

Chemical Analysis Report

TLH-ROC-2019-09-27-01

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

Event Description: **Run 4**
Request ID: **RQ-2019-08-12-33**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 18-OCT-2019 16:29

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 by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: SALEM BRANCH DOWNSTREAM OF CR159

Collection Date/Time: 09/26/2019 09:10

Field ID: GAD19SAL1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2123033	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P371483	
	EPA 300.0 Rev. 2.1	Chloride	7.3	A	mg Cl/L	P371980	
		Sulfate	1.0	A	mg SO4/L	P371984	
		Color (true)	71	A	PCU	P371486	
	SM 2120 B	Total Alkalinity	18		mg CaCO3/L	P371888	
	SM 2540 C-97	TDS	49		mg/L	P372028	
	SM 2540 D-97	TSS	3	I	mg/L	P372068	
	SM 4500 F-C-97	Fluoride	0.063	I	mg F/L	P371891	
2123034	EPA 350.1 Rev. 2.0	Ammonia-N	0.077		mg N/L	P371968	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P371621	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.67		mg N/L	P371650	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P371637	
	SM 5310 B-00	Organic Carbon	6.3		mg C/L	P371776	
2123035	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.094		mg P/L	P371490	
2123038	EPA 200.7 Rev. 4.4	Barium	10.7		ug/L	P371543	
		Calcium	6.50		mg/L	P371543	
		Iron	1.57E+03		ug/L	P371543	
		Magnesium	2.21		mg/L	P371543	
		Potassium	1.2	I	mg/L	P371543	
		Sodium	4.5		mg/L	P371543	
		Zinc	5.0	U	ug/L	P371543	
	EPA 200.8 Rev. 5.4	Aluminum	75		ug/L	P371543	
		Antimony	0.050	U	ug/L	P371543	
		Arsenic	0.91		ug/L	P371543	
		Boron**	12.2		ug/L	P371543	
		Cadmium	0.020	U	ug/L	P371543	
		Chromium	0.40	U	ug/L	P371543	
		Copper	0.47	I	ug/L	P371543	
		Lead	0.25	I	ug/L	P371543	
		Nickel	0.50	U	ug/L	P371543	
		Selenium	0.20	U	ug/L	P371543	
		Silver	0.010	U	ug/L	P371543	
		Thallium	0.10	U	ug/L	P371543	

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: P371483

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371543

Component	Result	Code	Units
Barium	1.0	U	ug/L
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: P371543

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P371980

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P371984

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371968

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: P371621

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371650

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371637

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371490

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

Reference Method: SM 2120 B
Batch ID: P371486

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P371888

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

Reference Method: SM 2540 C-97
Batch ID: P372028

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P372068

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P371891

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P371776

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: P371543

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	110		P	85 - 115
Iron	111		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	106		P	85 - 115
Sodium	107		P	85 - 115
Zinc	99.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371543

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	101		P	85 - 115
Boron	102		P	85 - 115
Cadmium	98.5		P	85 - 115
Chromium	98.4		P	85 - 115
Copper	98.0		P	85 - 115
Lead	102		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	98.8		P	85 - 115
Silver	99.6		P	85 - 115
Thallium	104		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P371980

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P371984

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371968

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371621

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P371650

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: P371637

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P371490

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.7		P	90 - 110

Reference Method: SM 2120 B
 Batch ID: P371486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.7		P	85 - 115

Reference Method: SM 2320 B-97
 Batch ID: P371888

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-97
 Batch ID: P371891

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P371776

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371543

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122656	Barium	103		P	80 - 120
2122656	Calcium	104		P	80 - 120
2122656	Iron	113		P	80 - 120
2122656	Magnesium	108		P	80 - 120
2122656	Potassium	100		P	80 - 120
2122656	Sodium	102		P	80 - 120
2122656	Zinc	103		P	80 - 120
2123022	Barium	108	108	P/P	80 - 120
2123022	Calcium	113	114	P/P	80 - 120
2123022	Iron	114	114	P/P	80 - 120
2123022	Magnesium	116	117	P/P	80 - 120
2123022	Potassium	107	109	P/P	80 - 120
2123022	Sodium	111	111	P/P	80 - 120
2123022	Zinc	107	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371543

