

**PUBLIC UTILITIES COMMISSION
FOR THE MUNICIPALITY OF CHATHAM-KENT
DRESDEN WASTEWATER TREATMENT PLANT**

2019 PERFORMANCE REPORT

January 1 to December 31, 2019

Amended Certificate of Approval # 8101-7QHKYR

Plant Type and Brief Description:

The Dresden Water Pollution Control Plant provides treatment of wastewater for approximately 2,500 residents of Dresden. Wastewater is collected and transported to the plant by gravity through the sanitary sewer system. As such, there are no sanitary pump stations located in Dresden.

The Dresden Water Pollution Control Plant is an Extended Aeration Plant with chemical phosphorus removal and final effluent disinfection. The plant was built in 1976 with a maximum design flow of 4,546m³/day. The plant discharges final effluent to the Sydenham River.

The existing treatment system includes the following processes:

- Raw sewage pumping
- Screening collection and removal
- Aerated Grit System
- Aeration Tanks
- Chemical phosphorus removal
- Settling Clarifiers
- Chlorine disinfection of final effluent
- Sludge collection and pumpage
- Sludge holding lagoons

Sludge from the holding lagoons is applied to agricultural land in the spring and fall each year.

REPORTING REQUIREMENTS

UNDER CERTIFICATE OF APPROVAL # 8101-7QHKYR

Summary and Interpretation of Monitoring and Comparison to the Effluent Limits: Condition 9 (5) (a)

Tables 1 and 2 outline monthly average results of parameters tested compared to the limits outlined in the Certificate of Approval Table 2 Effluent Limits.

The Total Phosphorus monthly average concentration limit was exceeded in the month of August.

The limit for the Total Phosphorus concentration is 1.0 mg/L and the August average concentration was 2.04 mg/L.

The Total Suspended Solids monthly average concentration limit was exceeded in the month of August.

The limit for the Total Phosphorus concentration is 25 mg/L and the August average concentration was 32 mg/L.

Success and Adequacy of the Works

During the reporting period, the annual average daily flow was 1,515 m³/day, which represents approximately 33% of the rated capacity of 4,546 m³/day.

There were no flow exceedances based on the Average Daily Flow during this reporting period. Overall, the Dresden WPCP performed well for this reporting period.

Table 1: Summary of Monitoring Data and Comparison to Effluent Limits & Objectives – Concentrations

as well as rated capacity to the sewage works

Rated Capacity: 4,546 m³/day average daily flow

Total sewage flow to the works during a calendar year divided by the number of days during which sewage was flowing to the works that year

Month	Total Monthly Influent Flow m ³	Avg Daily Influent Flow /Month m ³ /day	Avg Daily Influent Flow/Year m ³ /day	% of Plant Capacity	CBOD ₅ mg/L	pH	Total P mg/L	Total S.S. mg/L	Total Cl ₂ mg/L	E.coli
Limits	none	none	4,546	100	25	6.0 - 9.5	1.0	25		200
Objectives	none	none	4,546	100	15	6.0 - 9.5	0.8	15		
Jan	37,668	1,215			2.0	7.89	0.09	3.0	0.96	10
Feb	39,995	1,428			2.0	8.02	0.06	3.0	1.06	10
Mar	43,689	1,409			2.0	7.82	0.06	3.0	0.71	10
Apr	51,050	1,702			2.0	8.03	0.10	4.0	0.84	<10
May	53,944	1,740			2.0	8.08	0.19	2.8	0.67	13.16
Jun	41,960	1,399			2.0	7.82	0.37	11.5	0.69	28.66
Jul	36,132	1,166			2.0	7.92	0.26	3.2	0.65	15.85
Aug	36,201	1,168			3.3	7.35	2.04	32	1.17	31.78
Sep	87,671	2,922			2.0	8.26	0.14	2.8	0.63	15.65
Oct	56,896	1,835			2.0	8.00	0.59	4.5	0.89	20.93
Nov	34,366	1,146			2.0	8.00	0.27	3.0	0.87	15.65
Dec	33,270	1,073			2.0	7.87	0.14	1.4	0.94	10.00
Year			1,515	33%						
	Yearly Total Flow m³	Yearly Maximums								
	552,842	2,922			3.3	8.26	2.04	32	1.17	31.78

