

Chemical Analysis Report

NE-DIST-2016-08-10-02

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

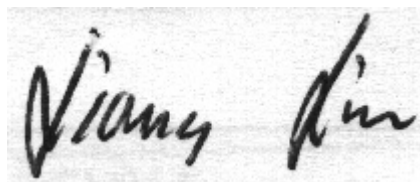
Event Description: **Suwannee 4**
Request ID: **RQ-2016-08-08-15**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 31-AUG-2016 16:38

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: SUWANEE SR6

Collection Date/Time: 08/09/2016 10:15

Field ID: 21020141

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823033	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P309513	
	EPA 300.0 Rev. 2.1	Chloride	5.5		mg Cl/L	P309941	
		Sulfate	0.50		mg SO4/L	P309944	
	SM 2120 B	Color (true)	360		PCU	P309525	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P309624	
	SM 2540 C-97	TDS	72		mg/L	P310095	
	SM 2540 D-97	TSS	3	I	mg/L	P309999	
	SM 4500 F-C-97	Fluoride	0.056	I	mg F/L	P309627	
1823036	EPA 350.1 Rev. 2.0	Ammonia-N	0.052		mg N/L	P309537	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P309791	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.021		mg N/L	P309756	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P309803	
	SM 5310 B-00	Organic Carbon	39		mg C/L	P310259	
1823039	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P309520	
1823059	EPA 200.7 Rev. 4.4	Calcium	1.97		mg/L	P309594	
		Iron	660		ug/L	P309594	
		Magnesium	1.18		mg/L	P309594	
		Potassium	0.52	I	mg/L	P309594	
		Sodium	4.0		mg/L	P309594	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P309594	
		Arsenic	0.55		ug/L	P309594	
		Cadmium	0.020	U	ug/L	P309594	
		Chromium	0.53		ug/L	P309594	
		Copper	0.22	I	ug/L	P309594	
		Lead	0.49		ug/L	P309594	
		Nickel	0.46		ug/L	P309594	
		Silver	0.0050	U	ug/L	P309594	

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: SUWANEE TURNER BTRMP

Collection Date/Time: 08/09/2016 10:45

Field ID: 21020152

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823034	EPA 180.1 Rev. 2.0	Turbidity	2.2	A	NTU	P309514	
	EPA 300.0 Rev. 2.1	Chloride	5.7		mg Cl/L	P309941	
		Sulfate	0.56		mg SO4/L	P309944	
	SM 2120 B	Color (true)	360		PCU	P309525	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P309624	
	SM 2540 C-97	TDS	56		mg/L	P310096	
	SM 2540 D-97	TSS	2	I	mg/L	P310000	
	SM 4500 F-C-97	Fluoride	0.057	I	mg F/L	P309627	
1823037	EPA 350.1 Rev. 2.0	Ammonia-N	0.060		mg N/L	P309537	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P309791	

Field ID: 21020152

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823037	EPA 353.2 Rev. 2.0	NO2NO3-N	0.019		mg N/L	P309756	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P309803	
	SM 5310 B-00	Organic Carbon	40		mg C/L	P310259	
1823040	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P309520	
1823060	EPA 200.7 Rev. 4.4	Calcium	2.04		mg/L	P309594	
		Iron	690		ug/L	P309594	
		Magnesium	1.27		mg/L	P309594	
		Potassium	0.53	I	mg/L	P309594	
		Sodium	4.1		mg/L	P309594	
		Zinc	5.0	U	ug/L	P309594	
	EPA 200.8 Rev. 5.4	Arsenic	0.60		ug/L	P309594	
		Cadmium	0.025	I	ug/L	P309594	
		Chromium	0.59		ug/L	P309594	
		Copper	0.27	I	ug/L	P309594	
		Lead	0.51		ug/L	P309594	
		Nickel	0.50		ug/L	P309594	
		Silver	0.0050	U	ug/L	P309594	

