Chemical Analysis Report

CEN-DIST-2018-07-25-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Myrle / Ann / Seacry**
Request ID: **RQ-2018-07-16-42**
Customer: **CEN-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 14-AUG-2018 11:53

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

A - Value reported is the mean of two or more determinations.
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value and/or the analysis did not meet established quality control criteria.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Myrtle @ 140m W of Center of South Lobe Collection Date/Time: 07/24/2018 10:07

Field ID: G2CE0190 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010478	EPA 180.1 Rev. 2.0	Turbidity	21		NTU	P349129	
	EPA 300.0 Rev. 2.1	Chloride	30		mg Cl/L	P349410	
		Sulfate	2.8		mg SO4/L	P349412	
	SM 2120 B	Color (true)	36	A	PCU	P349167	
	SM 2320 B-97	Total Alkalinity	52		mg CaCO3/L	P349352	
	SM 2540 C-97	TDS	123		mg/L	P349673	
	SM 2540 D-97	TSS	15		mg/L	P349366	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P349356	
2010480	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P349322	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P349377	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P349331	
	EPA 365.1 Rev. 2.0	Total-P	0.094		mg P/L	P349209	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P349296	
2010482	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P349139	
2010488	EPA 200.7 Rev. 4.4	Calcium	15.0		mg/L	P349205	
		Iron	200		ug/L	P349205	
		Magnesium	3.28		mg/L	P349205	
		Potassium	3.9		mg/L	P349205	
		Sodium	20.7		mg/L	P349205	
		Zinc	5.0	U	ug/L	P349205	
	EPA 200.8 Rev. 5.4	Arsenic	1.09		ug/L	P349205	
		Cadmium	0.020	U	ug/L	P349205	
		Chromium	0.40	U	ug/L	P349205	
		Copper	0.29	I	ug/L	P349205	
		Lead	0.29		ug/L	P349205	
		Nickel	0.28	I	ug/L	P349205	
		Silver	0.010	U	ug/L	P349205	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Myrtle @ 135m NE of Center of South Lobe **Collection Date/Time: 07/24/2018 10:15**

Field ID: G2CE0191 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010479	EPA 180.1 Rev. 2.0	Turbidity	20		NTU	P349129	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P349410	
		Sulfate	2.8		mg SO4/L	P349412	
	SM 2120 B	Color (true)	35		PCU	P349167	
	SM 2320 B-97	Total Alkalinity	52		mg CaCO3/L	P349352	
	SM 2540 C-97	TDS	132		mg/L	P349673	
	SM 2540 D-97	TSS	16		mg/L	P349366	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P349356	
2010481	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P349322	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P349377	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P349331	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P349209	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P349296	
2010483	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P349139	
2010489	EPA 200.7 Rev. 4.4	Calcium	15.5		mg/L	P349205	
		Iron	190		ug/L	P349205	
		Magnesium	3.41		mg/L	P349205	
		Potassium	4.1		mg/L	P349205	
		Sodium	21.4		mg/L	P349205	
		Zinc	5.0	U	ug/L	P349205	
	EPA 200.8 Rev. 5.4	Arsenic	1.16		ug/L	P349205	
		Cadmium	0.020	U	ug/L	P349205	
		Chromium	0.40	U	ug/L	P349205	
		Copper	0.34	I	ug/L	P349205	
		Lead	0.32		ug/L	P349205	
		Nickel	0.28	I	ug/L	P349205	
		Silver	0.010	U	ug/L	P349205	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P349129

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349205

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349205

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349410

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349412

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P349322

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349377

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349331

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P349209

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349139

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B
Batch ID: P349167

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P349352

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-97
Batch ID: P349673

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P349366

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P349356

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P349296

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349205

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	104		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	101		P	85 - 115
Sodium	98.3		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349205

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.3		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	95.7		P	85 - 115
Copper	98.0		P	85 - 115
Lead	94.5		P	85 - 115
Nickel	100		P	85 - 115
Silver	97.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349410

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349412

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P349322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	102		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349377

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	109		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349331

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P349209

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349139

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.1		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P349167

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P349352

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P349356

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.5		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P349296

