FREQUENCY Annual
 CAL. DUE DATE September, 2020

PRIMARY DEVICE

MANUFACTURER unknown
 PRIMARY ELEMENT Venturi
 DIAMETER inches ?

AS FOUND CERTIFICATION TEST yes
 ALLOWABLE [%] ERROR 5
 ERROR, represented as % F.S. Yes

TRANSMITTER INFORMATION

LSL (Lower Sensor Limit) psi 0.00
 USL (Upper Sensor Limit) psi 15.00
SCALING INFORMATION
 LVL (Lower Value Limit) psi 0.00
 UVL (Upper Value Limit) psi 0.92
 Full-scale Diff. Pressure psi 0.92
 Full-scale Flow Rate LPS 1000.00

COMPONENTS TESTED

CONVERTER DISPLAY yes
 mA OUTPUT no
 Flow (F) or Pressure (P) F
 OUTPUT - Linear (L) or SQRT (S) S

COMPARISON TESTING

	0.02	0.06	0.23	0.52	0.92	Target Press.
	0.00	6.51	24.97	56.46	100.00	% dP F.S.
REF. PRESSURE, actual	0.00	0.06	0.23	0.52	0.92	psi
REF. FLOW RATE, calculated	0.00	255.24	499.73	751.40	1000.00	LPS
MUT [Reading]	0.00	250.00	500.00	740.00	1000.00	LPS
MUT [Difference]	0.00	-5.24	0.27	-11.40	0.00	LPS
MUT [% Error], PRESSURE	n/a	n/a	n/a	n/a	n/a	% F.S.
MUT [% Error], FLOWRATE		-0.52	0.03	-1.14	0.00	% F.S.
mA OUTPUT						
MUT [Reading] min. 4.000 mA						
MUT [Difference] max. 20.000 mA						
MUT [% Error]						

ZERO Balance/Equalization Test

[AF] psi ? LPS
 [AL] psi ? LPS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE]	CRYS	1
PROCESS METER	PM	11

COMMENTS

Note: Poor resolution on gauge at lower flows.
 Flows estimated based on visual observation.

TESTING RESULTS

TEST	AVG % O.R.	PASS FAIL
DISPLAY	-0.41	PASS
mA OUTPUT	N/A	N/A

A reference pressure gauge was used to verify the overall reading accuracy of this device to within the tolerance limits as define above in this report.

Serving Ontario in Calibration Services

For Service Call 519-870-3569



AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER OCWA - West Highlands Hub
CONTACT David Jorge
Process Compliance Technician
p: 519-925-1938 x 225
c: 519-938-6909
e: djorge@ocwa.com

[MUT] MANUFACTURER Krohne
MODEL IFC010D
SERIAL NUMBER A99 15693
FUSE

PLANT ID Shelburne WWTP
METER ID WAS Flow
FIT ID FIT-01
CLIENT TAG OCWA# 62478
OTHER n/a
GPS COORDINATES N44 05.063 W080 11.535

VER. BY - FM Paris Machuk

Quality Management Standards Information -
Reference equipment and instrumentation used to
conduct this verification test is found in our AC-QMS
document at the time this test was conducted.

VERIFICATION DATE September 16, 2019
CAL. FREQUENCY Annual
CAL. DUE DATE September, 2020

PROGRAMMING PARAMETERS

DIAMETER (DN) mm 80
F.S. FLOW - MAG LPS 39.6
F.S. RANGE - O/P LPS 27.800
CAL. K-FACTOR GKL 5.16700

FORWARD TOTALIZER INFORMATION

AS FOUND 492414 M3
AS LEFT 492418 M3
DIFFERENCE 4 M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST Yes
FORWARD FLOW DIRECTION Yes
ALLOWABLE [%] ERROR 5

COMPONENTS TESTED

CONVERTER DISPLAY yes
mA OUTPUT yes
TOTALIZER Yes
ACCURACY BASED ON [% o.r.] yes

Zero Offset Flow LPS 0.0160

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

FLOW TUBE SIMULATION

				0.0	0.5	1.0	2.0	5.0	m/s
				0.0	5.0	10.0	20.0	50.0	% F.S. Flow
				0.1	7.2	14.3	28.5	71.2	% F.S. Range
REF. FLOW RATE				0.016	1.995	3.974	7.932	19.807	LPS
MUT [Reading]				0.016	2.005	3.978	7.933	19.814	LPS
MUT [Difference]				0.000	0.010	0.004	0.001	0.007	LPS
MUT [% Error]				0.00	0.50	0.10	0.01	0.04	%
mA OUTPUT				4.000	5.148	6.287	8.565	15.400	mA
MUT [Reading]				min. 4.000 mA	3.992	5.142	6.280	8.557	15.389
MUT [Difference]				max. 20.000 mA	-0.008	-0.006	-0.007	-0.008	-0.011
MUT [% Error]					-0.20	-0.12	-0.12	-0.10	-0.07
TOTALIZER - REF. FLOW RATE								19.807	LPS
TOTALIZER [MUT]								2	M3
TEST TIME								100.96	SECONDS
CALC. TOTALIZER								2.000	M3
ERROR								0.02	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	KRO	1
PROCESS METER	PM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.16	PASS
mA OUTPUT	-0.12	PASS
TOTALIZER	0.02	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER OCWA - West Highlands Hub
CONTACT David Jorge
Process Compliance Technician
p: 519-925-1938 x 225
c: 519-938-6909
e: djorge@ocwa.com

[MUT] MANUFACTURER Krohne
MODEL IFC010D
SERIAL NUMBER A99 15978
FUSE On Board Plug

PLANT ID Shelburne WWTP
METER ID RAS TANK #1
FIT ID FIT-02
CLIENT TAG n/a
OCWA# 62479
GPS COORDINATES N44 05.063 W080 11.535

VER. BY - FM Paris Machuk

Quality Management Standards Information -
Reference equipment and instrumentation used to
conduct this verification test is found in our AC-QMS
document at the time this test was conducted.

