Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Ontario Clean Water Agency
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March 27, 2018

Ministry of the Environment and Climate Change
Kingston District Office
1259 Gardiners Rd.
Kingston, ON K7M 8S5

Attention: Mr. James Mahoney, Supervisor

Dear Mr. Mahoney,

SUBJECT: Iroquois Wastewater Treatment Plant - 2017 Annual Report

Please find attached the 2017 Annual Performance Report for the Iroquois Wastewater Treatment Plant. This report was completed in accordance with Section 10(6) of Amended Certifcate of Approval No. 9689-8MQHNK. The report was prepared by the Ontario Clean Water Agency on behalf of the Municipality of South Dundas, based on the information provided. The report covers the period from January 1, 2017 to December 31, 2017.

Should you require any further information in relation to this report, please do not hesitate to contact our office.

Yours truly,

Dawn Crump
Process and Compliance Technician
Seaway Valley Cluster

c.c. Shannon Geraghty, C.A.O./Treasurer, Municipality of South Dundas
Denis Villeneuve, Supervisor of Water/Wastewater Operations, Municipality of South Dundas
Brenda Beaudoin, Provincial Officer, MOECC

Iroquois Wastewater Treatment Plant
2017 Annual Performance Report

The Iroquois WWTP is a Class II wastewater treatment facility owned and operated by the Municipality of South Dundas. Raw sewage is conveyed from the collection system to 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 Sequential Batch Reactors (SBR) 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.

The following report addresses the requirements outlined in Condition 10 (6) of Amended Certificate of Approval #9689-8MQHNK issued on October 25, 2011.

10(6) The Owner shall prepare and submit to the District Manager, a performance report, on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the Works;

The total volume of effluent discharged in 2017 was approximately 1,073,508 m^3. The average rate of discharge was 2,938 m^3/day which represents 89% of the 3,300 m^3/day design flow. The calculated percent removal of $CBOD_5$, TSS, TP and TAN in the final effluent described in the following paragraphs was determined using data from weekly effluent samples and monthly raw sewage composite sample results for the reporting period.

The allowable monthly average concentration for $CBOD_5$ in the effluent as stated in Condition 7 is 25 mg/L. The corresponding loading limit is 82.5 kg/day. Average concentrations and loadings were well below the limits specified in the ECA. For 2017, the average $CBOD_5$ in the effluent was 3.2 mg/L which represents approximately 81% removal of $CBOD_5$ from the raw sewage. The average loading rate for 2017 was 9.4 kg/day which is 11% of the allowable limit of 82.5 kg/day.

The allowable monthly average concentration for Total Suspended Solids (TSS) as stated in Condition 7 is 25mg/L. The corresponding loading limit is 82.5 kg/day. Average concentrations and loadings remained well below the limits specified in the ECA. In 2017, the average concentration of TSS in the effluent was approximately 4.35 mg/L which represents approximately 79% removal of TSS from the raw influent. The average loading rate for 2017 was 12.8 kg/day which is 15.5% of the allowable 82.5 kg/day limit.

The monthly average concentration limit for Total Phosphorus (TP) as stated in Condition 7 is 1.0 mg/L. The corresponding loading limit is 3.3 kg/day. Average concentrations and loadings remained below the limits specified in the ECA. The average monthly concentration during the reporting period was 0.22 mg/L which represents 76% removal of TP from the raw influent. The average monthly loading for 2017 was 0.65 kg/day which is 20% of the allowable 3.3 kg/day limit.

The monthly average concentration limit for total ammonia nitrogen (TAN) as stated in Condition 7 is 10 mg/L from June through September and 15 mg/L from October through May. The monthly average loading limit is 33.0 kg/day and 49.5, respectively. The average monthly concentration during the June - September reporting period was 0.13 mg/L. The average monthly loading during that time was 0.38 kg/day which is 1.2% of the allowable 33.0 kg/day limit. The average monthly concentration during the October - May reporting period was 0.02 mg/L. The average monthly loading during that time was 0.07 kg/day which is 0.14% of the allowable 49.5 kg/day limit.

Condition 7 stipulates that the *E. coli* monthly geometric mean density must not exceed 200 organisms/100 mL of effluent. During 2017, the average monthly geometric mean was 3.75 CFU/100 mL which did not exceed the monthly limit.

Condition 7 also requires the effluent to be non-acutely lethal to Rainbow Trout and Daphnia Magna, with grab samples being collected on an annual basis. The effluent sample collected on April 4, 2017 caused 0% mortality.

The pH of the effluent remained within the range of 6.0 - 9.5 specified in Table 2.

A summary of flow rates, monitoring data and laboratory results can be found in Appendix A.

(b) a description of any operating problems encountered and corrective actions taken;

Please see the Call-Out Summary in Appendix B.

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

Please see the Major Maintenance Project Summary in Appendix C.

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

Effluent samples are collected by the Municipality of South Dundas' licensed operational staff on a weekly basis. All samples are analyzed by a laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA). Accreditation ensures that the laboratory has acceptable laboratory protocols and test methods in place. It also requires the laboratory to provide evidence and assurances of the proficiency of the analysts performing the test methods.

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

The annual calibration and verification reports can be found attached in Appendix D.

(f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6;

Condition 6.1 - During the reporting period all monthly average concentrations of $CBOD_5$, TSS, TP and TAN were below the effluent objectives. The *E. coli* monthly geometric means were also below the stated objective.

Condition 6.2 (a) - Effluent pH remained within the 6.5- 9.5 range specified in the ECA.

Condition 6.2 (b) - The monthly average day flows remained below the 3,300 m^3/day design capacity. In addition, the daily maximum rated capacity of 16,800 m^3/day was not exceeded in 2017.

Condition 6.2 (c) - Effluent was essentially free of floating or settleable solids and did not contain substances that would cause a film, sheen, foam or discoloration to the receiving stream.

(g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

In 2017, a total of 808.5 m^3 of liquid biosolids was utilized as soil conditioner. Of this, 446 m^3 was land applied in June, and 304 m^3 was land applied in November (NASM Plan #21084). Another 58.5 m^3 was hauled to D.E.S. Environmental Services Inc. in April. It is anticipated that approximately the same volume of sludge will be generated in 2018.

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

There were no complaints received in relation to the Iroquois WWTP during the reporting period.