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122656	Aluminum	102		P	80 - 120
2122656	Antimony	104		P	80 - 120
2122656	Arsenic	102		P	80 - 120
2122656	Boron	99.3		P	80 - 120
2122656	Cadmium	99.7		P	80 - 120
2122656	Chromium	98.0		P	80 - 120
2122656	Copper	98.8		P	80 - 120
2122656	Lead	103		P	80 - 120
2122656	Nickel	97.8		P	80 - 120
2122656	Selenium	99.2		P	80 - 120
2122656	Silver	100		P	80 - 120
2122656	Thallium	109		P	80 - 120
2123022	Aluminum	99.2	101	P/P	80 - 120
2123022	Antimony	102	105	P/P	80 - 120
2123022	Arsenic	100	103	P/P	80 - 120
2123022	Boron	101	104	P/P	80 - 120
2123022	Cadmium	98.6	99.7	P/P	80 - 120
2123022	Chromium	99.2	100	P/P	80 - 120
2123022	Copper	98.9	102	P/P	80 - 120
2123022	Lead	101	104	P/P	80 - 120
2123022	Nickel	97.9	99.5	P/P	80 - 120
2123022	Selenium	97.7	98.4	P/P	80 - 120
2123022	Silver	98.9	102	P/P	80 - 120
2123022	Thallium	102	108	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P371980

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123033	Chloride	104		P	90 - 110
2123190	Chloride	104		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P371984

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123033	Sulfate	105		P	90 - 110
2123190	Sulfate	108		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123016	Ammonia-N	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123074	Kjeldahl Nitrogen	94.8	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123041	NO2NO3-N	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371637

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123041	Total-P	99.6	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371490

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123035	O-Phosphate-P	97.9	99.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P371891

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123040	Fluoride	97.9	97.3	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P371776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122935	Organic Carbon	104	105	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P371483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123048	Turbidity	1.92	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P371543

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123022	Barium	0.159	Spike	P	0 - 20
2123022	Calcium	0.922	Spike	P	0 - 20
2123022	Iron	0.191	Spike	P	0 - 20
2123022	Magnesium	0.873	Spike	P	0 - 20
2123022	Potassium	1.49	Spike	P	0 - 20
2123022	Sodium	0.544	Spike	P	0 - 20
2123022	Zinc	0.448	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P371543

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123022	Aluminum	1.83	Spike	P	0 - 20
2123022	Antimony	2.82	Spike	P	0 - 20
2123022	Arsenic	2.38	Spike	P	0 - 20
2123022	Boron	2.71	Spike	P	0 - 20
2123022	Cadmium	1.12	Spike	P	0 - 20
2123022	Chromium	1.21	Spike	P	0 - 20
2123022	Copper	3.10	Spike	P	0 - 20
2123022	Lead	3.31	Spike	P	0 - 20
2123022	Nickel	1.64	Spike	P	0 - 20
2123022	Selenium	0.766	Spike	P	0 - 20
2123022	Silver	2.63	Spike	P	0 - 20
2123022	Thallium	5.55	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P371980

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123033	Chloride	0.889	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P371984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123033	Sulfate	0.980	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123016	Ammonia-N	1.83	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123074	Kjeldahl Nitrogen	7.09	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123041	NO2NO3-N	0.810	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371637

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123041	Total-P	0.517	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371490

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123035	O-Phosphate-P	0.884	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P371486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123033	Color (true)	0.310	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P371888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123040	Total Alkalinity	1.10	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P372028

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123040	TDS	6.23	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P371891

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123040	Fluoride	0.476	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P371776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122935	Organic Carbon	0.156	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A94558

Included Lab Sample IDs: 2123033

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

Reference Method: SM 2120 B

Run ID: A94559

Included Lab Sample IDs: 2123033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.1	99.4	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94560

Included Lab Sample IDs: 2123035

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94627

Included Lab Sample IDs: 2123034

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94656

Included Lab Sample IDs: 2123034

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94665

Included Lab Sample IDs: 2123034

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.0	97.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A94666

Included Lab Sample IDs: 2123038

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	104	P/P	90 - 110
Calcium	101	106	P/P	90 - 110
Iron	104	108	P/P	90 - 110
Magnesium	105	109	P/P	90 - 110
Potassium	102	105	P/P	90 - 110
Sodium	101	105	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A94678
Included Lab Sample IDs: 2123034

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	98.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A94686
Included Lab Sample IDs: 2123033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	103	P/P	90 - 110
Sulfate	102	104	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A94720
Included Lab Sample IDs: 2123033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A94720
Included Lab Sample IDs: 2123033

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A94750
Included Lab Sample IDs: 2123034

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A94947
Included Lab Sample IDs: 2123038

