

Prescott Wastewater System

Sewage Works # 110001122

Annual Report

Prepared for: Town of Prescott

Reporting Period of January 1st – December 31st 2021

Issued: March 14, 2022

Revision: 0

Operating Authority:



This report has been prepared to meet the requirements of ECA #6996-9ZYNWH

Table of Contents

| | |
|---|-----------|
| Annual Report | 1 |
| Operations and Compliance Reliability Indices | 1 |
| System Process Description..... | 1 |
| Flows..... | 2 |
| Raw Flows | 2 |
| Effluent Flow..... | 3 |
| Effluent Quality Assurance or Control Measures | 3 |
| Effluent Quality | 4 |
| Carbonaceous Biochemical Oxygen Demand (5-Day) | 4 |
| Total Suspended Solids..... | 5 |
| Total Phosphorus..... | 6 |
| Total Ammonia Nitrogen | 7 |
| pH..... | 8 |
| E. Coli | 8 |
| Acute Lethality..... | 9 |
| Operating Issues | 9 |
| Maintenance | 9 |
| Flow Meter Calibration and Maintenance | 9 |
| Maintenance Summary | 9 |
| Notice of Modifications | 9 |
| Sludge Generation | 10 |
| Summary of Complaints..... | 10 |
| Summary of Abnormal Discharge Events..... | 10 |
| Bypass/Overflow..... | 10 |
| Spills..... | 10 |
| Performance Assessment Reports..... | A |
| Flow Meter Calibration Reports | B |

Operations and Compliance Reliability Indices

| Compliance Event | # of Events |
|-------------------------------------|-------------|
| Ministry of Environment Inspections | 0 |
| Ministry of Labour Inspections | 0 |
| Non-Compliance | 0 |
| Spills/Bypasses/Overflows | 0 |
| Sewer Main Blockages | 0 |

System Process Description

Prescott's sewage collection system is a gravity fed collection system consisting of combined sanitary and storm sewers. Five pumping stations pump wastewater from the collection system to the wastewater treatment facility.

Prescott's wastewater treatment plant is a Class III treatment facility. Raw sewage is pumped to the facility from an onsite pumping station (SPS #6), which is equipped with an influent bar screen and three dry well pumps. Wastewater passes through the inlet headworks where solids are removed using a mechanical rotary screen and conveyor. Grit is then removed using two parallel vortex grit separators. Aluminum sulphate is injected downstream of the grit separators to assist in phosphorous removal. The wastewater then enters three parallel, continuous-flow Sequencing Batch Reactors (SBRs) which operate with automated cycles (air off, air on, settle, and decant). Each SBR is equipped with a fine bubble aeration system, submersible mixer, variable speed effluent decanter and sludge removal pump. Effluent decanted from the SBRs enters an equalization tank where a pinch valve acts to ensure consistent flow through the UV disinfection system. The UV disinfection system consists of one channel with two units, one duty and one standby. Following disinfection, the effluent passes through an outfall chamber where grey water is recovered for plant processes before discharging to the St. Lawrence River.

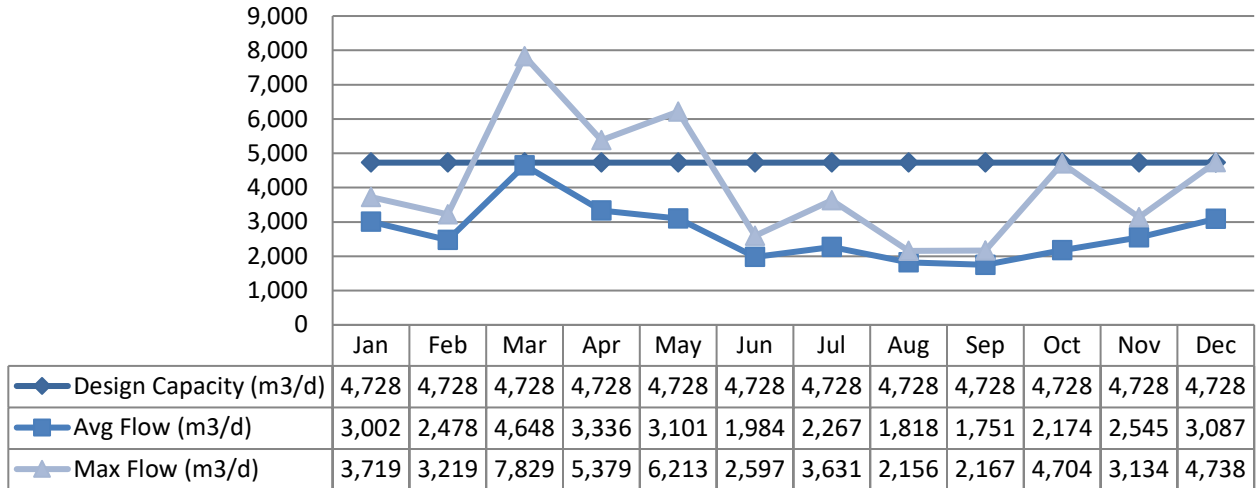
Activated sludge which has been removed from the SBRs is pumped to a two-stage aerobic digester equipped with a coarse bubble aeration system and manual decant arms. Activated sludge is stabilized (or digested) and dewatered, with the supernatant returning to the plant headworks. Digested sludge is then pumped to one of two large holding tanks, each equipped with a coarse bubble aeration system and manual decant arm, where further dewatering occurs. From the holding tanks, liquid sludge can be pumped to one of two large drying beds or hauled offsite for land application.

Flows

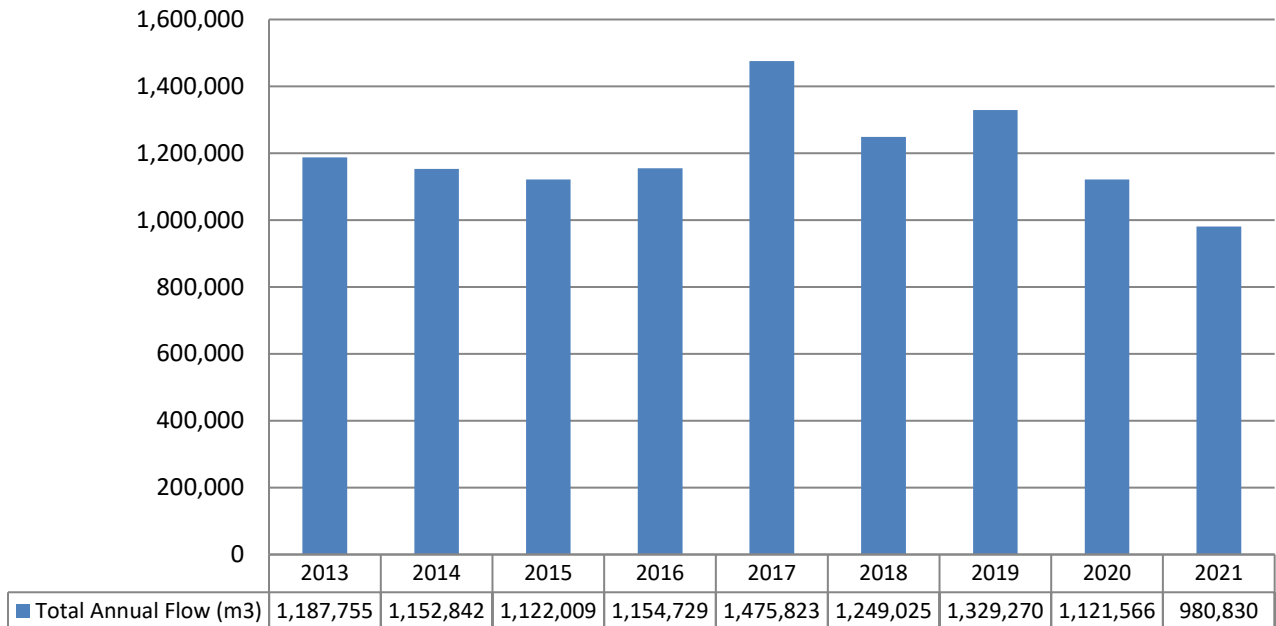
The hydraulic flows reaching the treatment facility in 2021 averaged 2682 m³/day which represents 57% of the 4,728 m³/day design.

Raw Flows

2021 Raw Flows:



Annual Raw Flow Comparison:



Effluent Flow

A total of 1,003,648 m³ of effluent was discharged from Prescott's wastewater treatment facility in 2021. Please refer to the Performance Assessment Reports in Appendix A for details.

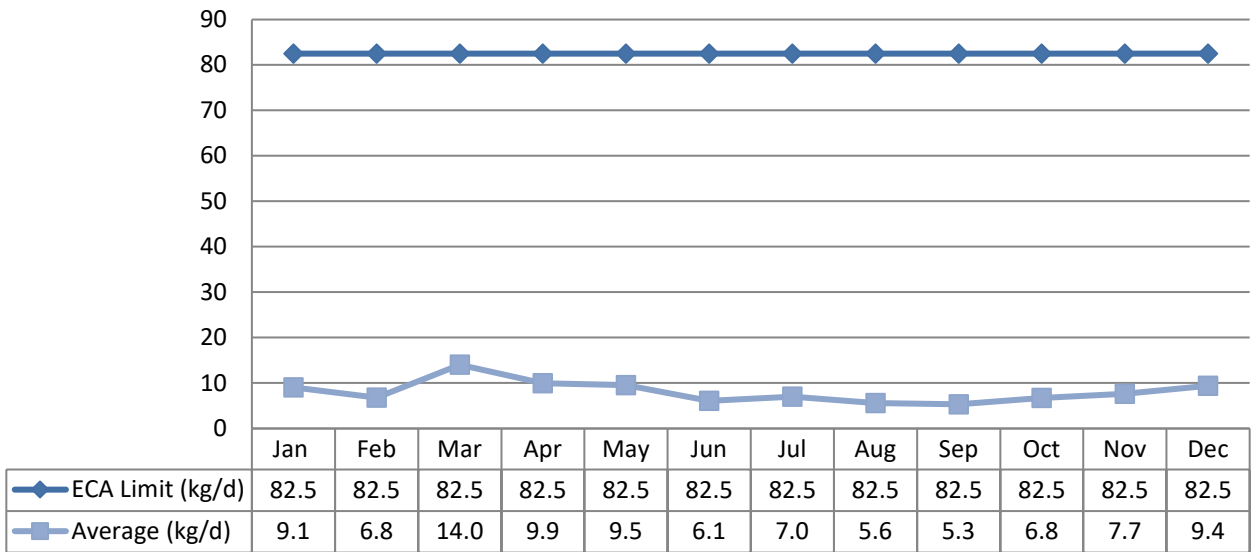
Effluent Quality Assurance or Control Measures

Effluent control measures include in-house sampling and testing for operational parameters. In-house testing provides real time results which are used to enhance process and operational performance. Samples are collected by OCWA's competent and licensed staff using approved methods and protocols for sampling including those specified in the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", the Ministry's publication, "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the publication, "Standard Methods for the Examination of Water and Wastewater".

Effluent samples collected during the reporting period were submitted to Caduceon in Kingston for analysis, with the exception of pH, temperature and un-ionized ammonia. Caduceon is accredited by the Canadian Association for Laboratory Accreditation (CALA). Accredited labs must meet strict provincial guidelines including an extensive quality assurance/quality control program. By choosing this laboratory, OCWA is ensuring appropriate control measures are undertaken during sample analysis.

The pH and temperature parameters were analyzed in the field at the time of sample collection by certified operators to ensure accuracy and precision of the results obtained. Un-ionized ammonia was calculated using the total ammonia nitrogen concentration, pH and temperature as required by the facility's ECA.