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: SUWANNEE CONE BRIDGE

Collection Date/Time: 08/09/2016 09:50

Field ID: 21010020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823035	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P309514	
	EPA 300.0 Rev. 2.1	Chloride	5.4		mg Cl/L	P309941	
		Sulfate	0.99		mg SO4/L	P309944	
		Color (true)	370		PCU	P309526	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P309624	
	SM 2540 C-97	TDS	83		mg/L	P310096	
	SM 2540 D-97	TSS	3	I	mg/L	P310000	
1823038	SM 4500 F-C-97	Fluoride	0.073	I	mg F/L	P309627	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.057		mg N/L	P309537	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P309791	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.050		mg N/L	P309756	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P309803	
	SM 5310 B-00	Organic Carbon	39		mg C/L	P310259	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P309520	
1823061	EPA 200.7 Rev. 4.4	Calcium	2.86		mg/L	P309594	
		Iron	680		ug/L	P309594	
		Magnesium	1.59		mg/L	P309594	
		Potassium	0.49	I	mg/L	P309594	
		Sodium	4.0		mg/L	P309594	
		Zinc	5.0	U	ug/L	P309594	
	EPA 200.8 Rev. 5.4	Arsenic	0.63		ug/L	P309594	

Field ID: 21010020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823061	EPA 200.8 Rev. 5.4	Cadmium	0.022	I	ug/L	P309594	
		Chromium	0.55		ug/L	P309594	
		Copper	0.22	I	ug/L	P309594	
		Lead	0.47		ug/L	P309594	
		Nickel	0.44		ug/L	P309594	
		Silver	0.0050	U	ug/L	P309594	

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: ROCKY WOODPECKER 135

Collection Date/Time: 08/09/2016 11:10

Field ID: 21010032

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823027	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P309513	
	EPA 300.0 Rev. 2.1	Chloride	4.2	A	mg Cl/L	P309941	
		Sulfate	1.5	A	mg SO4/L	P309944	
		Color (true)	450		PCU	P309525	
	SM 2320 B-97	Total Alkalinity	26		mg CaCO3/L	P309624	
	SM 2540 C-97	TDS	105		mg/L	P310095	
	SM 2540 D-97	TSS	3	I	mg/L	P309999	
	SM 4500 F-C-97	Fluoride	0.26		mg F/L	P309627	
1823029	EPA 350.1 Rev. 2.0	Ammonia-N	0.42		mg N/L	P309537	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P309791	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.015		mg N/L	P309755	
	EPA 365.1 Rev. 2.0	Total-P	0.57		mg P/L	P309803	
	SM 5310 B-00	Organic Carbon	34		mg C/L	P310048	
1823031	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.47		mg P/L	P309520	

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: JERRY AT CR25A

Collection Date/Time: 08/09/2016 12:05

Field ID: 21020136

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823028	EPA 180.1 Rev. 2.0	Turbidity	6.8		NTU	P309513	
	EPA 300.0 Rev. 2.1	Chloride	5.9		mg Cl/L	P309941	
		Sulfate	9.4		mg SO4/L	P310312	
		Color (true)	210		PCU	P309525	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P309624	
	SM 2540 C-97	TDS	82		mg/L	P310095	
	SM 2540 D-97	TSS	3	I	mg/L	P309999	
	SM 4500 F-C-97	Fluoride	0.35		mg F/L	P309627	
1823030	EPA 350.1 Rev. 2.0	Ammonia-N	0.071		mg N/L	P309537	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P309791	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.068		mg N/L	P309755	
	EPA 365.1 Rev. 2.0	Total-P	0.49		mg P/L	P309803	

Field ID: 21020136

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823030	SM 5310 B-00	Organic Carbon	23		mg C/L	P310048	
1823032	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.35		mg P/L	P309520	

