Chemical Analysis Report

SO-DIST-2020-06-12-01

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

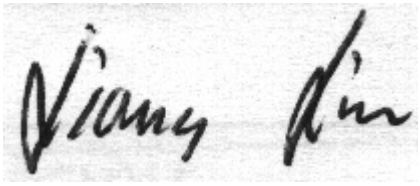
Event Description: **2020 SMP : Large Highlands**
Request ID: **RQ-2020-04-06-35**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Chris Hormuth

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 02-JUL-2020 14:40



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 by the Florida Department of Health Environmental Laboratory Certification Program 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: LittleRedWaterLake@Mid **Collection Date/Time: 06/11/2020 10:35**

Field ID: G4SD0171 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2176055	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P383156	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P383380	
		Sulfate	9.4		mg SO4/L	P383384	
	SM 2120 B-2011	Color (true)	54		PCU	P383159	
	SM 2320 B-2011	Total Alkalinity	4.7		mg CaCO3/L	P383248	
	SM 2540 C-2011	TDS	73	A	mg/L	P383569	
	SM 2540 D-2011	TSS	3	I A	mg/L	P383520	
	SM 4500 F-C-2011	Fluoride	0.064	I	mg F/L	P383251	
2176057	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P383179	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P383361	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P383206	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P383231	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P383311	
2176059	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P383165	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: JacksonCreek@SkippierRd **Collection Date/Time: 06/11/2020 11:30**

Field ID: G4SD0182 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2176056	EPA 180.1 Rev. 2.0	Turbidity	6.6		NTU	P383156	
	EPA 300.0 Rev. 2.1	Chloride	9.8		mg Cl/L	P383380	
		Sulfate	16		mg SO4/L	P383384	
	SM 2120 B-2011	Color (true)	240		PCU	P383159	
	SM 2320 B-2011	Total Alkalinity	1.3	I	mg CaCO3/L	P383248	
	SM 2540 C-2011	TDS	102		mg/L	P383569	
	SM 2540 D-2011	TSS	3	I	mg/L	P383520	
	SM 4500 F-C-2011	Fluoride	0.045	I	mg F/L	P383251	
2176058	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P383179	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P383267	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.27		mg N/L	P383206	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P383231	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P383311	
2176060	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.044		mg P/L	P383165	
2176065	EPA 200.7 Rev. 4.4	Barium	14.9		ug/L	P383241	
		Calcium	7.27		mg/L	P383241	
		Chromium	1.0	U	ug/L	P383241	
		Iron	390		ug/L	P383241	
		Magnesium	2.92		mg/L	P383241	
		Potassium	2.2		mg/L	P383241	
		Sodium	5.6		mg/L	P383241	
		Zinc	5.0	U	ug/L	P383241	
	EPA 200.8 Rev. 5.4	Aluminum	513		ug/L	P383241	
		Antimony	0.050	U	ug/L	P383241	
		Arsenic	1.12		ug/L	P383241	
		Boron**	28.7		ug/L	P383241	
		Cadmium	0.020	U	ug/L	P383846	
		Copper	0.62	I	ug/L	P383241	
		Lead	0.21	I	ug/L	P383846	
		Nickel	0.50	U	ug/L	P383241	
		Selenium	0.20	U	ug/L	P383241	
		Silver	0.010	U	ug/L	P383241	
		Thallium	0.10	U	ug/L	P383241	
	SM 2340B	Hardness	30.2		mg/L	P383241	

Ref. Method and Comment:
SM 2540 D-2011: 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: P383156

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383241

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/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: P383241

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Copper	0.40	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383846

Component	Result	Code	Units
Cadmium	0.020	U	ug/L
Lead	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383380

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383384

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383179

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383179

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383361

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383206

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383231

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383165

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

Reference Method: SM 2120 B-2011
Batch ID: P383159

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P383248

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

Reference Method: SM 2540 C-2011
Batch ID: P383569

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P383520

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P383251

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P383311

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: P383241

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	102		P	85 - 115
Chromium	98.3		P	85 - 115
Iron	100		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	98.1		P	85 - 115
Sodium	99.3		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383241