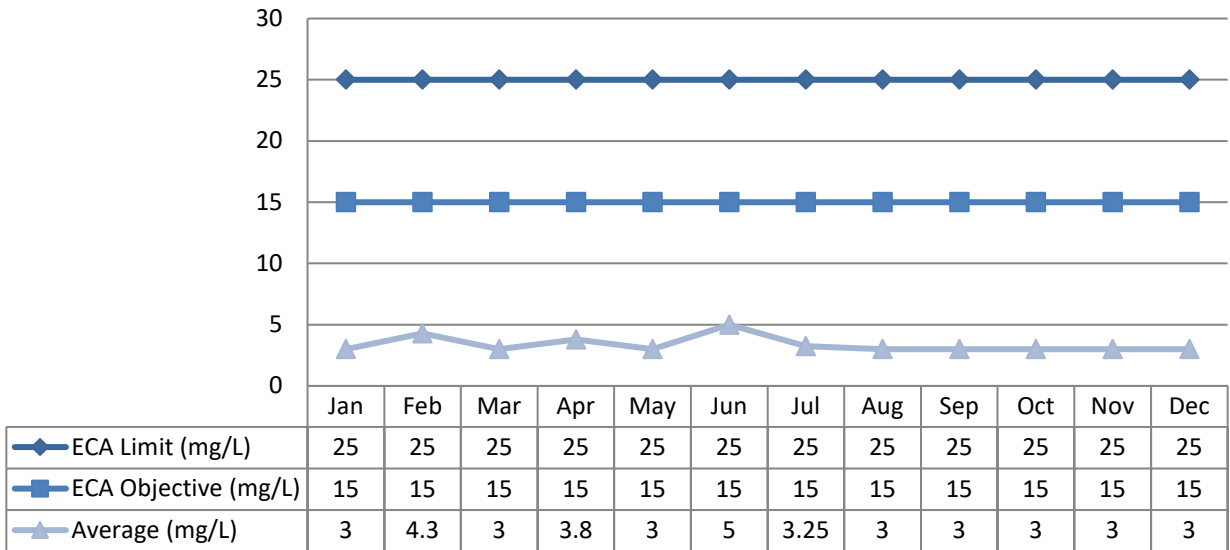
CBOD₅ Monthly Average Loading:



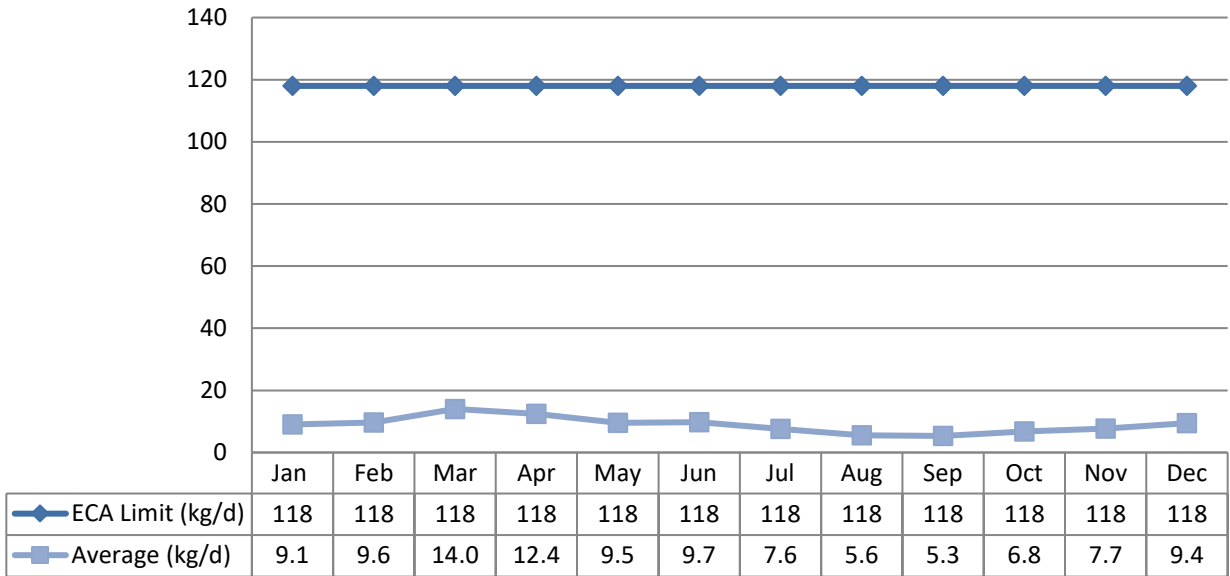
Total Suspended Solids

| Monthly Average | ECA Limit | ECA Objective | Exceedance |
|----------------------|-----------|---------------|------------|
| Concentration (mg/L) | 25 | 15 | No |
| Loading (kg/d) | 118 | - | No |

TSS Effluent Monthly Average Concentrations:



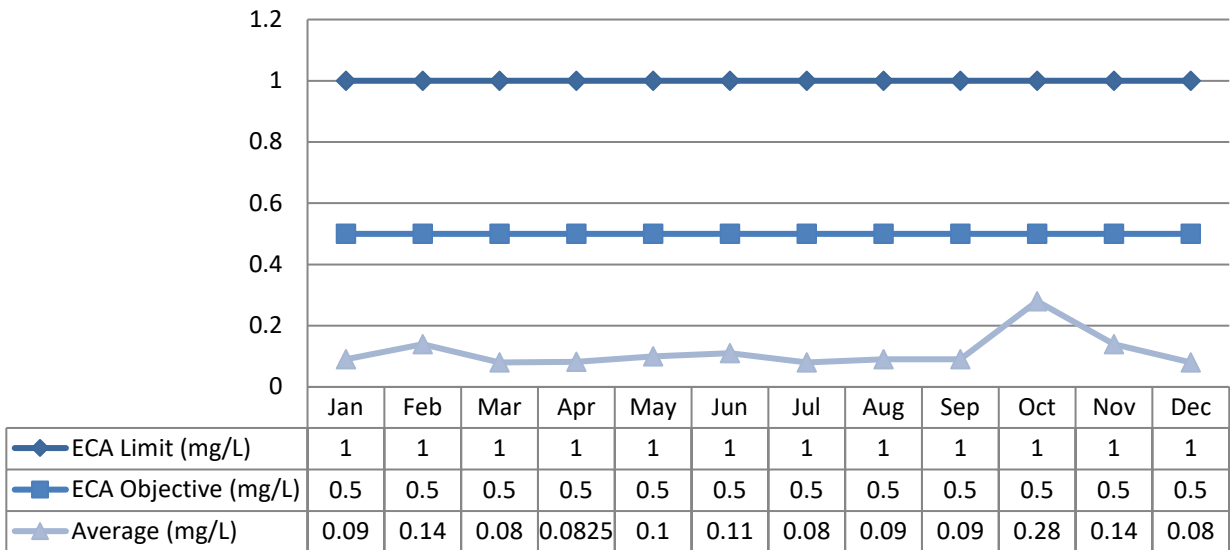
TSS Monthly Average Loading:



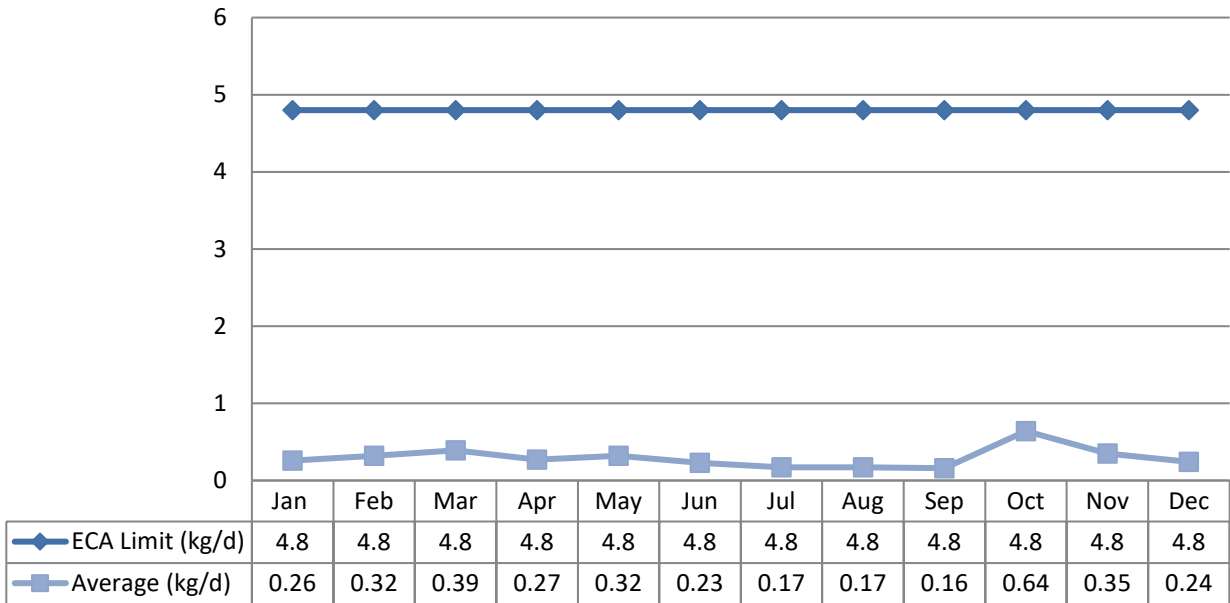
Total Phosphorus

| Monthly Average | ECA Limit | ECA Objective | Exceedance |
|----------------------|-----------|---------------|------------|
| Concentration (mg/L) | 1.0 | 0.5 | No |
| Loading (kg/d) | 4.8 | - | No |

TP Effluent Monthly Average Concentrations:



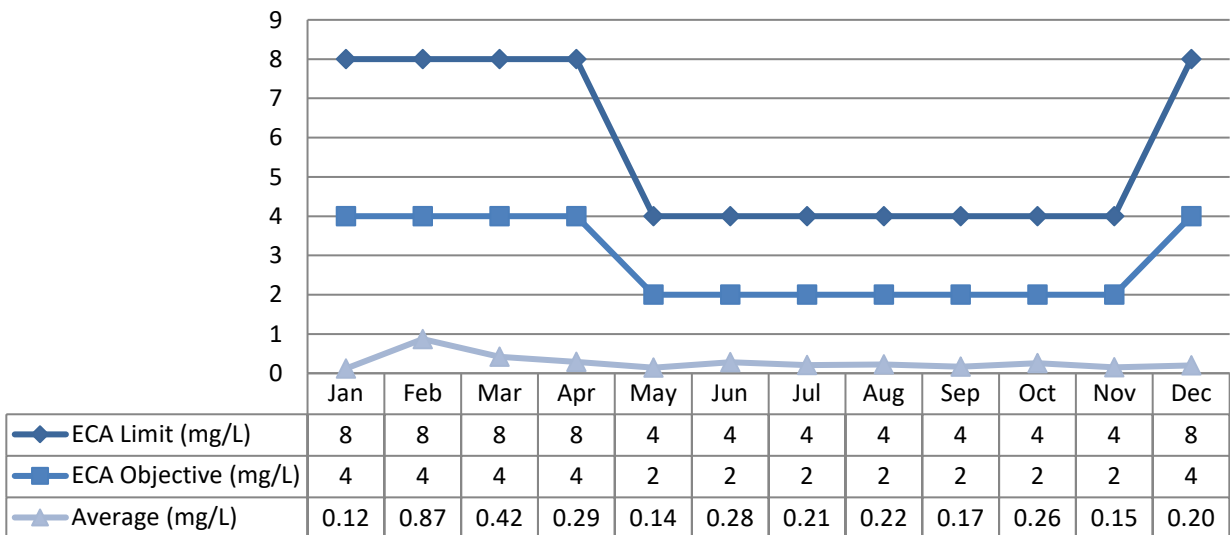
TP Monthly Average Loading:



Total Ammonia Nitrogen

| Discharge Period | ECA Limit | ECA Objective | Exceedance |
|------------------|-----------|---------------|------------|
| May 1 – Nov 30 | 4.0 | 2.0 | No |
| Dec 1 – April 30 | 8.0 | 4.0 | No |