Table 2: Summary of Monitoring Data and Comparison to Effluent Limits – Loadings

Month	Avg Daily influent Flow /Month m³/day	CBOD₅ Kg/Day	Total S.S. Kg/Day	Total P Kg/Day
Limits	none	113	113	4.5
Jan	1,215	2.43	3.65	0.11
Feb	1,428	2.86	4.29	0.08
Mar	1,409	2.82	4.23	0.09
Apr	1,702	3.40	6.81	0.16
May	1,740	3.48	4.79	0.33
Jun	1,399	2.80	16.08	0.52
Jul	1,166	2.33	3.73	0.30
Aug	1,168	3.80	37.37	2.38
Sep	2,922	5.84	8.18	0.40
Oct	1,835	3.67	8.26	1.09
Nov	1,146	2.29	3.44	0.31
Dec	1,073	2.15	1.50	0.15
	Yearly Maximums			
	2,922	5.84	37.37	2.38

**Operating Problems and Corrective Action:
Condition 9 (5) (b)**

The Dresden WPCP encountered an operational problem during the month of August while the one of its aeration tanks was down for maintenance. Due to toxic inflow, the operational aeration tank contents were transferred to a lined holding lagoon on the facility property. Both aeration tanks have were reseeded from another facility to restart the process.

**Summary of Maintenance Activities:
Condition 9 (5) (c)**

All regular and routine maintenance in the plant was carried out throughout the reporting period. Aeration tanks were drained and cleaned as well as inspected. Chatham-Kent PUC utilises an electronic preventative maintenance program to track preventative maintenance. In addition to the routine maintenance, the following additional maintenance activities and equipment replacement was completed for the reporting period:

- Motor Control Panel and Switch Gear Replacement (Main Lift Bld.) 90,000
- Clarifier Effluent Piping (Replaced) 70,000
- New Raw Water Pump #3 25,000
- Replacement of Wet Well Gates (all) 18,000
- Replacement Level Sensors (Wet Wells) 5,000
- Reparation of Raw Pump #1 2,000
- pH Meter Installation (Raw Water) 2,000

**Quality Assurance and Control Measures:
Condition 9 (5) (d)**

Dresden Water Pollution Plant followed a sampling schedule developed in accordance with the Certificate of Approval and applicable regulations for this reporting period.

Composite chemistry samples of the raw flow were collected using an auto sampler. Chemistry samples were submitted monthly to an accredited laboratory for analysis of BOD₅, Total Suspended Solids, Total Phosphorus, pH and Total Kjeldahl Nitrogen.

Composite chemistry samples of the effluent were collected using an auto sampler. Chemistry samples were submitted weekly to an accredited laboratory for analysis of CBOD₅, Total Suspended Solids, Total Kjeldahl Nitrogen, Total Phosphorus and Total Ammonia Nitrogen, Alkalinity, pH, Nitrite and Nitrate.

Bacteriological samples of the effluent were collected weekly according to the Sampling Program. Bacteriological samples were submitted weekly to an accredited laboratory for analysis.

In house samples were analyzed by a licensed operator for pH, DO, and temperature.

**Calibration and Maintenance on Effluent Monitoring Equipment:
Condition 9 (5) (e)**

All required probes and sensors are cleaned, maintained and/or calibrated on a monthly basis

or as required by manufacturers' specifications.

Monitoring equipment calibration/verification report(s) included for the following:

- Influent flow meter
- Effluent flow meter
- Spectrophotometer

Effluent Objectives:

Condition 9 (5) (f)

Table 1 outlines monthly average results of parameters tested compared to the objectives outlined in the Certificate of Approval Table 1 Effluent Objectives.