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.9		P	85 - 115
Antimony	99.6		P	85 - 115
Arsenic	101		P	85 - 115
Boron	102		P	85 - 115
Copper	98.4		P	85 - 115
Nickel	97.9		P	85 - 115
Selenium	101		P	85 - 115
Silver	101		P	85 - 115
Thallium	94.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383846

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	98.2		P	85 - 115
Lead	97.5		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383380

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383384

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383179

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	104		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383361

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383206

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383165

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	101		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P383159

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P383248

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P383251

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.5		P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P383311

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2175743	Barium	103		P	80 - 120
2175743	Calcium	102		P	80 - 120
2175743	Chromium	102		P	80 - 120
2175743	Iron	105		P	80 - 120
2175743	Magnesium	103		P	80 - 120
2175743	Potassium	99.5		P	80 - 120
2175743	Sodium	100		P	80 - 120
2175743	Zinc	105		P	80 - 120
2175929	Barium	103	103	P/P	80 - 120
2175929	Calcium	103		P	80 - 120
2175929	Chromium	101	101	P/P	80 - 120
2175929	Iron	102	101	P/P	80 - 120
2175929	Magnesium	100	99.6	P/P	80 - 120
2175929	Potassium	97.8	97.4	P/P	80 - 120
2175929	Sodium	97.7	97.4	P/P	80 - 120
2175929	Zinc	105	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2175743	Aluminum	97.6		P	80 - 120
2175743	Antimony	99.8		P	80 - 120
2175743	Arsenic	101		P	80 - 120
2175743	Boron	101		P	80 - 120
2175743	Copper	98.5		P	80 - 120
2175743	Nickel	97.1		P	80 - 120
2175743	Selenium	96.5		P	80 - 120
2175743	Silver	101		P	80 - 120
2175743	Thallium	104		P	80 - 120
2175929	Aluminum	97.2	94.7	P/P	80 - 120
2175929	Antimony	100	97.6	P/P	80 - 120
2175929	Arsenic	100	99.4	P/P	80 - 120
2175929	Boron	99.4	98.1	P/P	80 - 120
2175929	Copper	103	97.1	P/P	80 - 120
2175929	Nickel	98.2	95.5	P/P	80 - 120
2175929	Selenium	96.1	94.4	P/P	80 - 120
2175929	Silver	101	99.3	P/P	80 - 120
2175929	Thallium	106	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383846

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2175576	Cadmium	102	102	P/P	80 - 120
2175576	Lead	96.4	95.2	P/P	80 - 120
2175577	Cadmium	98.4		P	80 - 120
2175577	Lead	93.0		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383380

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2175991	Chloride	104		P	90 - 110
2176110	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383384

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2175991	Sulfate	103		P	90 - 110
2176110	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176033	Ammonia-N	99.0	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2175972	Kjeldahl Nitrogen	100	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383361

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176091	Kjeldahl Nitrogen	97.7	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383206

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176033	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176005	Total-P	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176059	O-Phosphate-P	98.9	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P383251

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176090	Fluoride	98.4	95.2	P/P	94 - 107

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P383311

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176111	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P383156

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176032	Turbidity	1.63	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2175929	Barium	0.222	Spike	P	0 - 20
2175929	Calcium	1.67	Spike	P	0 - 20
2175929	Chromium	0.129	Spike	P	0 - 20
2175929	Iron	0.921	Spike	P	0 - 20
2175929	Magnesium	0.488	Spike	P	0 - 20
2175929	Potassium	0.372	Spike	P	0 - 20
2175929	Sodium	0.194	Spike	P	0 - 20
2175929	Zinc	0.778	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2175929	Aluminum	2.49	Spike	P	0 - 20
2175929	Antimony	2.57	Spike	P	0 - 20
2175929	Arsenic	0.685	Spike	P	0 - 20
2175929	Boron	1.17	Spike	P	0 - 20
2175929	Copper	5.40	Spike	P	0 - 20
2175929	Nickel	2.80	Spike	P	0 - 20
2175929	Selenium	1.78	Spike	P	0 - 20
2175929	Silver	1.47	Spike	P	0 - 20
2175929	Thallium	3.31	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383846

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2175576	Cadmium	0.0792	Spike	P	0 - 20
2175576	Lead	1.22	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383380