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: P309513

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P309514

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P309594

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: P309594

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P309941

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P309944

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310312

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309537

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309791

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309755

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309756

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309803

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309520

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

Reference Method: SM 2120 B
Batch ID: P309525

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P309526

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P309624

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P310095

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P310096

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P309999

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310000

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P309627

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P310048

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

Reference Method: SM 5310 B-00
Batch ID: P310259

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: P309594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	107		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	102		P	85 - 115
Sodium	107		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.4		P	85 - 115
Cadmium	97.8		P	85 - 115
Chromium	96.7		P	85 - 115
Copper	96.5		P	85 - 115
Lead	97.9		P	85 - 115
Nickel	96.6		P	85 - 115
Silver	97.1		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309941

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309944

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310312

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	108		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309791

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309755

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309803

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309520

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

Reference Method: SM 2320 B-97
Batch ID: P309624

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P309627

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P310048

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.5		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P310259

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823138	Calcium	104		P	80 - 120
1823138	Iron	107	111	P/P	80 - 120
1823138	Magnesium	107		P	80 - 120
1823138	Potassium	103	104	P/P	80 - 120
1823138	Sodium	103	104	P/P	80 - 120
1823138	Zinc	102	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823138	Arsenic	97.9	98.7	P/P	80 - 120
1823138	Cadmium	100	99.3	P/P	80 - 120
1823138	Chromium	98.5	99.7	P/P	80 - 120
1823138	Copper	95.5	95.4	P/P	80 - 120
1823138	Lead	99.3	100	P/P	80 - 120
1823138	Nickel	95.6	95.9	P/P	80 - 120
1823138	Silver	99.7	100	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309941

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823027	Chloride	99.3		P	90 - 110
1823028	Chloride	96.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309944

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823027	Sulfate	95.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823232	Sulfate	100		P	90 - 110
1823236	Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823018	Ammonia-N	106	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823018	Kjeldahl Nitrogen	106	103	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P309755

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822978	NO2NO3-N	103	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P309756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823036	NO2NO3-N	91.8	91.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P309803

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823018	Total-P	98.5	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P309520

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823020	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Batch ID: P309627

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822973	Fluoride	99.8	100	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P310048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822933	Organic Carbon	101	102	P/P	85 - 115

Reference Method: SM 5310 B-00
 Batch ID: P310259

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823036	Organic Carbon	103		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P309513

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822974	Turbidity	3.41	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P309514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823034	Turbidity	5.45	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823138	Calcium	0.0250	Spike	P	0 - 20
1823138	Iron	2.54	Spike	P	0 - 20
1823138	Magnesium	1.37	Spike	P	0 - 20
1823138	Potassium	0.799	Spike	P	0 - 20
1823138	Sodium	0.538	Spike	P	0 - 20
1823138	Zinc	0.0398	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823138	Arsenic	0.752	Spike	P	0 - 20
1823138	Cadmium	0.717	Spike	P	0 - 20
1823138	Chromium	1.15	Spike	P	0 - 20
1823138	Copper	0.0527	Spike	P	0 - 20
1823138	Lead	1.23	Spike	P	0 - 20
1823138	Nickel	0.280	Spike	P	0 - 20
1823138	Silver	0.439	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823027	Chloride	0.266	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309944

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823027	Sulfate	8.46	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823232	Sulfate	0.713	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823018	Ammonia-N	1.26	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823018	Kjeldahl Nitrogen	2.27	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309755

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822978	NO2NO3-N	3.01	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823036	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823018	Total-P	0.809	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309520

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823020	O-Phosphate-P	1.30	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P309525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822998	Color (true)	0.839	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P309526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823134	Color (true)	0.669	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P309624

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822973	Total Alkalinity	0.245	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P310095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822975	TDS	6.56	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P310096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823134	TDS	8.57	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P309627

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822973	Fluoride	0.463	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P310048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822933	Organic Carbon	1.05	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P310259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823036	Organic Carbon	1.86	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: A71054
Included Lab Sample IDs: 1823027, 1823028, 1823033, 1823034, 1823035

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A71057

Included Lab Sample IDs: 1823031, 1823032, 1823039, 1823040, 1823041

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.3	P/P	90 - 110
O-Phosphate-P	99.8	100	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A71058

Included Lab Sample IDs: 1823027, 1823028, 1823033, 1823034, 1823035

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.4	98.7	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A71060