VERIFICATION DATE September 16, 2019
CAL. FREQUENCY Annual
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PROGRAMMING PARAMETERS

DIAMETER (DN)	mm	100
F.S. FLOW - MAG	LPS	62.8
F.S. RANGE - O/P	LPS	66.700
CAL. K-FACTOR	GKL	5.24300

FORWARD TOTALIZER INFORMATION

AS FOUND	8238507	M3
AS LEFT	8238519	M3
DIFFERENCE	12	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	Yes
ACCURACY BASED ON [% o.r.]	yes

Zero Offset Flow LPS 0.0300

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

FLOW TUBE SIMULATION

				0.0	1.0	2.0	5.0	10.0	m/s
				0.0	10.0	20.0	50.0	100.0	% F.S. Flow
				0.0	9.5	18.9	47.1	94.1	% F.S. Range
REF. FLOW RATE				0.03	6.31	12.58	31.41	62.79	LPS
MUT [Reading]				0.03	6.30	12.59	31.41	62.82	LPS
MUT [Difference]				0.00	-0.01	0.01	0.00	0.03	LPS
MUT [% Error]				0.00	-0.09	0.07	0.01	0.05	%
mA OUTPUT				4.000	5.513	7.018	11.534	19.061	mA
MUT [Reading]				min. 4.000 mA	3.989	5.498	7.006	11.519	19.046
MUT [Difference]				max. 20.000 mA	-0.011	-0.015	-0.012	-0.015	-0.015
MUT [% Error]					-0.28	-0.26	-0.17	-0.13	-0.08
TOTALIZER - REF. FLOW RATE								62.786	LPS
TOTALIZER [MUT]								7	M3
TEST TIME								111.36	SECONDS
CALC. TOTALIZER								6.992	M3
ERROR								0.12	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	KRO	1
PROCESS METER	PM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.01	PASS
mA OUTPUT	-0.18	PASS
TOTALIZER	0.12	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER OCWA - West Highlands Hub
CONTACT David Jorge
Process Compliance Technician
p: 519-925-1938 x 225
c: 519-938-6909
e: djorge@ocwa.com

[MUT] MANUFACTURER Krohne
MODEL IFC010D
SERIAL NUMBER A99 15977
FUSE Pull Plug on Board

PLANT ID Shelburne WWTP
METER ID RAS TANK #2
FIT ID FIT-03
CLIENT TAG n/a
OCWA# 62480
GPS COORDINATES n/a

VER. BY - FM Paris Machuk

Quality Management Standards Information -
Reference equipment and instrumentation used to
conduct this verification test is found in our AC-QMS
document at the time this test was conducted.

VERIFICATION DATE September 16, 2019
CAL. FREQUENCY Annual
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PROGRAMMING PARAMETERS

DIAMETER (DN)	mm	100
F.S. FLOW - MAG	LPS	63.7
F.S. RANGE - O/P	LPS	66.700
CAL. K-FACTOR	GKL	5.31800

FORWARD TOTALIZER INFORMATION

AS FOUND	8648312	M3
AS LEFT	8648323	M3
DIFFERENCE	11	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	Yes
ACCURACY BASED ON [% o.r.]	yes

Zero Offset Flow LPS 0.0400

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

FLOW TUBE SIMULATION

				0.0	1.0	2.0	5.0	10.0	m/s
				0.1	10.1	20.1	50.1	100.1	% F.S. Flow
				0.1	9.6	19.1	47.8	95.5	% F.S. Range
REF. FLOW RATE				0.04	6.41	12.77	31.87	63.69	LPS
MUT [Reading]				0.04	6.43	12.81	31.93	63.80	LPS
MUT [Difference]				0.00	0.02	0.04	0.06	0.11	LPS
MUT [% Error]				0.00	0.38	0.31	0.20	0.17	%
mA OUTPUT				4.000	5.537	7.063	11.644	19.279	mA
MUT [Reading]				min. 4.000 mA	3.996	5.541	7.066	11.659	19.301
MUT [Difference]				max. 20.000 mA	-0.004	0.004	0.003	0.015	0.022
MUT [% Error]					-0.10	0.08	0.04	0.13	0.12
TOTALIZER - REF. FLOW RATE								63.694	LPS
TOTALIZER [MUT]								6	M3
TEST TIME								94.01	SECONDS
CALC. TOTALIZER								5.988	M3
ERROR								0.20	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	KRO	1
PROCESS METER	PM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.26	PASS
mA OUTPUT	0.05	PASS
TOTALIZER	0.20	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL

CUSTOMER OCWA - West Highlands Hub
CONTACT David Jorge
Process Compliance Technician
p: 519-925-1938 x 225
c: 519-938-6909
e: djorge@ocwa.com

[MUT] MANUFACTURER

Krohne
MODEL IFC010D
SERIAL NUMBER A99 15979
FUSE Pull plug on Board
PLANT ID Shelburne WWTP
METER ID Truck Fill Flow
FIT ID FIT-04
CLIENT TAG n/a
OTHER OCWA# 62618
GPS COORDINATES n/a

EQUIPMENT DETAIL

VER. BY - FM Paris Machuk

Quality Management Standards Information -
Reference equipment and instrumentation used to
conduct this verification test is found in our AC-QMS
document at the time this test was conducted.

