

Iroquois Wastewater Treatment System

Sewage Works #120000159

Annual Report

Prepared for: Municipality of South Dundas

Reporting Period of January 1st – December 31st 2019

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Operations and Compliance Reliability Indices

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

System Process Description

Iroquois's sewage collection system is a gravity fed sanitary sewage collection system. There are two pumping stations which pump wastewater from the collection system to the wastewater treatment facility.

The Iroquois Wastewater Treatment Plant (WWTP) is a Class II wastewater treatment facility owned and operated by the Municipality of South Dundas. Raw sewage is pumped to the WWTP by the plant pumping station which is equipped with three submersible pumps. From the pumping station, wastewater passes through the inlet works, including mechanically cleaned fine screens and a grit removal and disposal system. Aluminum Sulphate is added to assist in phosphorous removal. The wastewater then moves through either of two parallel Sequencing Batch Reactors (SBRs) equipped with individual aeration systems, mixers, decanters and sludge removal pumps. Effluent decanted from the SBRs is treated by UV disinfection and subsequently passes through an outfall pipe to the St. Lawrence River.

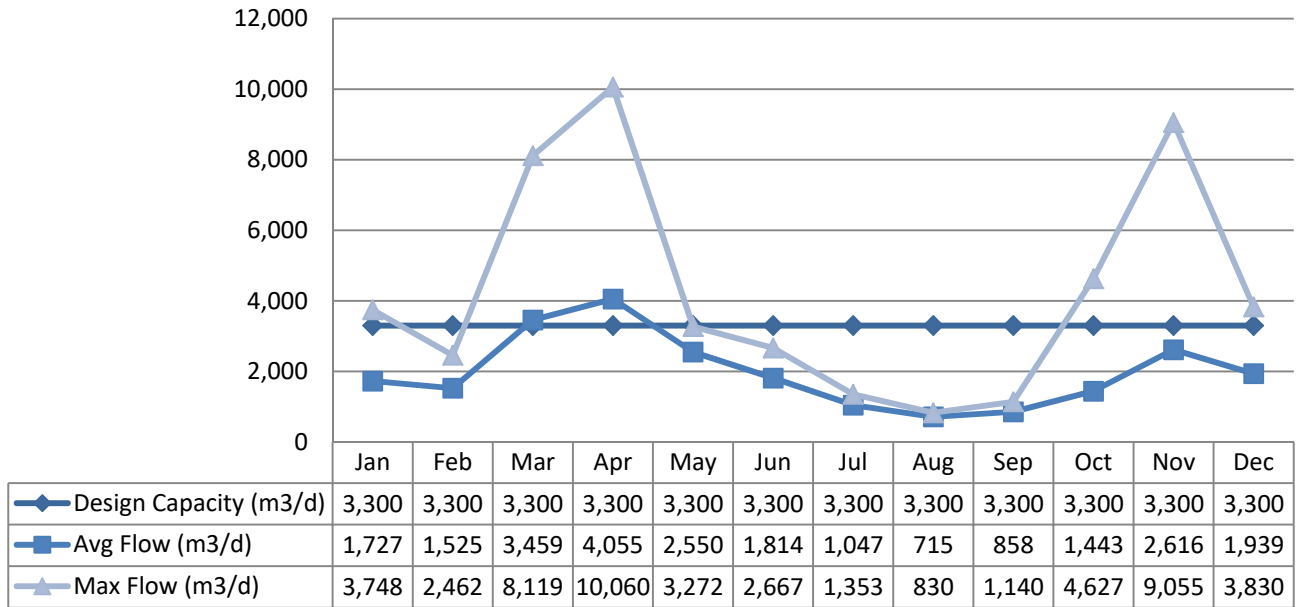
Sludge removed from the SBRs is transferred to a waste activated sludge tank. From the tank, the sludge enters a rotary drum thickener. Polymer is added to assist with the thickening process. Thickened sludge is pumped to an Autothermal Thermophilic Aerobic Digestion (ATAD) system for stabilization. The ATAD system is equipped with an off-gas scrubber and biofilter to provide odour control. The digested sludge is then pumped to one of three biosolids storage tanks. From the storage tanks, biosolids are hauled off site to be utilized as soil conditioner.

Wastewater System Flows

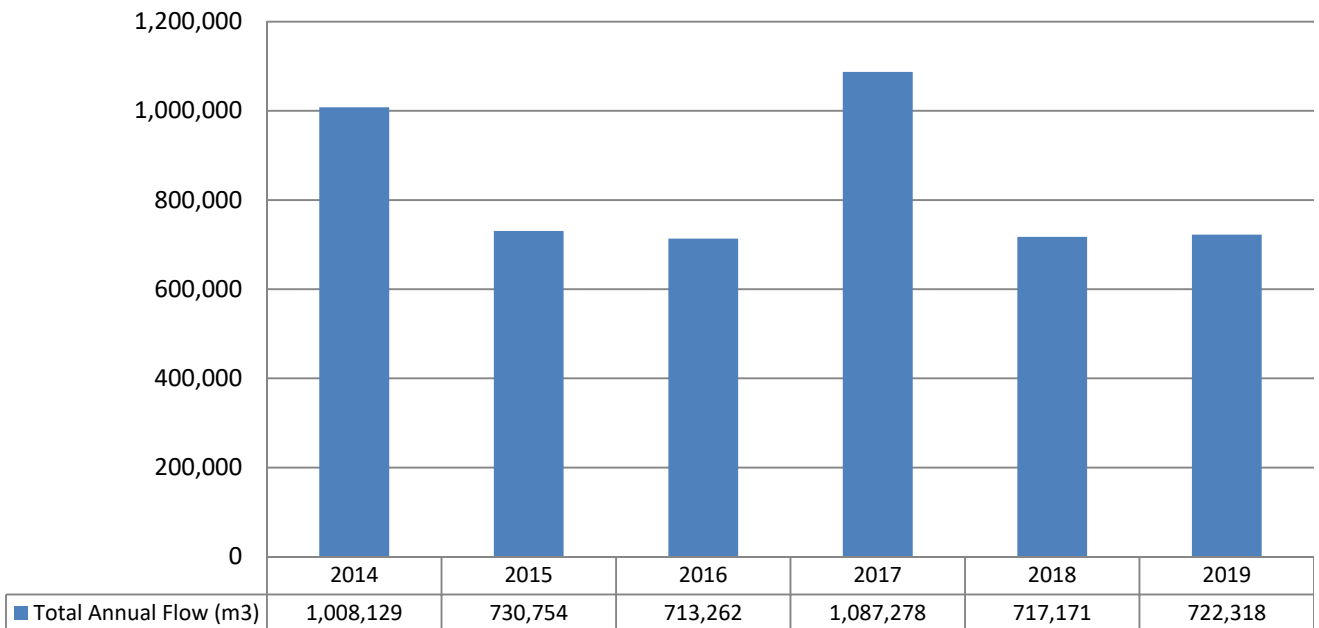
The hydraulic flows reaching the treatment facility in 2019 averaged 1,979 m³/day which represents 60% of the 3,300 m³/day design. Please see the Performance Assessment Reports attached in Appendix A for details.

Raw Flows

2019 Raw Flows:



Annual Raw Flow Comparison:



Effluent Flow

A total of 710,025 m³ of effluent was discharged from Iroquois' wastewater treatment facility in 2019.

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 then used to enhance process and operational performance. Samples are collected by the Municipality of South Dundas' 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 laboratory in Ottawa for analysis, with the exception of pH, temperature and unionized 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, the Municipality of South Dundas 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 Certificate of Approval.