The Total Phosphorus monthly average concentration effluent objective was exceeded in the month of August.

The effluent objective for the Total Phosphorus concentration is 0.8 mg/L and the August average concentration was 2.04 mg/L.

The Total Suspended Solids monthly average concentration effluent objective was exceeded in the month of August.

The effluent objective for the Total Phosphorus concentration is 15 mg/L and the August average concentration was 32 mg/L.

Sludge Management:
Condition 9 (5) (g)

During the reporting period, waste activated sludge was transferred to the sludge holding

lagoons. Terrapure Environmental Organic Solutions was contracted to land apply the sludge according to agreements listed below.

**Tabulation of the Volume of Sludge Generated
Summary of Locations where the Sludge was Disposed**

MONTH	SLUDGE VOLUME in m³	TRANSFER TO LOCATION	AGREEMENT NUMBER
May	1,000	Concession 2, Lot 14 Concession 2, Lot 15 Concession Block between Con 2 & 3, Lot 18 Zone Township Chatham Kent	NASM Plan# 16256
November	347	Concession 2, Lot 4 Zone Township Chatham Kent	NASM Plan# 16256
Total Sludge Applied	1,347		

Outline of Anticipated Volumes in Next Reporting Period

The sludge production and sludge handling method for the next reporting period is anticipated to be similar to that of this reporting period.

**Community Complaints:
Condition 9 (5) (h)**

There were no Customer Complaints received during the reporting period.

**By-pass, Spill, or Abnormal Discharge Events:
Condition 9 (5) (i)**

There were no by-pass or spill events for the reporting period.

**Other Information the District Manager Requires:
Condition 9 (5) (j)**

No other information was required by the District Manager during this reporting period.

APPENDIX A

Yearly Operational Data Summary for the Reporting Period

2019	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	TOTAL	MAX	MIN	AVG
Raw Sewage																
Total Flow 1000 m ³	37.668	39.995	43.689	51.050	53.944	41.960	36.132	36.201	87.671	56.896	34.366	33.270	552.842	87.671	33.270	46.070
Avg. Daily Flow 1000 m ³ /d	1.215	1.428	1.409	1.702	1.740	1.399	1.166	1.168	2.922	1.835	1.146	1.073	2.922	2.922	1.073	1.517
Max Daily Flow 1000 m ³ /d	2.377	2.092	3.080	4.794	3.704	2.640	1.797	2.195	4.443	5.882	2.151	1.658	5.882	5.882	1.658	3.068
Final Effluent																
Total Flow 1000 m ³	37.606	41.143	45.13	46.395	49.93	45.277	36.035	28.7801	74.637	52.805	34.308	30.172	522.218	74.637	28.780	43.518
Avg. Daily Flow 1000 m ³ /d	1.213	1.469	1.456	1.547	1.611	1.509	1.162	1.028	2.488	1.703	1.144	0.973	2.488	2.488	0.973	1.442
Max Daily Flow 1000 m ³ /d	2.282	2.071	1.893	3.314	3.502	2.082	1.563	1.615	4.018	5.507	2.039	2.135	5.507	5.507	1.563	2.668
Disinfection																
Cl2 Kgs. Used	93.6	88.2	76.2	103.7	106.4	85.9	86.8	107.3	168.2	143.0	110.5	71.8	1241.54	168.18	71.82	103.461
Cl2 Avg. Dosage mg/L	2.5	2.2	1.7	2.0	2.0	2.0	2.4	3.0	1.9	2.5	3.2	2.2	3.2	3.2	1.7	2.305
Cl2 Avg. Residual mg/L	0.96	1.06	0.71	0.84	0.67	0.69	0.65	1.17	0.63	0.89	0.87	0.94	1.2	1.2	0.6	0.839
# of Samples	23	20	21	22	23	20	23	17	21	23	21	21	21	45.3	21.7	31.506
Aluminum Sulphate																
Total Litres Used	2498.40	2419.20	2419.20	3456.00	5083.20	4595.0	3391.20	4184.64	4636.80	3931.20	3024.00	3124.80	42763.68	5083.20	2419.20	3563.640
Avg. Monthly Dosage	23.61	21.69	21.88	28.35	37.61	42.80	35.14	45.34	22.37	30.56	33.22	35.49	42763.68	45.3	21.7	31.506
Final Effluent Loadings																
CBOD ₅ kg/d	2.43	2.86	2.82	3.40	3.48	2.80	2.33	3.80	5.84	3.67	2.29	2.15	5.84	5.84	2.15	3.16
Solids, Suspended kg/d	3.65	4.29	4.23	6.81	4.79	16.08	3.73	37.37	8.18	8.26	3.44	1.50	37.37	37.37	1.50	8.53
Phosphorous, Total as P, kg/d	0.11	0.08	0.09	0.16	0.33	0.52	0.30	2.38	0.40	1.09	0.31	0.15	2.38	2.38	0.08	0.49
Ammonia as N, kg/d	0.24	0.08	0.18	0.18	0.16	1.02	0.07	0.32	0.29	0.20	0.06	0.09	1.02	1.02	0.06	0.24
Hauled Sludge																
Volume m ³					1,000						347		1347.0	1000.0	347.0	673.50
pH					6.94						7.47		7.47	7.47	6.94	7.21
Total Solids mg/l					20,000						27,000		27000.00	27000.00	20000.00	23500.00
Total P kg/m ³					450.00						630.00		630.00	630.00	450.00	540.00
Nitrogen kg/m ³					0.12						0.13		0.13	0.13	0.12	0.13

