Chemical Analysis Report

NE-DIST-2018-12-12-01

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

Event Description: **LSJR SW 1/2**
Request ID: **RQ-2018-12-10-14**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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8800 Baymeadows Way West
Jacksonville, FL 32256-7577
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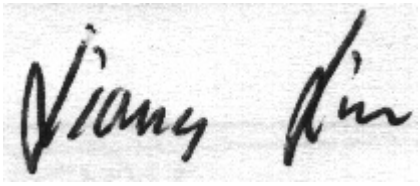
Date Certified: 04-JAN-2019 15:50



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: Mill Log at Russell Rd **Collection Date/Time: 12/11/2018 09:30**

Field ID: G2NE1150 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2048154	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P356063	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P356355	
		Sulfate	8.5		mg SO4/L	P356357	
	SM 2120 B	Color (true)	280		PCU	P356042	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P356140	
	SM 2540 C-97	TDS	123		mg/L	P356408	
	SM 2540 D-97	TSS	2	U	mg/L	P356480	
	SM 4500 F-C-97	Fluoride	0.049	I	mg F/L	P356141	
2048156	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P356257	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.96		mg N/L	P356220	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P356240	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P356230	
	SM 5310 B-00	Organic Carbon	35		mg C/L	P356143	
2048158	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P356055	
2048171	EPA 200.7 Rev. 4.4	Calcium	4.62		mg/L	P356098	
		Iron	1.42E+03		ug/L	P356098	
		Magnesium	1.96		mg/L	P356098	
		Potassium	0.93	I	mg/L	P356098	
		Sodium	9.2		mg/L	P356098	
		Zinc	30		ug/L	P356098	
	EPA 200.8 Rev. 5.4	Arsenic	0.75		ug/L	P356098	
		Cadmium	0.033	I	ug/L	P356098	
		Chromium	1.2	I	ug/L	P356098	
		Copper	0.58	I	ug/L	P356098	
		Lead	0.76		ug/L	P356098	
		Nickel	1.11		ug/L	P356098	
		Silver	0.010	U	ug/L	P356098	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 12/28/2018.

Sample Location: MILL LOG CREEK @ CR 739B(SANDRIDGE RD) Collection Date/Time: 12/11/2018 09:50

Field ID: 20030569 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2048155	EPA 180.1 Rev. 2.0	Turbidity	3.9	A	NTU	P356067	
	EPA 300.0 Rev. 2.1	Chloride	35		mg Cl/L	P356355	
		Sulfate	20		mg SO4/L	P356357	
	SM 2120 B	Color (true)	200		PCU	P356042	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P356140	
	SM 2540 C-97	TDS	160		mg/L	P356408	
	SM 2540 D-97	TSS	2	I	mg/L	P356480	
	SM 4500 F-C-97	Fluoride	0.056	I	mg F/L	P356141	
2048157	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P356257	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P356220	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P356240	
	EPA 365.1 Rev. 2.0	Total-P	0.89		mg P/L	P356230	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P356144	
2048159	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.80		mg P/L	P356055	
2048172	EPA 200.7 Rev. 4.4	Calcium	7.55		mg/L	P356098	
		Iron	530		ug/L	P356098	
		Magnesium	6.47		mg/L	P356098	
		Potassium	16.1		mg/L	P356098	
		Sodium	16.0		mg/L	P356098	
		Zinc	8.7	I	ug/L	P356098	
	EPA 200.8 Rev. 5.4	Arsenic	0.61		ug/L	P356098	
		Cadmium	0.020	U	ug/L	P356098	
		Chromium	1.3	I	ug/L	P356098	
		Copper	0.79	I	ug/L	P356098	
		Lead	0.29		ug/L	P356098	
		Nickel	0.46	I	ug/L	P356098	
		Silver	0.010	U	ug/L	P356098	

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: MILL CR @ SR 16 **Collection Date/Time: 12/11/2018 10:40**

Field ID: 20030474 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2048151	EPA 180.1 Rev. 2.0	Turbidity	3.1	A	NTU	P356063	
	EPA 300.0 Rev. 2.1	Chloride	84		mg Cl/L	P356355	
		Sulfate	84		mg SO4/L	P356357	
	SM 2120 B	Color (true)	53	A	PCU	P356042	
	SM 2320 B-97	Total Alkalinity	112		mg CaCO3/L	P356140	
	SM 2540 C-97	TDS	406		mg/L	P356408	
	SM 2540 D-97	TSS	2	I	mg/L	P356480	
	SM 4500 F-C-97	Fluoride	0.31		mg F/L	P356141	
2048152	EPA 350.1 Rev. 2.0	Ammonia-N	0.055		mg N/L	P356257	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P356227	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.76		mg N/L	P356240	
	EPA 365.1 Rev. 2.0	Total-P	0.23		mg P/L	P356230	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P356143	
2048153	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P356055	