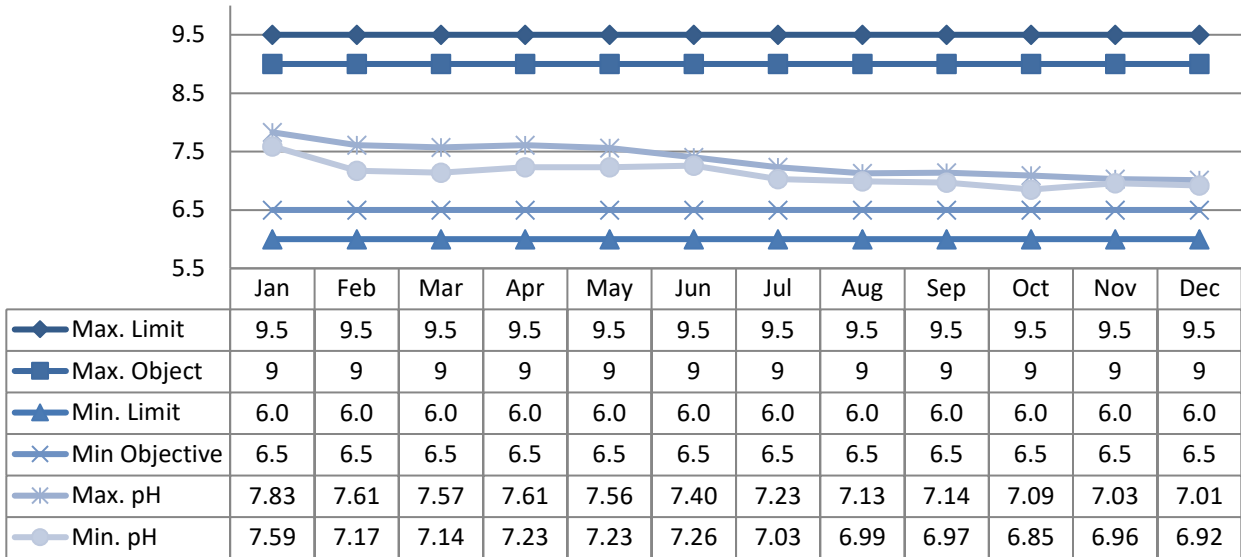
TAN Effluent Monthly Average Concentrations:



pH

| Reporting Period | ECA Limit | ECA Objective | Exceedance |
|------------------|-----------|---------------|------------|
| All results | 6.0 – 9.5 | 6.5 – 9.0 | No |

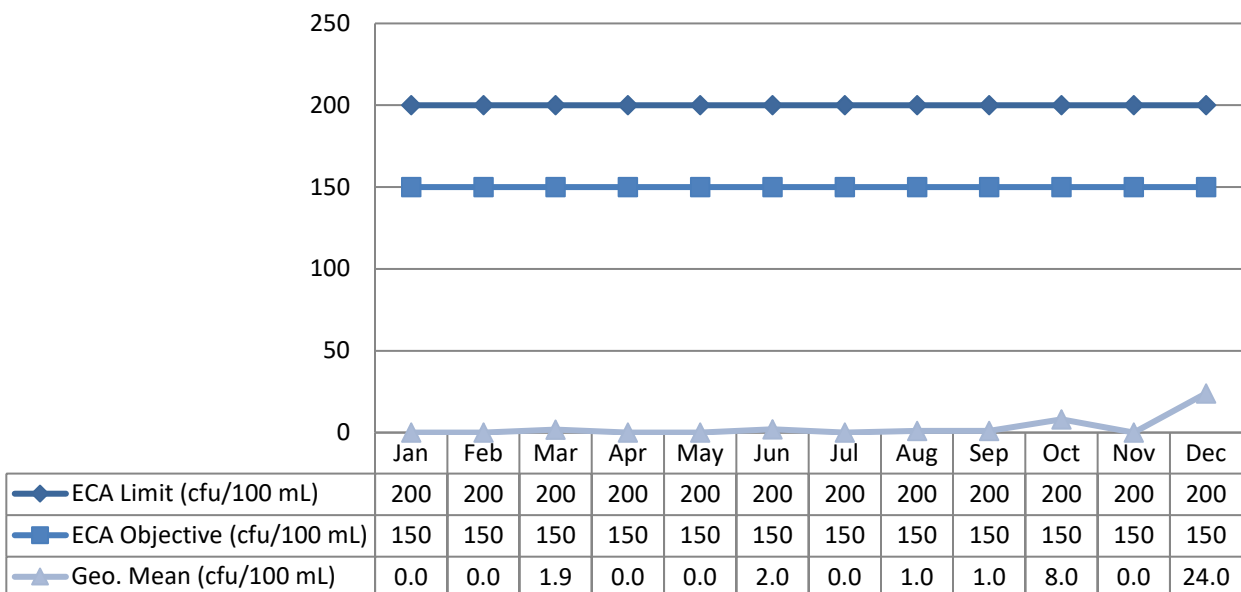
Monthly Minimum and Maximum pH Results:



E. Coli

| Monthly Average | ECA Limit | ECA Objective | Exceedance |
|--------------------------------------|-----------|---------------|------------|
| Geometric Mean Density (cfu/ 100 mL) | 200 | 150 | No |

E. Coli Monthly Geometric Mean Density (cfu/100 mL):



Acute Lethality

One sample was collected in 2021 and tested for acute lethality to Rainbow Trout and Daphnia Magna. Results are displayed as % mortality. An adverse result is indicated by a > 50% mortality rate.

| Date | Rainbow Trout | Daphnia Magna |
|------------|---------------|---------------|
| 21-07-2021 | 10% | 3.3% |

Operating Issues

No operational challenges noted in 2021.

Maintenance

Flow Meter Calibration and Maintenance

Copies of the flow meter calibration certificates for 2021 are attached in Appendix B.

Maintenance Summary

| Description |
|--|
| - Composite Sampler Heater |
| - SBR #2 Inspection / Air Diffuser Replacement |
| - SBR #2 Mixer Rebuild |
| - Auger Monster Repairs - Auger & Brush Replacement |
| - Diffuser Inspection, Repair in Digester #1 |
| - Grey Water System Repair |
| - Hazardous Gas Detector Repair |
| - Decant Arm #2 Rebuild |
| - Grit Sump Pump Replaced |
| - Rebuild Pump #2 Aerobic Biosolids |
| - Ultraviolet Components |
| - Effluent Pipe Divers Inspection |
| - SBR Blower Rebuild |
| - VFD Installation on Digester Blowers |
| - Pump #4 @ Sewage Pumping Station # 6 Rebuild |
| - New Pump #3 @ Sewage Pumping Station Boundary St. |
| - Pressure Level Sensor Replacement at Sewage Pumping Stations |
| - Flat Roof Repair Sewage Pumping Station #5 |
| - Debris Removed from South Drying Bed |
| - Substation Sprayed for Vegetation Removal |

Notice of Modifications

| Date | Process | Modification | Status |
|-----------------|---------|--------------|--------|
| None to report. | | | |

Sludge Generation

In 2021, a total of 4,720m³ of liquid bio-solids was hauled offsite by Terrapure Environmental and utilized as soil conditioner. Of this, 440 m³ was hauled to a processing facility in May, and 2000 m³ was spread in May (NASM Submission ID #23731). In the fall, 520 m³ was hauled to a processing facility and 1760m³ was spread in October (NASM Submission ID #22432). It is anticipated that approximately the same volume of sludge will be generated in 2022.

Summary of Complaints

| Location | Date | Nature of Complaint | Actions Taken |
|--|------|---------------------|---------------|
| No complaints were documented during the reporting period. | | | |

Summary of Abnormal Discharge Events

Bypass/Overflow

No overflows occurred in 2021.

| Date | Location | Duration (hh:mm) | Estimated Volume (m3) | SAC Ref. # | Details |
|-----------------|----------|------------------|-----------------------|------------|---------|
| None to report. | | | | | |

Spills

None to report.

Appendix A

Performance Assessment Reports

ONTARIO CLEAN WATER AGENCY PERFORMANCE ASSESSMENT REPORT

OWNER: TOWN OF PRESCOTT
 PROJECT: PRESCOTT WWTP
 WORKS NUM.: 110001122
 DESCRIPTION: THREE SEQUENTIAL BATCH REACTORS AND AEROBIC SLUDGE DIGESTION

YEAR: 2021
 WATER COURSE: ST. LAWRENCE
 DESIGN CAPACITY: 4,728 m³/d

| MONTH | RAW | | | TREATED | | | RAW | | | | SLUDGE | | |
|------------|------------------------------|--------------------------------|-----------------------------------|---------------------------------|-------------------------------------|--|-----------------------|-----------------------|-------------------------|------------------------|---|--|-------------------------------------|
| | Total Flow m ³ | Avg Day Flow m ³ | Max Day Flow m ³ /d | Effluent Flow m ³ | Effluent Avg Flow m ³ | Effluent Max Flow m ³ /d | Avg Raw BOD (mg/L) | Avg Raw TSS (mg/L) | Avg Raw PHOS. (mg/L) | Avg. Raw TKN (mg/L) | Sludge to Drying Beds m ³ | Liquid Sludge Hauled m ³ | Dry Sludge Hauled m ³ |
| JAN | 93,065 | 3,002 | 3,719 | 93,670 | 3,022 | 3,739 | 312 | 760 | 10.70 | 54.6 | | | |
| FEB | 69,376 | 2,478 | 3,219 | 70,148 | 2,505 | 3,249 | 283 | 550 | 8.80 | 51.2 | | | |
| MAR | 144,078 | 4,648 | 7,829 | 144,882 | 4,674 | 8,109 | 161 | 310 | 4.40 | 28.5 | | | |
| APR | 100,085 | 3,336 | 5,379 | 102,603 | 3,420 | 5,400 | 157 | 500 | 5.57 | 27.5 | | | |
| MAY | 96,129 | 3,101 | 6,213 | 98,546 | 3,179 | 6,164 | 67 | 135 | 2.10 | 15.9 | | 2440 | |
| JUN | 59,522 | 1,984 | 2,597 | 62,908 | 2,097 | 2,632 | 237 | 565 | 5.44 | 37.8 | | | |
| JUL | 70,267 | 2,267 | 3,631 | 72,192 | 2,329 | 4,122 | 205 | 490 | 5.40 | 35.9 | | | |
| AUG | 56,358 | 1,818 | 2,156 | 57,670 | 1,860 | 2,084 | 73 | 52 | 2.22 | 23.6 | | | |
| SEPT | 52,537 | 1,751 | 2,167 | 55,032 | 1,834 | 2,385 | 208 | 630 | 8.83 | 40.6 | | | |
| OCT | 67,387 | 2,174 | 4,704 | 69,780 | 2,251 | 4,492 | 145 | 432 | 3.50 | 27.5 | | 2280 | |
| NOV | 76,336 | 2,545 | 3,134 | 79,110 | 2,637 | 3,194 | 49 | 40 | 1.79 | 20.3 | | | |
| DEC | 95,691 | 3,087 | 4,738 | 97,107 | 3,132 | 4,922 | 32 | 44 | 0.91 | 12.4 | | | |
| TOTAL | 980,830 | | | 1,003,648 | | | | | | | 0 | 4720 | 0 |
| AVG | | 2,682 | | | 2,745 | | 161 | 376 | 4.97 | 31 | | | |
| MAX | | | 7,829 | | | 8,109 | | | | | | | |
| CRITERIA | | 4,728 | 16,000 | | | | | | | | | | |
| COMPLIANCE | | YES | YES | | | | | | | | | | |