(i) a summary of all By-pass, spill or abnormal discharge events;

Two bypass events occurred in 2017:

Date	Start Time	End Time	Duration (hh:mm)	Estimated Volume (m3)	SAC Ref. #
04-07-17	03:43	04:23	00:40	56.3	900666
	05:36	05:58	00:22	18.3	
10-30-17	09:54	15:10	01:52	149	901656

In both cases, heavy precipitation resulted in partially treated wastewater being discharged from the WWTP. Samples were collected and the bypasses were reported in accordance with federal and provincial requirements.

(j) any other information the District Manager requires from time to time.

No requests for additional information have been received.

APPENDIX A:

OPERATIONAL DATA

IROQUOIS WWTP
PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: SOUTH DUNDAS
PROJECT: IROQUOIS WWTP
WORKS NUM.: 120000159
DESCRIPTION: TWO SEQUENTIAL BATCH REACTORS AND AEROBIC SLUDGE DIGESTION

YEAR: 2017
WATER COURSE: ST. LAWRENCE
DESIGN CAPACITY: 3,300 m^3/d

MONTH	RAW			TREATED			RAW				SLUDGE
	Total Flow m^3	Avg Day Flow m^3	Max Day Flow m^3/d	Total Flow m^3	Avg Day Flow m^3	Max Day Flow m^3/d	Raw BOD (mg/L)	Raw TSS (mg/L)	Raw PHOS. (mg/L)	Raw TKN (mg/L)	Liquid Sludge Hauled m^3
JAN	90,568	2,922	5,365	89,039	2,872	5,184	23	14	0.70	7.0	0
FEB	72,736	2,598	5,848	67,960	2,427	5,833	46	26	1.08	9.5	0
MAR	88,117	2,842	5,371	87,207	2,813	5,550	15	18	0.91	8.5	0
APR	138,637	4,621	14,777	137,746	4,592	15,581	12	19	0.62	5.1	58.5
MAY	117,209	3,781	9,229	116,860	3,770	8,973	37	26	0.79	7.5	0
JUN	73,742	2,458	7,451	72,894	2,430	7,828	9	11	1.02	9.9	446
JUL	139,157	4,489	15,775	139,498	4,500	15,720	3	7	1.97	15.4	0
AUG	83,040	2,679	6,018	85,189	2,748	6,381	14	36	1.00	9.9	0
SEPT	49,391	1,646	3,186	48,282	1,609	3,013	11	36	0.61	6.3	0
OCT	65,203	2,103	15,879	62,603	2,019	14,927	5	8	0.52	6.2	0
NOV	107,872	3,596	7,636	105,389	3,513	7,359	28	27	0.78	7.8	304
DEC	61,606	1,987	2,816	60,841	1,963	2,836	3	29	0.92	8.5	0
TOTAL	1,087,278			1,073,508							808.5
AVG		2,977			2,938		17	21	0.91	8.5	
MAX			15,879			15,720					
CRITERIA		**3,300**	**16,800**								
COMPLIANCE		**YES**	**YES**								

2017 - 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	01/05/2017	<	3		3		0.18	<	0.01	<	2
	01/12/2017	<	3	<	3		0.21	<	0.01		4
	01/19/2017	<	3	<	3		0.15	<	0.01		2
	01/26/2017	<	3	<	3		0.17	<	0.01	<	2
	Monthly Average		3.0		3.0		0.18		0.01		2
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
February	02/02/2017	<	3	<	3		0.2	<	0.01		2
	02/09/2017	<	3		3		0.17	<	0.01		18
	02/16/2017	<	3	<	3		0.2		0.01		8
	02/23/2017	<	3		8		0.24	<	0.01		6
	Monthly Average		3.0		4.3		0.20		0.01		6
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
March	03/02/2017	<	3		6		0.2		0.08		10
	03/09/2017	<	3		6		0.27		0.01		2
	03/16/2017	<	3		8		0.22		0.02	<	2
	03/23/2017	<	3		4		0.25		0.02		4
	03/30/2017	<	3		6		0.24	<	0.01		4
	Monthly Average		3.0		6.0		0.24		0.03		4
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
April	04/06/2017	<	3	<	3		0.23		0.06		2
	04/11/2017		7		4		0.25		0.03		2
	04/20/2017	<	3		3		0.16		0.06	<	2
	04/27/2017	<	3		4		0.21		0.03	<	2
	Monthly Average		4.0		3.5		0.21		0.05		2
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
May	05/04/2017	<	3		6		0.29		0.06		2
	05/11/2017	<	3		9		0.31		0.03	<	2
	05/18/2017	<	3		7		0.28		0.04		4
	05/25/2017	<	3		3		0.21		0.05		8
	Monthly Average		3.0		6.3		0.27		0.05		3
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
June	06/01/2017	<	3		5		0.24		0.03		6
	06/08/2017	<	3		3		0.27		0.05		6
	06/15/2017	<	3		3		0.24		0.02	<	2
	06/22/2017	<	3		5		0.24	<	0.01		12
	06/29/2017	<	3	<	3		0.23	<	0.01		4
	Monthly Average		3.0		3.8		0.24		0.02		5
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
July	07/06/2017	<	3		5		0.25		0.05		72
	07/13/2017	<	3	<	3		0.23	<	0.01		2
	07/20/2017	<	3	<	3		0.2	<	0.01		2
	07/27/2017	<	3		5		0.29		1.7		2
	Monthly Average		3.0		4.0		0.24		0.44		5
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
August	08/03/2017	<	3		3		0.13	<	0.01		6
	08/10/2017	<	3		3		0.15		0.05		8
	08/17/2017	<	3	<	3		0.14	<	0.01		2
	08/24/2017	<	3	<	3		0.15	<	0.01		6
	08/31/2017	<	3	<	3		0.19		0.02	<	2
	Monthly Average		3.0		3.0		0.15		0.02		4
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
September	09/07/2017	<	3	<	3		0.14		0.02		4
	09/14/2017	<	3		6		0.17		0.05		2
	09/21/2017	<	3		5		0.17	<	0.01		104
	09/28/2017	<	3		3		0.14		0.1		8
	Monthly Average		3.0		4.25		0.16		0.05		9
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
October	10/05/2017	<	3	<	3		0.14		0.01	<	2
	10/12/2017	<	4	<	3		0.13		0.01	<	2
	10/19/2017	<	5	<	3		0.13	<	0.01		4
	10/26/2017	<	6	<	3		0.18	<	0.01		4
	Monthly Average		4.5		3.0		0.15		0.01		3
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
November	11/02/2017	<	3		7		0.27	<	0.01		4
	11/09/2017	<	3		8		0.36	<	0.01		4
	11/16/2017	<	3		< 3		0.32	<	0.01		2
	11/23/2017	<	3		8		0.39	<	0.01		2
	11/30/2017	<	3		< 3		0.3	<	0.01	<	2
	Monthly Average		3.0		7.7		0.33		0.01		2
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**
December	12/07/2017	<	3		5		0.37	<	0.01		2
	12/14/2017	<	3		3		0.27	<	0.01	<	2
	12/21/2017	<	3	<	3		0.37		0.06		10
	12/27/2017	<	3		3		0.16		0.05	<	2
	Monthly Average		3.0		3.5		0.29		0.03		3
	Compliant?		**YES**		**YES**		**YES**		**YES**		**YES**