	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	TOTAL	MAX	MIN	AVG
Microbiological																
results are geometric means																
E.Coli Results CFU/100ml	10.00	10.00	10.00	10.00	13.16	28.66	15.85	31.78	15.65	20.93	15.65	10.00		31.78	10.00	15.97
# of Samples	5	4	4	5	4	4	5	4	5	4	4	5	53	5	4	4
Raw Sewage																
BOD5, mg/L	180.0	210.0	860.0	300.0	120.0	120.0	180.0	160.0	75.0	180.0	76.0	150.0		860.0	75.0	217.6
Nitrogen, T. Kjeldahl as N, mg/L	25.0	24.0	18.0	22.0	17.0	33.0	34.0	35.0	27.0	14.0	15.0	25.0		35.0	14.0	24.1
PH	7.46	7.00	4.32	6.84	7.42	7.16	7.49	7.41	7.43	7.79	7.48	7.10		7.79	4.32	7.1
Phosphorous, Total as P, mg/L	3.1	4.2	2.7	4.6	3.3	4.9	5.4	5.3	2.9	5.3	2.6	5.3		5.4	2.6	4.1
Solids, Suspended mg/L	160	120	71	190	120	150	210	190	70	160	110	240		240	70	149
# of Samples	1	1	1	1	1	1	1	1	1	1	1	1	12	1	1	1
Final Effluent																
Total Ammonia mg/l	0.20	0.06	0.13	0.11	0.09	0.73	0.06	0.27	0.10	0.11	0.05	0.08		0.73	0.05	0.2
Total CBOD5 mg/l	2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.25	2.00	2.00	2.00	2.00		3.25	2.00	2.1
Total Kjeldahl Nitrogen (TKN) mg/l	0.68	0.56	0.58	0.80	1.30	1.23	0.93	1.25	0.73	0.97	1.18	0.72		1.30	0.56	0.9
pH (Maxxam Lab Results)	7.89	8.02	7.82	8.03	8.08	7.82	7.92	7.35	8.26	8.00	8.00	7.87		8.26	7.35	7.9
Total Phosphorus mg/l	0.09	0.06	0.06	0.10	0.19	0.37	0.26	2.04	0.14	0.59	0.27	0.14		2.04	0.06	0.4
Total Suspended Solids mg/L	3.00	3.00	3.00	4.00	2.75	11.50	3.20	32.00	2.80	4.50	3.00	1.40		32	1.4	6.2
Alkalinity (Total as CaCO3) mg/l	136.00	142.50	175.00	156.80	157.50	109.00	98.80	37.00	318.20	222.00	180.00	115.60		318.20	37.00	154.0
Nitrite mg/l	0.02	0.03	0.18	0.10	0.06	0.45	0.04	0.13	0.02	0.04	0.07	0.02		0.45	0.02	0.1
Nitrate mg/l	19.24	13.75	5.75	14.84	19.01	24.48	20.30	38.80	13.37	30.78	15.90	18.24		38.80	5.75	19.5
Temp. °C	10.07	9.80	10.29	12.77	15.24	17.47	20.76	20.99	19.73	23.23	13.25	12.23		23.23	9.80	15.5
# of Samples	5	4	4	5	4	4	5	4	5	4	4	5	53	5	4	4
Total Unionized Ammonia mg/l (Pro)	0.0011	0.0007	0.0020	0.0021	0.0015	0.0073	0.0011	0.0036	0.0038	0.0029	0.0008	0.0007		0.007263	0.000658	0.002305
Federal (Quarterly)																
Final Flow Qtr. m3	123879.00												139452.10	117285.00		
CBOD Qtr. mg/L	2.00												2.42	2.00		
SS Qtr. mg/L	3.00												12.67	2.97		
Number of Days	90												92	92		