VERIFICATION DATE September 16, 2019
CAL. FREQUENCY Annual
CAL. DUE DATE September, 2020

PROGRAMMING PARAMETERS

DIAMETER (DN) mm 100
F.S. FLOW - MAG LPS 60.4
F.S. RANGE - O/P LPS 75.000
CAL. K-FACTOR GKL 5.04500

FORWARD TOTALIZER INFORMATION

AS FOUND 53794 M3
AS LEFT 53809 M3
DIFFERENCE 15 M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST Yes
FORWARD FLOW DIRECTION Yes
ALLOWABLE [%] ERROR 5

COMPONENTS TESTED

CONVERTER DISPLAY yes
mA OUTPUT yes
TOTALIZER Yes
ACCURACY BASED ON [% o.r.] yes

Zero Offset Flow LPS 0.0500

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

FLOW TUBE SIMULATION

				0.0	1.0	2.0	5.0	10.0	m/s
				0.1	10.1	20.1	50.1	100.1	% F.S. Flow
				0.1	8.1	16.2	40.3	80.6	% F.S. Range
REF. FLOW RATE				0.05	6.09	12.13	30.24	60.44	LPS
MUT [Reading]				0.05	6.06	12.08	30.18	60.28	LPS
MUT [Difference]				0.00	-0.03	-0.05	-0.06	-0.16	LPS
MUT [% Error]				0.00	-0.47	-0.39	-0.21	-0.26	%
mA OUTPUT				4.000	5.299	6.587	10.452	16.893	mA
MUT [Reading]				min. 4.000 mA	4.005	5.297	6.589	10.441	16.872
MUT [Difference]				max. 20.000 mA	0.005	-0.002	0.002	-0.011	-0.021
MUT [% Error]					0.12	-0.04	0.03	-0.10	-0.12
TOTALIZER - REF. FLOW RATE								60.436	LPS
TOTALIZER [MUT]								6	M3
TEST TIME								99.44	SECONDS
CALC. TOTALIZER								6.010	M3
ERROR								-0.16	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	KRO	1
PROCESS METER	PM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	N/A

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.33	PASS
mA OUTPUT	-0.02	PASS
TOTALIZER	-0.16	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER OCWA - West Highlands Hub
CONTACT David Jorge
Process Compliance Technician
p: 519-925-1938 x 225
c: 519-938-6909
e: djorge@ocwa.com

[MUT] MANUFACTURER
MODEL
CONVERTER SERIAL NUMBER

EQUIPMENT DETAIL

Milltronics
OCM-III
n/a

PLANT ID Shelburne WWTP
METER ID Effluent Flow
FIT ID FIT-05
OCWA# 62506
OTHER n/a
GPS COORDINATES N44 05.063 W080 11.535

VER. BY - FM Paris Machuk

Quality Management Standards Information -
Reference equipment and instrumentation used to
conduct this verification test is found in our AC-QMS
document at the time this test was conducted.

VERIFICATION DATE September 16, 2019
CAL. FREQUENCY Annual
CAL. DUE DATE September, 2020

PROGRAMMING PARAMETERS

THROAT DIMENSION (DN)	inches	9
EMPTY DISTANCE	m	0.857
MAX. HEAD	m	0.345
DEAD ZONE	m	0.512
BLANKING DISTANCE	m	0.305
MAX. FLOW	LPS	105.0
F.S. RANGE - O/P	LPS	105.0

TOTALIZER

AS FOUND	16260112	M3
AS LEFT	16260147	M3
DIFFERENCE	35	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	no

Ultrasonic sensor installed to ensure full scale flow condition

ERROR DOCUMENTED IN THIS REPORT; BASED ON % F.S.

AS FOUND TEST RESULTS

				0.0	15.0	43.5	80.8	89.2	% F.S. Range
				0.000	0.100	0.200	0.300	0.320	m
REF. FLOW RATE				0.000	15.801	45.630	84.854	93.661	LPS
MUT [Reading]				0.002	16.380	46.550	85.040	93.920	LPS
MUT [Difference]				0.002	0.579	0.920	0.186	0.259	LPS
MUT [% Error]				n/a	0.55	0.88	0.18	0.25	%
mA OUTPUT				4.000	6.408	10.954	16.931	18.273	mA
MUT [Reading]			min. 4.000 mA	3.979	6.472	10.967	16.947	18.302	mA
MUT [Difference]			max. 20.000 mA	-0.021	0.064	0.013	0.016	0.029	mA
MUT [% Error]				-0.11	0.32	0.07	0.08	0.14	%
TOTALIZER - REF. FLOW RATE								93.661	LPS
TOTALIZER [MUT]								10	M3
TEST TIME								106.01	SECONDS
CALC. TOTALIZER								9.929	M3
ERROR								0.71	%

COMMENTS

Note: After the verification customer stopped process
and as suspected head was reading high approx. 1.4 cm
performed and Auto Zero to correct.

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD	Yes
PROCESS METER	PM	11
STOP WATCH	SW	Yes

RESULTS

TEST	AVG %FS	PASS FAIL
DISPLAY	0.46	PASS
mA OUTPUT	0.10	PASS
TOTALIZER	0.71	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance
as identified within this report.



AS FOUND CERTIFICATION

FORWARD FLOW DIRECTION

PASS

CLIENT DETAIL			EQUIPMENT DETAIL		
CUSTOMER	OCWA - West Highlands Hub		[MUT] MANUFACTURER	ROSEMOUNT	
CONTACT	David Jorge		MODEL	8712	
	Process Compliance Technician		CONVERTER SERIAL NUMBER	0860188157	
	p: 519-925-1938 x 225				
	c: 519-938-6909				
	e: djorge@ocwa.com		PLANT ID	Shelburne WWTP	
			METER ID	Raw Sewage Flow	
			FIT ID	FIT-06	
			CLIENT TAG	n/a	
			OTHER	n/a	
VER. BY - FM	Paris Machuk		GPS COORDINATES	N44 05.063	W080 11.535
Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.			VERIFICATION DATE	September 16, 2019	
			CAL. FREQUENCY	Annual	
			CAL. DUE DATE	September, 2020	

PROGRAMMING PARAMETERS			FORWARD TOTALIZER INFORMATION		
DIAMETER (DN)	mm	200	AS FOUND	1922785408	LITER
F.S. FLOW - MAG	LPS	387.3	AS LEFT	1922839936	LITER
F.S. RANGE - O/P	LPS	150.000	DIFFERENCE	54528	LITER
TUBE CAL. FACTOR		1025505911000011	TEST CRITERIA		
			AS FOUND CERTIFICATION TEST		Yes
			FORWARD FLOW DIRECTION		Yes
			ALLOWABLE [%] ERROR		5
			COMPONENTS TESTED		
			CONVERTER DISPLAY		yes
			mA OUTPUT		yes
			TOTALIZER		yes
			ACCURACY BASED ON [% o.r.]		yes
VERIFICATOR CAL. FACTOR		1000015010000000	ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.		