2017 - IROQUOIS WWTP LOADING CALCULATIONS

MONTH	Total Effluent Flow (m^3)		BOD	TSS	TP	NH_3
January	89,039	Monthly Average (mg/L)	3.0	3.0	0.2	0.01
		Loading (kg/d)	8.62	8.62	0.51	0.03
		Compliant?	YES	YES	YES	YES
February	67,960	Monthly Average (mg/L)	3.0	4.25	0.20	0.01
		Loading (kg/d)	6.58	9.32	0.44	0.02
		Compliant?	YES	YES	YES	YES
March	87,207	Monthly Average (mg/L)	3.0	6.0	0.24	0.03
		Loading (kg/d)	8.44	16.88	0.66	0.08
		Compliant?	YES	YES	YES	YES
April	137,746	Monthly Average (mg/L)	4.0	3.5	0.21	0.05
		Loading (kg/d)	17.77	15.55	0.94	0.20
		Compliant?	YES	YES	YES	YES
May	116,860	Monthly Average (mg/L)	3.0	6.25	0.27	0.045
		Loading (kg/d)	11.31	23.56	1.03	0.17
		Compliant?	YES	YES	YES	YES
June	72,894	Monthly Average (mg/L)	3.0	3.8	0.24	0.02
		Loading (kg/d)	7.05	8.94	0.57	0.06
		Compliant?	YES	YES	YES	YES
July	139,498	Monthly Average (mg/L)	3.0	4.0	0.24	0.44
		Loading (kg/d)	13.50	18.00	1.09	1.99
		Compliant?	YES	YES	YES	YES
August	85,189	Monthly Average (mg/L)	3.0	3.0	0.15	0.02
		Loading (kg/d)	8.24	8.24	0.42	0.05
		Compliant?	YES	YES	YES	YES
September	48,282	Monthly Average (mg/L)	3.0	4.25	0.16	0.05
		Loading (kg/d)	4.67	6.62	0.24	0.07
		Compliant?	YES	YES	YES	YES
October	62,603	Monthly Average (mg/L)	4.5	3.0	0.15	0.01
		Loading (kg/d)	9.09	6.06	0.29	0.02
		Compliant?	YES	YES	YES	YES
November	105,389	Monthly Average (mg/L)	3.0	7.7	0.33	0.01
		Loading (kg/d)	10.20	26.06	1.12	0.03
		Compliant?	YES	YES	YES	YES
December	60,841	Monthly Average (mg/L)	3.0	3.5	0.29	0.03
		Loading (kg/d)	5.89	6.87	0.57	0.06
		Compliant?	YES	YES	YES	YES

2017 - 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) (NH3 + NH4 as N)		Un-ionized Ammonia (mg/L)
01/05/2017	10.5	283.65	9.71	8.5	0.0575	<	0.01	0.0006
01/12/2017	11.0	284.15	9.70	8.4	0.0480	<	0.01	0.0005
01/19/2017	11.5	284.65	9.68	8.4	0.0498	<	0.01	0.0005
01/26/2017	10.4	283.55	9.72	8.5	0.0571	<	0.01	0.0006
02/02/2017	9.8	282.95	9.74	8.4	0.0439	<	0.01	0.0004
02/09/2017	9.1	282.25	9.76	8.4	0.0416	<	0.01	0.0004
02/16/2017	9.6	282.75	9.75	8.4	0.0432		0.01	0.0004
02/23/2017	9.2	282.35	9.76	8.5	0.0522	<	0.01	0.0005
03/02/2017	8.4	281.55	9.79	8.4	0.0395		0.08	0.0032
03/09/2017	9.4	282.55	9.75	8.3	0.0341		0.01	0.0003
03/16/2017	8.3	281.45	9.79	8.3	0.0314		0.02	0.0006
03/23/2017	8.8	281.95	9.77	7.9	0.0132		0.02	0.0003
03/30/2017	8.7	281.85	9.78	8.3	0.0323	<	0.01	0.0003
04/06/2017	8.1	281.25	9.80	8.1	0.0197		0.06	0.0012
04/11/2017	10.9	284.05	9.70	8.0	0.0195		0.03	0.0006
04/20/2017	9.8	282.95	9.74	7.9	0.0143		0.06	0.0009
04/27/2017	10.1	283.25	9.73	8.1	0.0230		0.03	0.0007
05/04/2017	11.4	284.55	9.68	8.0	0.0203		0.06	0.0012
05/11/2017	10.4	283.55	9.72	8.0	0.0188		0.03	0.0006
05/18/2017	11.7	284.85	9.67	8.1	0.0260		0.04	0.0010
05/25/2017	11.3	284.45	9.69	8.0	0.0201		0.05	0.0010
06/01/2017	12.7	285.85	9.64	7.9	0.0179		0.03	0.0005
06/08/2017	12.5	285.65	9.65	7.9	0.0176		0.05	0.0009
06/15/2017	13.5	286.65	9.61	8.1	0.0297		0.02	0.0006
06/22/2017	13.8	286.95	9.60	7.7	0.0123	<	0.01	0.0001
06/29/2017	13.9	287.05	9.60	7.8	0.0156	<	0.01	0.0002
07/06/2017	15	288.15	9.56	7.9	0.0212		0.05	0.0011
07/13/2017	14.4	287.55	9.58	7.7	0.0129	<	0.01	0.0001
07/20/2017	15.1	288.25	9.56	7.6	0.0108	<	0.01	0.0001
07/27/2017	16.3	289.45	9.52	7.5	0.0094		1.7	0.0160
08/03/2017	15.4	288.55	9.55	7.9	0.0218	<	0.01	0.0002
08/10/2017	16	289.15	9.53	8.2	0.0445		0.05	0.0022
08/17/2017	16.1	289.25	9.53	8.0	0.0288	<	0.01	0.0003
08/24/2017	16.1	289.25	9.53	8.1	0.0360	<	0.01	0.0004
08/31/2017	16.2	289.35	9.52	8.0	0.0290		0.02	0.0006
09/07/2017	16.3	289.45	9.52	7.8	0.0186		0.02	0.0004
09/14/2017	16.6	289.75	9.51	7.9	0.0239		0.05	0.0012
09/21/2017	16.8	289.95	9.51	7.7	0.0154	<	0.01	0.0002
09/28/2017	16.8	289.95	9.51	7.8	0.0193		0.1	0.0019
10/05/2017	16.8	289.95	9.51	7.9	0.0242		0.01	0.0002
10/12/2017	16.1	289.25	9.53	7.9	0.0230		0.01	0.0002
10/19/2017	15.7	288.85	9.54	7.9	0.0223	<	0.01	0.0002
10/26/2017	16.8	289.95	9.51	7.7	0.0154	<	0.01	0.0002
10/30/2017	13.5	286.65	9.61	8.2	0.0371		0.49	0.0182
11/02/2017	15.1	288.25	9.56	7.9	0.0214	<	0.01	0.0002
11/09/2017	12.8	285.95	9.64	8.0	0.0225	<	0.01	0.0002
11/16/2017	14.6	287.75	9.58	8.3	0.0502	<	0.01	0.0005
11/23/2017	12.6	285.75	9.64	8.2	0.0347	<	0.01	0.0003
11/30/2017	12.3	285.45	9.65	8.2	0.0340	<	0.01	0.0003
12/07/2017	12.2	285.35	9.66	8.2	0.0337	<	0.01	0.0003
12/14/2017	12.2	285.35	9.66	8.3	0.0421	<	0.01	0.0004
12/21/2017	10.8	283.95	9.70	8.3	0.0379		0.06	0.0023
12/27/2017	9.9	283.05	9.73	8.3	0.0354		0.05	0.0018

