Chemical Analysis Report

TLH-ROC-2018-04-11-03

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

Event Description: **kit C-b (WBID 3310) Aucilla River**
Request ID: **RQ-2018-04-16-35**
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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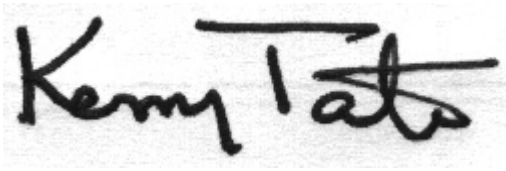
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 08-MAY-2018 15:43



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: AUCILLA RIVER **Collection Date/Time: 04/11/2018 09:55**

Field ID: G1TLHR0019 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1983691	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P343259	
	EPA 300.0 Rev. 2.1	Chloride	5.4		mg Cl/L	P343434	
		Sulfate	0.95		mg SO4/L	P343437	
	SM 2120 B	Color (true)	250		PCU	P343211	
	SM 2320 B-97	Total Alkalinity	26		mg CaCO3/L	P343812	
	SM 2540 C-97	TDS	77		mg/L	P343621	
	SM 2540 D-97	TSS	2	I	mg/L	P343873	
	SM 4500 F-C-97	Fluoride	0.053	I	mg F/L	P343816	
1983692	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P343687	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P343350	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.042		mg N/L	P343568	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P343481	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P343323	
1983693	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.044		mg P/L	P343224	
1983696	EPA 200.7 Rev. 4.4	Iron	690		ug/L	P343304	
		Zinc	5.0	U	ug/L	P343304	
	EPA 200.8 Rev. 5.4	Arsenic	0.26		ug/L	P343304	
		Cadmium	0.020	U	ug/L	P343304	
		Chromium	0.49	I	ug/L	P344319	
		Copper	0.63	I	ug/L	P343304	
		Lead	0.19	I	ug/L	P343304	
		Nickel	0.34	I	ug/L	P344319	
		Silver	0.010	U	ug/L	P343304	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-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: P343259

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343304

Component	Result	Code	Units
Iron	30	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343437

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343687

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343350

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343568

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343481

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343224

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

Reference Method: SM 2120 B
Batch ID: P343211

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P343812

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

Reference Method: SM 2540 C-97
Batch ID: P343621

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P343873

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P343816

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P343323

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: P343304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	97.4		P	85 - 115
Zinc	92.5		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	96.3		P	85 - 115
Copper	99.1		P	85 - 115
Lead	91.3		P	85 - 115
Silver	95.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	95.6		P	85 - 115
Nickel	95.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343687

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343350

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343568

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343481

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	107		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343224

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.9		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P343812

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

Reference Method: SM 4500 F-C-97
Batch ID: P343816

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.8		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343323

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983246	Iron	96.8		P	80 - 120
1983246	Zinc	94.2		P	80 - 120
1983394	Iron	95.6	96.9	P/P	80 - 120
1983394	Zinc	90.8	90.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983246	Arsenic	100		P	80 - 120
1983246	Cadmium	97.0		P	80 - 120
1983246	Copper	98.1		P	80 - 120
1983246	Lead	92.3		P	80 - 120
1983246	Silver	95.6		P	80 - 120
1983394	Arsenic	101	99.8	P/P	80 - 120
1983394	Cadmium	98.2	96.0	P/P	80 - 120
1983394	Copper	96.3	95.6	P/P	80 - 120
1983394	Lead	92.8	92.2	P/P	80 - 120
1983394	Silver	95.7	94.3	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1987474	Chromium	89.5	89.9	P/P	75 - 125
1987474	Nickel	90.6	91.4	P/P	75 - 125

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983244	Chloride	101		P	90 - 110
1983293	Chloride	96.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343437

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983244	Sulfate	98.3		P	90 - 110
1983293	Sulfate	93.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983684	Ammonia-N	94.4	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343350

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983903	Kjeldahl Nitrogen	97.4	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983678	NO2NO3-N	98.2	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343481

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983781	Total-P	102	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P343816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983728	Fluoride	96.1	96.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343323

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1981878	Organic Carbon	98.2		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983557	Turbidity	1.73	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983394	Iron	1.25	Spike	P	0 - 20
1983394	Zinc	0.00947	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983394	Arsenic	0.759	Spike	P	0 - 20
1983394	Cadmium	2.24	Spike	P	0 - 20
1983394	Copper	0.705	Spike	P	0 - 20
1983394	Lead	0.678	Spike	P	0 - 20
1983394	Silver	1.44	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1987474	Chromium	0.349	Spike	P	0 - 20
1987474	Nickel	0.720	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983244	Chloride	0.573	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983244	Sulfate	0.423	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983684	Ammonia-N	1.84	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343350

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983903	Kjeldahl Nitrogen	0.259	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983678	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983781	Total-P	0.131	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343224

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983679	O-Phosphate-P	0.248	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P343211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983425	Color (true)	1.07	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P343812

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983728	Total Alkalinity	0.445	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P343621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983677	TDS	2.77	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P343816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983728	Fluoride	0.480	Spike	P	0 - 3.5

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P343323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1981878	Organic Carbon	1.65	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A83166
Included Lab Sample IDs: 1983691