FLOW TUBE SIMULATION				3	10	30	ft/s
DISPLAY			0.00	3.00	10.00	30.00	ft/s
MUT Reading			0.00	3.00	10.00	30.02	ft/s
MUT % Error			n/a	0.00	0.00	0.07	%
mA OUTPUT			4.000	5.600	9.333	20.000	mA
MUT Reading	4	mA	3.999	5.601	9.335	20.012	mA
MUT % Error	20	mA	-0.02	0.02	0.02	0.06	%
TOTALIZER						30.00	ft/s
TEST Accumulation						3376.00	ft
TIME						112.34	seconds
CALC. Velocity						30.05	ft/s
% Error						0.17	%

*All values are for "As Found" values.

COMMENTS			RESULTS		
QUALITY MANAGEMENT STANDARDS INFO.			TEST	AVG % o.r.	PASS FAIL
[QMS] INFORMATION	IDENT.	ID #			
[REFERENCE] FTS	ROS	1			
PROCESS METER	PM	11	DISPLAY	0.02	PASS
ANALOG METER	AM	N/A	mA OUTPUT	0.03	PASS
STOP WATCH	SW	Yes	TOTALIZER	0.17	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



ABB
MAGMASTER
 Verification Report
AS FOUND CERTIFICATION
FORWARD FLOW DIRECTION
PASS

CLIENT DETAIL			EQUIPMENT DETAIL		
CUSTOMER	OCWA - West Highlands Hub		[MUT] MANUFACTURER	ABB	
CONTACT	David Jorge		MODEL	MagMaster	
	Process Compliance Technician		CONVERTER SERIAL NUMBER	3K620000015306	
	p: 519-925-1938 x 225		FUSE	Panel G - Breaker #4	
	c: 519-938-6909				
	e: djorge@ocwa.com		PLANT ID	Shelburne WWTP	
			METER ID	Storm Flow	
			FIT ID	FIT-07	
			CLIENT TAG	n/a	
			OTHER	n/a	
VER. BY - FM	Paris Machuk		GPS COORDINATES	N44 05.063	W080 11.535
Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was conducted.			VERIFICATION DATE	September 16, 2019	
			CAL. FREQUENCY	Annual	
			CAL. DUE DATE	September, 2020	

PROGRAMMING PARAMETERS			FORWARD TOTALIZER INFORMATION		
DIAMETER (DN)	mm	250	AS FOUND	601507	M3
F.S. FLOW - MAG	LPS	670.8	AS LEFT	601545	M3
F.S. RANGE - O/P	LPS	200.000	DIFFERENCE	38	M3
TUBE CAL. FACTOR	1	1.36650	TEST CRITERIA		
			AS FOUND CERTIFICATION TEST	Yes	
			FORWARD FLOW DIRECTION	Yes	
			ALLOWABLE [%] ERROR	5	
			COMPONENTS TESTED		
			CONVERTER DISPLAY	yes	
			mA OUTPUT	yes	
			TOTALIZER	yes	
			ACCURACY BASED ON [% o.r.]	yes	
			ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.		

FLOW TUBE SIMULATION							
		0.0	0.2	0.5	1.0	2.0	m/s
		0	2	5	10	20	% F.S. Flow
		0.0	6.7	16.8	33.5	67.1	% F.S. Range
REF. FLOW RATE		0.00	13.42	33.54	67.08	134.16	LPS
MUT [Reading]		0.00	13.30	33.39	66.91	133.96	LPS
MUT [Difference]		0.00	-0.12	-0.15	-0.17	-0.20	LPS
MUT [% Error]		n/a	-0.86	-0.44	-0.25	-0.15	%
mA OUTPUT		4.000	5.073	6.683	9.366	14.732	mA
MUT [Reading]	min. 4.000 mA	3.992	5.048	6.665	9.333	14.673	mA
MUT [Difference]	max. 20.000 mA	-0.008	-0.025	-0.018	-0.033	-0.059	mA
MUT [% Error]		-0.20	-0.50	-0.27	-0.35	-0.40	%
TOTALIZER - REF. FLOW RATE							LPS
TOTALIZER [MUT]							M3
TEST TIME							SECONDS
CALC. TOTALIZER							M3
ERROR							%

COMMENTS			RESULTS		
QUALITY MANAGEMENT STANDARDS INFO.					
[QMS] INFORMATION	IDENT.	ID #	TEST	AVG % o.r.	PASS FAIL
[REFERENCE] FTS	ABBMM	1	DISPLAY	-0.43	PASS
PROCESS METER	PM	11	mA OUTPUT	-0.35	PASS
ANALOG METER	AM	N/A	TOTALIZER	0.18	PASS
STOP WATCH	SW	Yes			

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.



ABB
MAGMASTER
 Verification Report
AS FOUND CERTIFICATION
FORWARD FLOW DIRECTION
PASS

CLIENT DETAIL			EQUIPMENT DETAIL		
CUSTOMER	OCWA - West Highlands Hub		[MUT] MANUFACTURER	ABB	
CONTACT	David Jorge		MODEL	MagMaster	
	Process Compliance Technician		CONVERTER SERIAL NUMBER	3K620000015305	
	p: 519-925-1938 x 225		FUSE	Panel G - Breaker #6	
	c: 519-938-6909				
	e: djorge@ocwa.com		PLANT ID	Shelburne WWTP	
			METER ID	Storm Return Flow	
			FIT ID	FIT-08	
			CLIENT TAG	n/a	
			OTHER	n/a	
VER. BY - FM	Paris Machuk		GPS COORDINATES	N44 05.063	W080 11.535
Quality Management Standards Information -			VERIFICATION DATE	September 16, 2019	
Reference equipment and instrumentation used to			CAL. FREQUENCY	Annual	
conduct this verification test is found in our AC-QMS			CAL. DUE DATE	September, 2020	
document at the time this test was conducted.					

