

Chemical Analysis Report

SE-DIST-2016-09-09-01

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

Event Description: **SMP-Okeechobee NNC sufficiency**

Request ID: **RQ-2016-09-05-71**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

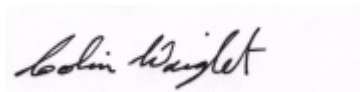
FL Dept. of Environmental Protection
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Certified by: Colin Wright, Environmental Administrator

Date Certified: 06-OCT-2016 17:15



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: L-63 @ SE 59M

Collection Date/Time: 09/08/2016 12:45

Field ID: G1SE0005

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830056	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P310908	
	EPA 300.0 Rev. 2.1	Chloride	27		mg Cl/L	P311402	
		Sulfate	9.3		mg SO4/L	P311408	
	SM 2120 B	Color (true)	370		PCU	P310928	
	SM 2320 B-97	Total Alkalinity	47		mg CaCO3/L	P311258	
	SM 2540 C-97	TDS	185		mg/L	P311460	
	SM 2540 D-97	TSS	2	I	mg/L	P311489	
	SM 4500 F-C-97	Fluoride	0.075	I	mg F/L	P311261	
1830058	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P311005	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P311099	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.063		mg N/L	P311588	
	EPA 365.1 Rev. 2.0	Total-P	0.84		mg P/L	P311493	
	SM 5310 B-00	Organic Carbon	33		mg C/L	P311339	
1830060	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.76		mg P/L	P310921	

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: Lettue Creek @ 710

Collection Date/Time: 09/08/2016 13:15

Field ID: G1SE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830057	EPA 180.1 Rev. 2.0	Turbidity	5.4		NTU	P310908	
	EPA 300.0 Rev. 2.1	Chloride	20		mg Cl/L	P311402	
		Sulfate	4.2		mg SO4/L	P311408	
	SM 2120 B	Color (true)	440		PCU	P310928	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P311258	
	SM 2540 C-97	TDS	169		mg/L	P311460	
	SM 2540 D-97	TSS	6	I	mg/L	P311489	
	SM 4500 F-C-97	Fluoride	0.070	I	mg F/L	P311261	
1830059	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P311005	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P311099	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P311588	
	EPA 365.1 Rev. 2.0	Total-P	0.90		mg P/L	P311493	
	SM 5310 B-00	Organic Carbon	40		mg C/L	P311339	
1830061	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.76		mg P/L	P310921	

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: Henry Creek @ 710

Collection Date/Time: 09/08/2016 13:00

Field ID: G1SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830062	EPA 180.1 Rev. 2.0	Turbidity	6.0		NTU	P310908	
	EPA 300.0 Rev. 2.1	Chloride	81		mg Cl/L	P311402	
		Sulfate	12		mg SO4/L	P311408	

Field ID: G1SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830062	SM 2120 B	Color (true)	530		PCU	P310928	
	SM 2320 B-97	Total Alkalinity	39		mg CaCO3/L	P311258	
	SM 2540 C-97	TDS	296		mg/L	P311460	
	SM 2540 D-97	TSS	9	I	mg/L	P311489	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P311261	
1830063	EPA 350.1 Rev. 2.0	Ammonia-N	0.077		mg N/L	P311005	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.2		mg N/L	P311099	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.058		mg N/L	P311588	
	EPA 365.1 Rev. 2.0	Total-P	0.65		mg P/L	P311493	
	SM 5310 B-00	Organic Carbon	47		mg C/L	P311339	
1830064	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.51		mg P/L	P310921	
1830068	EPA 200.7 Rev. 4.4	Calcium	21.7		mg/L	P311145	
		Iron	2.05E+03		ug/L	P311145	
		Magnesium	7.68		mg/L	P311145	
		Potassium	4.4		mg/L	P311145	
		Sodium	45.1		mg/L	P311145	
		Zinc	6.4	I	ug/L	P311145	
	EPA 200.8 Rev. 5.4	Arsenic	1.96		ug/L	P311145	
		Cadmium	0.020	U	ug/L	P311145	
		Chromium	1.23		ug/L	P311145	
		Copper	0.75		ug/L	P311145	
		Lead	0.49		ug/L	P311145	
		Nickel	0.56		ug/L	P311145	
		Silver	0.0050	U	ug/L	P311145	

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: P310908

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P311145

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311145

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: P311402

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311408

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311005

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311099

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311588

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311493

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310921

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
 Batch ID: P310928

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
 Batch ID: P311258

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

Reference Method: SM 2540 C-97
 Batch ID: P311460

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P311489

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P311261

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P311339

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: P311145

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	108		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	106		P	85 - 115
Sodium	105		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P311145