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	91.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010488	Calcium	101		P	80 - 120
2010488	Iron	101		P	80 - 120
2010488	Magnesium	99.5		P	80 - 120
2010488	Potassium	97.2		P	80 - 120
2010488	Sodium	96.5		P	80 - 120
2010488	Zinc	104		P	80 - 120
2010664	Calcium	101		P	80 - 120
2010664	Iron	99.7	101	P/P	80 - 120
2010664	Magnesium	99.2		P	80 - 120
2010664	Potassium	100	100	P/P	80 - 120
2010664	Sodium	99.3		P	80 - 120
2010664	Zinc	99.0	98.3	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010488	Arsenic	104		P	80 - 120
2010488	Cadmium	102		P	80 - 120
2010488	Chromium	95.3		P	80 - 120
2010488	Copper	99.6		P	80 - 120
2010488	Lead	97.8		P	80 - 120
2010488	Nickel	101		P	80 - 120
2010488	Silver	98.0		P	80 - 120
2010664	Arsenic	102	102	P/P	80 - 120
2010664	Cadmium	99.6	102	P/P	80 - 120
2010664	Chromium	96.1	96.0	P/P	80 - 120
2010664	Copper	95.0	95.8	P/P	80 - 120
2010664	Lead	95.4	95.2	P/P	80 - 120
2010664	Nickel	96.7	98.1	P/P	80 - 120
2010664	Silver	96.4	96.1	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349410

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010201	Chloride	103		P	90 - 110
2010534	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349412

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010201	Sulfate	103		P	90 - 110
2010534	Sulfate	99.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P349322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010204	Ammonia-N	100	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349377

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010493	Kjeldahl Nitrogen	99.7	92.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010480	NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P349209

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010204	Total-P	99.0	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349139

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010213	O-Phosphate-P	99.0	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P349356

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010817	Fluoride	96.7	96.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P349296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010223	Organic Carbon	99.2		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P349129

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010222	Turbidity	2.62	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010664	Calcium	0.497	Spike	P	0 - 20
2010664	Iron	0.980	Spike	P	0 - 20
2010664	Magnesium	0.562	Spike	P	0 - 20
2010664	Potassium	0.223	Spike	P	0 - 20
2010664	Sodium	0.833	Spike	P	0 - 20
2010664	Zinc	0.688	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010664	Arsenic	0.0953	Spike	P	0 - 20
2010664	Cadmium	2.66	Spike	P	0 - 20
2010664	Chromium	0.193	Spike	P	0 - 20
2010664	Copper	0.799	Spike	P	0 - 20
2010664	Lead	0.195	Spike	P	0 - 20
2010664	Nickel	1.41	Spike	P	0 - 20
2010664	Silver	0.379	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349410

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010201	Chloride	3.66	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010201	Sulfate	5.18	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P349322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010204	Ammonia-N	0.875	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010493	Kjeldahl Nitrogen	4.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010480	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P349209

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010204	Total-P	1.55	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349139

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010213	O-Phosphate-P	0.506	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P349167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010478	Color (true)	4.47	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P349352

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010817	Total Alkalinity	0.574	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P349673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010614	TDS	3.56	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P349356

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010817	Fluoride	0.0	Spike	P	0 - 3.5

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P349296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010223	Organic Carbon	0.0842	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A85472
Included Lab Sample IDs: 2010478, 2010479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A85473
Included Lab Sample IDs: 2010482, 2010483

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.0	97.6	P/P	90 - 110
O-Phosphate-P	97.6	98.1	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A85480
Included Lab Sample IDs: 2010478, 2010479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	105	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A85518
Included Lab Sample IDs: 2010480, 2010481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.3	98.7	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A85527
Included Lab Sample IDs: 2010480, 2010481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.8	96.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A85536
Included Lab Sample IDs: 2010480, 2010481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A85538
Included Lab Sample IDs: 2010480, 2010481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A85544
Included Lab Sample IDs: 2010488, 2010489

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	99.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A85544
Included Lab Sample IDs: 2010488, 2010489

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	100	98.7	P/P	90 - 110
Magnesium	99.8	98.2	P/P	90 - 110
Potassium	99.6	98.8	P/P	90 - 110
Sodium	97.7	97.4	P/P	90 - 110
Zinc	101	99.3	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A85546
Included Lab Sample IDs: 2010478, 2010479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A85546
Included Lab Sample IDs: 2010478, 2010479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A85560
Included Lab Sample IDs: 2010478, 2010479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	104	P/P	90 - 110
Sulfate	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A85579
Included Lab Sample IDs: 2010480, 2010481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.4	93.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A85664
Included Lab Sample IDs: 2010488, 2010489