Included Lab Sample IDs: 1823029, 1823030, 1823036, 1823037, 1823038

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	104	105	P/P	90 - 110
Ammonia-N	105	106	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A71090

Included Lab Sample IDs: 1823027, 1823028, 1823033, 1823034, 1823035

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	103	P/P	90 - 110
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A71090

Included Lab Sample IDs: 1823027, 1823028, 1823033, 1823034, 1823035

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	101	P/P	90 - 110
Fluoride	101	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71119

Included Lab Sample IDs: 1823059, 1823060, 1823061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	100	96.6	P/P	90 - 110
Arsenic	96.6	97.0	P/P	90 - 110
Cadmium	97.4	97.1	P/P	90 - 110
Cadmium	99.2	97.4	P/P	90 - 110
Chromium	100	97.5	P/P	90 - 110
Chromium	97.5	97.7	P/P	90 - 110
Copper	100	96.5	P/P	90 - 110
Copper	96.5	96.0	P/P	90 - 110
Lead	97.1	96.6	P/P	90 - 110
Lead	99.5	97.1	P/P	90 - 110
Nickel	96.3	95.4	P/P	90 - 110
Nickel	99.9	96.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71119

Included Lab Sample IDs: 1823059, 1823060, 1823061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	97.2	97.9	P/P	90 - 110
Silver	100	97.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71125

Included Lab Sample IDs: 1823029, 1823030, 1823036, 1823037, 1823038

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71131

Included Lab Sample IDs: 1823059, 1823060, 1823061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	98.3	98.5	P/P	90 - 110
Zinc	102	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A71177

Included Lab Sample IDs: 1823027, 1823028, 1823033, 1823034, 1823035

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	100	P/P	90 - 110
Sulfate	95.9	97.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71179

Included Lab Sample IDs: 1823029, 1823030, 1823036, 1823037, 1823038

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.9	98.9	P/P	90 - 110
Total-P	98.9	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71192

Included Lab Sample IDs: 1823029, 1823030, 1823036, 1823037, 1823038

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	105	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A71236

Included Lab Sample IDs: 1823029, 1823030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A71280

Included Lab Sample IDs: 1823028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	102	99.9	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A71301

Included Lab Sample IDs: 1823036, 1823037, 1823038

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.3	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				3.41	
	Turbidity				5.45	
EPA 200.7 Rev. 4.4	Calcium	105	104			0.0250
	Iron	107	107	111		2.54
	Magnesium	106	107			1.37
	Potassium	102	103	104		0.799
	Sodium	107	103	104		0.538
	Zinc	101	102	102		0.0398
EPA 200.8 Rev. 5.4	Arsenic	96.4	97.9	98.7		0.752
	Cadmium	97.8	100	99.3		0.717
	Chromium	96.7	98.5	99.7		1.15
	Copper	96.5	95.5	95.4		0.0527
	Lead	97.9	99.3	100		1.23
	Nickel	96.6	95.6	95.9		0.280
	Silver	97.1	99.7	100		0.439
EPA 300.0 Rev. 2.1	Chloride	97.9	99.3	96.9	0.266	
	Sulfate	94.0	95.8		8.46	
	Sulfate	101	100	99.6	0.713	
EPA 350.1 Rev. 2.0	Ammonia-N	108	106	107		1.26
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	106	103		2.27
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	98.0		3.01
	NO2NO3-N	104	91.8	91.4		0.489
EPA 365.1 Rev. 2.0	Total-P	101	98.5	99.4		0.809
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	101	102		1.30
SM 2120 B	Color (true)				0.839	
	Color (true)				0.669	
SM 2320 B-97	Total Alkalinity	103			0.245	
SM 2540 C-97	TDS				6.56	
	TDS				8.57	
SM 4500 F-C-97	Fluoride	99.3	99.8	100		0.463
SM 5310 B-00	Organic Carbon	97.5	101	102		1.05
	Organic Carbon	99.1	103			1.86