Effluent Quality

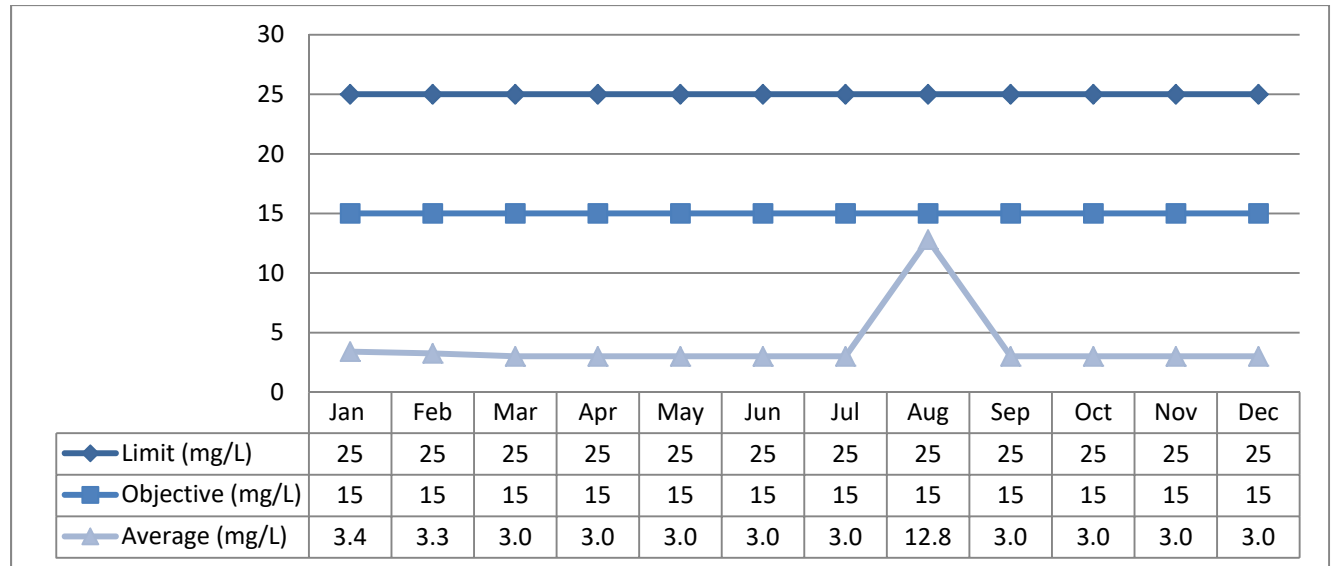
The monthly average concentrations of carbonaceous biochemical oxygen demand (CBOD₅), total suspended solids (TSS), total phosphorus (TP) and total ammonia nitrogen (TAN) remained below the effluent objectives and limits outlined in the facility's Certificate of Approval during 2019. The geometric mean density of E. coli in the effluent also remained below the ECA limit and objective in 2019. In addition the effluent pH remained within the limits and objectives throughout the year.

Effluent results from the WWTP for 2019 are tabulated below.

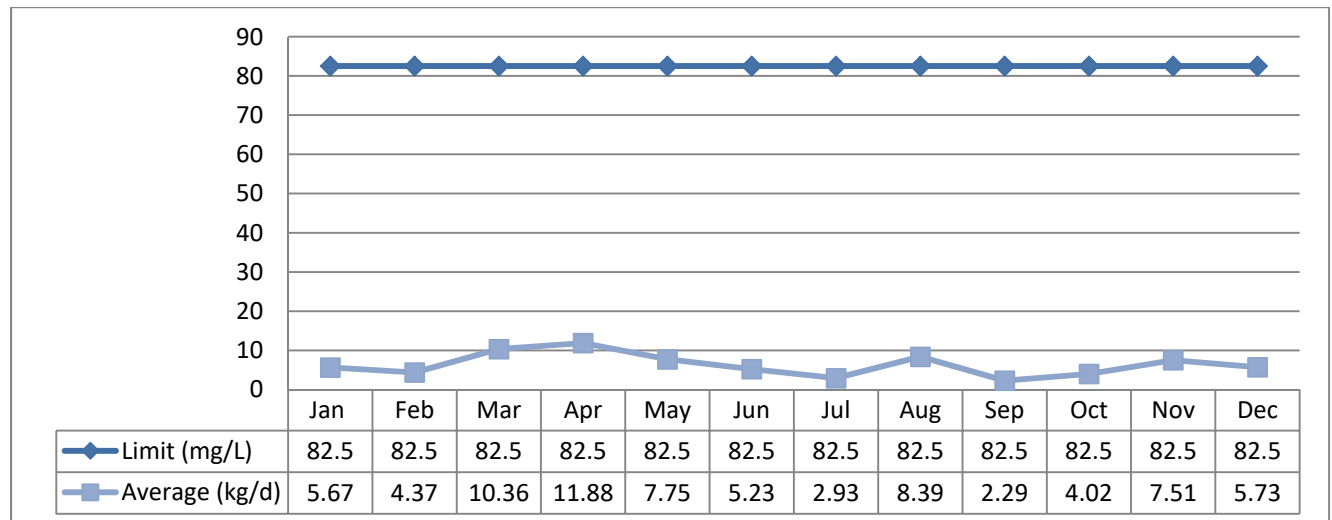
Carbonaceous Biochemical Oxygen Demand (5-Day)

Monthly Average	C of A Limit	C of A Objective	Exceedance
Concentration (mg/L)	25	15	No
Loading (kg/d)	82.5	n/a	No

CBOD₅ Effluent Monthly Average Concentrations:



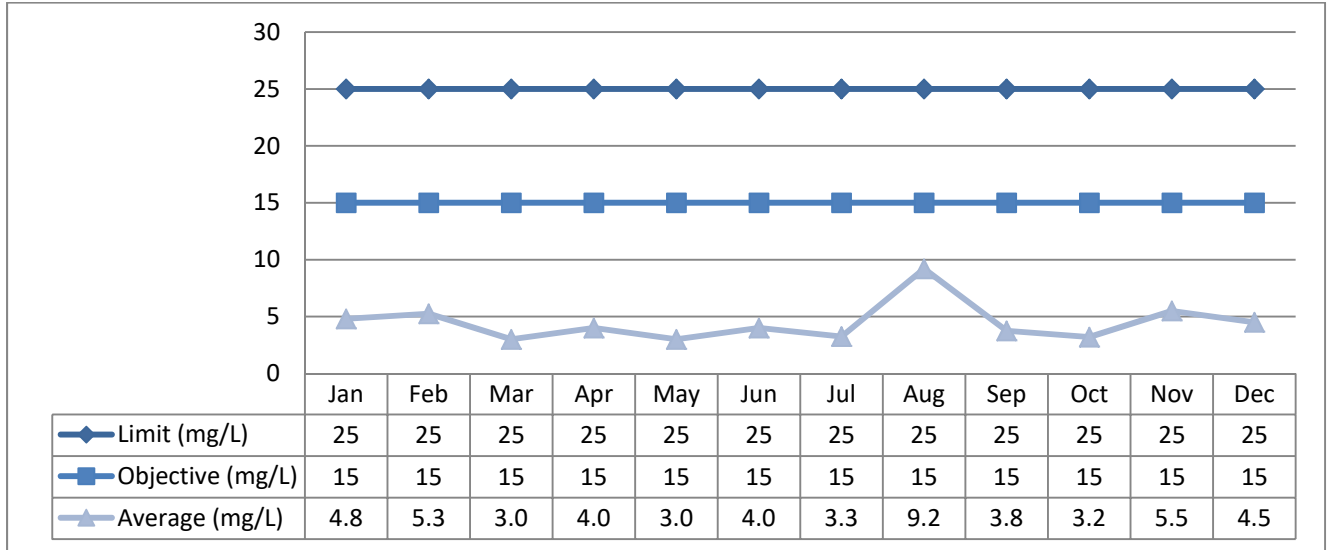
CBOD₅ Monthly Average Loading:



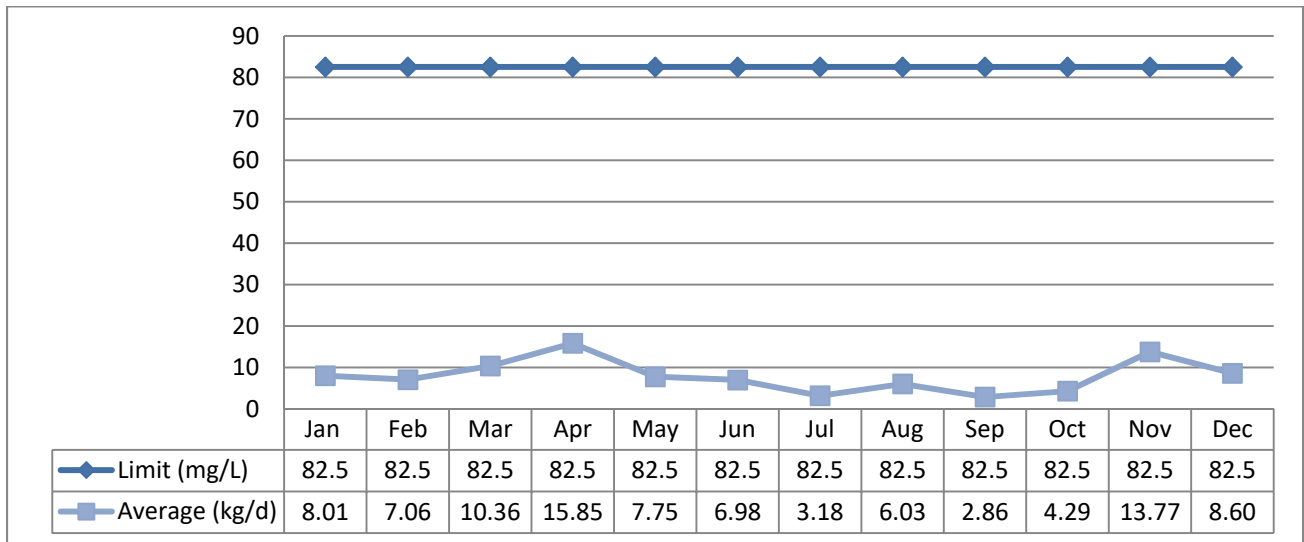
Total Suspended Solids

Monthly Average	C of A Limit	C of A Objective	Exceedance
Concentration (mg/L)	25	15	No
Loading (kg/d)	82.5	n/a	No

TSS Effluent Monthly Average Concentrations:



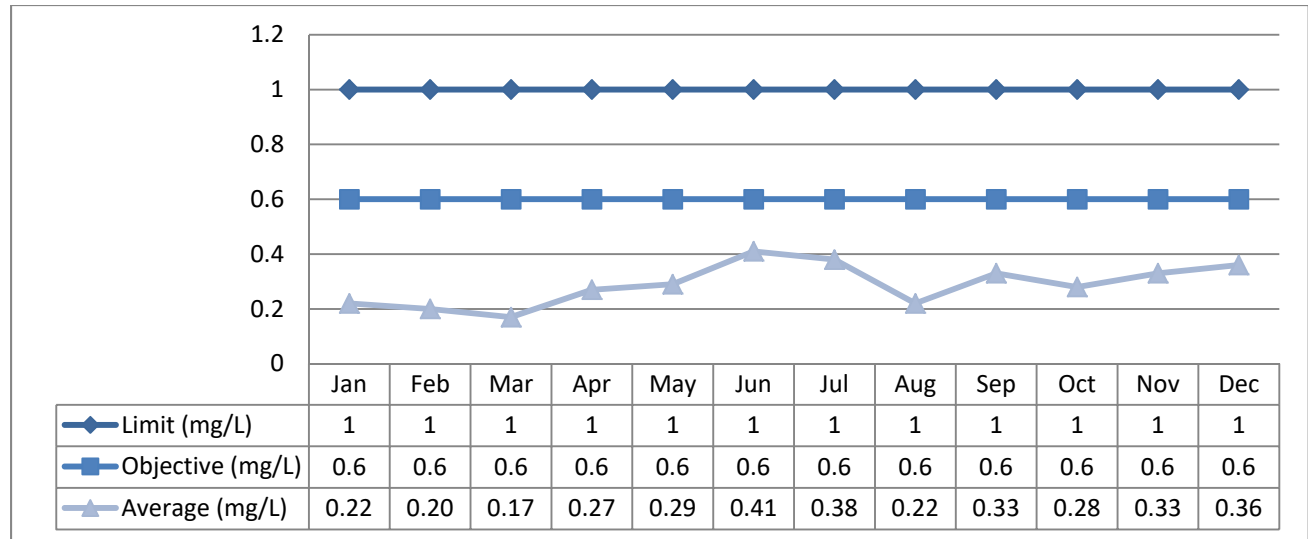
TSS Monthly Average Loading:



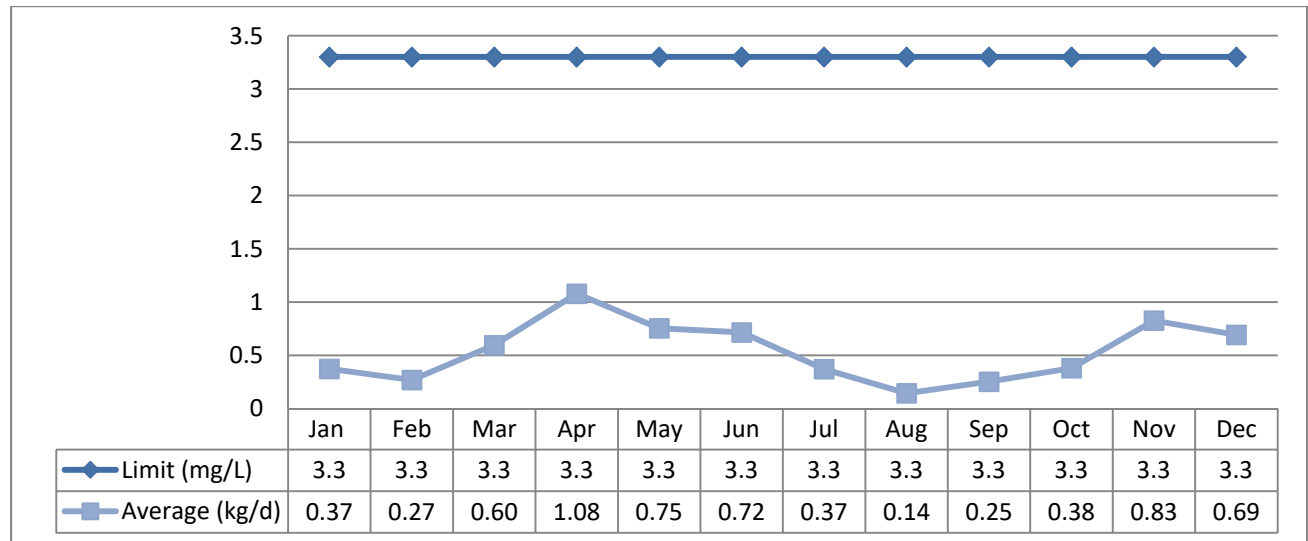
Total Phosphorus

Monthly Average	C of A Limit	C of A Objective	Exceedance
Concentration (mg/L)	1.0	0.6	No
Loading (kg/d)	3.3	n/a	No

TP Effluent Monthly Average Concentrations:



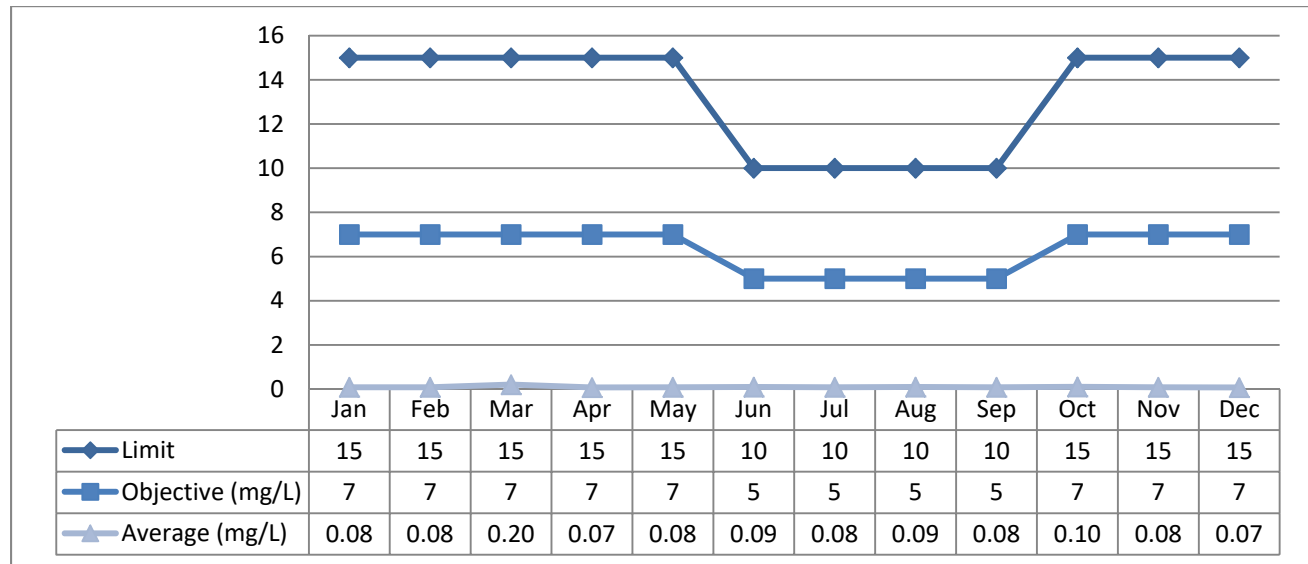
TP Monthly Average Loading:



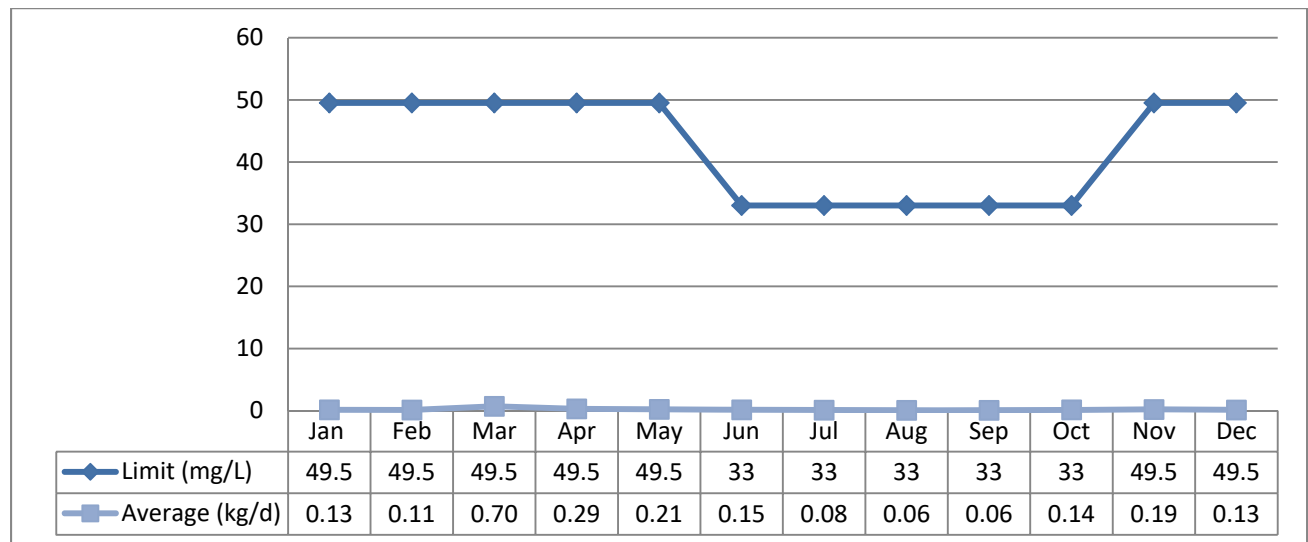
Total Ammonia Nitrogen

Monthly Average	Discharge Period	C of A Limit	C of A Objective	Exceedance
Concentration (mg/L)	Jun. 1 – Sept. 30	10	5	No
Loading (kg/d)		33	n/a	No
Concentration (mg/L)	Oct. 1 – May 31	15	7	No
Loading (kg/d)		49.5	n/a	No

TAN Effluent Monthly Average Concentrations:



TAN Monthly Average Loading:



Acute Lethality

One sample was collected in 2019 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
01-29-2019	0 %	0 %

Operating Issues

The maximum recorded flows during the months of January, March, April, October, November and December exceeded the average day design for the Iroquois WWTP. Based on a historical review of flows, it appears this system is impacted by inflow and infiltration.

Maintenance

Flow Meter Calibration and Maintenance

Copies of the flow meter calibration certificates for 2019 are attached in Appendix B.

Maintenance Summary

Description
<ul style="list-style-type: none"> - ISI reset hour counter in PLC and disconnected bypass - reinstalled grit motor and coupling unit - replaced motor/pump coupling on booster pump - replaced batteries in UPS cabinet - changed belt on air exhaust unit in blower room - serviced jet pump - replaced ORP probe - replaced self greasers - performed maintenance to alum pump - changed hydraulic fluid in UV system - performed maintenance on UV system

Notice of Modifications

Date	Process	Modification	Status
None to report.			

Sludge Generation

In 2019, a total of 458 m³ of liquid sludge was removed from Iroquois' WWTP and transported to a Waste Transfer Station by Terrapure Environmental where it was mixed with other materials (ECA #A710174). It is anticipated that approximately the same volume of sludge will be generated in 2020.

Summary of Complaints

There were no complaints documented during the reporting period.

Summary of Abnormal Discharge Events

Bypass/Overflow

No bypasses or overflows occurred during the reporting period.

Spills

No spills occurred during the reporting period.

Appendix A

Performance Assessment Reports

2019 - IROQUOIS WWTP EFFLUENT SAMPLING MONTHLY AVERAGES

MONTH	DATE	CBOD (mg/L)	TSS (mg/L)	TP (mg/L)	NH ₃ (mg/L)	E. Coli (CFU/100ml)
January	01/03/2019	< 3	< 3	0.19	0.04	< 2
	01/10/2019	< 3	< 3	0.25	0.02	< 2
	01/17/2019	< 3	< 3	0.23	0.12	< 2
	01/24/2019	< 3	12	0.24	0.1	< 2
	01/31/2019	5	< 3	0.21	0.12	< 2
	Monthly Average	3.4	4.8	0.22	0.08	2
Compliant?	YES	YES	YES	YES	YES	
February	02/07/2019	< 3	6	0.21	0.07	< 2
	02/14/2019	< 3	< 3	0.21	0.05	< 2
	02/21/2019	< 3	7	0.18	0.09	< 2
	02/28/2019	4	5	0.2	0.11	< 2
	Monthly Average	3.3	5.3	0.20	0.08	2
Compliant?	YES	YES	YES	YES	YES	
March	03/07/2019	< 3	3	0.2	0.06	< 2
	03/14/2019	< 3	< 3	0.15	0.07	< 2
	03/21/2019	< 3	3	0.14	0.62	< 2
	03/28/2019	< 3	3	0.2	0.06	< 2
	Monthly Average	3.0	3.0	0.17	0.20	2
Compliant?	YES	YES	YES	YES	YES	
April	04/04/2019	< 3	< 3	0.26	0.06	< 2
	04/11/2019	< 3	7	0.21	0.08	< 2
	04/17/2019	< 3	< 3	0.43	0.08	< 2
	04/25/2019	< 3	< 3	0.19	0.07	< 2
	Monthly Average	3.0	4.0	0.27	0.07	2
Compliant?	YES	YES	YES	YES	YES	
May	05/02/2019	< 3	< 3	0.22	0.11	< 2
	05/09/2019	< 3	< 3	0.25	0.1	< 2
	05/16/2019	< 3	< 3	0.26	0.06	< 2
	05/23/2019	< 3	< 3	0.33	0.08	< 2
	05/30/2019	< 3	3	0.4	0.06	< 2
	Monthly Average	3.0	3.0	0.29	0.08	2
Compliant?	YES	YES	YES	YES	YES	
June	06/06/2019	< 3	5	0.38	0.09	< 2
	06/13/2019	< 3	< 3	0.39	0.08	< 2
	06/20/2019	< 3	< 3	0.32	0.12	< 2
	06/27/2019	< 3	5	0.55	0.06	< 2
	Monthly Average	3.0	4.0	0.41	0.09	2
Compliant?	YES	YES	YES	YES	YES	
July	07/04/2019	< 3	4	0.56	0.11	< 2
	07/11/2019	< 3	< 3	0.41	0.07	< 2
	07/18/2019	< 3	3	0.33	0.07	< 2
	07/25/2019	< 3	< 3	0.22	0.08	< 2
	Monthly Average	3.0	3.3	0.38	0.08	2
Compliant?	YES	YES	YES	YES	YES	
August	08/01/2019	52	34	0.2	0.05	2
	08/08/2019	< 3	3	0.17	0.12	< 2
	08/15/2019	< 3	3	0.21	0.08	< 2
	08/22/2019	< 3	< 3	0.24	0.08	< 2
	08/29/2019	< 3	< 3	0.28	0.11	< 2
	Monthly Average	12.8	9.2	0.22	0.09	2
Compliant?	YES	YES	YES	YES	YES	
September	09/05/2019	< 3	< 3	0.26	0.06	< 2
	09/12/2019	< 3	5	0.39	0.06	< 2
	09/19/2019	< 3	< 3	0.35	0.09	< 2
	09/26/2019	< 3	4	0.33	0.10	4
	Monthly Average	3.0	3.75	0.33	0.08	2
Compliant?	YES	YES	YES	YES	YES	
October	10/03/2019	< 3	< 3	0.29	0.12	< 2
	10/10/2019	< 3	< 3	0.38	0.12	< 2
	10/17/2019	< 3	< 3	0.26	0.11	< 2
	10/24/2019	< 3	4	0.23	0.08	< 2
	10/31/2019	< 3	< 3	0.26	0.08	10
	Monthly Average	3	3.2	0.28	0.10	2
Compliant?	YES	YES	YES	YES	YES	
November	11/07/2019	< 3	6	0.25	0.08	< 2
	11/14/2019	< 3	5	0.33	0.08	< 2
	11/21/2019	< 3	3	0.39	0.09	< 2
	11/28/2019	< 3	8	0.35	0.06	< 2
	Monthly Average	3.0	5.5	0.33	0.08	2
Compliant?	YES	YES	YES	YES	YES	
December	12/05/2019	< 3	9	0.33	0.05	< 2
	12/12/2019	< 3	< 3	0.3	0.1	2
	12/19/2019	< 3	3	0.31	0.06	0
	12/23/2019	< 3	< 3	0.51	0.06	2
	Monthly Average	3.0	4.5	0.36	0.07	0
Compliant?	YES	YES	YES	YES	YES	