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2175991	Chloride	1.07	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2175991	Sulfate	0.916	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176033	Ammonia-N	1.82	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2175972	Kjeldahl Nitrogen	1.05	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383361

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176091	Kjeldahl Nitrogen	1.69	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176033	NO2NO3-N	1.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176005	Total-P	1.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176059	O-Phosphate-P	0.605	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P383159

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176110	Color (true)	1.33	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P383248

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176090	Total Alkalinity	0.437	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P383569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176055	TDS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P383251

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176090	Fluoride	2.37	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P383311

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176111	Organic Carbon	0.360	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A99305
Included Lab Sample IDs: 2176055, 2176056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	102	P/P	95 - 105

Reference Method: SM 2120 B-2011
Run ID: A99307
Included Lab Sample IDs: 2176055, 2176056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115
Color (true)	98.2	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A99308
Included Lab Sample IDs: 2176059, 2176060

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99311
Included Lab Sample IDs: 2176057, 2176058

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A99318
Included Lab Sample IDs: 2176057, 2176058

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

Reference Method: SM 2320 B-2011
Run ID: A99334
Included Lab Sample IDs: 2176055, 2176056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.7	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A99334
Included Lab Sample IDs: 2176055, 2176056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A99358
Included Lab Sample IDs: 2176065

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A99358
Included Lab Sample IDs: 2176065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	106	P/P	90 - 110
Chromium	101	101	P/P	90 - 110
Iron	106	106	P/P	90 - 110
Magnesium	106	106	P/P	90 - 110
Potassium	99.4	101	P/P	90 - 110
Sodium	104	105	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A99360
Included Lab Sample IDs: 2176058

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

Reference Method: SM 5310 B-2011
Run ID: A99365
Included Lab Sample IDs: 2176057, 2176058

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.1	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A99366
Included Lab Sample IDs: 2176057

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99379
Included Lab Sample IDs: 2176058

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.6	97.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A99401
Included Lab Sample IDs: 2176055, 2176056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.4	98.9	P/P	90 - 110
Chloride	98.7	97.4	P/P	90 - 110
Sulfate	98.2	100	P/P	90 - 110
Sulfate	99.6	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99420
Included Lab Sample IDs: 2176057

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99420
Included Lab Sample IDs: 2176057

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.0	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99592
Included Lab Sample IDs: 2176065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.1	95.0	P/P	90 - 110
Antimony	95.0	93.7	P/P	90 - 110
Arsenic	95.7	94.5	P/P	90 - 110
Boron	99.1	98.6	P/P	90 - 110
Copper	95.1	93.0	P/P	90 - 110
Nickel	94.9	93.4	P/P	90 - 110
Selenium	95.6	94.6	P/P	90 - 110
Silver	96.4	95.4	P/P	90 - 110
Thallium	93.6	91.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99618
Included Lab Sample IDs: 2176065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	101	95.9	P/P	90 - 110
Lead	97.7	94.7	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						1.63	
EPA 200.7 Rev. 4.4	Barium	100	103	103	103			0.222
	Calcium	102	102	103				1.67
	Chromium	98.3	102	101	101			0.129
	Iron	100	105	102	101			0.921
	Magnesium	102	103	100	99.6			0.488
	Potassium	98.1	99.5	97.8	97.4			0.372
	Sodium	99.3	100	97.7	97.4			0.194
	Zinc	101	105	105	106			0.778
EPA 200.8 Rev. 5.4	Aluminum	97.9	97.2	94.7	97.6			2.49
	Antimony	99.6	100	97.6	99.8			2.57
	Arsenic	101	100	99.4	101			0.685
	Boron	102	99.4	98.1	101			1.17
	Cadmium	98.2	102	102	98.4			0.0792
	Copper	98.4	103	97.1	98.5			5.40
	Lead	97.5	96.4	95.2	93.0			1.22
	Nickel	97.9	98.2	95.5	97.1			2.80
	Selenium	101	96.1	94.4	96.5			1.78
	Silver	101	101	99.3	101			1.47
	Thallium	94.2	106	103	104			3.31
EPA 300.0 Rev. 2.1	Chloride	101	104	103			1.07	
	Sulfate	101	103	102			0.916	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	99.0	97.0				1.82
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	100	102				1.05
	Kjeldahl Nitrogen	99.5	97.7	100				1.69
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	100	99.5				1.00
EPA 365.1 Rev. 2.0	Total-P	106	104	106				1.65
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.9	99.5				0.605
SM 2120 B-2011	Color (true)	100					1.33	
SM 2320 B-2011	Total Alkalinity	101					0.437	
SM 2540 C-2011	TDS						0.0	
SM 4500 F-C-2011	Fluoride	99.5	98.4	95.2				2.37
SM 5310 B-2011	Organic Carbon	98.2	102	102				0.360