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: P356063

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356067

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356098

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: P356098

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: P356355

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356357

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356257

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356220

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356227

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356240

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356230

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356055

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

Reference Method: SM 2120 B
Batch ID: P356042

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P356140

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

Reference Method: SM 2540 C-97
Batch ID: P356408

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356480

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P356141

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P356143

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

Reference Method: SM 5310 B-00
Batch ID: P356144

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: P356098

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	111		P	85 - 115
Iron	109		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	107		P	85 - 115
Sodium	108		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356098

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	107		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	105		P	85 - 115
Copper	106		P	85 - 115
Lead	107		P	85 - 115
Nickel	105		P	85 - 115
Silver	105		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356357

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356257

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356220

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356227

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356240

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356230

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356055

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.8		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P356042

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

Reference Method: SM 2320 B-97
Batch ID: P356140

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P356141

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.3		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356143

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.2		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P356144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048121	Calcium	116	115	P/P	80 - 120
2048121	Iron	114	112	P/P	80 - 120
2048121	Magnesium	116	116	P/P	80 - 120
2048121	Potassium	115	115	P/P	80 - 120
2048121	Sodium	112	110	P/P	80 - 120
2048121	Zinc	104	106	P/P	80 - 120
2048147	Calcium	108		P	80 - 120
2048147	Iron	110		P	80 - 120
2048147	Magnesium	106		P	80 - 120
2048147	Potassium	108		P	80 - 120
2048147	Sodium	109		P	80 - 120
2048147	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048121	Arsenic	107	107	P/P	80 - 120
2048121	Cadmium	105	108	P/P	80 - 120
2048121	Chromium	105	106	P/P	80 - 120
2048121	Copper	104	105	P/P	80 - 120
2048121	Lead	107	107	P/P	80 - 120
2048121	Nickel	103	103	P/P	80 - 120
2048121	Silver	104	105	P/P	80 - 120
2048147	Arsenic	108		P	80 - 120
2048147	Cadmium	109		P	80 - 120
2048147	Chromium	104		P	80 - 120
2048147	Copper	99.6		P	80 - 120
2048147	Lead	108		P	80 - 120
2048147	Nickel	99.5		P	80 - 120
2048147	Silver	104		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048135	Chloride	96.4		P	90 - 110
2048518	Chloride	96.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048135	Sulfate	94.2		P	90 - 110
2048518	Sulfate	92.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048157	Ammonia-N	99.1	100	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356220

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048197	Kjeldahl Nitrogen	94.7	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356227

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048152	Kjeldahl Nitrogen	100	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048136	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356230

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048197	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356055

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048031	O-Phosphate-P	93.5	95.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P356141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048022	Fluoride	99.5	100	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356143

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048023	Organic Carbon	103	101	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P356144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048157	Organic Carbon	99.0		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356063

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048151	Turbidity	5.56	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048155	Turbidity	1.27	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048121	Calcium	0.759	Spike	P	0 - 20
2048121	Iron	1.19	Spike	P	0 - 20
2048121	Magnesium	0.251	Spike	P	0 - 20
2048121	Potassium	0.291	Spike	P	0 - 20
2048121	Sodium	0.936	Spike	P	0 - 20
2048121	Zinc	2.23	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048121	Arsenic	0.112	Spike	P	0 - 20
2048121	Cadmium	2.92	Spike	P	0 - 20
2048121	Chromium	0.0994	Spike	P	0 - 20
2048121	Copper	0.509	Spike	P	0 - 20
2048121	Lead	0.242	Spike	P	0 - 20
2048121	Nickel	0.260	Spike	P	0 - 20
2048121	Silver	1.36	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048135	Chloride	0.908	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048135	Sulfate	0.559	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048157	Ammonia-N	0.465	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048197	Kjeldahl Nitrogen	0.716	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356227

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048152	Kjeldahl Nitrogen	4.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048136	NO2NO3-N	0.491	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356230