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	100	P/P	90 - 110
Cadmium	99.5	98.5	P/P	90 - 110
Chromium	98.3	95.6	P/P	90 - 110
Copper	101	100	P/P	90 - 110
Lead	97.7	96.9	P/P	90 - 110
Nickel	100	101	P/P	90 - 110
Silver	95.3	95.0	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						2.62	
EPA 200.7 Rev. 4.4	Calcium	101	101	101				0.497
	Iron	104	101	99.7	101			0.980
	Magnesium	101	99.5	99.2				0.562
	Potassium	101	97.2	100	100			0.223
	Sodium	98.3	96.5	99.3				0.833
	Zinc	102	104	99.0	98.3			0.688
EPA 200.8 Rev. 5.4	Arsenic	99.3	104	102	102			0.0953
	Cadmium	101	102	99.6	102			2.66
	Chromium	95.7	95.3	96.1	96.0			0.193
	Copper	98.0	99.6	95.0	95.8			0.799
	Lead	94.5	97.8	95.4	95.2			0.195
	Nickel	100	101	96.7	98.1			1.41
	Silver	97.3	98.0	96.4	96.1			0.379
EPA 300.0 Rev. 2.1	Chloride	100	103	101			3.66	
	Sulfate	99.8	103	99.5			5.18	
EPA 350.1 Rev. 2.0	Ammonia-N	102	100	101				0.875
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109	99.7	92.6				4.62
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	103				0.487
EPA 365.1 Rev. 2.0	Total-P	96.5	99.0	97.4				1.55
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	99.0	98.5				0.506
SM 2120 B	Color (true)	104					4.47	
SM 2320 B-97	Total Alkalinity	103					0.574	
SM 2540 C-97	TDS						3.56	
SM 4500 F-C-97	Fluoride	96.5	96.7	96.7				0.0
SM 5310 B-00	Organic Carbon	91.6	99.2					0.0842

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2010478, 2010479
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2010488, 2010489
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2010488, 2010489
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2010478, 2010479
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2010478, 2010479
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2010480, 2010481
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2010480, 2010481
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2010480, 2010481
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2010480, 2010481
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2010482, 2010483
SM 2120 B / E31780	True Color measured at 450 nm	2010478, 2010479
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2010478, 2010479
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2010478, 2010479
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2010478, 2010479
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2010478, 2010479

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2010480, 2010481

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	07/25/2018			07/25/2018 16:44	William L. Brown IV	2010478, 2010479
EPA 200.7 Rev. 4.4	07/25/2018	07/26/2018 14:30	Elliott D. Healy	07/27/2018 13:58	Betina Topolski	2010488
	07/25/2018	07/26/2018 14:30	Elliott D. Healy	07/27/2018 14:18	Betina Topolski	2010489
EPA 200.8 Rev. 5.4	07/25/2018	07/26/2018 14:30	Elliott D. Healy	08/02/2018 20:07	Allison Taylor	2010488
	07/25/2018	07/26/2018 14:30	Elliott D. Healy	08/02/2018 20:26	Allison Taylor	2010489
EPA 300.0 Rev. 2.1	07/25/2018			07/30/2018 15:10	Lipi Saha	2010478
	07/25/2018			07/30/2018 15:22	Lipi Saha	2010479
EPA 350.1 Rev. 2.0	07/25/2018			07/27/2018 13:38	Ping Hua	2010480
	07/25/2018			07/27/2018 13:40	Ping Hua	2010481
EPA 351.2 Rev. 2.0	07/25/2018	07/30/2018 10:15	Adrian Shelby	07/31/2018 10:44	Joseph Suarez	2010480
	07/25/2018	07/30/2018 10:15	Adrian Shelby	07/31/2018 10:46	Joseph Suarez	2010481
EPA 353.2 Rev. 2.0	07/25/2018			07/27/2018 12:44	Lauren Bottorf	2010480
	07/25/2018			07/27/2018 12:53	Lauren Bottorf	2010481
EPA 365.1 Rev. 2.0	07/25/2018	07/26/2018 12:35	Sima Feizi	07/27/2018 09:36	Beverly Y. Sanders	2010480
	07/25/2018	07/26/2018 12:35	Sima Feizi	07/27/2018 09:37	Beverly Y. Sanders	2010481
EPA 365.1 Rev. 2.0 dissolved	07/25/2018			07/25/2018 17:40	Julia Storbeck	2010482
	07/25/2018			07/25/2018 17:45	Julia Storbeck	2010483
SM 2120 B	07/25/2018			07/25/2018 17:17	Tanya Welborn	2010478
	07/25/2018			07/25/2018 17:18	Tanya Welborn	2010479
SM 2320 B-97	07/25/2018			07/26/2018 22:51	Dale L. Simmons	2010478
	07/25/2018			07/26/2018 23:01	Dale L. Simmons	2010479
SM 2540 C-97	07/25/2018			07/28/2018 20:08	Yijie Li	2010478, 2010479
SM 2540 D-97	07/25/2018			07/28/2018 23:02	Yijie Li	2010478, 2010479
SM 4500 F-C-97	07/25/2018			07/26/2018 22:51	Dale L. Simmons	2010478
	07/25/2018			07/26/2018 23:01	Dale L. Simmons	2010479
SM 5310 B-00	07/25/2018			07/26/2018 18:53	Megan Treadwell	2010480
	07/25/2018			07/26/2018 19:07	Megan Treadwell	2010481