PROGRAMMING PARAMETERS			FORWARD TOTALIZER INFORMATION		
DIAMETER (DN)	mm	200	AS FOUND	628401	M3
F.S. FLOW - MAG	LPS	468.4	AS LEFT	628426	M3
F.S. RANGE - O/P	LPS	100.000	DIFFERENCE	25	M3
TUBE CAL. FACTOR	1	1.49102			
					TEST CRITERIA
			AS FOUND CERTIFICATION TEST		Yes
			FORWARD FLOW DIRECTION		Yes
			ALLOWABLE [%] ERROR		5
					COMPONENTS TESTED
			CONVERTER DISPLAY		yes
			mA OUTPUT		yes
			TOTALIZER		yes
			ACCURACY BASED ON [% o.r.]		yes
			ERROR DOCUMENTED IN THIS REPORT: BASED ON % o.r.		

FLOW TUBE SIMULATION							
		0.0	0.2	0.5	1.0	2.0	m/s
		0	2	5	10	20	% F.S. Flow
		0.0	9.4	23.4	46.8	93.7	% F.S. Range
REF. FLOW RATE		0.00	9.37	23.42	46.84	93.68	LPS
MUT [Reading]		0.00	9.36	23.39	46.80	93.67	LPS
MUT [Difference]		0.00	-0.01	-0.03	-0.04	-0.01	LPS
MUT [% Error]		n/a	-0.09	-0.13	-0.09	-0.01	%
mA OUTPUT		4.000	5.499	7.747	11.495	18.989	mA
MUT [Reading]	min. 4.000 mA	3.992	5.481	7.729	11.453	18.935	mA
MUT [Difference]	max. 20.000 mA	-0.008	-0.018	-0.018	-0.042	-0.054	mA
MUT [% Error]		-0.20	-0.33	-0.24	-0.36	-0.29	%
TOTALIZER - REF. FLOW RATE		ENTER Totalizer test velocity if different from above in m/s 2.0					LPS
TOTALIZER [MUT]						19	M3
TEST TIME						202.85	SECONDS
CALC. TOTALIZER						19.004	M3
ERROR						-0.02	%

COMMENTS			RESULTS		
QUALITY MANAGEMENT STANDARDS INFO.					
[QMS] INFORMATION	IDENT.	ID #	TEST	AVG % o.r.	PASS FAIL
[REFERENCE] FTS	ABBMM	1	DISPLAY	-0.08	PASS
PROCESS METER	PM	11	mA OUTPUT	-0.28	PASS
ANALOG METER	AM	N/A	TOTALIZER	-0.02	PASS
STOP WATCH	SW	N/A			

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ABB
MAGMASTER
 Verification Report
AS FOUND CERTIFICATION
FORWARD FLOW DIRECTION
PASS

CLIENT DETAIL

CUSTOMER OCWA - West Highlands Hub
CONTACT David Jorge
 Process Compliance Technician
 p: 519-925-1938 x 225
 c: 519-938-6909
 e: djorge@ocwa.com

VER. BY - FM Paris Machuk

Quality Management Standards Information -
 Reference equipment and instrumentation used to
 conduct this verification test is found in our AC-QMS
 document at the time this test was conducted.

EQUIPMENT DETAIL

[MUT] MANUFACTURER ABB
MODEL MagMaster
CONVERTER SERIAL NUMBER 3K620000015302
FUSE Panel G - Breaker #8

PLANT ID Shelburne WWTP
METER ID Sludge Transfer Flow
FIT ID FIT-09
CLIENT TAG n/a
OTHER n/a
GPS COORDINATES N44 05.063 W080 11.535

VERIFICATION DATE September 16, 2019
CAL. FREQUENCY Annual
CAL. DUE DATE September, 2020

PROGRAMMING PARAMETERS

DIAMETER (DN)	mm	200
F.S. FLOW - MAG	LPS	468.7
F.S. RANGE - O/P	LPS	80.000
TUBE CAL. FACTOR	1	1.49194

FORWARD TOTALIZER INFORMATION

AS FOUND	34905	M3
AS LEFT	34913	M3
DIFFERENCE	8	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes
ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.	

FLOW TUBE SIMULATION

				0.0	0.1	0.2	0.5	1.0	m/s
				0	1	2	5	10	% F.S. Flow
				0.0	5.9	11.7	29.3	58.6	% F.S. Range
REF. FLOW RATE				0.00	4.69	9.37	23.44	46.87	LPS
MUT [Reading]				0.00	4.70	9.42	23.46	46.87	LPS
MUT [Difference]				0.00	0.01	0.05	0.02	0.00	LPS
MUT [% Error]				n/a	0.28	0.49	0.11	0.00	%
mA OUTPUT				4.000	4.937	5.875	8.687	13.374	mA
MUT [Reading]				min. 4.000 mA	3.991	4.927	5.863	8.671	13.347
MUT [Difference]				max. 20.000 mA	-0.009	-0.010	-0.012	-0.016	-0.027
MUT [% Error]					-0.22	-0.21	-0.20	-0.18	%
TOTALIZER - REF. FLOW RATE								46.871	LPS
TOTALIZER [MUT]								5	M3
TEST TIME								106.87	SECONDS
CALC. TOTALIZER								5.009	M3
ERROR								-0.18	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBMM	1
PROCESS METER	PM	11
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.22	PASS
mA OUTPUT	-0.20	PASS
TOTALIZER	-0.18	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