Comments: Average raw BOD, TP and TSS based on 24hr composite sample results

2021 - PRESCOTT WWTP EFFLUENT SAMPLING MONTHLY AVERAGES

| MONTH | DATE | CBOD ₅ (mg/L) | TSS (mg/L) | TP (mg/L) | NH ₃ (mg/L) | E. Coll (CFU/100ml) | | |
|-----------------|-----------------|--------------------------|------------|-----------|------------------------|---------------------|------|--|
| January | 05-Jan-21 | < | 3 | < | 0.05 | 0.1 | 0 | |
| | 12-Jan-21 | < | 3 | < | 0.05 | 0.08 | 2 | |
| | 19-Jan-21 | < | 3 | < | 0.14 | 0.18 | 44 | |
| | 25-Jan-21 | < | 3 | < | 0.1 | 0.08 | 3 | |
| | Monthly Average | 3 | 3 | 0.09 | 0.12 | 0 | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| February | 02-Feb-21 | < | 3 | 5 | 0.24 | 0.49 | 1 | |
| | 09-Feb-21 | < | 3 | 4 | 0.1 | 0.08 | 9 | |
| | 17-Feb-21 | < | 3 | 5 | 0.14 | 0.41 | 11 | |
| | 23-Feb-21 | < | 3 | 3 | 0.09 | 2.49 | 0 | |
| | Monthly Average | 3.0 | 4.3 | 0.14 | 0.87 | 0 | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| March | 03/02/21 | < | 3 | 3 | 0.12 | 0.14 | 2 | |
| | 03/09/21 | < | 3 | < | 0.1 | 0.09 | 4 | |
| | 03/16/21 | < | 3 | 3 | 0.06 | 1.34 | 3 | |
| | 03/23/21 | < | 3 | < | 0.07 | 0.29 | 1 | |
| | 03/30/21 | < | 3 | < | 0.07 | 0.25 | 1 | |
| Monthly Average | 3.0 | 3.0 | 0.08 | 0.42 | 1.89 | | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| April | 04/06/21 | < | 3 | 5 | 0.07 | 0.3 | 12 | |
| | 04/13/21 | < | 3 | 4 | 0.1 | 0.56 | 0 | |
| | 04/20/21 | < | 3 | < | 0.07 | 0.13 | 0 | |
| | 04/27/21 | < | 3 | < | 0.09 | 0.15 | 0 | |
| | Monthly Average | 3 | 3.8 | 0.0825 | 0.29 | 0 | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| May | 04-May-21 | < | 3 | 3 | 0.07 | 0.13 | 0 | |
| | 11-May-21 | < | 3 | 3 | 0.09 | 0.11 | 5 | |
| | 18-May-21 | < | 3 | 3 | 0.12 | 0.12 | 0 | |
| | 25-May-21 | < | 3 | < | 0.12 | 0.18 | 0 | |
| | Monthly Average | 3 | 3.00 | 0.10 | 0.14 | 0 | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| June | 01-Jun-21 | < | 3 | < | 0.12 | 0.21 | 0 | |
| | 08-Jun-21 | < | 3 | < | 0.12 | 0.18 | 1 | |
| | 15-Jun-21 | < | 3 | 3 | 0.10 | 0.34 | 1700 | |
| | 22-Jun-21 | < | 3 | 5 | 0.11 | 0.47 | 9 | |
| | 29-Jun-21 | < | 3 | 10 | 0.12 | 0.2 | 165 | |
| Monthly Average | 3 | 5 | 0.11 | 0.28 | 1.98 | | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| July | 07-Jul-21 | < | 3 | < | 0.07 | 0.18 | 250 | |
| | 13-Jul-21 | < | 3 | 4 | 0.1 | 0.35 | 1 | |
| | 20-Jul-21 | < | 3 | < | 0.07 | 0.17 | 0 | |
| | 27-Jul-21 | < | 3 | 3 | 0.06 | 0.13 | 0 | |
| | Monthly Average | 3 | 3.25 | 0.08 | 0.21 | 0 | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| August | 03-Aug-21 | < | 3 | 3 | 0.1 | 0.13 | 0 | |
| | 10-Aug-21 | < | 3 | < | 0.07 | 0.13 | 16 | |
| | 17-Aug-21 | < | 3 | < | 0.08 | 0.36 | 2 | |
| | 24-Aug-21 | < | 3 | < | 0.1 | 0.25 | 28 | |
| | 31-Aug-21 | < | 3 | < | 0.1 | 0.23 | 7 | |
| Monthly Average | 3 | 3.00 | 0.09 | 0.22 | 1 | | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| September | 07-Sep-21 | < | 3 | < | 0.09 | 0.14 | 62 | |
| | 14-Sep-21 | < | 3 | < | 0.09 | 0.15 | 15 | |
| | 21-Sep-21 | < | 3 | 3 | 0.09 | 0.21 | 6 | |
| | 28-Sep-21 | < | 3 | 3 | 0.1 | 0.17 | 0 | |
| | Monthly Average | 3 | 3 | 0.09 | 0.17 | 1 | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| October | 05-Oct-21 | < | 3 | < | 0.14 | 0.2 | 64 | |
| | 12-Oct-21 | < | 3 | < | 0.21 | 0.19 | 1 | |
| | 19-Oct-21 | < | 3 | 3 | 0.5 | 0.47 | 1 | |
| | 26-Oct-21 | < | 3 | < | 0.28 | 0.18 | 65 | |
| | Monthly Average | 3.0 | 3.0 | 0.28 | 0.26 | 8 | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| November | 02-Nov-21 | < | 3 | < | 0.16 | 0.31 | 2 | |
| | 09-Nov-21 | < | 3 | < | 0.16 | 0.14 | 2 | |
| | 16-Nov-21 | < | 3 | < | 0.12 | 0.14 | 0 | |
| | 23-Nov-21 | < | 3 | < | 0.13 | 0.11 | 18 | |
| | 30-Nov-21 | < | 3 | < | 0.11 | 0.07 | 25 | |
| Monthly Average | 3 | 3 | 0.14 | 0.15 | 0 | | | |
| Compliant? | YES | YES | YES | YES | YES | | | |
| December | 07-Dec-21 | < | 3 | < | 0.08 | 0.1 | 92 | |
| | 14-Dec-21 | < | 3 | 3 | 0.08 | 0.18 | 24 | |
| | 21-Dec-21 | < | 3 | 3 | 0.08 | 0.12 | 20 | |
| | 29-Dec-21 | < | 3 | < | 0.07 | 0.4 | 8 | |
| | Monthly Average | 3.0 | 3 | 0.08 | 0.20 | 24 | | |
| Compliant? | YES | YES | YES | YES | YES | | | |

2021 - PRESCOTT WWTP LOADING CALCULATIONS

| MONTH | Total Effluent Flow (m ³) | | CBOD ₅ | TSS | TP | NH ₃ |
|-----------|---------------------------------------|------------------------|-------------------|-------|-------|-----------------|
| January | 93,670 | Monthly Average (mg/L) | 3.0 | 3.0 | 0.085 | 0.12 |
| | | Loading (kg/d) | 9.06 | 9.06 | 0.26 | 0.36 |
| | | Compliant? | YES | YES | YES | YES |
| February | 70,148 | Monthly Average (mg/L) | 3.00 | 4.3 | 0.14 | 0.87 |
| | | Loading (kg/d) | 6.79 | 9.62 | 0.32 | 1.96 |
| | | Compliant? | YES | YES | YES | YES |
| March | 144,882 | Monthly Average (mg/L) | 3.0 | 3.0 | 0.08 | 0.42 |
| | | Loading (kg/d) | 14.02 | 14.02 | 0.39 | 1.97 |
| | | Compliant? | YES | YES | YES | YES |
| April | 102,603 | Monthly Average (mg/L) | 3.0 | 3.75 | 0.08 | 0.29 |
| | | Loading (kg/d) | 9.93 | 12.41 | 0.27 | 0.94 |
| | | Compliant? | YES | YES | YES | YES |
| May | 98,546 | Monthly Average (mg/L) | 3.0 | 3 | 0.10 | 0.14 |
| | | Loading (kg/d) | 9.54 | 9.54 | 0.32 | 0.43 |
| | | Compliant? | YES | YES | YES | YES |
| June | 62,908 | Monthly Average (mg/L) | 3.0 | 4.8 | 0.11 | 0.28 |
| | | Loading (kg/d) | 6.09 | 9.74 | 0.23 | 0.57 |
| | | Compliant? | YES | YES | YES | YES |
| July | 72,192 | Monthly Average (mg/L) | 3.0 | 3.3 | 0.08 | 0.21 |
| | | Loading (kg/d) | 6.99 | 7.57 | 0.17 | 0.48 |
| | | Compliant? | YES | YES | YES | YES |
| August | 57,670 | Monthly Average (mg/L) | 3.0 | 3.0 | 0.09 | 0.22 |
| | | Loading (kg/d) | 5.58 | 5.58 | 0.17 | 0.41 |
| | | Compliant? | YES | YES | YES | YES |
| September | 55,032 | Monthly Average (mg/L) | 3.0 | 3 | 0.09 | 0.17 |
| | | Loading (kg/d) | 5.33 | 5.33 | 0.16 | 0.30 |
| | | Compliant? | YES | YES | YES | YES |
| October | 69,780 | Monthly Average (mg/L) | 3.0 | 3.0 | 0.28 | 0.26 |
| | | Loading (kg/d) | 6.75 | 6.75 | 0.64 | 0.59 |
| | | Compliant? | YES | YES | YES | YES |
| November | 79,110 | Monthly Average (mg/L) | 3 | 3.0 | 0.14 | 0.15 |
| | | Loading (kg/d) | 7.66 | 7.66 | 0.35 | 0.39 |
| | | Compliant? | YES | YES | YES | YES |
| December | 97,107 | Monthly Average (mg/L) | 3.0 | 3.0 | 0.08 | 0.20 |
| | | Loading (kg/d) | 9.40 | 9.40 | 0.24 | 0.63 |
| | | Compliant? | YES | YES | YES | YES |