2019 - IROQUOIS WWTP LOADING CALCULATIONS

MONTH	Total Effluent Flow (m ³)		BOD	TSS	TP	NH ₃
January	51,714	Monthly Average (mg/L)	3.4	4.8	0.2	0.08
		Loading (kg/d)	5.67	8.01	0.37	0.13
		Compliant?	YES	YES	YES	YES
February	41,700	Monthly Average (mg/L)	3.3	5.25	0.20	0.08
		Loading (kg/d)	4.37	7.06	0.27	0.11
		Compliant?	YES	YES	YES	YES
March	107,041	Monthly Average (mg/L)	3.0	3.0	0.17	0.20
		Loading (kg/d)	10.36	10.36	0.60	0.70
		Compliant?	YES	YES	YES	YES
April	122,802	Monthly Average (mg/L)	3.0	4	0.27	0.07
		Loading (kg/d)	11.88	15.85	1.08	0.29
		Compliant?	YES	YES	YES	YES
May	80,057	Monthly Average (mg/L)	3.0	3	0.29	0.082
		Loading (kg/d)	7.75	7.75	0.75	0.21
		Compliant?	YES	YES	YES	YES
June	54,091	Monthly Average (mg/L)	3.0	4	0.41	0.09
		Loading (kg/d)	5.23	6.98	0.72	0.15
		Compliant?	YES	YES	YES	YES
July	30,295	Monthly Average (mg/L)	3.0	3.3	0.38	0.08
		Loading (kg/d)	2.93	3.18	0.37	0.08
		Compliant?	YES	YES	YES	YES
August	20,329	Monthly Average (mg/L)	12.8	9.2	0.22	0.09
		Loading (kg/d)	8.39	6.03	0.14	0.06
		Compliant?	YES	YES	YES	YES
September	23,655	Monthly Average (mg/L)	3.0	3.75	0.33	0.08
		Loading (kg/d)	2.29	2.86	0.25	0.06
		Compliant?	YES	YES	YES	YES
October	41,531	Monthly Average (mg/L)	3.0	3.2	0.28	0.10
		Loading (kg/d)	4.02	4.29	0.38	0.14
		Compliant?	YES	YES	YES	YES
November	77,597	Monthly Average (mg/L)	3.0	5.5	0.33	0.08
		Loading (kg/d)	7.51	13.77	0.83	0.19
		Compliant?	YES	YES	YES	YES
December	59,212	Monthly Average (mg/L)	3.0	4.5	0.36	0.07
		Loading (kg/d)	5.73	8.60	0.69	0.13
		Compliant?	YES	YES	YES	YES

2019 - IROQUOIS 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)
01/03/2019	10.0	283.15	9.73	8.0	0.0182	0.04	0.0007
01/10/2019	10.9	284.05	9.70	8.1	0.0245	0.02	0.0005
01/17/2019	10.2	283.35	9.72	8.1	0.0232	0.12	0.0028
01/24/2019	9.7	282.85	9.74	8.0	0.0178	0.1	0.0018
01/31/2019	9.8	282.95	9.74	8.3	0.0352	0.12	0.0042
02/07/2019	10.1	283.25	9.73	7.8	0.0117	0.07	0.0008
02/14/2019	9.6	282.75	9.75	8.2	0.0277	0.05	0.0014
02/21/2019	9.4	282.55	9.75	8.2	0.0273	0.09	0.0025
02/28/2019	8.8	281.95	9.77	8.3	0.0326	0.11	0.0036
03/07/2019	8.4	281.55	9.79	8.4	0.0395	0.06	0.0024
03/14/2019	9.6	282.75	9.75	8.2	0.0277	0.07	0.0019
03/21/2019	8.3	281.45	9.79	8.3	0.0314	0.62	0.0194
03/28/2019	7.7	280.85	9.81	8.1	0.0191	0.06	0.0011
04/04/2019	7.3	280.48	9.82	8.3	0.0291	0.06	0.0017
04/11/2019	7.8	280.95	9.81	8.2	0.0241	0.08	0.0019
04/17/2019	8.6	281.75	9.78	7.5	0.0052	0.08	0.0004
04/25/2019	10.6	283.75	9.71	7.8	0.0121	0.07	0.0008
05/02/2019	11.6	284.75	9.68	8.1	0.0258	0.11	0.0028
05/09/2019	11.2	284.35	9.69	7.8	0.0127	0.1	0.0013
05/16/2019	12.4	285.55	9.65	7.7	0.0111	0.06	0.0007
05/23/2019	13.5	286.65	9.61	7.9	0.0190	0.08	0.0015
05/30/2019	12.3	285.45	9.65	7.7	0.0110	0.06	0.0007
06/06/2019	12.5	285.65	9.65	7.7	0.0112	0.09	0.0010
06/13/2019	13.1	286.25	9.63	7.9	0.0184	0.08	0.0015
06/20/2019	13.3	286.45	9.62	7.6	0.0095	0.12	0.0011
06/27/2019	13.6	286.75	9.61	7.9	0.0191	0.06	0.0011
07/04/2019	13.8	286.95	9.60	7.9	0.0194	0.11	0.0021
07/11/2019	14.1	287.25	9.59	7.8	0.0158	0.07	0.0011
07/18/2019	13.9	287.05	9.60	7.6	0.0099	0.07	0.0007
07/25/2019	14.6	287.75	9.58	7.6	0.0104	0.08	0.0008
08/01/2019	16.8	289.95	9.51	7.5	0.0098	0.05	0.0005
08/08/2019	16.6	289.75	9.51	7.7	0.0152	0.12	0.0018
08/15/2019	16.9	290.05	9.50	7.7	0.0155	0.08	0.0012
08/22/2019	17.1	290.25	9.50	7.7	0.0158	0.08	0.0013
08/29/2019	17.8	290.95	9.47	7.9	0.0260	0.11	0.0029
09/05/2019	17.1	290.25	9.50	7.7	0.0158	0.06	0.0009
09/12/2019	18	291.15	9.47	7.8	0.0211	0.06	0.0013
09/19/2019	18.1	291.25	9.46	7.9	0.0266	0.09	0.0024
09/26/2019	18.1	291.25	9.46	7.9	0.0266	0.1	0.0027
10/10/2019	16.5	289.65	9.52	7.9	0.0237	0.12	0.0028
10/17/2019	16.4	289.55	9.52	8.0	0.0294	0.11	0.0032
10/24/2019	16	289.15	9.53	7.4	0.0079	0.08	0.0006
10/31/2019	15.4	288.55	9.55	7.4	0.0069	0.08	0.0005
11/07/2019	14.1	287.25	9.59	7.4	0.0059	0.08	0.0005
11/14/2019	13.5	286.65	9.61	6.9	0.0019	0.08	0.0002
11/21/2019	13.9	287.05	9.60	7.5	0.0086	0.09	0.0008
11/28/2019	13.3	286.45	9.62	7.7	0.0108	0.06	0.0007
12/05/2019	15.6	288.75	9.54	7.5	0.0084	0.05	0.0004
12/12/2019	14.2	287.35	9.59	7.8	0.0163	0.1	0.0016
12/19/2019	11.7	284.85	9.67	7.7	0.0105	0.06	0.0006
12/23/2019	12.5	285.65	9.65	7.6	0.0093	0.06	0.0006

$pK_a = 0.09018 + 2729.92/T$, where pK_a is the dissociation constant of ammonia at a given temperature.