**2019 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS**

Appendix D

Process Flow Schematic

2019

**2019 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS**

Appendix E

Community Complaints Received

2019

Ontario Clean Water Agency Community Complaints

Facility ID: 5773
Facility Name: Shelburne Wastewater Treatment Plant
Address: 300 Centennial Street
City: Shelburne
Province: Ontario
Postal Code: L0N 1S0
Name of Person who filed Complaint: _____
Address: _____
Phone: _____
NOTE: If there were multiple complaints, provide the name of the person who filed the initial complaint and note the number and details in the "Description" field below
Date of Complaint: 14/08/2019
Time of Complaint: 05:45:08 PM

Nature of Complaint

- | | | |
|---|--|--|
| ☐ Noise | ☐ Water Supply Taste/Colour | ☐ Water Pressure/No Water |
| ☐ Visual | ☐ Service Problem | ☐ Basement Flooding |
| ☒ Odour | ☐ Sludge Related | |
- Other: _____

Description:

Resident called SAC concerning an odour from the plant and being unable to be outside and cook on their barbeque

Action taken in response:

The plant was promptly investigated for odours following awareness of the complaint and it was found that no significant odour was being produced at the plant. Operator was closely monitoring odour production at the facility.

Was the source of the problem identified?: ● Yes ○ No

Was the source an OCWA facility/activity?: ○ Yes ● No If "Yes", describe:

If any remedial action is required, complete action plan form

Updated By: David Jorge 24/03/2020 09:52:11 PM

Investigating Operator: Monika Kowalska

Comments:

The resident was not identified due to calling SAC and not OCWA staff. Unable to troubleshoot and/or discuss directly with resident.

**2019 Annual Performance Report
Shelburne Wastewater Treatment Plant
Amended Environmental Compliance Approval No. 6413-ABLQQS**

Appendix F

Bypass Event Summary

2019

Shelburne WWTP Bypass Servicing Timeline

Shelburne North Clarifier Maintenance and Repair Summary

2019	Events
Mon Jan 21	- Noticed sludge scraper and scum sweep not turning, shear pin intact
Wed Jan 23	- Caldecott inspected clarifier, bull gear missing a chunk of teeth on gear - Caldecott working on ordering new bull gear
Mon Feb 4	- Caldecott informed OCWA bull gear finally shipped out of IOWA
Wed Feb 13	- Caldecott informed OCWA bull gear being held at customs border
Tues Feb 19	- Caldecott informed OCWA bull gear being held at customs border still
Fri Feb 22	- Drained half of clarifier
Tues Feb 26	- Clarifier filled over the weekend due to isolation valve not working properly, began draining again - Caldecott replaced bull gear, smaller size, old one discontinued - Caldecott noticed gear box was loose, took back to shop to fix it - Caldecott took isolation gate to make a taller one
Wed Feb 27	- Clarifier filled up again - Filter feed splitter box water looks cloudier than normal - Isolated clarifier again, using new isolation gate, to begin draining - Caldecott needed to adjust gear box mounting plate, to fit new bull gear - Caldecott supplied 6 new shear pins for new bull gear
Thurs Feb 28	- Transferred sludge from clarifier to primary digester
Fri March 1	- Caldecott installed refurbished gear box - Transferred sludge from clarifier to primary digester - Reduced raw sewage pump speed from 35 to 5% to reduce flow through plant and reduce amount of final effluent leaving plant, due to high ammonia results from the lab. Excess flow is being pumped/stored in Storm Ponds for now - Sent 772m ³ to pond
Sat March 2	- Sent 857m ³ to pond
Sun March 3	- Sent 952m ³ to pond
Mon March 4	- Transferred sludge from clarifier to primary digester - Clarifier fully drained - Sent 1694m ³ to pond
Tues March 5	- Caldecott noticed outer scum sweep broken off, which caused the sludge scraper to jam and broke teeth off bull gear - Some of the plastic skirting in clarifier was damaged and is being replaced - Sent 617m ³ to pond
Wed March 6	- Caldecott working to repair sludge scraper and outer scum sweep - Caldecott repaired clarifier isolation valve - Slowly filling clarifier to return to operation - Sent 778m ³ to pond
Thurs March 7	- Scrubbed Final Effluent UV channel, cleaned all UV sleeves and replaced burnt out lamps - Sent 579m ³ to pond
Fri March 8	- Clarifier back in service

	- Sent 533m ³ to pond
--	----------------------------------

Filter By-Pass Maintenance and Repair Summary

2019	Events
Sat March 9	- Sent 691m ³ to pond
Sun March 10	- Sent 1135m ³ to pond
Mon March 11	- Sent 184m ³ to pond
Tues March 12	- Sent 67m ³ to pond
Wed March 13	- Sent 71m ³ to pond
Thurs March 14	- Sent 2164m ³ to pond
Fri March 15	- Sent 3942m ³ to pond
Sat March 16	- Began returning from pond - Nothing Sent to pond between March 16-19
Wednesday March 20	- Alfa Laval on site to help troubleshoot noisy backwash pumps - Sent 392.4m ³ to pond
Thurs March 21	- Filters backwashed (1)-93x, (2)-137x, clogged cloths, drained 1 filter at a time, scooped up 5 buckets full of scum, grit, debris. - Noticed 1 cloth on each filter was loose. - Sent 1809m ³ to pond
Fri March 22	- Filters backwashed (1)-56x, (2)-129x, clogged cloths, drained 1 filter at a time, scooped up more scum, grit, debris. - Sent 1799m ³ to pond
Sat March 23	- Filters backwashed (1)-219x, (2)-131x, clogged cloths. - Sent 905m ³ to pond
Sun March 24	- Filter 2 backwashed 179x, clogged cloths. - Sent 1847m ³ to pond
Mon March 25	- Filter 2 backwashed 143x, clogged cloths, drained filter, then refilled and began filtering again. - Sent 2188m ³ to pond
Tues March 26	- Lifted 1 disk from each filter to repair loose cloths - Sent 1063m ³ to pond
Wed March 27	- Filter 1 backwashed 106x, clogged cloths. - Sent 866.9m ³ to pond
Fri March 29	- Sent 192m ³ to pond
Sat March 30	- Sent 952m ³ to pond
Sun March 31	- Filter 2 backwashed 71x, clogged cloths. - Sent 597m ³ to pond
Mon April 1	- Filter 2 backwashed 114x, clogged cloths, drained filter, then refilled and began filtering ok again. - Sent 179m ³ to pond - Call back for filter alarm. Drained, refilled, manual backwash performed.
Tues April 2	- Filter 1 backwashed 117x, clogged cloths, drained filter, refilled, manual backwash - Shelburne Public Works removed filter backwash pump valves for inspection, cleaned away rags & scum, reinstalled the valves

