

Chemical Analysis Report

SW-DIST-2018-12-20-01

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

Event Description: **Alafia River**
Request ID: **RQ-2018-12-17-45**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 08-JAN-2019 15:26

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: ALAFIA RIVER @ CENTER AVE

Collection Date/Time: 12/19/2018 11:20

Field ID: G2SW0045

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2050149	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P356502	
	EPA 300.0 Rev. 2.1	Chloride	26		mg Cl/L	P356721	
		Sulfate	71		mg SO4/L	P356723	
	SM 2120 B	Color (true)	56		PCU	P356472	
	SM 2320 B-97	Total Alkalinity	89		mg CaCO3/L	P356661	
	SM 2540 C-97	TDS	271	A	mg/L	P356692	
	SM 2540 D-97	TSS	3	IA	mg/L	P356584	
	SM 4500 F-C-97	Fluoride	0.92		mg F/L	P356662	
2050150	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P356623	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60	J	mg N/L	P356576	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.74		mg N/L	P356514	
	EPA 365.1 Rev. 2.0	Total-P	0.68		mg P/L	P356655	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P356718	
2050151	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.56		mg P/L	P356473	
2050159	EPA 200.7 Rev. 4.4	Calcium	45.5		mg/L	P356486	
		Iron	240		ug/L	P356486	
		Magnesium	15.6		mg/L	P356486	
		Potassium	3.9		mg/L	P356486	
		Sodium	23.5		mg/L	P356486	
		Zinc	5.0	U	ug/L	P356486	
	EPA 200.8 Rev. 5.4	Arsenic	1.39		ug/L	P356486	
		Cadmium	0.053	I	ug/L	P356486	
		Chromium	0.68	I	ug/L	P356486	
		Copper	0.71	I	ug/L	P356486	
		Lead	0.16	I	ug/L	P356486	
		Nickel	0.90		ug/L	P356486	
		Silver	0.010	U	ug/L	P356486	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Refer to the narrative for an explanation of QC Codes.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356502

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356486

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: P356486

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: P356721

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356723

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356623

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356576

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356514

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356655

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356473

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

Reference Method: SM 2120 B
Batch ID: P356472

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P356661

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

Reference Method: SM 2540 C-97
Batch ID: P356692

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356584

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356662

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P356718

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: P356486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	108		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	106		P	85 - 115
Sodium	105		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	108		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	104		P	85 - 115
Copper	106		P	85 - 115
Lead	105		P	85 - 115
Nickel	106		P	85 - 115
Silver	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356721

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356723

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356623

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356576

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356514

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356655

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356473

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.2		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P356472

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P356661

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

Reference Method: SM 4500 F-C-97
Batch ID: P356662

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.3		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356718

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049747	Calcium	104		P	80 - 120
2049747	Iron	108		P	80 - 120
2049747	Magnesium	109		P	80 - 120
2049747	Potassium	110		P	80 - 120
2049747	Sodium	106		P	80 - 120
2049747	Zinc	103		P	80 - 120
2050256	Calcium	111		P	80 - 120
2050256	Iron	110	111	P/P	80 - 120
2050256	Magnesium	110		P	80 - 120
2050256	Potassium	106		P	80 - 120
2050256	Sodium	107		P	80 - 120
2050256	Zinc	110	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049747	Arsenic	106		P	80 - 120
2049747	Cadmium	105		P	80 - 120
2049747	Chromium	99.9		P	80 - 120
2049747	Copper	102		P	80 - 120
2049747	Lead	102		P	80 - 120
2049747	Nickel	102		P	80 - 120
2049747	Silver	102		P	80 - 120
2050256	Arsenic	108	108	P/P	80 - 120
2050256	Cadmium	106	106	P/P	80 - 120
2050256	Chromium	102	103	P/P	80 - 120
2050256	Copper	106	106	P/P	80 - 120
2050256	Lead	104	106	P/P	80 - 120
2050256	Nickel	105	105	P/P	80 - 120
2050256	Silver	102	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356721

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050014	Chloride	96.6		P	90 - 110
2050221	Chloride	94.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356723

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050014	Sulfate	96.0		P	90 - 110
2050221	Sulfate	91.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356623

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050061	Ammonia-N	103	98.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356576

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050150	Kjeldahl Nitrogen	115	99.5	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050222	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356473

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050062	O-Phosphate-P	93.2	95.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P356662

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050297	Fluoride	98.7	98.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356718

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050119	Organic Carbon	92.0	92.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356502

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050118	Turbidity	3.08	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050256	Calcium	1.18	Spike	P	0 - 20
2050256	Iron	0.744	Spike	P	0 - 20
2050256	Magnesium	0.314	Spike	P	0 - 20
2050256	Potassium	0.294	Spike	P	0 - 20
2050256	Sodium	1.71	Spike	P	0 - 20
2050256	Zinc	3.56	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050256	Arsenic	0.500	Spike	P	0 - 20
2050256	Cadmium	0.424	Spike	P	0 - 20
2050256	Chromium	0.875	Spike	P	0 - 20
2050256	Copper	0.443	Spike	P	0 - 20
2050256	Lead	1.87	Spike	P	0 - 20
2050256	Nickel	0.0617	Spike	P	0 - 20
2050256	Silver	0.848	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050221	Chloride	1.45	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050221	Sulfate	1.36	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050061	Ammonia-N	3.32	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050150	Kjeldahl Nitrogen	9.76	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050222	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356655