2021 - PRESCOTT WWTP EFFLUENT UN-IONIZED AMMONIA

| Sample Date | Sample Temperature ° C | Sample Temp. Kelvin | Dissociation Constant pK _a | Effluent Sample pH on-site | Fraction of Un-ionized Ammonia | Total Ammonia (mg/L) (NH ₃ + NH ₄ as N) | Un-ionized Ammonia (mg/L) |
|-------------|------------------------|---------------------|---------------------------------------|----------------------------|--------------------------------|---|---------------------------|
| 01/05/2021 | 9.9 | 283.02 | 9.74 | 7.67 | 0.0085 | 0.1 | 0.00119 |
| 01/12/2021 | 9.9 | 283.02 | 9.74 | 7.66 | 0.0083 | 0.08 | 0.00067 |
| 01/19/2021 | 9.2 | 282.37 | 9.76 | 7.59 | 0.0067 | 0.18 | 0.00121 |
| 01/25/2021 | 8.5 | 281.66 | 9.78 | 7.83 | 0.0110 | 0.08 | 0.00088 |
| 02/02/2021 | 7.2 | 280.32 | 9.83 | 7.61 | 0.0060 | 0.49 | 0.00294 |
| 02/09/2021 | 8.9 | 282.05 | 9.77 | 7.17 | 0.0025 | 0.08 | 0.00020 |
| 02/17/2021 | 8.4 | 281.55 | 9.79 | 7.17 | 0.0024 | 0.41 | 0.00099 |
| 02/23/2021 | 13.7 | 286.85 | 9.61 | 7.18 | 0.0037 | 2.49 | 0.00928 |
| 03/02/2021 | 13.5 | 286.65 | 9.61 | 7.14 | 0.0033 | 0.14 | 0.00047 |
| 03/09/2021 | 15.8 | 288.95 | 9.54 | 7.20 | 0.0046 | 0.09 | 0.00041 |
| 03/16/2021 | 13.3 | 286.45 | 9.62 | 7.57 | 0.0088 | 1.34 | 0.01183 |
| 03/23/2021 | 8.9 | 282.05 | 9.77 | 7.31 | 0.0035 | 0.29 | 0.00100 |
| 03/30/2021 | 8.3 | 281.45 | 9.79 | 7.53 | 0.0055 | 0.25 | 0.00137 |
| 04/06/2021 | 9.0 | 282.15 | 9.77 | 7.45 | 0.0048 | 0.3 | 0.00144 |
| 04/13/2021 | 10.5 | 283.65 | 9.71 | 7.56 | 0.0070 | 0.56 | 0.00390 |
| 04/20/2021 | 13.4 | 286.55 | 9.62 | 7.23 | 0.0041 | 0.13 | 0.00053 |
| 04/27/2021 | 8.6 | 281.75 | 9.78 | 7.61 | 0.0067 | 0.15 | 0.00101 |
| 05/04/2021 | 9.1 | 282.25 | 9.76 | 7.56 | 0.0062 | 0.13 | 0.00081 |
| 05/11/2021 | 13.5 | 286.65 | 9.61 | 7.23 | 0.0041 | 0.11 | 0.00045 |
| 05/18/2021 | 13.2 | 286.35 | 9.62 | 7.42 | 0.0062 | 0.12 | 0.00075 |
| 05/25/2021 | 18.8 | 291.95 | 9.44 | 7.36 | 0.0082 | 0.18 | 0.00148 |
| 06/01/2021 | 16.0 | 289.15 | 9.53 | 7.30 | 0.0058 | 0.21 | 0.00123 |
| 06/08/2021 | 19.7 | 292.85 | 9.41 | 7.27 | 0.0072 | 0.18 | 0.00129 |
| 06/15/2021 | 18.0 | 291.15 | 9.47 | 7.26 | 0.0062 | 0.34 | 0.00210 |
| 06/22/2021 | 19.0 | 292.15 | 9.43 | 7.32 | 0.0076 | 0.47 | 0.00358 |
| 06/29/2021 | 21.7 | 294.85 | 9.35 | 7.40 | 0.0111 | 0.2 | 0.00222 |
| 07/06/2021 | 20.0 | 293.15 | 9.40 | 7.23 | 0.0067 | 0.18 | 0.00120 |
| 07/13/2021 | 20.2 | 293.35 | 9.40 | 7.03 | 0.0043 | 0.35 | 0.00150 |
| 07/20/2021 | 19.9 | 293.05 | 9.41 | 7.08 | 0.0047 | 0.17 | 0.00080 |
| 07/27/2021 | 19.8 | 292.95 | 9.41 | 7.10 | 0.0049 | 0.13 | 0.00064 |
| 08/03/2021 | 19.9 | 293.05 | 9.41 | 7.06 | 0.0045 | 0.13 | 0.00058 |
| 08/10/2021 | 21.0 | 294.15 | 9.37 | 7.10 | 0.0053 | 0.13 | 0.00069 |
| 08/17/2021 | 20.9 | 294.05 | 9.37 | 7.13 | 0.0057 | 0.36 | 0.00204 |
| 08/24/2021 | 21.8 | 294.95 | 9.35 | 7.07 | 0.0053 | 0.25 | 0.00132 |
| 08/31/2021 | 21.6 | 294.75 | 9.35 | 6.99 | 0.0043 | 0.23 | 0.00100 |
| 09/07/2021 | 19.5 | 292.65 | 9.42 | 6.97 | 0.0035 | 0.14 | 0.00050 |
| 09/14/2021 | 20.5 | 293.65 | 9.39 | 7.14 | 0.0056 | 0.15 | 0.00085 |
| 09/21/2021 | 20.1 | 293.25 | 9.40 | 7.08 | 0.0048 | 0.21 | 0.00100 |
| 09/28/2021 | 19.4 | 292.65 | 9.42 | 7.09 | 0.0046 | 0.17 | 0.00079 |
| 10/05/2021 | 18.9 | 292.05 | 9.44 | 7.09 | 0.0045 | 0.2 | 0.00089 |
| 10/12/2021 | 20.3 | 293.45 | 9.39 | 6.85 | 0.0029 | 0.19 | 0.00054 |
| 10/19/2021 | 17.4 | 290.55 | 9.49 | 6.90 | 0.0026 | 0.47 | 0.00122 |
| 10/26/2021 | 13.9 | 287.05 | 9.60 | 7.03 | 0.0027 | 0.18 | 0.00048 |
| 11/02/2021 | 14.9 | 288.05 | 9.57 | 6.95 | 0.0024 | 0.31 | 0.00075 |
| 11/09/2021 | 15.5 | 288.65 | 9.55 | 6.98 | 0.0027 | 0.14 | 0.00038 |
| 11/16/2021 | 13.6 | 286.75 | 9.61 | 6.95 | 0.0022 | 0.14 | 0.00031 |
| 11/23/2021 | 13.4 | 286.55 | 9.62 | 6.98 | 0.0023 | 0.11 | 0.00025 |
| 11/30/2021 | 11.9 | 285.05 | 9.67 | 7.03 | 0.0023 | 0.07 | 0.00016 |
| 12/07/2021 | 11.2 | 284.35 | 9.69 | 6.99 | 0.0020 | 0.1 | 0.00020 |
| 12/14/2021 | 9.9 | 283.05 | 9.73 | 7.01 | 0.0019 | 0.18 | 0.00034 |
| 12/21/2021 | 9 | 282.15 | 9.77 | 6.92 | 0.0014 | 0.12 | 0.00017 |
| 12/29/2021 | 9.6 | 282.75 | 9.75 | 7.01 | 0.0018 | 0.4 | 0.00073 |
| | | 273.15 | 10.08 | | 0.0000 | | 0.00000 |

Prescott Wastewater Treatment System – 2021 Annual Report

2021 - PRESCOTT WWTP MONTHLY AEROBIC BIOSOLIDS CONCENTRATION RATIO

| | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|-------------------|-------|-------|-------|-------|-------|---------|---------|-------|-------|-------|--------|--------|
| Ammonia | 15 | 1.585 | 8.33 | 118.6 | 10.75 | 73.3 | 224.295 | 0.335 | 0.265 | 0.08 | 21.6 | 54.0 |
| Nitrate | 0 | 0 | 0 | 1 | 0 | 0 | 0.65 | 0.1 | 0.55 | 4.40 | 0.75 | 0.15 |
| Ammonia + Nitrate | 15 | 1.7 | 8.4 | 119.1 | 10.9 | 73.4 | 224.945 | 0.435 | 0.815 | 4 | 22.4 | 54.2 |
| Total Phosphorus | 389 | 253 | 411 | 400 | 308 | 292.0 | 326.5 | 271.5 | 426 | 342 | 586 | 477 |
| Total Solids | 51300 | 22500 | 14650 | 18950 | 10075 | 14100.0 | 11750 | 11950 | 11900 | 12000 | 25000 | 19700 |
| Aluminum | 414 | 2494 | 373 | 568 | 387 | 422.0 | 415.5 | 388 | 560.5 | 495 | 776 | 1027.5 |
| Arsenic | 0.10 | 0.10 | 0.10 | 0.10 | 0.15 | 0.10 | 0.1 | 0.11 | 0.1 | 0.10 | 0.2 | 0.2 |
| Cadmium | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| Chromium | 0.46 | 0.27 | 0.33 | 0.50 | 0.42 | 0.39 | 0.375 | 0.38 | 0.56 | 0.42 | 0.805 | 0.885 |
| Cobalt | 0.04 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.045 | 0.03 | 0.045 | 0.04 | 0.07 | 0.075 |
| Copper | 5.25 | 3.58 | 4.02 | 6.21 | 4.21 | 4.55 | 4.45 | 4.26 | 5.355 | 5 | 10.175 | 11.55 |
| Lead | 0.50 | 0.35 | 0.30 | 0.50 | 0.30 | 0.40 | 0.35 | 0.35 | 0.4 | 0.35 | 0.7 | 0.75 |
| Mercury | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.004 | 0.007 | 0.008 | 0.01 | 0.0145 | 0.01 |
| Molybdenum | 0.12 | 0.09 | 0.09 | 0.14 | 0.10 | 0.10 | 0.095 | 0.085 | 0.14 | 0.11 | 0.24 | 0.28 |
| Nickel | 0.29 | 0.20 | 0.24 | 0.31 | 0.26 | 0.27 | 0.275 | 0.295 | 0.355 | 0.30 | 0.605 | 0.655 |
| Selenium | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.1 | 0.1 | 0.1 | 0.10 | 0.15 | 0.1 |
| Zinc | 5.93 | 4.54 | 3.87 | 6.37 | 4.62 | 4.32 | 4.355 | 4.22 | 5.485 | 5.1 | 10.875 | 12.25 |

Metals ratio = mg metals/kg solids

| | Metal/Solids Ratio (Sludge) | | | | | | | | | | | | Limit |
|------------|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|-------|
| | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | |
| Arsenic | 1.95 | 4.44 | 6.83 | 5.28 | 14.89 | 7.09 | 8.51 | 9.21 | 8.40 | 8.33 | 8.00 | 10.15 | 170 |
| Cadmium | 0.58 | 1.33 | 2.05 | 1.58 | 2.98 | 2.13 | 2.55 | 2.51 | 2.52 | 2.50 | 1.20 | 1.52 | 34 |
| Chromium | 8.9 | 12.0 | 22.2 | 26.1 | 41.7 | 27.7 | 31.9 | 31.8 | 47.1 | 35.00 | 32.20 | 44.92 | 2800 |
| Cobalt | 0.68 | 1.33 | 2.05 | 1.58 | 3.47 | 2.48 | 3.83 | 2.51 | 3.78 | 2.92 | 2.80 | 3.81 | 340 |
| Copper | 102 | 159 | 274 | 327 | 417 | 323 | 379 | 356 | 450 | 405.42 | 407.00 | 586.29 | 1700 |
| Lead | 9.75 | 15.56 | 20.48 | 26.39 | 29.78 | 28.37 | 29.79 | 29.29 | 33.61 | 29.17 | 28.00 | 38.07 | 1100 |
| Mercury | 0.33 | 0.40 | 0.44 | 0.63 | 0.50 | 0.53 | 0.34 | 0.59 | 0.67 | 0.50 | 0.58 | 0.51 | 11 |
| Molybdenum | 2.34 | 3.78 | 5.80 | 7.12 | 9.93 | 6.74 | 8.09 | 7.11 | 11.76 | 9.17 | 9.60 | 14.21 | 94 |
| Nickel | 5.56 | 8.67 | 16.04 | 16.36 | 25.31 | 18.79 | 23.40 | 24.69 | 29.83 | 25.00 | 24.20 | 33.25 | 420 |
| Selenium | 1.95 | 4.44 | 6.83 | 5.28 | 9.93 | 7.09 | 8.51 | 8.37 | 8.40 | 8.33 | 6.00 | 5.08 | 34 |
| Zinc | 115 | 202 | 264 | 336 | 458 | 306 | 371 | 353 | 461 | 422.50 | 435.00 | 621.83 | 4200 |

| | | | | | | | | | | | | |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Sludge is Acceptable | TRUE | TRUE | TRUE | TRUE | TRUE | TRUE | TRUE | TRUE | TRUE | TRUE | TRUE | TRUE |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|

SOME ANALYSIS RESULTS EXPRESSED AS "<" (LESS THAN);HOWEVER, IN ORDER TO COMPLETE THE CALCULATION, ONLY THE NUMERIC VALUE WAS USED; THEREFORE THE AVG. CONC. IS GREATER THAN ACTUAL.

Appendix B

Flow Meter Calibration Reports

CapitalControls

Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

The Town of Prescott

Waste Water Treatment Plant

Verification of Instrumentation

Report April 28, 2021

Prepared For: Prescott W.W.T.P.