f = 1/(10^(pK_a - pH) +1), where f is the decimal fraction of un-ionized ammonia (NH_3).

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

T = (K = degrees C + 273.16), where T is the ambient water temperature in Kelvin.

2017 - IROQUOIS WWTP AEROBIC BIOSOLIDS RESULTS

SLUDGE RESULTS		05-Jan-17		02-Feb-17		02-Mar-17		06-Apr-17		04-May-17		01-Jun-17		06-Jul-17		03-Aug-17		07-Sep-17		05-Oct-17		02-Nov-17		12-Dec-17	
Ammonia	mg/L		565		853		508		191		333		65.5		16.9		8.91		2.9		0.27		0.1		32.9
Nitrate	mg/L		1		0.5		0.2		17.3		1.9		23.5		161		270		274		332		322		177
Ammonia + Nitrate	mg/L		566		854		508		208		335		89		178		279		277		332		322		210
Total Phosphorus	mg/L		983		646		762		258		379		574		366		348		326		334		286		329
Total Solids	mg/L		64100		18900		21700		10300		26200		17100		13900		11300		11800		11600		10200		11500
Aluminum	mg/L		1390		881		894		453		386		704		586		555		530		525		472		408
Arsenic	mg/L	<	0.10	<	0.10	<	0.10	<	0.01		0.30	<	0.10		0.1	<	0.1		0.2	<	0.1		0.10	<	0.10
Cadmium	mg/L	<	0.030	<	0.030	<	0.030	<	0.030	<	0.030	<	0.030	<	0.03	<	0.3	<	0.030	<	0.03	<	0.030	<	0.030
Chromium	mg/L		2.63		0.41		0.48		0.28		0.25		0.41		0.47		0.43		0.45		0.38		0.36		0.56
Cobalt	mg/L		0.05		0.03		0.050		0.03	<	0.03	<	0.03		0.04		0.06		0.08		0.05		0.05		0.05
Copper	mg/L		86.10		21.60		27.40		11.20		10.30		15.60		14.5		12.1		12.9		10.9		9.15		10.30
Lead	mg/L		1.80		0.60		0.60		0.30		0.30		0.40		0.7		0.3		0.4		0.3		0.30		0.40
Mercury	mg/L		0.04		0.01		0.02		0.00		0.00		0.01		0.006		0.003		0.005		0.004		0.004		0.01
Molybdenum	mg/L		0.37		0.15		0.19		0.09		0.08		0.14		0.13		0.1		0.14		0.11		0.09		0.09
Nickel	mg/L		1.56		0.46		0.56		0.30		0.26		0.41		0.43		0.41		0.55		0.51		0.45		0.50
Selenium	mg/L		0.10	<	0.10	<	0.10	<	0.01	<	0.10	<	0.10	<	0.1	<	0.1	<	0.1	<	0.1	<	0.10	<	0.10
Zinc	mg/L		20.0		10.50		13.80		5.95		5.20		8.22		7.09		6.7		8.1		6.1		5.2		5.80

2017 - IROQUOIS WWTP MONTHLY AEROBIC BIOSOLIDS CONCENTRATION RATIO

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Ammonia	565	853	508.00	191	333.0	65.5	16.9	8.91	2.9	0	0	33
Nitrate	1	0.5	0.20	17.3	1.9	23.5	161	270	274	332	322	177
Ammonia + Nitrate	566	854	508	208	335	89	178	279	277	332	322	210
Total Phosphorus	983	646	762.00	258	379.0	574.0	366	348	326	334	286	329
Total Solids	64100	18900	21700	10300	26200	17100	13900	11300	11800	11600	10200	11500
Aluminum	1390	881	894.00	453	386.0	704.0	586	555	530	525	472	408
Arsenic	0.1	0.1	0.1	0.0	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Cadmium	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.30	0.03	0.03	0.03	0.03
Chromium	2.6	0.41	0.48	0.28	0.3	0.4	0.5	0.4	0.5	0.4	0.4	0.6
Cobalt	0.05	0.03	0.05	0.03	0.03	0.03	0.04	0.06	0.08	0.05	0.05	0.05
Copper	86.1	21.6	27.40	11.2	10.3	15.6	14.5	12.1	12.9	10.9	9.2	10.3
Lead	1.8	0.6	0.60	0.3	0.3	0.4	0.7	0.3	0.4	0.3	0.3	0.4
Mercury	0.037	0.010	0.02	0.003	0.004	0.007	0.006	0.003	0.005	0.004	0.004	0.009
Molybdenum	0.4	0.15	0.19	0.09	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nickel	1.6	0.46	0.56	0.3	0.3	0.4	0.4	0.4	0.6	0.5	0.5	0.5
Selenium	0.1	0.1	0.10	0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Zinc	20.0	10.5	13.80	5.95	5.2	8.2	7.1	6.7	8.1	6.1	5.2	5.8