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048197	Total-P	0.0969	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048031	O-Phosphate-P	1.99	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P356042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048151	Color (true)	0.206	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P356140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048022	Total Alkalinity	0.125	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P356408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048022	TDS	7.76	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048022	Fluoride	0.467	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P356143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048023	Organic Carbon	1.86	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P356144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048157	Organic Carbon	1.46	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: SM 2120 B
Run ID: A88306
Included Lab Sample IDs: 2048151, 2048154, 2048155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	99.9	P/P	90 - 115
Color (true)	99.8	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A88313
Included Lab Sample IDs: 2048153, 2048158, 2048159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.0	P/P	90 - 110
O-Phosphate-P	98.6	98.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A88316
Included Lab Sample IDs: 2048151, 2048154, 2048155

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A88324
Included Lab Sample IDs: 2048151, 2048154, 2048155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.2	99.7	P/P	90 - 110
Sulfate	97.4	98.1	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A88341
Included Lab Sample IDs: 2048151, 2048154, 2048155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	98.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A88341
Included Lab Sample IDs: 2048151, 2048154, 2048155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	97.7	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A88343
Included Lab Sample IDs: 2048152, 2048156, 2048157

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	92.3	97.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A88385
Included Lab Sample IDs: 2048152, 2048156, 2048157

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A88389
Included Lab Sample IDs: 2048152, 2048156, 2048157

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A88390
Included Lab Sample IDs: 2048171, 2048172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	103	108	P/P	90 - 110
Magnesium	103	108	P/P	90 - 110
Potassium	102	106	P/P	90 - 110
Sodium	101	107	P/P	90 - 110
Zinc	99.9	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A88400
Included Lab Sample IDs: 2048171, 2048172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	99.1	P/P	95 - 105

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88403
Included Lab Sample IDs: 2048152

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88412
Included Lab Sample IDs: 2048156, 2048157

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88429
Included Lab Sample IDs: 2048152, 2048157

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88434
Included Lab Sample IDs: 2048156

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88513
Included Lab Sample IDs: 2048171, 2048172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	106	106	P/P	90 - 110
Chromium	106	105	P/P	90 - 110
Copper	104	103	P/P	90 - 110
Lead	109	109	P/P	90 - 110
Nickel	104	102	P/P	90 - 110
Silver	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88549
Included Lab Sample IDs: 2048171, 2048172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	104	106	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						5.56	
	Turbidity						1.27	
EPA 200.7 Rev. 4.4	Calcium	111	116	115	108			0.759
	Iron	109	114	112	110			1.19
	Magnesium	112	116	116	106			0.251
	Potassium	107	115	115	108			0.291
	Sodium	108	112	110	109			0.936
	Zinc	101	104	106	101			2.23
EPA 200.8 Rev. 5.4	Arsenic	107	107	107	108			0.112
	Cadmium	105	105	108	109			2.92
	Chromium	105	105	106	104			0.0994
	Copper	106	104	105	99.6			0.509
	Lead	107	107	107	108			0.242
	Nickel	105	103	103	99.5			0.260
	Silver	105	104	105	104			1.36
EPA 300.0 Rev. 2.1	Chloride	96.6	96.4	96.2			0.908	
	Sulfate	94.9	94.2	92.9			0.559	
EPA 350.1 Rev. 2.0	Ammonia-N	98.3	99.1	100				0.465
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	94.7	95.8				0.716
	Kjeldahl Nitrogen	100	100	108				4.35
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	102				0.491
EPA 365.1 Rev. 2.0	Total-P	102	102	102				0.0969
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.8	93.5	95.8				1.99
SM 2120 B	Color (true)	100					0.206	
SM 2320 B-97	Total Alkalinity	101					0.125	
SM 2540 C-97	TDS						7.76	
SM 4500 F-C-97	Fluoride	98.3	99.5	100				0.467
SM 5310 B-00	Organic Carbon	97.2	103	101				1.86
	Organic Carbon	92.2	99.0					1.46

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2048151, 2048154, 2048155
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2048171, 2048172
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2048171, 2048172
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2048151, 2048154, 2048155
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2048151, 2048154, 2048155
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2048152, 2048156, 2048157
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2048152, 2048156, 2048157
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2048152, 2048156, 2048157
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2048152, 2048156, 2048157
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2048153, 2048158, 2048159
SM 2120 B / E31780	True Color measured at 450 nm	2048151, 2048154, 2048155
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2048151, 2048154, 2048155

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2048151, 2048154, 2048155
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2048151, 2048154, 2048155
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2048151, 2048154, 2048155
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2048152, 2048156, 2048157