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P311145

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	98.7		P	85 - 115
Chromium	102		P	85 - 115
Copper	99.6		P	85 - 115
Lead	97.3		P	85 - 115
Nickel	101		P	85 - 115
Silver	97.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P311402

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P311408

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P311005

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P311099

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

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P311588

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: P311493

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P310921

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P311258

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

Reference Method: SM 4500 F-C-97
Batch ID: P311261

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P311339

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311145

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830459	Calcium	105		P	80 - 120
1830459	Iron	108	108	P/P	80 - 120
1830459	Magnesium	105	106	P/P	80 - 120
1830459	Potassium	106	107	P/P	80 - 120
1830459	Sodium	102	103	P/P	80 - 120
1830459	Zinc	98.5	98.9	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311145

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830459	Arsenic	101	100	P/P	80 - 120
1830459	Cadmium	101	101	P/P	80 - 120
1830459	Chromium	102	101	P/P	80 - 120
1830459	Copper	96.0	98.2	P/P	80 - 120
1830459	Lead	97.0	97.1	P/P	80 - 120
1830459	Nickel	97.7	96.9	P/P	80 - 120
1830459	Silver	99.2	98.3	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829977	Chloride	98.7		P	90 - 110
1830051	Chloride	98.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311408

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829977	Sulfate	98.9		P	90 - 110
1830051	Sulfate	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311005

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829965	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311099

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830034	Kjeldahl Nitrogen	96.6	95.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830052	NO2NO3-N	93.0	93.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311493

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830036	Total-P	97.8	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310921

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830038	O-Phosphate-P	98.1	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P311261

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830451	Fluoride	98.2	98.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P311339

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829982	Organic Carbon	101	103	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310908

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830023	Turbidity	1.88	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830459	Calcium	0.692	Spike	P	0 - 20
1830459	Iron	0.0711	Spike	P	0 - 20
1830459	Magnesium	0.261	Spike	P	0 - 20
1830459	Potassium	0.670	Spike	P	0 - 20
1830459	Sodium	0.510	Spike	P	0 - 20
1830459	Zinc	0.406	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830459	Arsenic	1.03	Spike	P	0 - 20
1830459	Cadmium	0.881	Spike	P	0 - 20
1830459	Chromium	0.459	Spike	P	0 - 20
1830459	Copper	2.31	Spike	P	0 - 20
1830459	Lead	0.115	Spike	P	0 - 20
1830459	Nickel	0.849	Spike	P	0 - 20
1830459	Silver	0.853	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829977	Chloride	0.178	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829977	Sulfate	4.88	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311005

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829965	Ammonia-N	0.587	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311099

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830034	Kjeldahl Nitrogen	0.535	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830052	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311493

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830036	Total-P	0.0449	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830038	O-Phosphate-P	1.12	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P310928

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830023	Color (true)	0.0972	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P311258

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830451	Total Alkalinity	1.74	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P311460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830023	TDS	2.95	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P311261

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830451	Fluoride	0.0	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P311339

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829982	Organic Carbon	2.05	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: A71511
Included Lab Sample IDs: 1830056, 1830057, 1830062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71518
Included Lab Sample IDs: 1830060, 1830061, 1830064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.9	96.7	P/P	90 - 110
O-Phosphate-P	98.3	97.9	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A71519
Included Lab Sample IDs: 1830056, 1830057, 1830062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.6	97.5	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71566
Included Lab Sample IDs: 1830058, 1830059, 1830063

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71576
Included Lab Sample IDs: 1830056, 1830057, 1830062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	101	98.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71656

Included Lab Sample IDs: 1830058, 1830059, 1830063

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.7	96.6	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A71657

Included Lab Sample IDs: 1830056, 1830057, 1830062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	105	P/P	90 - 110
Total Alkalinity	105	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A71657

Included Lab Sample IDs: 1830056, 1830057, 1830062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	100	P/P	90 - 110
Fluoride	102	101	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A71682

Included Lab Sample IDs: 1830058, 1830059, 1830063

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	108	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71712

Included Lab Sample IDs: 1830068

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.7	99.5	P/P	90 - 110
Cadmium	95.5	97.2	P/P	90 - 110
Chromium	98.4	101	P/P	90 - 110
Lead	94.4	95.2	P/P	90 - 110
Silver	96.3	96.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71718

Included Lab Sample IDs: 1830068

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	101	P/P	90 - 110
Iron	103	104	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	99.9	100	P/P	90 - 110
Sodium	99.7	99.1	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71721

Included Lab Sample IDs: 1830068

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	97.2	95.6	P/P	90 - 110
Nickel	96.6	95.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71734