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050150	Total-P	1.87	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050062	O-Phosphate-P	1.71	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P356472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050118	Color (true)	0.280	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P356661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050297	Total Alkalinity	0.165	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P356692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050149	TDS	2.95	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356662

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050297	Fluoride	0.0	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P356718

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050119	Organic Carbon	0.548	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 365.1 Rev. 2.0 dissolved

Run ID: A88469

Included Lab Sample IDs: 2050151

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.2	97.4	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A88470

Included Lab Sample IDs: 2050149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.4	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A88486

Included Lab Sample IDs: 2050149

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88490

Included Lab Sample IDs: 2050150

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88500

Included Lab Sample IDs: 2050150

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

Reference Method: SM 2320 B-97

Run ID: A88542

Included Lab Sample IDs: 2050149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	98.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88542

Included Lab Sample IDs: 2050149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88546

Included Lab Sample IDs: 2050149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Sulfate	99.8	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88547

Included Lab Sample IDs: 2050159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	107	P/P	90 - 110
Iron	105	107	P/P	90 - 110
Magnesium	106	108	P/P	90 - 110
Potassium	104	106	P/P	90 - 110
Sodium	105	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A88560

Included Lab Sample IDs: 2050150

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	103	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A88576

Included Lab Sample IDs: 2050150

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	94.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88585

Included Lab Sample IDs: 2050150

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88616

Included Lab Sample IDs: 2050159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	103	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88617

Included Lab Sample IDs: 2050159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	105	105	P/P	90 - 110
Cadmium	103	103	P/P	90 - 110
Chromium	104	104	P/P	90 - 110
Copper	107	107	P/P	90 - 110
Lead	107	106	P/P	90 - 110
Nickel	105	106	P/P	90 - 110
Silver	101	102	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					3.08	
EPA 200.7 Rev. 4.4	Calcium	107	104	111			1.18
	Iron	108	108	110	111		0.744
	Magnesium	106	109	110			0.314
	Potassium	106	110	106			0.294
	Sodium	105	106	107			1.71
	Zinc	103	103	110	106		3.56
EPA 200.8 Rev. 5.4	Arsenic	108	106	108	108		0.500
	Cadmium	103	105	106	106		0.424
	Chromium	104	99.9	102	103		0.875
	Copper	106	102	106	106		0.443
	Lead	105	102	104	106		1.87
	Nickel	106	102	105	105		0.0617
	Silver	102	102	102	103		0.848
EPA 300.0 Rev. 2.1	Chloride	99.3	94.6	96.6		1.45	
	Sulfate	97.5	91.8	96.0		1.36	
EPA 350.1 Rev. 2.0	Ammonia-N	100	103	98.5			3.32
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	115	99.5			9.76
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	96.4					1.87
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.2	93.2	95.0			1.71
SM 2120 B	Color (true)	101				0.280	
SM 2320 B-97	Total Alkalinity	101				0.165	
SM 2540 C-97	TDS					2.95	
SM 4500 F-C-97	Fluoride	96.3	98.7	98.7			0.0
SM 5310 B-00	Organic Carbon	95.4	92.0	92.9			0.548

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2050149
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2050159
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2050159
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2050149
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2050149
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2050150
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2050150
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2050150
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2050150
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2050151
SM 2120 B / E31780	True Color measured at 450 nm	2050149
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2050149
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2050149
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2050149
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2050149

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2050150

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	12/20/2018			12/20/2018 15:16	Megan Treadwell	2050149
EPA 200.7 Rev. 4.4	12/20/2018	12/20/2018 18:00	Elliott D. Healy	01/03/2019 13:01	Betina Topolski	2050159
	12/20/2018	12/20/2018 18:00	Elliott D. Healy	12/27/2018 19:37	Martin Acosta	2050159
EPA 200.8 Rev. 5.4	12/20/2018	12/20/2018 18:00	Elliott D. Healy	01/03/2019 00:50	Allison Taylor	2050159
EPA 300.0 Rev. 2.1	12/20/2018			12/29/2018 01:21	Lipi Saha	2050149
EPA 350.1 Rev. 2.0	12/20/2018			12/21/2018 10:33	Ping Hua	2050150
EPA 351.2 Rev. 2.0	12/20/2018	12/26/2018 10:45	Adrian Shelby	12/27/2018 17:15	Chelsea Hernandez	2050150
EPA 353.2 Rev. 2.0	12/20/2018			12/21/2018 10:10	Lauren Bottorf	2050150
EPA 365.1 Rev. 2.0	12/20/2018	12/28/2018 11:30	Joseph Suarez	01/02/2019 08:59	Beverly Y. Sanders	2050150
EPA 365.1 Rev. 2.0 dissolved	12/20/2018			12/20/2018 14:54	Jhamieka S. Greenwood	2050151
SM 2120 B	12/20/2018			12/20/2018 15:56	Chelsea Hernandez	2050149
SM 2320 B-97	12/20/2018			12/27/2018 22:42	Dale L. Simmons	2050149
SM 2540 C-97	12/20/2018			12/21/2018 11:15	Yijie Li	2050149
SM 2540 D-97	12/20/2018			12/21/2018 11:15	Yijie Li	2050149
SM 4500 F-C-97	12/20/2018			12/27/2018 22:42	Dale L. Simmons	2050149
SM 5310 B-00	12/20/2018			12/21/2018 21:21	Megan Treadwell	2050150