Calibration Date: April 27, 2021

Calibration Due: April 27, 2022

Verifications performed by: Tim Stewart

Report prepared by: Tim Stewart



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

Table of Contents

| | | |
|----------|---|---------------|
| 1 | LIST OF VERIFIED DEVICES | - 2 - |
| 2 | EQUIPMENT USED | - 3 - |
| 3 | PROCEDURES USED | - 3 - |
| 3.1 | Flowmeter Verification | - 3 - |
| 4 | INSTRUMENT VERIFICATION | - 6 - |
| 4.1 | FIT-103 Sludge Loading Flow | - 7 - |
| 4.2 | FIT-102 Supernatant Flow | - 8 - |
| 4.3 | FIT-101 RAS/WAS Flow | - 9 - |
| 4.4 | FIT-104 Sewage Influent Flow | - 10 - |
| 4.5 | FIT-301 Plant Effluent Flow | - 11 - |
| 4.6 | FIT-701 Sewage Pumping Station # 5 Flow | - 12 - |
| 5 | APPENDIX A- EQUIPMENT CALIBRATION CERTIFICATES | - 12 - |



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

1 List of Verified Devices

This letter is to confirm that annual verification on the following devices has been completed.

| ID | Process | Make/Model | Results |
|---------|------------------------|-----------------|---------|
| FIT-103 | Sludge Loading | ABB/Magmaster | Passed |
| FIT-102 | Supernatant | ABB/Magmaster | Passed |
| FIT-101 | RAS/WAS | ABB/Magmaster | Passed |
| FIT-104 | Sewage Influent | ABB/Magmaster | Passed |
| FIT-301 | Sewage Effluent | Siemens/OCM III | Passed |
| FIT-701 | Sewage Pump Station #5 | Rosemount/8712 | Passed |
| | | | |
| | | | |
| | | | |



03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

2 Equipment Used

The following equipment was used to perform the calibrations:

Fluke 725 Multifunction Process Calibrator used to measure current.
Level Simulator for the Flume Flow Meters
ABB Checkmaster for Magnetic Flow Meters
Rosemount 8714d Simulator

3 Procedures Used

To verify the equipment standard verification procedures developed by the Township were used and standard industry practice.

3.1 Flowmeter Verification

Verification, Magnetic Flow Meter:

The verification of ABB Flow measuring devices (the device under test) are checked for the following characteristic values:

1. Functionality and deviation in flow measurement.
2. Deviation in the current and frequency outputs in reference to the flow rate data determined by the measuring device.

Measuring devices: The verification system consists of the Checkmaster flow simulator and the appropriate connection cables.

CapitalControls

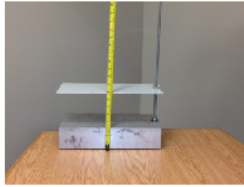
Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

Verification of Flume Flow Meters:

By use of a mechanical level simulating tool installed in the Parshall Flume an exact level can be simulated causing the transmitter to display flow based on the simulator adjusted level.

Shown below is a picture of a simple level simulator used to simulate flows/levels in a Parshall Flume.



By adjusting the reflector upward from the bottom ridge of the base, which will sit on the floor of the flume directly under the level sensor, the flow meter will transmit and display the flow proportional to the simulated level. In this case a 24inch Parshall flume with the simulator set to 240mm can be verified against the chart on the next page. The flow on the transmitter should be comparable to 156.4 l/s.



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

FLOW CHART
GREYLINE INSTRUMENTS INC.
24" Parshall Flume

Formula: $Q = KH^2n$
 where: Q = Flow in Liters per Second.
 K = 0.031982
 H = Head in Millimeters.
 n = 1.8500
 H maximum: 750.0 Millimeters
 H increment: 5 Millimeters

| mm | L/s | mm | L/s | mm | L/s | mm | L/s |
|-------|--------|-------|-------|-------|-------|-------|-------|
| 5.000 | 0.3875 | 195.0 | 113.4 | 385.0 | 325.4 | 575.0 | 605.9 |
| 10.00 | 1.135 | 200.0 | 117.9 | 390.0 | 331.9 | 580.0 | 614.1 |
| 15.00 | 2.127 | 205.0 | 122.5 | 395.0 | 338.6 | 585.0 | 622.3 |
| 20.00 | 3.323 | 210.0 | 127.2 | 400.0 | 345.2 | 590.0 | 630.6 |
| 25.00 | 4.696 | 215.0 | 131.9 | 405.0 | 351.9 | 595.0 | 638.9 |
| 30.00 | 6.229 | 220.0 | 136.7 | 410.0 | 358.7 | 600.0 | 647.2 |
| 35.00 | 7.911 | 225.0 | 141.5 | 415.0 | 365.5 | 605.0 | 655.6 |
| 40.00 | 9.730 | 230.0 | 146.4 | 420.0 | 372.3 | 610.0 | 664.0 |
| 45.00 | 11.68 | 235.0 | 151.4 | 425.0 | 379.2 | 615.0 | 672.5 |
| 50.00 | 13.75 | 240.0 | 156.4 | 430.0 | 386.2 | 620.0 | 681.0 |
| 55.00 | 15.94 | 245.0 | 161.5 | 435.0 | 393.2 | 625.0 | 689.5 |
| 60.00 | 18.24 | 250.0 | 166.6 | 440.0 | 400.2 | 630.0 | 698.1 |
| 65.00 | 20.65 | 255.0 | 171.8 | 445.0 | 407.3 | 635.0 | 706.7 |
| 70.00 | 23.16 | 260.0 | 177.1 | 450.0 | 414.4 | 640.0 | 715.3 |
| 75.00 | 25.78 | 265.0 | 182.4 | 455.0 | 421.5 | 645.0 | 724.0 |
| 80.00 | 28.49 | 270.0 | 187.7 | 460.0 | 428.7 | 650.0 | 732.7 |
| 85.00 | 31.30 | 275.0 | 193.1 | 465.0 | 436.0 | 655.0 | 741.5 |
| 90.00 | 34.20 | 280.0 | 198.6 | 470.0 | 443.3 | 660.0 | 750.2 |
| 95.00 | 37.19 | 285.0 | 204.1 | 475.0 | 450.6 | 665.0 | 759.1 |
| 100.0 | 40.26 | 290.0 | 209.7 | 480.0 | 458.0 | 670.0 | 767.9 |
| 105.0 | 43.43 | 295.0 | 215.3 | 485.0 | 465.4 | 675.0 | 776.8 |
| 110.0 | 46.67 | 300.0 | 221.0 | 490.0 | 472.8 | 680.0 | 785.8 |
| 115.0 | 50.00 | 305.0 | 226.8 | 495.0 | 480.3 | 685.0 | 794.8 |
| 120.0 | 53.41 | 310.0 | 232.6 | 500.0 | 487.9 | 690.0 | 803.8 |
| 125.0 | 56.90 | 315.0 | 238.4 | 505.0 | 495.5 | 695.0 | 812.8 |
| 130.0 | 60.47 | 320.0 | 244.3 | 510.0 | 503.1 | 700.0 | 821.9 |
| 135.0 | 64.11 | 325.0 | 250.2 | 515.0 | 510.8 | 705.0 | 831.0 |
| 140.0 | 67.83 | 330.0 | 256.2 | 520.0 | 518.5 | 710.0 | 840.2 |
| 145.0 | 71.62 | 335.0 | 262.3 | 525.0 | 526.2 | 715.0 | 849.3 |
| 150.0 | 75.48 | 340.0 | 268.4 | 530.0 | 534.0 | 720.0 | 858.6 |
| 155.0 | 79.42 | 345.0 | 274.5 | 535.0 | 541.8 | 725.0 | 867.8 |
| 160.0 | 83.43 | 350.0 | 280.7 | 540.0 | 549.7 | 730.0 | 877.1 |
| 165.0 | 87.50 | 355.0 | 286.9 | 545.0 | 557.6 | 735.0 | 886.6 |
| 170.0 | 91.64 | 360.0 | 293.2 | 550.0 | 565.6 | 740.0 | 896.8 |
| 175.0 | 95.86 | 365.0 | 299.5 | 555.0 | 573.5 | 745.0 | 906.2 |
| 180.0 | 100.1 | 370.0 | 305.9 | 560.0 | 581.6 | 750.0 | 914.7 |
| 185.0 | 104.5 | 375.0 | 312.4 | 565.0 | 589.6 | | |
| 190.0 | 108.9 | 380.0 | 318.8 | 570.0 | 597.7 | | |

CapitalControls

Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

4 Instrument Verification

See the following pages of reports for individual equipment.



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

4.1 FIT-103 Sludge Loading Flow

Flow Meter Conformance Report

| Customer Information | | Meter Information | |
|----------------------|-----------------------|-------------------------|-------------|
| Customer: | Owner | Meter Owner: | Owner |
| CalMaster2 Owner: | | Meter Type: | MagMaster |
| Verification Date: | 27/04/2021 1:45:38 PM | Sensor Size / Pipe ID: | 100 mm |
| Report Date: | 28/04/2021 2:23:01 PM | Pipe Status: | Full |
| | | Sensor Serial No.: | P/70341/6/2 |
| | | Transmitter Serial No.: | vkH055232 |
| | | Tag: | TxmTag |
| | | Location: | Location |

Overall Meter: Passed
The flow meter has passed all of its tests with no significant fault detected.

| Summary of Results | | Totaliser Information | | | |
|---------------------------|--------|------------------------|--------|-------|-------------|
| Coil Group: | Passed | | Start: | End: | Difference: |
| Electrode Group: | Passed | Fwd: (m ³) | 98184 | 98187 | 3 |
| Sensor Group: | Passed | Rev: (m ³) | 17994 | 17994 | 0 |
| Transmitter Signal Group: | Passed | Net: (m ³) | 80190 | 80193 | 3 |
| Transmitter Driver Group: | Passed | | | | |
| Transmitter Output Group: | Passed | | | | |

| CheckMaster Information | | Post-Processing Information | |
|-------------------------|-----------------------|-----------------------------|-----------------------|
| Serial No.: | 20273-14 | CalMaster2 Version: | 1.00.1062 |
| Firmware Version: | CM1.0.1099 | Scripts Version: | 1.01.2017 |
| Test Script Version: | Issue 20 | Download Date: | 28/04/2021 2:20:37 PM |
| Next Calibration Date: | 03/08/2021 1:50:12 PM | Number of Tests Scored: | 4 |

*CheckMaster has performed the tests in accordance to ABB Protocol.
For details of ABB Protocol or assistance please refer to local ABB service office.*

Installation Comments:

28/04/2021 2:23:01 PM
Date/Time: _____ Operator Signature: _____ Print Name: _____
QSTA1359 Iss.2

| ABB Instrumentation World Flow Technology Centres | | | |
|--|--|---|--|
| ABB Limited. Oldlands Lane, Stonehouse Gloucestershire, GL10 3TA, U.K. Tel: +44 (0) 1453 826661 | ABB Automation Inc. 125 East County Line Road Warminster, PA 18974-4996 U.S.A. Tel: +1 215 674 6000 | ABB Australia Pty Ltd. 4 Baysome Rd Moorebank, NSW 2170 Tel: +61-2-9621-0111 | ABB Automation GmbH. Dransfelder Str. 2 37079 Göttingen GERMANY Tel: +49 (0) 551 905212 |



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

4.2 FIT-102 Supernatant Flow

Flow Meter Conformance Report

| Customer Information | | Meter Information | |
|----------------------|-----------------------|-------------------------|-------------|
| Customer: | Owner | Meter Owner: | Owner |
| CalMaster2 Owner: | | Meter Type: | MagMaster |
| Verification Date: | 27/04/2021 2:14:31 PM | Sensor Size / Pipe ID: | 100 mm |
| Report Date: | 28/04/2021 2:23:51 PM | Pipe Status: | Full |
| | | Sensor Serial No.: | P/71186/2/1 |
| | | Transmitter Serial No.: | VKH 299621 |
| | | Tag: | TimTag |
| | | Location: | Location |

Overall Meter: Passed
The flow meter has passed all of its tests with no significant fault detected.

| Summary of Results | | Totaliser Information | | | |
|---------------------------|--------|-----------------------|-----------|-----------|-------------|
| Coil Group: | Passed | | Start: | End: | Difference: |
| Electrode Group: | Passed | Fwd: (t) | 138403073 | 138405608 | 2535 |
| Sensor Group: | Passed | Rev: (t) | 302992 | 302994 | -2 |
| Transmitter Signal Group: | Passed | Net: (t) | 138100080 | 138102614 | 2534 |
| Transmitter Driver Group: | Passed | | | | |
| Transmitter Output Group: | Passed | | | | |

| CheckMaster Information | | Post-Processing Information | |
|-------------------------|-----------------------|-----------------------------|-----------------------|
| Serial No.: | 20273-14 | CalMaster2 Version: | 1.00.1062 |
| Firmware Version: | CM1.0.1099 | Scripts Version: | 1.01.2017 |
| Test Script Version: | Issue 20 | Download Date: | 28/04/2021 2:20:37 PM |
| Next Calibration Date: | 03/08/2021 1:50:12 PM | Number of Tests Scored: | 4 |