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1823027, 1823028, 1823033, 1823034, 1823035
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1823059, 1823060, 1823061
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1823059, 1823060, 1823061
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1823027, 1823028, 1823033, 1823034, 1823035
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1823027, 1823028, 1823033, 1823034, 1823035
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1823029, 1823030, 1823036, 1823037, 1823038
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1823029, 1823030, 1823036, 1823037, 1823038
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1823029, 1823030, 1823036, 1823037, 1823038
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1823029, 1823030, 1823036, 1823037, 1823038
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1823031, 1823032, 1823039, 1823040, 1823041
SM 2120 B / E31780	True Color measured at 450 nm	1823027, 1823028, 1823033, 1823034, 1823035
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1823027, 1823028, 1823033, 1823034, 1823035
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1823027, 1823028, 1823033, 1823034, 1823035
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1823027, 1823028, 1823033, 1823034, 1823035
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1823027, 1823028, 1823033, 1823034, 1823035
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1823029, 1823030, 1823036, 1823037, 1823038

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	08/10/2016			08/10/2016 14:56	Sima Feizi	1823027, 1823028, 1823033, 1823034, 1823035
EPA 200.7 Rev. 4.4	08/10/2016	08/11/2016	Elliott D. Healy	08/15/2016	Joshua Ayres	1823059, 1823060, 1823061
EPA 200.8 Rev. 5.4	08/10/2016	08/11/2016	Elliott D. Healy	08/12/2016	Charles J. Peterson	1823059, 1823060, 1823061
EPA 300.0 Rev. 2.1	08/10/2016			08/18/2016	Ping Hua	1823027, 1823033, 1823034, 1823035
	08/10/2016			08/24/2016	Ping Hua	1823028
EPA 350.1 Rev. 2.0	08/10/2016			08/10/2016	Julie Michelle Frank	1823029, 1823030, 1823036, 1823037, 1823038
EPA 351.2 Rev. 2.0	08/10/2016	08/16/2016	Sofia Elnemr	08/17/2016	Christopher Armour	1823029, 1823030, 1823036, 1823037, 1823038
EPA 353.2 Rev. 2.0	08/10/2016			08/15/2016	Beverly Y. Sanders	1823029, 1823030, 1823036, 1823037, 1823038
EPA 365.1 Rev. 2.0	08/10/2016	08/16/2016	Vijayalakshmi Reddy	08/17/2016	Lipi Saha	1823029, 1823030, 1823036, 1823037, 1823038
EPA 365.1 Rev. 2.0 dissolved	08/10/2016			08/10/2016 16:39	Julia Storbeck	1823039, 1823040
	08/10/2016			08/10/2016 16:40	Julia Storbeck	1823041
	08/10/2016			08/10/2016 16:56	Julia Storbeck	1823031
	08/10/2016			08/10/2016 16:58	Julia Storbeck	1823032
SM 2120 B	08/10/2016			08/10/2016 17:59	Rochelle Y Jackson	1823027
	08/10/2016			08/10/2016 18:00	Rochelle Y Jackson	1823028, 1823033
	08/10/2016			08/10/2016 18:01	Rochelle Y Jackson	1823034
	08/10/2016			08/10/2016 18:02	Rochelle Y Jackson	1823035
SM 2320 B-97	08/10/2016			08/12/2016	Dale L. Simmons	1823027, 1823028, 1823033, 1823034, 1823035
SM 2540 C-97	08/10/2016			08/11/2016	Yijie Li	1823027, 1823028, 1823033, 1823034, 1823035
SM 2540 D-97	08/10/2016			08/11/2016	Yijie Li	1823027, 1823028, 1823033, 1823034, 1823035
SM 4500 F-C-97	08/10/2016			08/12/2016	Dale L. Simmons	1823027, 1823028, 1823033, 1823034, 1823035
SM 5310 B-00	08/10/2016			08/19/2016	Sofia Elnemr	1823029, 1823030
	08/10/2016			08/24/2016	Sofia Elnemr	1823036, 1823037, 1823038