Metals ratio = mg metals/kg solids

	Metal/Solids Ratio (Sludge)												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Limit
Arsenic	1.56	5.29	4.61	0.97	11.45	5.85	7.19	8.85	16.95	8.62	9.80	8.70	**170**
Cadmium	0.47	1.59	1.38	2.91	1.15	1.75	2.16	26.55	2.54	2.59	2.94	2.61	**34**
Chromium	41.0	21.7	22.1	27.2	9.5	24.0	33.8	38.1	38.1	32.8	35.3	48.7	**2800**
Cobalt	0.78	1.59	2.30	2.91	1.15	1.75	2.88	5.31	6.78	4.31	4.90	4.35	**340**
Copper	1343	1143	1263	1087	393	912	1043	1071	1093	940	897	896	**1700**
Lead	28.1	31.7	27.6	29.1	11.5	23.4	50.4	26.5	33.9	25.9	29.4	34.8	**1100**
Mercury	0.58	0.53	0.88	0.29	0.15	0.41	0.43	0.27	0.42	0.34	0.39	0.78	**11**
Molybdenum	5.77	7.94	8.76	8.74	3.05	8.19	9.35	8.85	11.86	9.48	8.82	7.83	**94**
Nickel	24.3	24.3	25.8	29.1	9.9	24.0	30.9	36.3	46.6	44.0	44.1	43.5	**420**
Selenium	1.56	5.29	4.61	0.97	3.82	5.85	7.19	8.85	8.47	8.62	9.80	8.70	**34**
Zinc	312	556	636	578	198	481	510	593	686	526	505	504	**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:

CALL-OUT SUMMARY

Iroquois WWTP Call-Outs

Jan 13: -UV major alarm, 5 lamps out
-Alarm acknowledged and reset, the bulbs were replaced

April 5: -ACV 701 failed to open, torque trip
-Valve was opened and closed manually and the torque percentage was increased

April 7: -Pumping station high level alarm
-Checked plant to ensure there was no bypass. Plant was keeping up with flows in Type 3
-Bypass from 3:43am-4:28am
-Samples were taken during bypass event and bypass was monitored until flows returned to normal
-Contacted MOE

April 8: -ACV 701 failed to close, torque trip
-Valve was opened and closed manually and the torque percentage was increased

April 10: -ACV 701 failed to close, torque trip
-Valve was opened and closed manually and the torque percentage was increased

April 13: -SBR PLC lost communication due to loose wire
-Tightened wire connections and communication to PLC was restored

April 19: -ABS 3 refused to run
-ABS 3 was turned off and blowers ABS 1 & 2 ran for the night
-Electrician looked at the blower the following day and ensured it reset

June 24: -UV major alarm due to banks tripped.
-UV system was reset

June 30: -High flows/level in SBRs
-High flows caused water to be diverted to the high rate tank
-Plant was able to keep up with flows and water in high rate tank was pumped to the headworks the following day
-ACV 702 failed to close, torque trip
-Valve was opened and closed manually and the torque percentage was increased

July 11: -ACV 702 failed to close, torque trip
-Valve was opened and closed manually and the torque percentage was increased

July 22: -ABG 1 high temp or pressure alarm
-Blower reset as well as SBR HMI restarted

July 24-25: -High screen and SBR level alarm
-High flows caused water to be diverted to the high rate tank
-Plant was able to keep up with flows and water in high rate tank was pumped to the headworks the following day

Aug 9: -Headworks alarm; valve 404 refused to open and put into Type 3
-Valve was put into local, SBR was decanted and then the SBR was halted
-Rotork came at a later date and fixed the valve

Aug 11: -Hydraulic pump on UV cleaning mechanism fault
-Hydraulic fluid was changed

Aug 12: -P3 VFD faulted
-P3 VFD only needed to be reset

Aug 23: -Power Outage
-Alarms caused by power outage were reset
-UV blubs that went out due to power outage were replaced

Oct 30: -High level in wet well alarm
-Samples were taken during bypass event and bypass was monitored until flows returned to normal
-Contacted MOE

APPENDIX C:

MAJOR MAINTENANCE PROJECT SUMMARY

Iroquois WWTP Major Maintenance Projects Summary 2017

Jan 16:	-Replaced UV bulbs
Feb 1:	-Replaced UV bulbs -RDT on site for lift inspection
Feb 16:	-Premier Tech reduced threshold in SBRs to start Type 3 to 5500m^3/Day
Feb 27:	-Replaced UV bulbs & ballast
March 1:	-Replaced UV bulbs
March 22:	-MPS certifying backflow preventers
March 28:	-Replaced UV bulbs
April 20:	-ABS 3 reset switch fixed
May 2:	-Replaced UV bulbs
May 11:	-Replaced two UV ballasts -Roads built berm around horseshoe driveway
June 8:	-Fire extinguisher inspection
July 4:	-Alum delivered
July 7:	-Replaced UV bulbs
July 12:	-Morrisburg Plumbing installed two washtubs and drains
July 14:	-Eastern Welding installed railing
July 19:	-Kevin from Aerzen on site for blower maintenance & fixing ABG 1&2
July 27:	-Rotork valve 404 that is seized being removed from Gilles from Rotork
Aug 2:	-Rotork on site to reinstall valve 404
Aug 4:	-Chubb Edwards on site to fix security system
Aug 11:	-Rotork on site to fix 4-20 signal wires
Aug 18:	-Replaced UV bulbs