Federal WSER Acute Lethality
Average Daily Volume Effluent (m ³):
1431

APPENDIX B

Calibration Reports for the Reporting Period

Western Office Eastern Office
2088 Jetstream Road 1602 Old Wooler Road
London, Ontario Wooler, Ontario
N5V 3P6 K0K 3M0

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER Chatham-Kent, North-East Area
CONTACT Todd Daily, Senior Operator
Dresden Sewage Treatment Plant
699 Camden Street, Dresden ON
Cell: 519-359-2815

EQUIPMENT DETAIL

[MUT] MANUFACTURER Milltronics
MODEL OCM III
CONVERTER SERIAL NUMBER N/A

VER. BY - FM Paris Machuk/Brendon Jacksic

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

PLANT ID Dresden Water Pollution Control Plant
METER ID Raw Flow (Influent)
FIT ID FIT-201
CLIENT TAG N/A
OTHER N/A
GPS COORDINATES N/A
ADDRESS 699 Camden St. Dresden, ON
VERIFICATION DATE January 31, 2019
CAL. FREQUENCY Annual
CAL. DUE DATE January, 2020

PROGRAMMING PARAMETERS

THROAT DIMENSION (DN)	inches	12
EMPTY DISTANCE	m	1.365
MAX. HEAD	m	0.293
DEAD ZONE	m	1.072
BLANKING DISTANCE	m	0.300
MAX. FLOW	M3/D	9200.8
F.S. RANGE - O/P	M3/D	9200.0

TOTALIZER		
AS FOUND	6447924	M3
AS LEFT	6447967	M3
DIFFERENCE	43	M3

TEST CRITERIA		
AS FOUND CERTIFICATION TEST		Yes
ALLOWABLE [%] ERROR		15

COMPONENTS TESTED

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

Ultrasonic sensor installed to ensure full scale flow condition

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

AS FOUND TEST RESULTS

		19.5	36.2	56.0	78.7	96.0	% F.S. Range
		0.100	0.150	0.200	0.250	0.285	m
REF. FLOW RATE		1794.44	3326.13	5153.43	7237.58	8834.92	M3/D
MUT [Reading]		2042.60	3684.98	5635.50	7605.71	9332.52	M3/D
MUT [Difference]		248.16	358.85	482.07	368.13	497.60	M3/D
MUT [% Error]		2.70	3.90	5.24	4.00	5.41	%
mA OUTPUT		7.121	9.784	12.962	16.586	19.364	mA
MUT [Reading]	min. 4.000 mA	7.578	10.358	13.999	17.211	20.289	mA
MUT [Difference]	max. 20.000 mA	0.457	0.574	1.037	0.625	0.925	mA
MUT [% Error]		2.29	2.87	5.19	3.12	4.63	%
TOTALIZER - REF. FLOW RATE						8834.924	M3/D
TOTALIZER [MUT]						10	M3
TEST TIME						91.99	SECONDS
CALC. TOTALIZER						9.407	M3
ERROR						5.93	%