	- Installed new alum flow line at raw sewage channel - Sent 179m³ to pond
Wed April 3	- Filters backwashed (1)-169x, (2)-90x, clogged cloths. - No flow sent to ponds
Thurs April 4	- Filters backwashed (1)-111x, (2)-95x, clogged cloths. - Shelburne Public Works removed filter pumps for cleaning & reinstalled pumps. - Shelburne Public Works removed check valves on filter 1. - Sent 77m³ to pond - Call back for filter alarm. Drained, refilled, manual backwash performed.
Fri April 5	- Filters backwashed (1)-67x, (2)-69x, clogged cloths. - Shelburne Public Works removed backwash valves on filter 2, found rags on 2 of the 5 valves. Reinstalled valves - Also removed all 4 backwash pumps and cleaned rags from impeller of 1 pump - Stayed O/T due to underperforming filters - Call back for filter alarm. Drained, refilled, manual backwash performed - Sent 1783 m³ to pond
Sat April 6	- Filter 2 backwashed 115x, clogged cloths, drained filter, then refilled and began filtering ok again. - Due diligence, returned for call back twice to check on filters. - Sent 63 m³ to pond
Sun April 7	- Due diligence, returned for call back to check on filters.
Mon April 8	- Filters backwashed (1)-39x, (2)-47x, clogged cloths, drained filter, then refilled and began filtering ok - Shelburne Public Works removed backwash valves on filter 2, found rags on 1 of the 5 valves. Reinstalled valves. - Due diligence, returned for call back to check on filters. Was alarming earlier but ok upon leaving - Sent 401 m³ to pond
Tues April 9	- Filters backwashed (1)-179x, (2)-90x, clogged cloths, drained filter, then refilled multiple times. Unable to resolve issue. - Stayed O/T due to underperforming filters - Sent 512 m³ to pond - H2Flow on site for FULL UV service
Wed April 10	- Filters backwashed (1)-121x, (2)-84x, clogged cloths, drained filter, then refilled multiple times. Unable to resolve issue. - Re-seeded plant - Partial filter by-pass initiated at 1510 - Collected F.E. samples - Sent 665 m³ to pond
Thurs April 11	- Filter 2 backwashed 164x, clogged cloths. - Troubleshoot/cleaned filters - Steve from Arthur performed Jar Test, increased Alum flow - No flow sent to ponds
Fri April 12	- Troubleshoot/cleaned filters - Returned 672 m³ from pond

Sat April 13	- Sent 15m ³ to pond
Sun April 14	- Sent 686m ³ to pond
Mon April 15	- Troubleshoot/cleaned filters - Sent 129m ³ to pond
Tues April 16	- Troubleshoot/cleaned filters - Returned 318 m ³ from pond
Wed April 17	- Troubleshoot/cleaned filters - Steve from Arthur performed Jar Test, increased Alum flow - Returned 421 m ³ from pond
Thurs April 18	- Troubleshoot/cleaned filters - Brad Hoover onsite, assessed issues, recommended solutions - Sent 305m ³ to pond
Fri April 19	- Returned 135 m ³ from pond
Sat April 20	- Returned 243 m ³ from pond
Sun April 21	- Returned 444 m ³ from pond
Mon April 22	- Returned 1121 m ³ from pond
Tues April 23	- Troubleshoot/cleaned filters - Returned 986 m ³ from pond
Wed April 24	- Troubleshoot/cleaned filters - Brad Hoover on-site, follow-up - Returned 1775 m ³ from pond
Thurs April 25	- Transferred 100m ³ from primary digester to pond - Troubleshoot/cleaned filters - Returned 1246.6 m ³ from pond
Fri April 26	- Troubleshoot/cleaned filters - Returned 1178.7 m ³ from pond
Sat April 27	- Returned 756 m ³ from pond
Sun April 28	- Returned 843.2 m ³ from pond
Mon April 29	- Transferred 230m ³ from primary digester to pond - Troubleshoot/cleaned filters - Returned 347.6m ³ from pond
Tues April 30	- Belwood on-site to investigate if 2 blowers to aeration can be run. Not possible - Troubleshoot/cleaned filters - Returned 859.6 m ³ from pond
Wed May 1	- Transferred 178m ³ from primary digester to pond - Troubleshoot/cleaned filters - Sent 368.7m ³ to pond
Thurs May 2	- Transferred 438m ³ from primary digester to pond - Troubleshoot/cleaned filters - Sent 234.8m ³ to pond
Fri May 3	- Troubleshoot/cleaned filters - Returned 1012.3 m ³ from pond
Sat May 4	- Returned 1116.6 m ³ from pond
Sun May 5	- Returned 1469.8 m ³ from pond
Mon May 6	- Transferred 335m ³ from primary digester to pond - Troubleshoot/cleaned filters