Aug 24:	-Replaced UV bulbs
Sept 1:	-Replaced UV bulbs
Sept 21:	-Replaced UV bulbs
Oct 2:	-Replaced UV bulbs
Oct 27:	-Replaced UV bulbs
Nov 1:	-Dave Phifer looking at pump float control issue -Rob from QEL on site to calibrate gas detectors
Nov 6:	-Dave Phifer replaced bad relay on float control system
Nov 9:	-Alum delivered
Nov 23:	-Rob from QEL on site to repair gas meter
Nov 27:	-Replaced UV bulbs
Dec 11:	-GenRep on site to do annual generator maintenance

APPENDIX D:

INSTRUMENT CALIBRATIONS & VERIFICATIONS

830 Industrial Ave. Ottawa, ON K1G-4B8 Ph. 613 248-1999 Fax: 613 248-1997

5 Iroquois WPCP.

Site Reports July, 2017

5.1 FIT-401 Waste Sludge Basin 1:

DTM Version: 3.13.00 Page 1/3

Flowmeter Verification Certificate Transmitter

Customer	Plant

Order code	Tag Name
PROMAG 10 W DN80	1.0381 - 1.0381
Device type	K-Factor
H107C816000	0
Serial number	Zero point
V1.03.00	
Software Version Transmitter	Software Version I/O-Module
07/19/2017	10:48
Verification date	Verification time

Verification result Transmitter: Passed

Test item	Result	Applied Limits
Amplifier	Passed	Basis: 0.65 %
Current Output 1	Passed	0.05 mA
Pulse Output 1	Not tested	0 P
Test Sensor	Passed	

FieldCheck Details	**Simubox Details**
240223	8784351
Production number	Production number
1.07.08	1.00.01
Software Version	Software Version
06/2017	09/2016
Last Calibration Date	Last Calibration Date

Date Operator's Sign Inspector's Sign

Overall results:
The achieved test results show that the instrumment 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) Prerequisite is an additional proof of electrode integrity withe high voltage test.

Endress+Hauser

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FieldCheck - Result Tab Transmitter

Customer		Plant	
Order code		Tag Name	———
Device type	PROMAG 10 W DN80	K-Factor	1.0381 - 1.0381
Serial number	H107C816000	Zero point	0
Software Version Transmitter	V1.03.00	Software Version I/O-Module	
Verification date	07/19/2017	Verification time	10:48

Verification Flow end value (100 %): 20.106 l/s
Flow speed 4.00 m/s

Passed / Failed	Test item	Simul. Signal	Limit Value	Deviation
	Test Transmitter			
✓	Amplifier	1.005 l/s (5%)	1.60 %	0.51 %
✓		2.011 l/s (10.0%)	1.10 %	0.17 %
✓		10.053 l/s (50.0%)	0.70 %	0.12 %
✓		20.106 l/s (100%)	0.65 %	0.00 %
✓	Current Output 1	4.000 mA (0%)	0.05 mA	0.002 mA
✓		4.800 mA (5%)	0.05 mA	0.000 mA
✓		5.600 mA (10.0%)	0.05 mA	0.002 mA
✓		12.000 mA (50.0%)	0.05 mA	0.003 mA
✓		20.000 mA (100%)	0.05 mA	0.015 mA
–	Pulse Output 1	—	—	—
		Start value	**Limits range**	**Measured value**
	Test Sensor			
✓	Coil Curr. Rise	50.000 ms	13.340..50.000 ms	43.281 ms
✓	Coil Curr. Stability		—	—

Legend of symbols

✓	✗	–	?	!
Passed	Failed	not tested	not testable	Attention

830 Industrial Ave. Ottawa, ON K1G-4B8 Ph. 613 248-1999 Fax: 613 248-1997

FieldCheck: Parameters Transmitter

Customer		Plant	
Order code		Tag Name	———
Device type	PROMAG 10 W DN80	K-Factor	1.0381 - 1.0381
Serial number	H107C816000	Zero point	0
Software Version Transmitter	V1.03.00	Software Version I/O-Module	
Verification date	07/19/2017	Verification time	10:48

Curent Output	Assign	Current Range	Value 0_4mA	Value 20 mA		
Terminal 26/27	VOLUME FLOW	4-20 mA activ	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/P	Passive/Positive	100.01 ms		

Actual System Ident. 125.0

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5.2 FIT-402 Waste Sludge Basin 2:

DTM Version: 3.13.00 Page 1/3

Flowmeter Verification Certificate Transmitter

Customer	Plant

Order code	Tag Name
PROMAG 10 W DN80	0.9737 - 0.9737
Device type	K-Factor
JA091316000	0
Serial number	Zero point
V1.04.00	
Software Version Transmitter	Software Version I/O-Module
07/19/2017	10:57
Verification date	Verification time

Verification result Transmitter: Passed

Test item	Result	Applied Limits
Amplifier	Passed	Basis: 0.65 %
Current Output 1	Passed	0.05 mA
Pulse Output 1	Not tested	0 P
Test Sensor	Passed	

FieldCheck Details	**Simubox Details**
240223	8784351
Production number	Production number
1.07.08	1.00.01
Software Version	Software Version
06/2017	09/2016
Last Calibration Date	Last Calibration Date

Date Operator's Sign Inspector's Sign

Overall results:

The achieved test results show that the instrumment 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) Prerequisite is an additional proof of electrode integrity withe high voltage test.

Endress+Hauser

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FieldCheck - Result Tab Transmitter

Customer		Plant	
Order code		Tag Name	———
Device type	PROMAG 10 W DN80	K-Factor	0.9737 - 0.9737
Serial number	JA091316000	Zero point	0
Software Version Transmitter	V1.04.00	Software Version I/O-Module	
Verification date	07/19/2017	Verification time	10:57

Verification Flow end value (100 %): 20.106 l/s
Flow speed 4.00 m/s

Passed / Failed	Test item	Simul. Signal	Limit Value	Deviation
	Test Transmitter			
✓	Amplifier	1.005 l/s (5%)	1.60 %	0.36 %
✓		2.011 l/s (10.0%)	1.10 %	0.01 %
✓		10.053 l/s (50.0%)	0.70 %	0.09 %
✓		20.106 l/s (100%)	0.65 %	0.02 %
✓	Current Output 1	4.000 mA (0%)	0.05 mA	-0.004 mA
✓		4.800 mA (5%)	0.05 mA	-0.007 mA
✓		5.600 mA (10.0%)	0.05 mA	-0.008 mA
✓		12.000 mA (50.0%)	0.05 mA	-0.020 mA
✓		20.000 mA (100%)	0.05 mA	-0.026 mA
–	Pulse Output 1	—	—	—
		Start value	**Limits range**	**Measured value**
	Test Sensor			
✓	Coil Curr. Rise	50.000 ms	13.340..50.000 ms	42.891 ms
✓	Coil Curr. Stability		—	—