COMMENTS

Note: Extreme cold in effect - may be causing over reading but should be within +/- 15% if waste water by MOE standards

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD	Yes
PROCESS METER	DMM	1
STOP WATCH	SW	Yes

RESULTS

TEST	AVG %FS	PASS FAIL
DISPLAY	4.64	PASS
mA OUTPUT	3.62	PASS
TOTALIZER	5.93	PASS

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

Western Office Eastern Office
2088 Jetstream Road 1602 Old Wooler Road
London, Ontario Wooler, Ontario
N5V 3P6 K0K 3M0

AS FOUND CERTIFICATION

PASS

CLIENT DETAIL		EQUIPMENT DETAIL	
CUSTOMER	Chatham-Kent, North-East Area	[MUT] MANUFACTURER	Milltronics
CONTACT	Todd Daily, Senior Operator	MODEL	OCM III
	Dresden Sewage Treatment Plant	CONVERTER SERIAL NUMBER	N/A
	699 Camden Street, Dresden ON		
	Cell: 519-359-2815		
VER. BY - FM Paris Machuk		PLANT ID	Dresden Water Pollution Control Plant
Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was		METER ID	Effluent Flow
		FIT ID	FIT-Effluent
		CLIENT TAG	FIT-601
		OTHER	N/A
		GPS COORDINATES	N/A
		ADDRESS	699 Camden St. Dresden, ON
		VERIFICATION DATE	January 31, 2019
		CAL. FREQUENCY	Annual
		CAL. DUE DATE	January, 2020

PROGRAMMING PARAMETERS			TOTALIZER		
THROAT DIMENSION (DN)	inches	12	AS FOUND	8151340	M3
EMPTY DISTANCE	m	0.875	AS LEFT	8151380	M3
MAX. HEAD	m	0.293	DIFFERENCE	40	M3
DEAD ZONE	m	0.582	TEST CRITERIA		
BLANKING DISTANCE	m	0.300	AS FOUND CERTIFICATION TEST	Yes	
MAX. FLOW	M3/D	9207.0	ALLOWABLE [%] ERROR	5	
F.S. RANGE - O/P	M3/D	9206.0	COMPONENTS TESTED		
			CONVERTER DISPLAY	yes	
			mA OUTPUT	Yes	
			TOTALIZER	yes	
			ACCURACY BASED ON [% o.r.]	no	
			ERROR DOCUMENTED IN THIS REPORT, BASED ON % F.S.		

Ultrasonic sensor installed to ensure full scale flow condition

AS FOUND TEST RESULTS

		19.5	36.1	56.0	78.6	96.0	% F.S. Range
		0.100	0.150	0.200	0.250	0.285	m
REF. FLOW RATE		1794.44	3326.13	5153.43	7237.58	8834.92	M3/D
MUT [Reading]		1744.20	3227.88	5144.20	7212.12	8800.20	M3/D
MUT [Difference]		-50.24	-98.25	-9.23	-25.46	-34.72	M3/D
MUT [% Error]		-0.55	-1.07	-0.10	-0.28	-0.38	%
mA OUTPUT		7.118	9.780	12.956	16.578	19.353	mA
MUT [Reading]	min. 4.000 mA	6.994	9.625	12.884	16.520	19.285	mA
MUT [Difference]	max. 20.000 mA	-0.124	-0.155	-0.072	-0.058	-0.068	mA
MUT [% Error]		-0.62	-0.78	-0.36	-0.29	-0.34	%
TOTALIZER - REF. FLOW RATE						8834.924	M3/D
TOTALIZER [MUT]						10	M3
TEST TIME						98.02	SECONDS
CALC. TOTALIZER						10.023	M3
ERROR						-0.23	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD	Yes
PROCESS METER	DMM	1
STOP WATCH	SW	Yes