$T = (K = \text{degrees C} + 273.16)$, where T is the ambient water temperature in Kelvin.

2019 - IROQUOIS WWTP AEROBIC BIOSOLIDS RESULTS

SLUDGE RESULTS		03-Jan-19	07-Feb-19	07-Mar-20	04-Apr-19	02-May-19	06-Jun-19	11-Jul-19	08-Aug-19	05-Sep-19	03-Oct-19	07-Nov-19	05-Dec-19
Ammonia	mg/L	1350	1450	1570	899	1270	981	997	1420	1100	959	1050	1300
Nitrate	mg/L	< 3	< 3	4.4	< 5	< 1	5.9	< 1	2.6	3.7	< 10	< 1	1.8
Ammonia + Nitrate	mg/L	1353	1453	1574	904	1271	987	998	1423	1104	969	1051	1302
Total Phosphorus	mg/L	1880	1730	1460	1360	1580	1130	970	1410	1230	1070	1070	1140
Total Solids	mg/L	38400	56200	44100	43900	72000	38000	82300	38900	35000	26600	32000	33300
Aluminum	mg/L	2350	1570	1580	1990	1940	1970	1720	1540	1110	1090	1260	1410
Arsenic	mg/L	0.20	0.20	0.10	0.20	0.20	0.20	0.2	0.3	0.1	0.1	0.20	0.19
Cadmium	mg/L	0.050	0.040	0.040	< 0.030	0.040	0.040	0.04	0.05	0.030	< 0.03	0.040	0.040
Chromium	mg/L	1.63	0.86	0.86	0.99	1.11	1.55	1.5	2.14	1.03	0.83	0.76	1.10
Cobalt	mg/L	0.19	0.13	0.090	0.12	0.20	0.20	0.22	0.21	0.12	0.06	0.10	0.13
Copper	mg/L	73.00	51.00	53.00	63.50	62.50	67.00	62	79.5	44.3	31.9	47.8	44.90
Lead	mg/L	1.40	1.00	1.00	1.20	1.40	1.80	1.6	1.7	1	0.6	0.90	1.00
Mercury	mg/L	0.02	0.05	0.02	0.01	0.01	0.04	0.057	0.029	0.011	0.016	0.012	0.01
Molybdenum	mg/L	0.49	0.36	0.34	0.49	0.53	0.52	0.56	0.63	0.35	0.26	0.38	0.37
Nickel	mg/L	1.62	1.05	1.13	1.40	1.53	1.69	1.65	1.87	1.05	0.84	0.94	1.10
Selenium	mg/L	0.20	0.10	0.10	0.20	0.20	0.20	0.2	0.2	0.1	0.1	0.10	0.20
Zinc	mg/L	36.0	25.40	24.80	31.0	31.80	29.00	28.4	27	21.9	17.1	24.6	25.90

Appendix B

Flow Meter Calibration Reports

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5 Iroquois W.P.C.P.

Site Reports August, 2019

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5.1 FIT-401 Waste Sludge Basin 1:

DTM Version: 3.29.00

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Flowmeter Verification Certificate Transmitter

Contract	Plant
Order code FRCMAG 10 W DIN80	Tag Name 1.0381 - 1.0381
Date of issue H107C816303	K-Factor 0
Serial number V1.03.00	Zero point
Software Version Transmitter 07/28/2019	Software Version IO-Module 09:01 AM
Verification date	Verification time

Verification result Transmitter: Passed

Test item	Result	Applied Limits
Amplifier	Passed	Range: 0.05 %
Current Output 1	Passed	0.05 mA
Pulse Output 1	Not tested	0 P
Test Sensor	Passed	

FieldCheck Details 230223	Simbox Details 8784301
Production number 1.07.08	Production number 1.00.01
Software Version 03/2019	Software Version 03/2019
Last Calibration Date	Last Generated Date

..... Date Operator's Sign Inspector's Sign

Overall results:
The achieved test results show that the instrument is completely functional, and the measuring results lie within +/- 1% of the original calibration. ¹⁾
The calibration of the Fieldcheck test system is fully traceable to national standards.

¹⁾ Passgrade is an additional proof of electrode integrity with a high voltage test.

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FieldCheck - Result Tab Transmitter

Customer		Plant	
Order code		Test Blank	
Device type	PROXIAG 10 VV DND9	K-Factor	1.0001 - 1.0001
Serial number	HT07CB10000	Zero point	0
Signature Version Transmitter	V1.03.00	Signature Version I/O Module	
Verification date	07/26/09	Verification time	09:01 AM

Verification Flow and value (100 %): 20.103 l/s
Flow speed 4.00 m/s

Passed / Failed	Test Item	Simul. Signal	Limit Value	Deviation
	Test Transmitter			
✓	Amplifier	1.000 l/s (5%)	1.00 %	-0.22 %
✓		2.011 l/s (10.0%)	1.10 %	0.16 %
✓		10.069 l/s (50.0%)	0.70 %	-0.03 %
✓		20.103 l/s (100%)	0.55 %	-0.03 %
✓	Current Output 1	4.000 mA (5%)	0.05 mA	0.003 mA
✓		4.200 mA (5%)	0.05 mA	-0.001 mA
✓		5.000 mA (10.0%)	0.05 mA	-0.002 mA
✓		12.000 mA (50.0%)	0.05 mA	0.002 mA
✓		20.000 mA (100%)	0.05 mA	0.021 mA
---	Pulse Output 1	---	---	---
		Start value	Limit range	Measured value
✓	Cell Out. 15s	50.000 l/s	13.340_50.000 l/s	43.255 l/s
✓	Cell Out. 30s			

Legend of symbols

✓	✗	---	?	
Passed	Failed	not tested	not testable	Attention

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FieldCheck: Parameters Transmitter

Customer		Plant	
Order code		Top Works	
Device type	PROFAS 16 WIC100	IC-Filter	1.0001 - 1.0001
Serial number	01070918000	Zero point	0
Software Version Transmitter	V1.03.00	Software Version IC-Filter	
Verification date	07/29/2019	Verification time	03:01 AM

Current Output	Assign	Current Range	Value 0 4mA	Value 20 mA		
Terminal 23/27	VOLUME FLOW	4-20 mA rati	0.0 l/s	60.00 l/s		
Pulse Output	Assign	Pulse Value	Output signal	Pulse width		
Terminal 24/25	VOLUME FLOW	0.008 m3/P	Passive/Positive	100.00 ms		

Actual System Ident.

123.0

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5.2 FIT-402 Waste Sludge Basin 2:

DTM Version: 3.29.00

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Flowmeter Verification Certificate Transmitter

Customer	Plant
Order code	Tag Name
PRO/MAG 10 W DN80	0.0737 - 0.0737
Device type	K-Factor
JA091316000	0
Serial number	Zero point
V1.04.00	Software Version (O-Micro)
Software Version Transmitter	09:11 AM
07/29/2019	Verification time
Verification date	

Verification result Transmitter: Passed

Test Item	Result	Accepted Limits
Accuracy	Passed	Basic: 0.65 %
Current Output 1	Passed	0.05 mA
Pulse Output 1	Not tested	0 P
Test Sensor	Passed	

FieldCheck Details	Smartbox Details
240223	8794351
Production number	Production number
1.07.08	1.00.01
Software Version	Software Version
03/2019	03/2019
Last Calibration Date	Last Calibration Date

Date _____ Operator's Sign _____ Inspector's Sign _____

Overall results:

The achieved test results show that the instrument is completely functional, and the measuring results lie within +/- 1% of the original calibration. ¹⁾

The calibration of the Fieldcheck test system is fully traceable to national standards.

1) Propanol is an additional proof of certificate validity with a NIST-validated.