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	104	P/P	90 - 110
Antimony	103	101	P/P	90 - 110
Arsenic	102	102	P/P	90 - 110
Boron	102	104	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Chromium	102	101	P/P	90 - 110
Copper	102	102	P/P	90 - 110
Lead	105	105	P/P	90 - 110
Nickel	102	101	P/P	90 - 110
Silver	99.0	99.3	P/P	90 - 110
Thallium	98.7	97.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94978

Included Lab Sample IDs: 2123038

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	102	103	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					1.92	
EPA 200.7 Rev. 4.4	Barium	101	103	108	108		0.159
	Calcium	110	104	113	114		0.922
	Iron	111	113	114	114		0.191
	Magnesium	112	108	116	117		0.873
	Potassium	106	100	107	109		1.49
	Sodium	107	102	111	111		0.544
	Zinc	99.2	103	107	107		0.448
EPA 200.8 Rev. 5.4	Aluminum	100	102	99.2	101		1.83
	Antimony	102	104	102	105		2.82
	Arsenic	101	102	100	103		2.38
	Boron	102	99.3	101	104		2.71
	Cadmium	98.5	99.7	98.6	99.7		1.12
	Chromium	98.4	98.0	99.2	100		1.21
	Copper	98.0	98.8	98.9	102		3.10
	Lead	102	103	101	104		3.31
	Nickel	98.7	97.8	97.9	99.5		1.64
	Selenium	98.8	99.2	97.7	98.4		0.766
	Silver	99.6	100	98.9	102		2.63
	Thallium	104	109	102	108		5.55
EPA 300.0 Rev. 2.1	Chloride	102	104	104		0.889	
	Sulfate	103	105	108		0.980	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	102	103			1.83
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.8	94.8	106			7.09
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	104	105			0.810
EPA 365.1 Rev. 2.0	Total-P	97.0	99.6	100			0.517
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	97.9	99.6			0.884
SM 2120 B	Color (true)	98.7				0.310	
SM 2320 B-97	Total Alkalinity	103				1.10	
SM 2540 C-97	TDS					6.23	
SM 4500 F-C-97	Fluoride	98.2	97.9	97.3			0.476
SM 5310 B-00	Organic Carbon	103	104	105			0.156

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2123033
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2123038
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2123038
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2123033
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2123033
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2123034
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2123034
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2123034
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2123034

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2123035
SM 2120 B / E31780	True Color measured at 450 nm	2123033
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2123033
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2123033
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2123033
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2123033
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2123034

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	09/27/2019			09/27/2019 16:08	Samantha Davila	2123033
EPA 200.7 Rev. 4.4	09/27/2019	09/30/2019 14:15	Elliott D. Healy	10/02/2019 15:07	Alexander Thompson	2123038
EPA 200.8 Rev. 5.4	09/27/2019	09/30/2019 14:15	Elliott D. Healy	10/14/2019 18:43	Robert K Palmer	2123038
	09/27/2019	09/30/2019 14:15	Elliott D. Healy	10/15/2019 22:31	Robert K Palmer	2123038
EPA 300.0 Rev. 2.1	09/27/2019			10/05/2019 07:16	Julia Storbeck	2123033
EPA 350.1 Rev. 2.0	09/27/2019			10/04/2019 12:06	Ping Hua	2123034
EPA 351.2 Rev. 2.0	09/27/2019	10/01/2019 11:12	Sima Feizi	10/02/2019 14:59	Julia Storbeck	2123034
EPA 353.2 Rev. 2.0	09/27/2019			10/01/2019 11:34	Beverly Y. Sanders	2123034
EPA 365.1 Rev. 2.0	09/27/2019	10/01/2019 12:41	Vijayalakshmi Reddy	10/02/2019 11:39	Lipi Saha	2123034
EPA 365.1 Rev. 2.0 dissolved	09/27/2019			09/27/2019 16:31	Virginia P. Brown	2123035
SM 2120 B	09/27/2019			09/27/2019 16:56	Madeline Funaro	2123033
SM 2320 B-97	09/27/2019			10/03/2019 07:44	Dale L. Simmons	2123033
SM 2540 C-97	09/27/2019			10/02/2019 15:09	Yijie Li	2123033
SM 2540 D-97	09/27/2019			10/02/2019 15:09	Yijie Li	2123033
SM 4500 F-C-97	09/27/2019			10/03/2019 07:44	Dale L. Simmons	2123033
SM 5310 B-00	09/27/2019			10/02/2019 20:02	Madeline Funaro	2123034