Legend of symbols

✓	✗	–	?	!
Passed	Failed	not tested	not testable	Attention

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FieldCheck: Parameters Transmitter

Customer		Plant	
Order code		Tag Name	———
Device type	PROMAG 10 W DN80	K-Factor	0.9737 - 0.9737
Serial number	JA091316000	Zero point	0
Software Version Transmitter	V1.04.00	Software Version I/O-Module	
Verification date	07/19/2017	Verification time	10:57

Curent Output	Assign	Current Range	Value 0_4mA	Value 20 mA		
Terminal 26/27	VOLUME FLOW	4-20 mA activ	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/P	Passive/Positive	100.01 ms		

Actual System Ident. 127.0

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

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5.3 FIT-305 Raw Sewage Influent Channel 1:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: **July 21 / 2017**

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 - 20.00 *mA***

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS OK	FIXED	N/A	FAULTY	COMMENTS
	GENERAL					***Calibration by means of Simulating Channel Level***
1	TAGGING			**X**		**Milltronics OCM-III Configuration**
2						**Flume Type = Parshall Size = 12"**
	MECHANICAL					**P47- Blanking Distance = 61.01694 cm**
3	MOUNTING: check for proper fastening, etc.	**X**				**P46 - Zero Head = 173.3498 cm**
4	ORIENTATION: check for proper angle, etc.)	**X**				**P7 - Max. Head = 44.28499 cm**
5	POSITION: relative position to other components (ie. for proper flow, blanking distance), etc.	**X**				**P1 Linear Units = cm** **Flow Units = l/s**
6						**Type = Flow Parshall Damping = 20%**
	ELECTRICAL					**Relay 1 = Off Relay 2 = Off Relay 2 = Off**
7		**X**				**Trending Configuration Sample at 60 min. Intervals**
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		Level Target	**0 – 199.5 l/sec**
		ELECTRONIC TYPE		**Fluke 725 calibrator** **S/N 8759025** **Cal. Report# July 18, 2017**	

Configuration Parameters:

Calibration Data Test **Tolerance: 15.00%**

		Input Variable	*Transmitter Var.*	*Cal. Value*	*% Error*	*Notes*
	FIT 305	**20.32 cm**	**58.3 l/s**	**59.7 l/s**	**.56%**	**Jig set at 8 inchs**
		58.3 l/s	**8.59 mA**	**8.68 mA**		

NOTES :*****Current calculated based on *Display Variable* 8.68 *mA* = ((58.3/*199.5*)*16) +4**

Error (% Full Scale) = ((Measured Output - Calculated *Variable*) / Full Scale) * 100
= ((8.59 m*A* – 8.68 *mA*) / 16 mA)*100
= -0.56 *% of full scale*

Checked By: *Tim Stewart*

Cell: 613 325 9213
Email: tim.stewart@capitalcontrols.ca

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

830 Industrial Ave. Ottawa, ON K1G-4B8 Ph. 613 248-1999 Fax: 613 248-1997

5.4 FIT-306 Raw Sewage Influent Channel 2:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: **July 21 / 2017**

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 - 20.00 *mA***

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS OK	FIXED	N/A	FAULTY	COMMENTS
	GENERAL					***Calibration by means of Simulating Channel Level***
1	TAGGING			X		**Milltronics OCM-III Configuration**
2						**Flume Type = Parshall Size = 12"**
	MECHANICAL					**P47- Blanking Distance = 61.01694 cm**
3	MOUNTING: check for proper fastening, etc.	X				**P46 - Zero Head = 173.4538 cm**
4	ORIENTATION: check for proper angle, etc.)	X				**P7 - Max. Head = 44.1699 cm**
5	POSITION: relative position to other components (ie. for proper flow, blanking distance), etc.	X				**P1 Linear Units = cm** **Flow Units = l/s**
6						**Type = Flow Parshall Damping = 20%**
	ELECTRICAL					**Relay 1 = Off Relay 2 = Off Relay 2 = Off**
7		X				**Trending Configuration Sample at 60 min. Intervals**
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		Level Target	
		ELECTRONIC TYPE		**Fluke 752 calibrator** **S/N 8759025** **Cal. Report# July 18, 2017**	**0 – 198.7 l/sec**

Configuration Parameters:	**Calibration Data Test**	**Tolerance: 15.00%**			
	Input Variable	***Transmitter Var.***	***Cal. Value***	***% Error***	***Notes***
FIT 306	**19.05 cm**	**54.7 l/sec**	**53.9 l/s**	**.40%**	**Jig set at 7.5 inches**
	54.7	**8.55 mA**	**8.40 mA**	**.93%**	

NOTES:***Current calculated based on *Display Variable* 8.40 *mA* = ((54.7/*198.7)*16) +4***

Error (% Full Scale) = ((Measured Output - Calculated *Variable*) / Full Scale) * 100
= ((8.55 *mA* – 8.40 *mA*) / 16 mA)*100
= 0.93 *% of full scale*

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5.5 FIT-901 Effluent Pump Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: **July 21 / 2017**

DESCRIPTION: **Iroquois WPCP Effluent Pump Flow**	MODEL: **7ME69201AA101AA0**	TAG: **FIT-901**
MANUFACTURER : **Siemens**	Serial N1D6053478	

Client Name: **Township of South Stormont** . Device Output Signal : **4.00 - 20.00 *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					Coil resistance : 112.7 Ohms = passed
	MOUNTING: Check for proper fastening, etc.	**X**				
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 Cal. Report# July 18, 2017**	**0.0 – 75.0 l/Sec = 4.00 to 20.00 *mA***

Configuration Parameters:

Calibration Data Test **Tolerance: 5.0%**

		Input Variable	*Output Variable*	*% Error*	*Status*	*Notes*
	FIT-901	**15.4 l/Sec**	**7.11 *mA***	**1.13%**	**Passed**	

NOTES:*****Current calculated based on *Display Variable* 7.29 *mA* = ((15.4/*75.0)*16) +4**