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FieldCheck - Result Tab Transmitter

Customer		Plant	
Order code		Tan Name	
Device type	PROCECO 10 W D 150	K-Factor	0.9737 - 0.9737
Serial number	468181000	Zero point	0
Siemens Variable Transmitter	VE 0400	Siemens Version NO-NO/00	
Verification date	07/22/09	Verification time	09:11:03

Verification Flow end value (100 %): 20.103 l/s
Flow speed 4.00 m/s

Passed / Failed	Test Item	Signal / Signal	Limit Value	Deviation
	Test Transmitter			
✓	Amplifier	1.003 l/s (5%)	1.00 %	-0.23 %
✓		2.011 l/s (10.0%)	1.10 %	-0.08 %
✓		10.053 l/s (50.0%)	0.79 %	-0.03 %
✓		20.103 l/s (100%)	0.65 %	0.03 %
✓	Current Output 1			
✓		4.000 mA (0%)	0.03 mA	-0.007 mA
✓		4.003 mA (0%)	0.03 mA	-0.000 mA
✓		5.000 mA (10.0%)	0.03 mA	-0.010 mA
✓		12.000 mA (50.0%)	0.03 mA	-0.022 mA
✓		20.000 mA (100%)	0.03 mA	-0.022 mA
✓	Ratio Output 1			
		Start value	Upper range	Measured value
✓	Prod. # sensor			
✓	Cell Cal. Res	50.000 ms	13.340 - 53.000 0.5	42.001 ms
✓	Cell Cal. Stability			

Legend of symbols

✓	✗	—	?	!
Passed	Failed	not tested	not checked	Attention

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FieldCheck: Parameters Transmitter

Customer		Plant	
Order code		Tag Name	
Device type	FTD30AG 19 W D260	K-Factor	0.9737 - 0.9737
Serial number	J105151070	Zero point	0
Software Version Transmitter	V1.03.00	Software Version IO-Modules	
Verification date	07/26/2019	Verification time	08:11 AM

Current Output	Assign	Current Range	Value 0 mA	Value 20 mA		
Terminal 26/27	VOLUME FLOW	4-20 mA zohv	0.0 l/s	50.00 l/s		
Pulse Output	Assign	Pulse Value	Output signal	Pulse width		
Terminal 24/25	VOLUME FLOW	0.008 m3/h	Passive/Positive	100.00 ms		

Actual System Ident.

125.0

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5.3 FIT-305 Raw Sewage Influent Channel 1:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT						
DATE: July 29 / 2019						
DESCRIPTION: Iroquois WPCP Raw Sewage Influent Ch#1.		MODEL: OCM III Model: 7ML 1002-0AA05		TAG: FIT-305		
MANUFACTURER: Siemens		Serial # S/N. PDB/C0010053				
Client Name: Township of South Dundas.				Device Output Signal : 4.00 - 20.0 mA		
INSTALLATION INSPECTION						
	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		Calibration by means of Simulating Channel Level Milltronics OCM-III Configuration
2						Flume Type = Parshall Size = 12"
MECHANICAL						
3	MOUNTING: check for proper fastening, etc.	X				P47- Blanking Distance = 61.01694 cm
4	ORIENTATION: check for proper angle, etc.)	X				P46 - Zero Head = 175.3498 cm
5	POSITION: relative position to other components (ie. for proper flow, blanking distance), etc.	X				P7 - Max. Head = 44.28499 cm
6						P1 Linear Units = cm Flow Units = l/s
ELECTRICAL						
7		X				Type = Flow Parshall Damping = 20% Relay 1 = Off Relay 2 = Off Relay 2 = Off
8	WIRE TAGGING: (exists and proper wire type)	X				Trending Configuration Sample at 60 min. intervals
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				
SET-UP/CALIBRATION						
DIGITAL		ADJUSTMENT USING		VERIFIED USING		SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE		Level Target		0 – 199.5 l/sec
		ELECTRONIC TYPE		Fluke 725 callibrator S/N 8759025		
Configuration Parameters:			Calibration Data Test Tolerance: 5.00%			
		Input Variable	Transmitter Value.	Cal. Value	% Error	Notes
	(Calibration Jig set to 0.203 m)	0.203 m	61.04 l/s	59.57 l/s	0.54 %	Passed
	(Calibration Jig set to 0.064 m)	0.064 m	10.95 l/s	9.95 l/s	0.50 %	Passed
Error (% Full Scale) = ((Transmitter Value - Calculated Value) / Full Scale) * 100 = ((61.04-59.97) / 199.5) *100 = 0.54 % of full scale				Checked By: <i>Tim Stewart</i> Cell: 613 325 9213 Email: tim.stewart@capitalcontrols.ca		

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5.4 FIT-306 Raw Sewage Influent Channel 2:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT						DATE: July 29 / 2019
DESCRIPTION: Iroquois WPCP Raw Sewage Influent Ch#2.		MODEL: OCM III Model: 7ML 1002-0AA05		TAG: FIT-306		
MANUFACTURER : Siemens		Serial # S/N. PDB/C0010053				
Client Name: Township of South Dundas.				Device Output Signal : 4.00 - 20.0 mA		
INSTALLATION INSPECTION						
	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		Calibration by means of Simulating Channel Level Milltronics OCM-III Configuration
2						Flume Type = Parshall Size = 12"
MECHANICAL						
3	MOUNTING: check for proper fastening, etc.	X				P47- Blanking Distance = 61.01694 cm
4	ORIENTATION: check for proper angle, etc.)	X				P46 - Zero Head = 176.3498 cm
5	POSITION: relative position to other components (ie. for proper flow, blanking distance), etc.	X				P7 - Max. Head = 44.1699 cm
6						P1 Linear Units = cm Flow Units = l/s
ELECTRICAL						
7		X				Type = Flow Parshall Damping = 20% Relay 1 = Off Relay 2 = Off Relay 2 = Off
8	WIRE TAGGING: (exists and proper wire type)	X				Trending Configuration Sample at 60 min. intervals
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION GSA, ULC:	X				
SET-UP/CALIBRATION						
DIGITAL		ADJUSTMENT USING		VERIFIED USING		SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE		Level Target		
		ELECTRONIC TYPE		Fluke 752 calibrator S/N 8759025		0 - 198.7 l/sec
Configuration Parameters:		Calibration Data Test Tolerance: 5.00%				
		Input Variable	Transmitter Value.	Cal. Value	% Error	Notes
	(Calibration Jig set to 0.211 m)	0.213 m	65.46 l/s	64.18 l/s	0.64 %	Passed
	(Calibration Jig set to 0.064 m)	0.065 m	12.33 l/s	10.20 l/s	1.07 %	Passed
$\text{Error (\% Full Scale)} = ((\text{Transmitter Value} - \text{Calculated Variable}) / \text{Full Scale}) * 100$ $= ((65.46 - 64.18 / 198.7) * 100)$ $= 0.64 \% \text{ of full scale}$						Checked By: <i>Tim Stewart</i> Cell: 613 325 9213 Email: tim.stewart@capitalcontrols.ca

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5.5 FIT-901 Effluent Pump Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT						
DESCRIPTION: Iroquois WPCP Effluent Pump Flow					MODEL: 7ME69201AA101AA0	DATE: July 29 / 2019
MANUFACTURER : Siemens					Serial N1D6053478	TAG: FIT-901
Client Name: Township of South Stormont .				Device Output Signal : 4.00 - 20.0 mA		
INSTALLATION INSPECTION						
	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		- Flow Verification by means of Coil Verification and output measurement
2						
MECHANICAL						
	MOUNTING: Check for proper fastening, etc.	X				Coil resistance : 113.1 Ohms = passed
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				
6	Cleaning: Check for Staining or Deposits, etc.)					
ELECTRICAL						
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				
SET-UP/CALIBRATION						
DIGITAL		ADJUSTMENT USING		VERIFIED USING		SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE				
		ELECTRONIC TYPE		Fluke 725 calibrator S/N 8759025		0.0 – 75.0 l/Sec = 4.00 to 20.0 mA
Configuration Parameters:			Calibration Data Test Tolerance: 5.0%			
		Transmitter Value	SCADA Value	% Error	Status	Notes
	FIT-901	4.8 l/s	4.7 l/s	0.13%	Passed	
Error (% Full Scale) = ((Transmitter Value - SCADA Value) / Full Scale) * 100 = ((4.8-4.7) / 75) * 100 = 0.13 % of full scale					Checked By: <i>Tim Stewart</i> Cell: 613 25 9213 Email: tim.stewart@capitalcontrols.ca	