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2176055, 2176056
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2176065
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2176065
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2176055, 2176056
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2176055, 2176056
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2176057, 2176058
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2176057, 2176058
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2176057, 2176058
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2176057, 2176058
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2176059, 2176060
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2176055, 2176056
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2176055, 2176056
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2176065

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2176055, 2176056
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2176055, 2176056
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2176055, 2176056
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2176057, 2176058

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	06/12/2020			06/12/2020 15:44	Yen Ta	2176055, 2176056
EPA 200.7 Rev. 4.4	06/12/2020	06/15/2020 17:30	Elliott D. Healy	06/16/2020 16:53	Betina Topolski	2176065
EPA 200.8 Rev. 5.4	06/12/2020	06/15/2020 17:30	Elliott D. Healy	06/29/2020 17:02	Justin Cutchin	2176065
	06/12/2020	06/29/2020 11:09	Justin Cutchin	06/30/2020 19:12	Justin Cutchin	2176065
EPA 300.0 Rev. 2.1	06/12/2020			06/17/2020 01:13	Elliott Rodriguez	2176055
	06/12/2020			06/17/2020 01:52	Elliott Rodriguez	2176056
EPA 350.1 Rev. 2.0	06/12/2020			06/14/2020 11:48	Ping Hua	2176057
	06/12/2020			06/14/2020 11:49	Ping Hua	2176058
EPA 351.2 Rev. 2.0	06/12/2020	06/16/2020 11:50	Sima Feizi	06/17/2020 12:07	Jhamieka S. Greenwood	2176058
	06/12/2020	06/18/2020 09:50	Sima Feizi	06/19/2020 09:15	Jhamieka S. Greenwood	2176057
EPA 353.2 Rev. 2.0	06/12/2020			06/15/2020 08:21	Beverly Y. Sanders	2176057
	06/12/2020			06/15/2020 08:22	Beverly Y. Sanders	2176058
EPA 365.1 Rev. 2.0	06/12/2020	06/15/2020 15:28	Yen Ta	06/16/2020 13:48	Lipi Saha	2176058
	06/12/2020	06/15/2020 15:28	Yen Ta	06/17/2020 08:47	Lipi Saha	2176057
EPA 365.1 Rev. 2.0 dissolved	06/12/2020			06/12/2020 21:13	Julia Storbeck	2176059
	06/12/2020			06/12/2020 21:17	Julia Storbeck	2176060
SM 2120 B-2011	06/12/2020			06/12/2020 16:35	Benjamin T. Nordmann	2176055
	06/12/2020			06/12/2020 16:49	Benjamin T. Nordmann	2176056
SM 2320 B-2011	06/12/2020			06/16/2020 02:23	Dale L. Simmons	2176055
	06/12/2020			06/16/2020 02:33	Dale L. Simmons	2176056
SM 2340B	06/12/2020			06/16/2020 16:53	Betina Topolski	2176065
SM 2540 C-2011	06/12/2020			06/16/2020 14:02	Yijie Li	2176055, 2176056
SM 2540 D-2011	06/12/2020			06/16/2020 14:22	Yijie Li	2176055, 2176056
SM 4500 F-C-2011	06/12/2020			06/16/2020 02:23	Dale L. Simmons	2176055
	06/12/2020			06/16/2020 02:33	Dale L. Simmons	2176056
SM 5310 B-2011	06/12/2020			06/16/2020 15:21	David Boose	2176057
	06/12/2020			06/16/2020 15:33	David Boose	2176058