	- Returned 825.9 m³ from pond
Tues May 7	- Transferred 323.6m³ from primary digester to pond - Troubleshoot/cleaned filters - Returned 914.0 m³ from pond
Wed May 8	- Transferred 186m³ from primary digester to pond - Brad Hoover on-site, follow up, recommended more solutions - Troubleshoot/cleaned filters - Returned 1332.3 m³ from pond
Thurs May 9	- Shelburne Public Works on-site for cleaning pumps/valves on filters - Troubleshoot/cleaned filters - Returned 1656.4 m³ from pond
Fri May 10	- Shelburne Public Works on-site for cleaning pumps/valves on filters - Troubleshoot/cleaned filters - Returned 117.4 m³ from pond
Sat May 11	- Returned 362.1 m³ from pond
Sun May 12	- Returned 143.3 m³ from pond
Mon May 13	- Troubleshoot/cleaned filters - Sent 177.1 m³ to pond
Tues May 14	- Installed drainage on Filter 2 - Troubleshoot/cleaned filters - Sent 699.7 m³ to pond
Wed May 15	- Installed drainage on Filter 1 - Troubleshoot/cleaned filters - Returned 257.5 m³ from pond
Thurs May 16	- Caldecott welded weldolets on aeration air line headers - Troubleshoot/cleaned filters - Returned 361.7 m³ from pond
Fri May 17	- Caldecott welded weldolets on aeration air line headers - Troubleshoot/cleaned filters - Returned 64.7 m³ from pond
Sat May 18	- Returned 252.6 m³ from pond
Sun May 19	- Returned 252.6 m³ from pond
Mon May 20	- Returned 357.3 m³ from pond
Tues May 21	- Pro Aqua on-site for injecting aeration cells with acid to clean air diffusers - Wessuc on-site cleaning primary & secondary digesters - Wessuc hauling sludge from biosolids tank - Troubleshoot/cleaned filters - Returned 516.6 m³ from pond
Wed May 22	- Wessuc on-site cleaning primary digester - Wessuc hauling sludge from biosolids tank - Troubleshoot/cleaned filters - Returned 635.1 m³ from pond
Thurs May 23	- Brad Hoover on-site, follow up, made recommendations - Troubleshoot/cleaned filters - Wessuc hauling sludge from biosolids tank - Returned 426.2 m³ from pond
Fri May 24	- Troubleshoot/cleaned filters

	- Returned 603.2 m ³ from pond
Sat May 25	- Returned 220.3 m ³ from pond
Sun May 26	- Returned 158.8m ³ from pond
Mon May 27	- Troubleshoot/cleaned filters - Cleaned UV/Filter channels. Replaced lamps/sleeves - Sent 123.4 m ³ to pond
Tues May 28	- Troubleshoot/cleaned filters - Sent 91.8 m ³ to pond
Wed May 29	- Troubleshoot/cleaned filters - Filter 2 replaced sensor - Returned 112.0m ³ from pond
Thurs May 30	- Troubleshoot/cleaned filters - Returned 380.0m ³ from pond
Fri May 31	- Troubleshoot/cleaned filters - Returned 952.6m ³ from pond
Sat June 1	- Returned 1746.8m ³ from pond
Sun June 2	- Returned 1314.5m ³ from pond
Mon June 3	- Troubleshoot/cleaned filters - Pumped out north aeration to south aeration - Returned 678.6m ³ from pond
Tues June 4	- Troubleshoot/cleaned filters - Pumped out north aeration to south aeration - Returned 81.3m ³ from pond
Wed June 5	- Troubleshoot/cleaned filters - Wessuc on-site cleaning north aeration cells - Sent 89.7 m ³ to pond
Thurs June 6	- Troubleshoot/cleaned filters - Wessuc on-site cleaning north aeration cells - Wessuc on-site hauling sludge from north aeration cells - Returned 219.9m ³ from pond
Fri June 7	- Troubleshoot/cleaned filters - Wessuc on-site cleaning north aeration cells - Returned 351m ³ from pond
Sat June 8	- Returned 286.4m ³ from pond
Sun June 9	- Returned 472.8m ³ from pond
Mon June 10	- Troubleshoot/cleaned filters - Returned 396.9m ³ from pond
Tues June 11	- Troubleshoot/cleaned filters - Pro-Aqua on-site changing diffusers in north aeration - Returned 461.7m ³ from pond
Wed June 12	- Troubleshoot/cleaned filters - Brad Hoover on-site for recommendations - Returned 361.8m ³ from pond
Thurs June 13	- Troubleshoot/cleaned filters - Belwood replaced fuse on blower #4 - Returned 256.8m ³ from pond
Fri June 14	- Troubleshoot/cleaned filters

	- Pumped out south aeration cells to north aeration cells - Sent 649.0 m³ to pond
Sat June 15	- Pumped out south aeration cells to north aeration cells - Sent 954.3 m³ to pond
Sun June 16	- Pumped out south aeration cells to north aeration cells - Belwood replaced fuse on blower #1 - Sent 1085.3 m³ to pond
Mon June 17	- Troubleshoot/cleaned filters - Returned 370.8m³ from pond
Tues June 18	- Wessuc on-site cleaning south aeration cells - Returned 587.36m³ from pond
Wed June 19	- Wessuc on-site cleaning south aeration cells - Returned 306.3m³ from pond
Thurs June 20	- Wessuc on-site cleaning south aeration cells - Troubleshoot/cleaned filters - Returned 228.3m³ from pond
Fri June 21	- Troubleshoot/cleaned filters - Returned 260.2m³ from pond
Sat June 22	- Returned 328.2m³ from pond
Sun June 23	- Returned 350.8m³ from pond
Mon June 24	- Troubleshoot/cleaned filters - Returned 311.4m³ from pond
Tues June 25	- Returned 383.6m³ from pond
Wed June 26	- Cleaned out south aeration cells - Returned 438.5m³ from pond
Thurs June 27	- Troubleshoot/cleaned filters - Pro-Aqua on-site changing diffusers in south aeration cells - Returned 346.3m³ from pond
Fri June 28	- Began filling south aeration - Kyle Foster dropped of bin for cleaning primary digester on Tues - Returned 427.5m³ from pond
Sat June 29	- Returned 884.6m³ from pond
Sun June 30	- Returned 788.4m³ from pond
Mon July 1	- Returned 537.1m³ from pond
Tues July 2	- Kyle Foster on-site to clean primary digester - Returned 689.6m³ from pond