Error (% Full Scale) = ((Measured Output - Calculated *Variable*) / Full Scale) * 100

= ((7.11 *mA* – 7.29 *mA*) / 16 mA)*100
= -1.13 *% of full scale*

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5.6 FIT-304 Raw Waste Water Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: **July 21 2017**

DESCRIPTION: **Iroquois WPCP Raw Water Flow**	MODEL: **7ME65204PJ132AA2**	TAG: **FIT-304**
MANUFACTURER : **Siemens FM MAG 5100W**	Serial: **192102H243**	

Client Name: **Township of South Stormont** . Device Output Signal : **4.00 - 20.00 *mA***

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS OK	FIXED	N/A	FAULTY	COMMENTS
	GENERAL					
1	TAGGING			X		Flow verification by coil verification and output measurement
2						
	MECHANICAL					Coil Resistance = 113.9 Ohms = passed
	MOUNTING: Check for proper fastening, etc.	X				
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 Cal. Report# July 18, 2017**	**0.0 – 300.0 l/Sec = 4.00 to 20.00 *mA***

Configuration Parameters:

Calibration Data Test **Tolerance: 5.0%**

		Input Variable	*Output Variable*	*% Error*	*Status*	*Notes*
	FIT- 304	**47 l/s**	**6.43 *mA***	**0.50%**	**Passed**	

NOTES:*****Current calculated based on *Display Variable* 6.51 *mA* = ((47/*300.0)*16) +4**

Error (% Full Scale) = ((Measured Output - Calculated *Variable*) / Full Scale) * 100

= ((6.43 *mA* – 6.51 *mA*) / 16 mA)*100
= -0.50 *% of full scale*

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5.7 FIT-302 P.S Inlet Sewage Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: **July 21 / 2017**

DESCRIPTION: **Iroquois WPCP Inlet Sewage Flow Elizabeth St. Pump Station**	MODEL: **7ME65204PJ132AA2**	TAG: **FIT-302**
MANUFACTURER : **Siemens FM MAG 6000W**	Serial: **N1D2087032**	

Client Name: **Township of South Stormont** . Device Output Signal : **4.00 - 20.00 *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					Coil Resistance = 99.8 Ohms = passed
	MOUNTING: Check for proper fastening, etc.	X				
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 calibrator S/N 8759025 Cal. Report# July 18, 2017**	**0.0 – 400.0 l/Sec = 4.00 to 20.00 *mA***

Configuration Parameters:

Calibration Data Test **Tolerance: 5.0%**

		Input Variable	*Output Variable*	*% Error*	*Status*	*Notes*
	FIT-302	**92 l/Sec**	**7.63*mA***	**.31%**	**Passed**	

NOTES:*****Current calculated based on *Display Variable* 7.68 *mA* = ((92/400)*16) +4**

Error (% Full Scale) = ((Measured Output - Calculated *Variable*) / Full Scale) * 100

= ((7.63*mA* – 7.68 *mA*) / 16 mA)*100
= -.31 *% of full scale*

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5.8 FIT-301 Inlet Sewage Plant Pump Station Flow

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: **July 21 / 2017**

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 - 20.00 *mA***

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS OK	FIXED	N/A	FAULTY	COMMENTS
	GENERAL					
1	TAGGING			X		- Flow Verification by means of coil verification and output measurement
2						
	MECHANICAL					Coil Resistance = 101.4 Ohms = passed
	MOUNTING: Check for proper fastening, etc.	X				
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 Cal. Report# July 18, 2017**	**0.0 – 400.0 l/s = 4.00 to 20.00 *mA***

Configuration Parameters:

Calibration Data Test **Tolerance: 5.0%**

		Input Variable	*Output Variable*	*% Error*	*Status*	*Notes*
	FIT- 301	**47 l/s**	**6.10 *mA***	**1.38%**	**Passed**	

NOTES:*****Current calculated based on *Display Variable* 5.88 *mA* = ((47/400)*16) +4**

Error (% Full Scale) = ((Measured Output - Calculated *Variable*) / Full Scale) * 100

= ((6.10 *mA* – 5.88 *mA*) / 16 mA)*100
= 1.38 *% of full scale*

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5.9 FIT-501 U.V Inlet Channel Flow:

FIELD EQUIPMENT VERIFICATION / CALIBRATION REPORT

DATE: **July 21 / 2017**

DESCRIPTION: **Iroquois U.V Inlet Channel Flow**	MODEL: **7ME65201AA101AA0**	TAG: **FIT-501**
MANUFACTURER : **Siemens FM MAG 6000**	Serial: **N1D2087032**	

Client Name: **Township of South Stormont** . Device Output Signal : **4.00 - 20.00 *mA***

INSTALLATION INSPECTION

	DESCRIPTION	FINDINGS				COMMENTS
		OK	FIXED	N/A	FAULTY	
	GENERAL					
1	TAGGING			X		***Channel Configuration:***
2						**H = 0.868m**
	MECHANICAL					**B = 0.900m**
	MOUNTING: Check for proper fastening, etc.	X				***Sensor Configuration:***
4	CELL: Check Operation / Slope, etc.)	X				**h_{Sensor} = 0.000 m (at bottom) h_{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					**Analog Configuration:**
7		X				**Channel 1 = 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/s = 0.838x0.900x .249 m/s x1000**

SET-UP/CALIBRATION

	DIGITAL		ADJUSTMENT USING	VERIFIED USING	SETPOINT / RANGE
14	SETPOINT ADJUSTMENT	MECHANICAL TYPE			
		ELECTRONIC TYPE	**Fluke 725 calibrator S/N 8759025 Cal. Report# July 18, 2017**		**0 – 400.0 l/s = 4.00 to 20.00 *mA***

Configuration Parameters:	Calibration Data Test		Tolerance: 2%		
	Input Variable	***Output Variable***	***% Error***	***Status***	***Notes***
FIT- 501 **Velocity 0.249 m/s Area = .839 x .900 =.755m2**	**188.1 l/Sec**	**11.69 *mA***	**1.06%**	**passed**	

NOTES:*****Current calculated based on *Display Variable* 11.52 *mA* = ((188.1/400)*16) +4**
Error (% Full Scale) = ((Measured Output - Calculated *Variable*) / Full Scale) * 100

= ((11.69 *mA* – 11.52 *mA*) / 16 mA)*100
= 1.06 *% of full scale*

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