*CheckMaster has performed the tests in accordance to ABB Protocol.
For details of ABB Protocol or assistance please refer to local ABB service office.*

Installation Comments:

28/04/2021 2:23:51 PM
Date/Time: _____ Operator Signature: _____ Print Name: _____
QSTA1359 Iss.2

| ABB Instrumentation World Flow Technology Centres | | | |
|--|--|---|--|
| ABB Limited. Oldlands Lane, Stonehouse Gloucestershire, GL10 3TA, U.K. Tel: +44 (0) 1453 826661 | ABB Automation Inc. 125 East County Line Road Warminster, PA 18974-4996 U.S.A. Tel: +1 215 674 6000 | ABB Australia Pty Ltd. 4 Baysome Rd Moorebank, NSW 2170 Tel: +61-2-9621-0111 | ABB Automation GmbH. Dransfelder Str. 2 37079 Göttingen GERMANY Tel: +49 (0) 551 905212 |



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

4.3 FIT-101 RAS/WAS Flow

Flow Meter Conformance Report

| Customer Information | | Meter Information | |
|----------------------|-----------------------|-------------------------|-------------|
| Customer: | Owner | Meter Owner: | Owner |
| CalMaster2 Owner: | | Meter Type: | MagMaster |
| Verification Date: | 27/04/2021 2:35:30 PM | Sensor Size / Pipe ID: | 100 mm |
| Report Date: | 28/04/2021 2:24:41 PM | Pipe Status: | Full |
| | | Sensor Serial No.: | P/74445/2/2 |
| | | Transmitter Serial No.: | vkh061310 |
| | | Tag: | TxmTag |
| | | Location: | Location |

Overall Meter: Passed
The flow meter has passed all of its tests with no significant fault detected.

| Summary of Results | | Totaliser Information | | | |
|---------------------------|--------|------------------------|--------|--------|-------------|
| Coil Group: | Passed | | Start: | End: | Difference: |
| Electrode Group: | Passed | Fwd: (m ³) | 301578 | 301584 | 6 |
| Sensor Group: | Passed | Rev: (m ³) | 18259 | 18259 | 0 |
| Transmitter Signal Group: | Passed | Net: (m ³) | 283319 | 283325 | 6 |
| Transmitter Driver Group: | Passed | | | | |
| Transmitter Output Group: | Passed | | | | |

| CheckMaster Information | | Post-Processing Information | |
|-------------------------|-----------------------|-----------------------------|-----------------------|
| Serial No.: | 20273-14 | CalMaster2 Version: | 1.00.1062 |
| Firmware Version: | CM1.0.1099 | Scripts Version: | 1.01.2017 |
| Test Script Version: | Issue 20 | Download Date: | 28/04/2021 2:20:37 PM |
| Next Calibration Date: | 03/08/2021 1:50:12 PM | Number of Tests Scored: | 4 |

*CheckMaster has performed the tests in accordance to ABB Protocol.
For details of ABB Protocol or assistance please refer to local ABB service office.*

Installation Comments:

28/04/2021 2:24:41 PM

Date/Time: _____ Operator Signature: _____ Print Name: _____ QSTA1359 Iss.2

| ABB Instrumentation World Flow Technology Centres | | | |
|--|---|--|---|
| ABB Limited. Oldends Lane, Stonehouse Gloucestershire, GL10 3TA, U.K. Tel: +44 (0) 1453 826661 | ABB Automation Inc. 125 East County Line Road Warminster, PA 18974-4996 U.S.A. Tel: +1 215 674 6000 | ABB Australia Pty Ltd. 4 Baysome Rd Moorebank, NSW 2170 Tel: +61-2-9621-0111 | ABB Automation GmbH. Dransfelder Str. 2 37079 Göttingen GERMANY Tel: +49 (0) 551 905212 |



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

4.4 FIT-104 Sewage Influent Flow

Flow Meter Conformance Report

| Customer Information | | Meter Information | |
|----------------------|-----------------------|-------------------------|------------|
| Customer: | Owner | Meter Owner: | Owner |
| CalMaster2 Owner: | | Meter Type: | MagMaster |
| Verification Date: | 27/04/2021 3:08:53 PM | Sensor Size / Pipe ID: | 350 mm |
| Report Date: | 28/04/2021 2:25:47 PM | Pipe Status: | Full |
| | | Sensor Serial No.: | 3K62/19300 |
| | | Transmitter Serial No.: | VKH 268980 |
| | | Tag: | TxmTag |
| | | Location: | Location |

Overall Meter: Passed
The flow meter has passed all of its tests with no significant fault detected.

| Summary of Results | | Totaliser Information | | | |
|---------------------------|--------|------------------------|----------|-------------|---|
| Coil Group: | Passed | Start: | End: | Difference: | |
| Electrode Group: | Passed | Fwd: (m ³) | 14301208 | 14301217 | 9 |
| Sensor Group: | Passed | Rev: (m ³) | 1419 | 1419 | 0 |
| Transmitter Signal Group: | Passed | Net: (m ³) | 14299789 | 14299798 | 9 |
| Transmitter Driver Group: | Passed | | | | |
| Transmitter Output Group: | Passed | | | | |

| CheckMaster Information | | Post-Processing Information | |
|-------------------------|-----------------------|-----------------------------|-----------------------|
| Serial No.: | 20273-14 | CalMaster2 Version: | 1.00.1062 |
| Firmware Version: | CM1.0.1099 | Scripta Version: | 1.01.2017 |
| Test Script Version: | Issue 20 | Download Date: | 28/04/2021 2:20:37 PM |
| Next Calibration Date: | 03/08/2021 1:50:12 PM | Number of Tests Scored: | 4 |

*CheckMaster has performed the tests in accordance to ABB Protocol.
For details of ABB Protocol or assistance please refer to local ABB service office.*

Installation Comments:

28/04/2021 2:25:47 PM

Date/Time: _____ Operator Signature: _____ Print Name: _____ QSTA1359 Iss.2

| ABB Instrumentation World Flow Technology Centres | | | |
|---|--|---|--|
| ABB Limited. Oldends Lane, Stonehouse Gloucestershire, GL10 3TA, U.K. Tel: +44 (0) 1453 826661 | ABB Automation Inc. 125 East County Line Road Warminster, PA 18974-4996 U.S.A. Tel: +1 215 674 6000 | ABB Australia Pty Ltd. 4 Baysome Rd Moorebank, NSW 2170 Tel: +61-2-9621-0111 | ABB Automation GmbH. Dransfelder Str. 2 37079 Göttingen GERMANY Tel: +49 (0) 551 905212 |



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

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4.5 FIT-301 Plant Effluent Flow

Flow Meter
As Found Results

Instrument Calibration/Verification Report

Date: April 27 2021

Client Details

Customer O.C.W.A. Seaway Valley
Contact Mark Lauzon
613-223-8678

Calibrations by: Tim Stewart
Capital Controls
613-248-1999

Instrument Details

Manufacturer Siemens
Model OCM III
Serial Number 011303101XY
Location Prescott W.W.T.P.
Process Plant Effluent
Tag ID FIT-301
Output 4-20 mA

Programming Parameters

12 inch Parshall Flume
Mode = Flow
Exponential device
Ratiometric
Range = 0-209.6 l/s
Height of max head = 45.68 cm
Height of sensor = 125.84 cm

Blanking Distance = 30.482 cm
Relay 1 de-energizes on low flow

Calibration Equipment

Make Fluke Meter
Model 725
Serial # 8759025
Level Stand

Test Procedure

Level stand to simulate level and flow

Pass/Fail Criteria: 5% of Full Scale

Errors are expressed in percentage of Full Scale

| Level | 0.0 cm | 6.3 cm | 32.0 cm |
|--------------------|----------|-----------|------------|
| Calculated Flow | 0.00 l/s | 9.710 l/s | 120.62 l/s |
| Instrument Display | 0.00 l/s | 10.25 l/s | 123.68 l/s |
| Display Error | 0.00% | 0.23% | 1.46% |
| Expected mA Output | 4.00 mA | 4.74 mA | 13.22 mA |
| Actual mA Output | 4.12 mA | 5.01 mA | 13.45 mA |
| mA Output Error | 0.75% | 1.68% | 1.44% |

Comments

The instrument under test has passed the annual calibration.



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

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4.6 FIT-701 Sewage Pumping Station # 5 Flow

Flow Meter Instrument Calibration/Verification Report Date: April 27 2021
As Found Results

Client Details

Customer Seaway Valley O.C.W.A
Contact Mark Lauzon
613-223-8678

Calibrations by: Tim Stewart
Capital Controls
613-248-1999

Instrument Details

Manufacturer Rosemount
Model 8712DR12N0M4
Serial Number 960261974
Location Prescott Pump Station #5
Output 4-20 mA
Process P.S. #5 Sewage Flow
Tag ID FIT- 701

Programming Parameters

Units m3/day
Full Scale 17280 m3/day
Cal Factor 0950805209226005#

Calibration Equipment

Make Fluke Rosemount
Model 725 8714D
Serial # 8759025 21040206

Errors are expressed in percentage of Full Scale

4-20 mA = 0-17280 m3/day

Test Procedure

Pass/Fail Criteria: 5% of Full Scale

Simulation using flow tube simulator

| | | | | | Avg Error | Results |
|--------------------|-----------|-----------|------------|------------|-----------|---------|
| Simulated Value | 0.00 ft/s | 3.00 ft/s | 10.00 ft/s | 30.00 ft/s | | |
| Instrument Display | 0.00 ft/s | 3.00 ft/s | 10.00 ft/s | 30.00 ft/s | | |
| Display Error | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | Passed |
| Expected mA Output | 4.00 mA | 5.60 mA | 9.33 mA | 20.00 mA | | |
| Actual mA Output | 4.02 mA | 5.62 mA | 9.35 mA | 20.00 mA | | |
| mA Output Error | 0.13% | 0.13% | 0.13% | 0.00% | 0.07% | Passed |

Comments

The instrument under test is within error tolerance and has passed the annual calibration.

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Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

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Appendix A- Equipment Calibration Certificates



www.pylonelectronics.com

Pylon Electronics Inc.
 47 Coonrade Road
 Ottawa, ON K2E 7L9

Page: 1 of 1

CERTIFICATE OF CALIBRATION

| | | | |
|---------------|------------------------|----------------|-------------|
| Description | MULTI FUNCTION PROCESS | Work Order | N0924415 |
| Model Number | 7AF | Serial Number | 8759035 |
| Instrument Id | N/A | Cal Procedure | 667581 |
| Manufacturer | FLUKE | Cal Date | 31 Mar 2021 |
| Customer Name | CAPITAL CONTROLS | Recall Cycle | 52 Weeks |
| | | Next Cal Date | 31 Mar 2022 |
| | | Purchase Order | PO REQUIRED |

Calibration Environment: Temperature 23.5 °C Relative Humidity 32.6 %RH
 Received Condition: Within Tolerance
 Completed Conditions: Within Tolerance
 Remarks: TAB OF STANDS BROKEN.

Standards Used to Establish Traceability

| Instrument Type | Model | Asset # | Cal Date/Date |
|------------------------------|--------------|----------|---------------|
| CALIBRATOR WITH SCOPE OPTION | 5522A-SC1300 | 240-1210 | 21 Dec 2021 |
| MULTIMETER | 34401A | 354-933 | 22 Sep 2021 |

This certificate certifies the traceability of the calibration of the above listed instrument to the International System of Units (SI) through a traceable measurement system. The Certificate received and completed conditions and the TDS specifications are based on the previous condition specifications referenced on the TDS unless otherwise indicated. Any statement of compliance is made without liability to the instrument manufacturer into account and is based on the instrument's performance against the limits specified on the last calibration.