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	12/12/2018			12/12/2018 17:07	Megan Treadwell	2048151, 2048154, 2048155
EPA 200.7 Rev. 4.4	12/12/2018	12/13/2018 15:45	Elliott D. Healy	12/17/2018 20:28	Betina Topolski	2048171
	12/12/2018	12/13/2018 15:45	Elliott D. Healy	12/17/2018 20:36	Betina Topolski	2048172
	12/12/2018	12/13/2018 15:45	Elliott D. Healy	12/18/2018 10:13	Betina Topolski	2048171
	12/12/2018	12/13/2018 15:45	Elliott D. Healy	12/18/2018 10:19	Betina Topolski	2048172
EPA 200.8 Rev. 5.4	12/12/2018	12/13/2018 15:45	Elliott D. Healy	12/22/2018 04:45	Allison Taylor	2048171
	12/12/2018	12/13/2018 15:45	Elliott D. Healy	12/22/2018 04:54	Allison Taylor	2048172
	12/12/2018	12/13/2018 15:45	Elliott D. Healy	12/28/2018 00:14	Allison Taylor	2048171
	12/12/2018	12/13/2018 15:45	Elliott D. Healy	12/28/2018 00:21	Allison Taylor	2048172
EPA 300.0 Rev. 2.1	12/12/2018			12/18/2018 16:56	Lipi Saha	2048151
	12/12/2018			12/18/2018 17:09	Lipi Saha	2048154
	12/12/2018			12/18/2018 17:21	Lipi Saha	2048155
EPA 350.1 Rev. 2.0	12/12/2018			12/14/2018 12:37	Ping Hua	2048157
	12/12/2018			12/14/2018 12:53	Ping Hua	2048152
	12/12/2018			12/14/2018 12:55	Ping Hua	2048156
EPA 351.2 Rev. 2.0	12/12/2018	12/14/2018 12:30	Adrian Shelby	12/17/2018 17:22	Chelsea Hernandez	2048152
	12/12/2018	12/17/2018 14:00	Adrian Shelby	12/18/2018 10:50	Chelsea Hernandez	2048156
	12/12/2018	12/17/2018 14:00	Adrian Shelby	12/18/2018 10:51	Chelsea Hernandez	2048157
EPA 353.2 Rev. 2.0	12/12/2018			12/17/2018 11:11	Beverly Y. Sanders	2048152
	12/12/2018			12/17/2018 11:12	Beverly Y. Sanders	2048156
	12/12/2018			12/17/2018 11:13	Beverly Y. Sanders	2048157
EPA 365.1 Rev. 2.0	12/12/2018	12/17/2018 11:45	Sima Feizi	12/18/2018 15:27	Beverly Y. Sanders	2048152
	12/12/2018	12/17/2018 11:45	Sima Feizi	12/18/2018 15:29	Beverly Y. Sanders	2048157
	12/12/2018	12/17/2018 11:45	Sima Feizi	12/19/2018 13:54	Beverly Y. Sanders	2048156
EPA 365.1 Rev. 2.0 dissolved	12/12/2018			12/12/2018 16:57	Jhamieka S. Greenwood	2048153
	12/12/2018			12/12/2018 17:00	Jhamieka S. Greenwood	2048158
	12/12/2018			12/12/2018 17:32	Jhamieka S. Greenwood	2048159
SM 2120 B	12/12/2018			12/12/2018 14:52	Chelsea Hernandez	2048151
	12/12/2018			12/12/2018 14:57	Chelsea Hernandez	2048154
	12/12/2018			12/12/2018 14:59	Chelsea Hernandez	2048155
SM 2320 B-97	12/12/2018			12/13/2018 17:29	Lauren Bottorf	2048151
	12/12/2018			12/13/2018 17:39	Lauren Bottorf	2048154
	12/12/2018			12/13/2018 17:49	Lauren Bottorf	2048155
SM 2540 C-97	12/12/2018			12/13/2018 23:45	Yijie Li	2048151, 2048154, 2048155
SM 2540 D-97	12/12/2018			12/13/2018 23:45	Yijie Li	2048151, 2048154, 2048155
SM 4500 F-C-97	12/12/2018			12/13/2018 17:29	Lauren Bottorf	2048151
	12/12/2018			12/13/2018 17:39	Lauren Bottorf	2048154
	12/12/2018			12/13/2018 17:49	Lauren Bottorf	2048155
SM 5310 B-00	12/12/2018			12/13/2018 08:03	Megan Treadwell	2048152
	12/12/2018			12/13/2018 08:16	Megan Treadwell	2048156

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	12/12/2018			12/13/2018 08:52	Megan Treadwell	2048157