Included Lab Sample IDs: 1830058, 1830059, 1830063

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71755

Included Lab Sample IDs: 1830058, 1830059, 1830063

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	100	P/P	90 - 110
Total-P	99.8	101	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				1.88	
EPA 200.7 Rev. 4.4	Calcium	105	105			0.692
	Iron	108	108	108		0.0711
	Magnesium	112	105	106		0.261
	Potassium	106	106	107		0.670
	Sodium	105	102	103		0.510
	Zinc	101	98.5	98.9		0.406
EPA 200.8 Rev. 5.4	Arsenic	101	101	100		1.03
	Cadmium	98.7	101	101		0.881
	Chromium	102	102	101		0.459
	Copper	99.6	96.0	98.2		2.31
	Lead	97.3	97.0	97.1		0.115
	Nickel	101	97.7	96.9		0.849
	Silver	97.9	99.2	98.3		0.853
EPA 300.0 Rev. 2.1	Chloride	99.5	98.7	98.5	0.178	
	Sulfate	98.3	99.1	98.9	4.88	
EPA 350.1 Rev. 2.0	Ammonia-N	103	102	101		0.587
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	96.6	95.7		0.535
EPA 353.2 Rev. 2.0	NO2NO3-N	104	93.0	93.0		0.0
EPA 365.1 Rev. 2.0	Total-P	98.1	97.8	97.8		0.0449
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.1	99.5		1.12
SM 2120 B	Color (true)				0.0972	
SM 2320 B-97	Total Alkalinity	103			1.74	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
					LCS	
SM 2540 C-97	TDS				2.95	
SM 4500 F-C-97	Fluoride	100	98.2	98.2		0.0
SM 5310 B-00	Organic Carbon	102	101	103		2.05

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1830056, 1830057, 1830062
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1830068
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1830068
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1830056, 1830057, 1830062
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1830056, 1830057, 1830062
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1830058, 1830059, 1830063
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1830058, 1830059, 1830063
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1830058, 1830059, 1830063
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1830058, 1830059, 1830063
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1830060, 1830061, 1830064
SM 2120 B / E31780	True Color measured at 450 nm	1830056, 1830057, 1830062
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1830056, 1830057, 1830062
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1830056, 1830057, 1830062
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1830056, 1830057, 1830062
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1830056, 1830057, 1830062
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1830058, 1830059, 1830063

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	09/09/2016			09/09/2016 14:47	Sima Feizi	1830056, 1830057, 1830062
EPA 200.7 Rev. 4.4	09/09/2016	09/14/2016	Elliott D. Healy	09/19/2016	Joshua Ayres	1830068
EPA 200.8 Rev. 5.4	09/09/2016	09/14/2016	Elliott D. Healy	09/15/2016	Charles J. Peterson	1830068
	09/09/2016	09/14/2016	Elliott D. Healy	09/19/2016	Charles J. Peterson	1830068
EPA 300.0 Rev. 2.1	09/09/2016			09/16/2016	Ping Hua	1830056, 1830057, 1830062
EPA 350.1 Rev. 2.0	09/09/2016			09/13/2016	Sofia Elnemr	1830058, 1830059, 1830063
EPA 351.2 Rev. 2.0	09/09/2016	09/14/2016	Adrian Shelby	09/15/2016	Christopher Armour	1830058, 1830059, 1830063
EPA 353.2 Rev. 2.0	09/09/2016			09/20/2016	Beverly Y. Sanders	1830058, 1830059, 1830063
EPA 365.1 Rev. 2.0	09/09/2016	09/20/2016	Lipi Saha	09/21/2016	Lipi Saha	1830058, 1830059, 1830063
EPA 365.1 Rev. 2.0 dissolved	09/09/2016			09/09/2016 16:03	Julia Storbeck	1830060
	09/09/2016			09/09/2016 16:05	Julia Storbeck	1830061
	09/09/2016			09/09/2016 16:11	Julia Storbeck	1830064
SM 2120 B	09/09/2016			09/09/2016 18:05	Julie Michelle Frank	1830056
	09/09/2016			09/09/2016 18:06	Julie Michelle Frank	1830057
	09/09/2016			09/09/2016 18:07	Julie Michelle Frank	1830062
SM 2320 B-97	09/09/2016			09/15/2016	Dale L. Simmons	1830056, 1830057, 1830062
SM 2540 C-97	09/09/2016			09/13/2016	Yijie Li	1830056, 1830057, 1830062
SM 2540 D-97	09/09/2016			09/13/2016	Yijie Li	1830056, 1830057, 1830062
SM 4500 F-C-97	09/09/2016			09/15/2016	Dale L. Simmons	1830056, 1830057, 1830062
SM 5310 B-00	09/09/2016			09/15/2016	Sofia Elnemr	1830058, 1830059, 1830063