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	100	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A83169
Included Lab Sample IDs: 1983693

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83184
Included Lab Sample IDs: 1983691

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.0	P/P	95 - 105

Reference Method: SM 5310 B-00
Run ID: A83208
Included Lab Sample IDs: 1983692

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.6	97.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83234
Included Lab Sample IDs: 1983691

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.1	P/P	90 - 110
Sulfate	102	99.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83239
Included Lab Sample IDs: 1983696

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	97.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83239
Included Lab Sample IDs: 1983696

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	98.4	96.7	P/P	90 - 110
Copper	103	98.7	P/P	90 - 110
Lead	96.0	94.1	P/P	90 - 110
Silver	98.0	96.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83243
Included Lab Sample IDs: 1983696

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	95.9	94.0	P/P	90 - 110
Zinc	96.1	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83278
Included Lab Sample IDs: 1983692

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83287
Included Lab Sample IDs: 1983692

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83314
Included Lab Sample IDs: 1983692

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83326
Included Lab Sample IDs: 1983692

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

Reference Method: SM 2320 B-97
Run ID: A83371
Included Lab Sample IDs: 1983691

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	99.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A83371
Included Lab Sample IDs: 1983691

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83582
Included Lab Sample IDs: 1983696

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	97.2	98.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83609
Included Lab Sample IDs: 1983696

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	103	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			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						1.73	
EPA 200.7 Rev. 4.4	Iron	97.4	96.8	95.6	96.9			1.25
	Zinc	92.5	94.2	90.8	90.8			0.0094
EPA 200.8 Rev. 5.4	Arsenic	100	100	101	99.8			0.759
	Cadmium	96.3	97.0	98.2	96.0			2.24
	Chromium	95.6	89.5	89.9				0.349
	Copper	99.1	98.1	96.3	95.6			0.705
	Lead	91.3	92.3	92.8	92.2			0.678
	Nickel	95.8	90.6	91.4				0.720
	Silver	95.0	95.6	95.7	94.3			1.44
EPA 300.0 Rev. 2.1	Chloride	98.9	101	96.3			0.573	
	Sulfate	98.0	98.3	93.7			0.423	
EPA 350.1 Rev. 2.0	Ammonia-N	97.7	94.4	97.0				1.84
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	97.4	97.8				0.259
EPA 353.2 Rev. 2.0	NO2NO3-N	101	98.2	98.2				0.0
EPA 365.1 Rev. 2.0	Total-P	107	102	102				0.131
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9						0.248
SM 2120 B	Color (true)						1.07	
SM 2320 B-97	Total Alkalinity	101					0.445	
SM 2540 C-97	TDS						2.77	
SM 4500 F-C-97	Fluoride	94.8	96.1	96.9				0.480
SM 5310 B-00	Organic Carbon	98.2	98.2					1.65

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1983691
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1983696
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1983696
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1983691
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1983691
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1983692
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1983692
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1983692
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1983692
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1983693
SM 2120 B / E31780	True Color measured at 450 nm	1983691
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1983691
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1983691
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1983691
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1983691
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1983692

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	04/11/2018			04/11/2018 17:57	William L. Brown IV	1983691
EPA 200.7 Rev. 4.4	04/11/2018	04/12/2018 18:50	Elliott D. Healy	04/13/2018 22:27	Betina Topolski	1983696
EPA 200.8 Rev. 5.4	04/11/2018	04/12/2018 18:50	Elliott D. Healy	04/15/2018 06:28	Robert K Palmer	1983696
	04/11/2018	04/30/2018 15:15	Elliott D. Healy	05/01/2018 19:06	Robert K Palmer	1983696
	04/11/2018	04/30/2018 15:15	Elliott D. Healy	05/02/2018 10:09	Robert K Palmer	1983696
EPA 300.0 Rev. 2.1	04/11/2018			04/14/2018 02:40	Lipi Saha	1983691
EPA 350.1 Rev. 2.0	04/11/2018			04/17/2018 10:53	Ping Hua	1983692
EPA 351.2 Rev. 2.0	04/11/2018	04/13/2018 10:00	Adrian Shelby	04/17/2018 10:43	Joseph Suarez	1983692
EPA 353.2 Rev. 2.0	04/11/2018			04/17/2018 13:29	Lauren Bottorf	1983692
EPA 365.1 Rev. 2.0	04/11/2018	04/16/2018 13:16	Sima Feizi	04/18/2018 10:39	Beverly Y. Sanders	1983692
EPA 365.1 Rev. 2.0 dissolved	04/11/2018			04/11/2018 16:33	Megan Treadwell	1983693
SM 2120 B	04/11/2018			04/11/2018 16:11	Tanya Welborn	1983691
SM 2320 B-97	04/11/2018			04/19/2018 23:17	Dale L. Simmons	1983691
SM 2540 C-97	04/11/2018			04/13/2018 15:23	Yijie Li	1983691
SM 2540 D-97	04/11/2018			04/13/2018 15:23	Yijie Li	1983691
SM 4500 F-C-97	04/11/2018			04/19/2018 23:17	Dale L. Simmons	1983691
SM 5310 B-00	04/11/2018			04/13/2018 02:35	Megan Treadwell	1983692