The above listed instrument has been calibrated using standards that are traceable to the International System of Units (SI) through a National Metrological Institute (such as NRC or NIST). Pylon's quality system meets the requirements of ISO/IEC 17025:2017. Unless otherwise specified, Pylon material is a minimum of a 4:1 ratio between the instrument under test and the measurement system.

This report consists of two pages with equipment information, the Certificate of Calibration and the Test Data Sheet (TDS). Copyright of this report is owned by the issuing laboratory and may not be reproduced, either in full, except by the prior written permission of the issuing laboratory. The data is found and printed in the order of the instrument's query. Certificate remarks identify if adjustments were performed.

Measurement: 915 Quality Assurance: 302 Date of Issue: 31 Mar 2021 P-303 Page 16 of 16
 HALIFAX MONTRÉAL OTTAWA TORONTO EDMONTON CALGARY

CapitalControls

Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

03-1333 Michael St Ottawa, ON K1B-3M9 Ph. 613 248-1999 Fax: 613 248-1997

Page 1 of 4


| TEST REF. | | TEST DESCRIPTION | RESULTS | | | |
|--|--|------------------|----------|----------|-------|----------|
| | | | MIN | AS FOUND | FINAL | MAX |
| P. 25 UPPER DISPLAY VOLTAGE MEASUREMENT TESTS | | | | | | |
| | | APPLIED (V) | V | V | | V |
| | | 0 | -0.002 | 0.000 | | 0.002 |
| | | 15 | 14.995 | 15.001 | | 15.005 |
| | | 30 | 29.992 | 30.004 | | 30.008 |
| P. 26 LOWER DISPLAY mV/TC MEASUREMENT TESTS | | | | | | |
| | | APPLIED (V) | V | V | V | V |
| | | 0.00 m | -0.02 m | 0.00 m | | 0.02 m |
| | | 45.00 m | 44.97 m | 44.99 m | | 45.03 m |
| | | 90.00 m | 89.96 m | 89.99 m | | 90.04 m |
| P. 27 LOWER DISPLAY VOLTAGE MEASUREMENT TESTS | | | | | | |
| | | APPLIED (V) | V | V | V | V |
| | | 0.000 | -0.002 | 0.000 | | 0.002 |
| | | 10.000 | 9.993 | 9.999 | | 10.004 |
| | | 20.000 | 19.994 | 19.999 | | 20.006 |
| P. 28 UPPER DISPLAY mA MEASUREMENT TESTS | | | | | | |
| | | APPLIED (A) | A | A | A | A |
| | | 4.000 m | 3.997 m | 3.999 m | | 4.003 m |
| | | 12.000 m | 11.995 m | 11.999 m | | 12.005 m |
| | | 24.000 m | 23.993 m | 23.999 m | | 24.007 m |

Instruments used during verification are Traceable to NIST standards. See Appendix for Calibration Reports
www.capitalcontrols.ca



Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

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|  | | Calibration Test Data | | | |
|---|---|-----------------------|------------|-------|------------|
| Description: MULTI FUNCTION PROCESS CALIB | | Work order: N0921415 | | | |
| Model: 725 | | Serial: 8759023 | | | |
| TEST REF. | TEST DESCRIPTION | RESULTS | | | |
| | | MIN | AS FOUND | FINAL | MAX |
| P. 29 | LOWER DISPLAY mA MEASUREMENT TESTS | | | | |
| | APPLIED (A) | A | A | A | A |
| | 4.000 mA | 3.997 mA | 4.000 mA | | 4.003 mA |
| | 12.000 mA | 11.999 mA | 12.000 mA | | 12.005 mA |
| | 24.000 mA | 23.999 mA | 24.002 mA | | 24.007 mA |
| P. 30 | LOWER DISPLAY FREQUENCY MEASUREMENT TESTS | | | | |
| | APPLIED FRQ (Hz) | Hz | Hz | Hz | Hz |
| | 10.000 kHz | 9.998 kHz | 10.000 kHz | | 10.002 kHz |
| P. 31 | LOWER DISPLAY FREQUENCY SOURCE TEST | | | | |
| | APPLIED (Hz) | Hz | Hz | Hz | Hz |
| | 10 kHz | 9.975 kHz | 10.000 kHz | | 10.025 kHz |
| P. 32 | LOWER DISPLAY 4-W RESISTANCE MEASUREMENT TESTS | | | | |
| | APPLIED (Ω) | Ω | Ω | Ω | Ω |
| | 15 | 14.98 | 14.99 | | 15.00 |
| | 350 | 349.90 | 349.97 | | 350.10 |
| | 500 | 499.5 | 499.9 | | 500.5 |
| | 1500 | 1499.5 | 1499.9 | | 1500.5 |
| | 3200 | 3199.0 | 3199.7 | | 3200.0 |
| P. 33 | LOWER DISPLAY 3-WIRE RTD MEASUREMENT TESTS | | | | |
| | APPLIED (Ω) | Ω | Ω | Ω | Ω |
| | 350 | 349.85 | 349.85 | | 350.20 |

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| Calibration Test Data | | | | | |
|---|--|-----------------------------|-----------|-------|-----------|
| Description: MULTI FUNCTION PROCESS CALIB | | Work order: N0821415 | | | |
| Model: 725 | | Serial: 8759025 | | | |
| TEST # | TEST DESCRIPTION | RESULTS | | | |
| | | MIN | AS FOUND | FINAL | MAX |
| P. 34 | LOWER DISPLAY T/C MEASUREMENT TESTS | | | | |
| | APPLIED (°C) (V) | °C | °C | °C | °C |
| | C 0.000 m | -0.7 | -0.2 | | 0.7 |
| P. 35 | LOWER DISPLAY T/C SOURCE TEST | | | | |
| | APPLIED (°C) | °C | °C | °C | °C |
| | C | -0.7 | -0.1 | | 0.7 |
| P. 36 | LOWER DISPLAY mA SOURCE TESTS | | | | |
| | OUTPUT (A) | A | A | A | A |
| | 4 m | 3.9972 m | 3.9985 m | | 4.0028 m |
| | 12 m | 11.9956 m | 11.9986 m | | 12.0044 m |
| | 24 m | 23.9932 m | 23.9980 m | | 24.0068 m |
| P. 37 | LOWER DISPLAY mV SOURCE TESTS | | | | |
| | OUTPUT (V) | V | V | V | V |
| | 0.00 m | -0.002 m | 0.000 m | | 0.002 m |
| | 45.00 m | 44.970 m | 44.997 m | | 45.030 m |
| | 100.00 m | 99.980 m | 99.998 m | | 100.040 m |
| | LOWER DISPLAY VOLTAGE SOURCE TESTS | | | | |
| | OUTPUT (V) | V | V | V | V |
| | 0.000 | -0.002 | 0.000 | | 0.002 |
| | 5.000 | 4.9970 | 5.0000 | | 5.0030 |
| | 10.000 | 9.9980 | 10.0000 | | 10.0040 |

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Page 4 of 4

|  Calibration Test Data | | | | | |
|--|--|-------------|-----------------|-------|--------|
| Description: | MULTI FUNCTION PROCESS CALIB | Work order: | N0921415 | | |
| Model: | 725 | Serial: | 3759025 | | |
| | TEST DESCRIPTION | RESULTS | | | |
| | | MIN | AS FOUND | FINAL | MAX |
| P. 38 | LOWER DISPLAY RESISTANCE SOURCE TESTS | | | | |
| | OUTPUT (Ω) | Ω | Ω | Ω | Ω |
| | 15 | 14.8 | 15.0 | | 15.1 |
| | 360 | 359.9 | 360.0 | | 360.1 |
| | 500 | 499.5 | 500.0 | | 500.5 |
| | 1500 | 1499.5 | 1499.9 | | 1500.5 |
| | 3200 | 3199.0 | 3199.8 | | 3200.0 |
| P. 39 | PRESSURE MODULE INPUT | | | | |
| | (WITH 700 SERIES PRESSURE MODULE) | | | | |
| | DISPLAY SHOWS (PSI) | Pass / Fail | N/A | | |
| | | | | | |
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Instruments used during verification are Traceable to NIST standards. See Appendix for Calibration Reports
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Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

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ABB Confidential



ABB Limited

Contract Number: P064100114
 Serial Version: Issue 20

CalMaster2 Verification System Certificate of Calibration

CalMaster2 Serial Number: 31220020282534



CalMaster2 CA Certificate

Instrument Serial Number: 20273
 Software Revision Date: 20160206

CalMaster2 Values

| General Value | Test Procedure |
|---------------|----------------|
| 2027 | 2 |
| C-518C | 3 |
| E-5118 | 4 |
| 98.972 | 4 |
| 1075C | 4 |
| 11-0812 | 5 |
| 20000.200 | 7 |
| 34010.241C | 9 |
| 100.0200 | 8 |
| TRIM-518C | 10 |
| 2.0278 | 11 |
| E-1010 | 12 |
| E-4410 | 13 |
| 13.8218 | 14 |
| E-0010 | 15 |
| E-0020 | 16 |

Equipment Calibration Data

| Equipment | Serial Number | Calibration Expiry Date |
|-------------------------|---------------|-------------------------|
| C-518C | 9817813 | 2-11-2022 |
| Control Equipment | 9817813 | 24/02/2022 |
| Serial 518C Transmitter | 9817813 | 24/02/2022 |

This certifies that the CalMaster2 unit has passed Calibration. All equipment used is traceable to National and International standards. All CalMaster2 equipment supplied has been upgraded to current standards.

Calibration Date: 03/08/2021

Next Calibration Due Date: 03/08/2021

Signed:

Mark Torne

For and on behalf of ABE Limited

Date: 2 Aug 2020

Q37FA1320 Issue 1

CapitalControls

Electrical/Control Panels – PLC/SCADA Programming – Instrumentation Calibrations

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F.R. Tecnologías de Flujo, S.A. de C.V.
 Av. Miguel de Cervantes 111
 Complejo Industrial Chihachua
 Chihuahua, Chih. México 31136
 Tel. 011 52 (614) 425-7000
 Fax. 011 52 (614) 425 7010

9/16/2020

Certificate Of Calibration And Traceability To NIST Consistent with ISO 10474 3.1B

Equipment Name: CALIBRATOR
 Model Number: 8714D
 Serial Number: 21040206
 Customer: CAPITAL CONTROLS AND INSTRUMENTATIO
 Customer P.O.: P33023
 RMA Number: N/A
 Date Calibrated: 9/16/20

The accuracy and calibration of all instruments used in this calibration are traceable to the National Institute of Standards and Technology. The instruments and test software used to perform the calibration are as follows:

Test Equipment

| Instrument | Rosemount Instrument Number |
|--------------------|-----------------------------|
| Digital Multimeter | CM3-1474 |
| Digital Multimeter | CM3-0335 |
| Standard Resistor | CM3-0331 |
| Thermo-hygrometer | CL-1-838 |
| Test Software | Ver 4.0 Build 3 |

Calibration Data

| Switch Position | As Received | After Calibration | Accuracy | Yearly Drift Specification |
|-----------------|-------------|-------------------|----------|----------------------------|
| 20 | 30.00293 | 30.00009 | +-.05% | + 0.100% |
| 10 | 10.00018 | 10.00018 | +-.10% | + 0.100% |
| 3 | 2.99961 | 2.99961 | +-.10% | + 0.100% |

Recommended Calibration Date: 9/16/2021

Measuring and test equipment used in the manufacture and inspection of the above item is directly traceable to the National Institute of Standards and Technology. This traceability is intended to satisfy the intent of MIL-STD-45662, Notice 1.

Rolando Vata
 Quality Manager

This certificate is produced by an electronic data system and is valid without signature.

VERIFIED BY 814

ENG003
 Rev C April 27 2020

24