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5.6 FIT-304 Raw Waste Water Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT						
					DATE: July 29 2019	
DESCRIPTION: Iroquois WPCP Raw Water Flow			MODEL: 7ME85204PJ132AA2		TAG: FIT-304	
MANUFACTURER : Siemens FM MAG 5100W			Serial: 192102H243			
Client Name: Township of South Stormont .				Device Output Signal : 4.00 - 20.0 mA		
INSTALLATION INSPECTION						
	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		Flow verification by coil verification and output measurement
2						
MECHANICAL						
	MOUNTING: Check for proper fastening, etc.	X				Coil Resistance = 112.3 Ohms = passed
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				
6	Cleaning: Check for Staining or Deposits, etc.)					
ELECTRICAL						
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				
SET-UP/CALIBRATION						
DIGITAL		ADJUSTMENT USING		VERIFIED USING		SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE				
		ELECTRONIC TYPE		Fluke 725 calibrator S/N 8759025		0.0 – 300.0 l/Sec = 4.00 to 20.0 mA
Configuration Parameters:			Calibration Data Test Tolerance: 5.0%			
		Transmitter Value	SCADA Value	% Error	Status	Notes
	<i>FIT- 304</i>	61.0 l/s	59.8 l/s	0.063%	Passed	
Error (% Full Scale) = ((Transmitter Value – SCADA Value) / Full Scale) * 100 = ((61.0-59.8) / 300) * 100 = 0.06 % of full scale					Checked By: <i>Tim Stewart</i> Cell: 613 325 9213 Email: tim.stewart@capitalcontrols.ca	

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5.7 FIT-302 P.S Inlet Sewage Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT						
DESCRIPTION: Iroquois WPCP Inlet Sewage Flow Elizabeth St. Pump Station				MODEL: 7ME65204PJ132AA2	DATE: July 29 / 2019	
MANUFACTURER : Siemens FM MAG 6000W				Serial: N1D2087032	TAG: FIT-302	
Client Name: Township of South Stormont .			Device Output Signal : 4.00 - 20.0 mA			
INSTALLATION INSPECTION						
	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		Flow verification by coil verification and output measurement
2						
MECHANICAL						
	MOUNTING: Check for proper fastening, etc.	X				Coil Resistance = 99.2 Ohms = passed
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				
6	Cleaning: Check for Staining or Deposits, etc.)					
ELECTRICAL						
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				
13						
SET-UP/CALIBRATION						
DIGITAL		ADJUSTMENT USING		VERIFIED USING	SETPOINT / RANGE	
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE				
		ELECTRONIC TYPE		Fluke 725 callibrator S/N 8759025	0.0 – 400.0 I/Sec = 4.00 to 20.0 mA	
Configuration Parameters:		Calibration Data Test Tolerance: 5.0%				
		<i>Input Variable</i>	<i>Output Variable</i>	<i>% Error</i>	<i>Status</i>	<i>Notes</i>
	<i>FIT-302</i>	84.1 I/Sec	85.2	0.28%	Passed	
Error (% Full Scale) = ((Transmitter Value – SCADA Value) / Full Scale) * 100 = ((84.1-85.2) /400) *100 = -0.28 % of full scale				Checked By: <i>Tim Stewart</i> Cell: 613 325 9213 Email: tim.stewart@capitalcontrols.ca		

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5.8 FIT-301 Inlet Sewage Plant Pump Station Flow

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: July 29 / 2019

DESCRIPTION: Iroquois Inlet Sewage Plant P.S Flow Sewage Flow MODEL: 7ME69201AA101AA0 TAG: FIT-301
 MANUFACTURER : Siemens FM MAG 6000 Serial: N1D2087032

Client Name: Township of South Stormont . Device Output Signal : 4.00 - 20.0 mA

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
GENERAL						
1	TAGGING			X		- Flow Verification by means of coil verification and output measurement
2						
MECHANICAL						
	MOUNTING: Check for proper fastening, etc.	X				Coil Resistance = 98.6 Ohms = passed
4	CELL: Check Operation / Slope, etc.)	X				
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				
6	Cleaning: Check for Staining or Deposits, etc.)					
ELECTRICAL						
7		X				
8	WIRE TAGGING: (exists and proper wire type)	X				
9	QUALITY OF CONNECTIONS:	X				
10	GROUNDING:	X				
11	SHIELDING: (check if grounded only at PLC end of wire)	X				
12	CERTIFICATION CSA, ULC:	X				

SET-UP/CALIBRATION

DIGITAL		ADJUSTMENT USING	VERIFIED USING	SETPOINT / RANGE
14	SETPOINT ADJUSTMENT			
		MECHANICAL TYPE		
			Fluke 725 calibrator S/N 8759025	0.0 – 400.0 l/Sec = 4.00 to 20.0 mA

Configuration Parameters:	Calibration Data Test				Tolerance: 5.0%	
	Transmitter Value	SCADA Value	% Error	Status	Notes	
FIT-301	53.9 l/sec	53.6 l/sec	0.08%	Passed		

Error (% Full Scale) = ((Transmitter Value – SCADA Value) / Full Scale) * 100

$$= ((53.9-53.6) / 400) * 100$$

$$= 0.08 \% \text{ of full scale}$$

Checked By: *Tim Stewart*

Cell: 613 325 9213

Email: tim.stewart@capitalcontrols.ca

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5.9 FIT-501 U.V Inlet Channel Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT								
DESCRIPTION: Iroquois U.V Inlet Channel Flow					MODEL: OCM Pro CF	DATE: July 29/ 2019		
MANUFACTURER : Nivus			Serial: N1D2087032		TAG: FIT-501			
Client Name: Township of South Stormont				Device Output Signal : 4.00 - 20.0 mA				
INSTALLATION INSPECTION								
	DESCRIPTION	FINDINGS				COMMENTS		
		OK	FIXED	N/A	FAULTY			
GENERAL								
1	TAGGING			X		Channel Configuration: H = 0.868m B = 0.900m		
2								
MECHANICAL								
	MOUNTING: Check for proper fastening, etc.	X				Sensor Configuration:		
4	CELL: Check Operation / Slope, etc.)	X				$h_{\text{Sensor}} = 0.000$ m (at bottom) $h_{\text{max}} = 0.868$ (max level)		
5	POSITION: Relative position to other components (ie. for proper flow, blanking distance), etc.	X				Velocity = Sensor#1 Mounting = 0.000m Wedge Pos. Average = X1		
6	Cleaning: Check for Staining or Deposits, etc.)							
ELECTRICAL								
7		X				Analog Configuration: Channel 1 = 0/4 mA to 20 mA		
8	WIRE TAGGING: (exists and proper wire type)	X				Communications:		
9	QUALITY OF CONNECTIONS:	X				Mask I/P = 255.255.255.0		
10	GROUNDING:	X				Remote I/P = 192.168.000.010		
11	SHIELDING: (check if grounded only at PLC end of wire)	X				Gateway = 192.168.000.001		
12	CERTIFICATION CSA, ULC:	X				Calculated l/sec. = $(0.868 \times 0.900 \times (0.848/0.289))1000$		
SET-UP/CALIBRATION								
DIGITAL		ADJUSTMENT USING		VERIFIED USING		SETPOINT / RANGE		
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE				0 – 400.0 l/Sec = 4.00 to 20.0 mA		
		ELECTRONIC TYPE	Fluke 725 callbrator S/N 8759025					
Configuration Parameters: FIT-501			Calibration Data Test		Tolerance: 5%			
	Velocity	Area	Transmitter Variable	Calculated Variable	% Error	Status Notes		
	0.244 m/sec	.875 x .900 = .788 m2	190.2 l/sec	192 l/sec	0.45%	passed		
	0.217 m/sec	.874 x .900 = .735 m2	169.5 l/sec	170.6 l/sec	0.28%	passed		
<table border="0" style="width:100%;"> <tr> <td style="width:60%; vertical-align: top;"> NOTES:*** Error (% Full Scale) = ((Calculated Variable – Transmitter Variable) / Full Scale) * 100 = $(192 - 190.2)/400 * 100$ = -.45 % of full scale </td> <td style="width:40%; vertical-align: top; text-align: right;"> Checked By: <i>Tim Stewart</i> Cell: 613 325 9213 Email: tim.stewart@capitalcontrols.ca </td> </tr> </table>							NOTES:*** Error (% Full Scale) = ((Calculated Variable – Transmitter Variable) / Full Scale) * 100 = $(192 - 190.2)/400 * 100$ = -.45 % of full scale	Checked By: <i>Tim Stewart</i> Cell: 613 325 9213 Email: tim.stewart@capitalcontrols.ca
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