RESULTS

TEST	AVG %FS	PASS FAIL
DISPLAY	-0.46	PASS
mA OUTPUT	-0.48	PASS
TOTALIZER	-0.23	PASS

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



Multi-Wavelength Colorimeter
Verification Report

PASS

AS FOUND CERTIFICATION

CUSTOMER CONTACT	Municipality of Chatham-Kent Todd Daly Chief Operator, North East Dresden WPCP 699 Camden St. Dresden, ON N0P 1M0 c. 519-359-2815 e. toddd@chatham-kent.ca Randy Nichol	[MUT] MANUFACTURER	HACH
		MODEL	DR3900
		SERIAL NUMBER	1711042
		CLIENT TAG	n/a
		LOCATION	Dresden STP
		OTHER	n/a
VER. BY		TOLERANCE [mg/L]	0.05
		STANDARD RECOVERY [%]	90
Quality Management Standards Information - Standards, reference equipment, and instrumentation used to conduct this test outlining the lot#, and expiry date is found in our current QMS document.		VERIFICATION DATE	Mar 5, 2019
		CAL. FREQUENCY	Annual
		CAL. DUE DATE	Mar-2020

CHLORINE [Cl₂] SECONDARY STANDARDS

STANDARD	BLANK [mg/L]			READING mg/L	PASS FAIL
STD 1	0.25	+/-	0.09	0.23	PASS
STD 2	0.94	+/-	0.10	0.95	PASS
STD 3	1.71	+/-	0.14	1.73	PASS

CHLORINE [Cl₂] PRIMARY STANDARDS

STANDARD VALUE [mg/L]	30	BLANK SAMPLE SIZE [mL]	10.0
STANDARD ADDITIONS SIZE [mL]	0.200	DPD LOT#	A8134
		EXPIRY DATE	May-2013

SAMPLE TEST #	Cl ₂ STANDARD mL	COMBINED SAMPLE mL	REFERENCE STANDARD mg/L	REFERENCE READING mg/L	MUT READING mg/L	DIFF. ERROR mg/L	PASS FAIL	STANDARD RECOVERY %
BLANK	0	10.000	0	0	0	0	PASS	N/A
STD 1	0.200	10.200	0.59	0.56	0.56	0.00	PASS	94.9
STD 2	0.400	10.400	1.15	1.06	1.07	0.01	PASS	92.2
STD 3	0.600	10.600	1.70	1.52	1.53	0.01	PASS	89.4
AVERAGE RESULTS						0.01	PASS	92.2

COMMENTS

[QMS] INFORMATION	ITEM	ID #
[REFERENCE] HACH PCII	HACH PC II	1
10.0 mL PIPETTE	HACH-PP-10	1
0.2 mL PIPETTE	G-PP-2	1
SECONDARY STANDARDS	AS-CLSS	1
PRIMARY STANDARDS	AS-CLPS	1
ABSORBANCE STANDARDS	AS-ABS	1

ABSORBANCE CHECKS		
WAVELENGTH	TESTED	PASS/FAIL
420 nm	Yes	PASS
520 nm	Yes	PASS
560 nm	Yes	PASS
610 nm	Yes	PASS

Primary and Secondary standards were used to confirm the overall accuracy of this instrument along with conducting an analytical comparative technique against a reference meter. All values are considered "AS FOUND" readings. If the "AS FOUND" readings were not within acceptable limits, an "AS LEFT" report will be issued if the instrument was able to be calibrated to indicate the overall accuracy of the meter. If the meter was not calibrated for any reason, a comment will be issued for this instrument.