Chemical Analysis Report

WQAP-2016-08-17-01

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

Event Description: **Wakulla River**
Request ID: **RQ-2016-08-15-75**
Customer: **WQAP**
Project ID: **BMAP**

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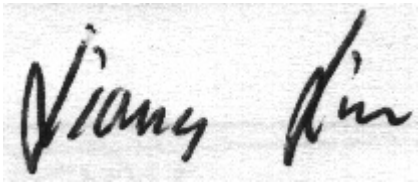
Certified by: Liang Lin, Environmental Administrator

Date Certified: 13-SEP-2016 16:38



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: Wakulla River at Boat Tram **Collection Date/Time: 08/17/2016 11:25**

Field ID: 44059-08172016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824534	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P309905	
	EPA 300.0 Rev. 2.1	Chloride	8.1		mg Cl/L	P310311	
	SM 2120 B	Color (true)	38		PCU	P309911	
	SM 2320 B-97	Total Alkalinity	130		mg CaCO3/L	P310234	
	SM 2540 C-97	TDS	174		mg/L	P310531	
	SM 2540 D-97	TSS	3	I	mg/L	P310483	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P310240	
1824536	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P310059	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.22		mg N/L	P310075	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P310345	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P309960	
	SM 5310 B-00	Organic Carbon	3.4		mg C/L	P310368	
1824538	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.027		mg P/L	P309982	
1824543	EPA 200.7 Rev. 4.4	Calcium	44.3		mg/L	P310115	
		Iron	46	I	ug/L	P310115	
		Magnesium	9.47		mg/L	P310115	
		Potassium	0.54	I	mg/L	P310115	
		Sodium	5.3		mg/L	P310115	
		Zinc	5.0	U	ug/L	P310115	
	EPA 200.8 Rev. 5.4	Arsenic	0.63		ug/L	P310115	
		Cadmium	0.026	I	ug/L	P310115	
		Chromium	0.90		ug/L	P310115	
		Copper	0.16	I	ug/L	P310115	
		Lead	0.053	I	ug/L	P310115	
		Nickel	0.17	I	ug/L	P310115	
		Silver	0.0050	U	ug/L	P310115	

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

Sample Location: Wakulla River at CR 365 Bridge **Collection Date/Time: 08/17/2016 14:00**

Field ID: 34879-08172016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824535	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P309905	
	EPA 300.0 Rev. 2.1	Chloride	8.1		mg Cl/L	P310311	
	SM 2120 B	Color (true)	34		PCU	P309911	
	SM 2320 B-97	Total Alkalinity	133		mg CaCO3/L	P310234	
	SM 2540 C-97	TDS	182	A	mg/L	P310531	
	SM 2540 D-97	TSS	3	I	mg/L	P310483	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P310240	
1824537	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P310059	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.18	I	mg N/L	P310075	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P310345	

Field ID: 34879-08172016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824537	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P310035	
	SM 5310 B-00	Organic Carbon	3.2		mg C/L	P310368	
1824539	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.025		mg P/L	P309982	
1824544	EPA 200.7 Rev. 4.4	Calcium	46.5		mg/L	P310115	
		Iron	39	I	ug/L	P310115	
		Magnesium	9.62		mg/L	P310115	
		Potassium	0.54	I	mg/L	P310115	
		Sodium	5.4		mg/L	P310115	
		Zinc	5.0	U	ug/L	P310115	
	EPA 200.8 Rev. 5.4	Arsenic	0.65		ug/L	P310115	
		Cadmium	0.020	U	ug/L	P310115	
		Chromium	0.93		ug/L	P310115	
		Copper	0.11	I	ug/L	P310115	
		Lead	0.050	U	ug/L	P310115	
		Nickel	0.22		ug/L	P310115	
		Silver	0.0050	U	ug/L	P310115	

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: P309905

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310115

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: P310115

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310311

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310059

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310075

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310345

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309960

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310035

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309982

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

Reference Method: SM 2120 B
Batch ID: P309911

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P310234

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P310531

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310483

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P310240

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P310368

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: P310115

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	107		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	101		P	85 - 115
Sodium	102		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310115

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	103		P	85 - 115
Copper	96.0		P	85 - 115
Lead	98.7		P	85 - 115
Nickel	97.2		P	85 - 115
Silver	98.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310311

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310059

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310075

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: P310345

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309960

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310035

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309982

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

Reference Method: SM 2320 B-97
Batch ID: P310234

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P310240

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.8		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P310368

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.5		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824544	Calcium	105		P	80 - 120
1824544	Iron	107	108	P/P	80 - 120
1824544	Magnesium	104		P	80 - 120
1824544	Potassium	102	104	P/P	80 - 120
1824544	Sodium	105		P	80 - 120
1824544	Zinc	101	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824544	Arsenic	101	101	P/P	80 - 120
1824544	Cadmium	99.9	103	P/P	80 - 120
1824544	Chromium	101	102	P/P	80 - 120
1824544	Copper	92.3	92.1	P/P	80 - 120
1824544	Lead	98.0	99.0	P/P	80 - 120
1824544	Nickel	93.4	93.4	P/P	80 - 120
1824544	Silver	98.7	95.0	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310311

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824352	Chloride	102		P	90 - 110
1824383	Chloride	99.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310059

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824536	Ammonia-N	101	99.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824386	Kjeldahl Nitrogen	88.6	91.0	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310345

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824389	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310035

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824624	Total-P	101	102	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824538	O-Phosphate-P	98.8	99.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P310240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824610	Fluoride	98.6	100	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P310368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824227	Organic Carbon	100	93.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P309905

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824497	Turbidity	5.11	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824544	Calcium	0.238	Spike	P	0 - 20
1824544	Iron	1.05	Spike	P	0 - 20
1824544	Magnesium	0.580	Spike	P	0 - 20
1824544	Potassium	1.63	Spike	P	0 - 20
1824544	Sodium	1.50	Spike	P	0 - 20
1824544	Zinc	0.781	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824544	Arsenic	0.244	Spike	P	0 - 20
1824544	Cadmium	3.15	Spike	P	0 - 20
1824544	Chromium	0.646	Spike	P	0 - 20
1824544	Copper	0.285	Spike	P	0 - 20
1824544	Lead	0.983	Spike	P	0 - 20
1824544	Nickel	0.0365	Spike	P	0 - 20
1824544	Silver	3.89	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310311

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824352	Chloride	0.0675	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310059

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824536	Ammonia-N	0.983	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824386	Kjeldahl Nitrogen	1.41	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824389	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824475	Total-P	0.860	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824624	Total-P	0.536	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824538	O-Phosphate-P	0.159	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P309911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824353	Color (true)	0.244	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P310234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824610	Total Alkalinity	0.616	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P310531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824535	TDS	5.49	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P310240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824610	Fluoride	1.46	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P310368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824227	Organic Carbon	4.25	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: A71180
Included Lab Sample IDs: 1824534, 1824535

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

Reference Method: SM 2120 B
Run ID: A71190
Included Lab Sample IDs: 1824534, 1824535

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	99.7	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71210
Included Lab Sample IDs: 1824538, 1824539

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	99.5	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71238
Included Lab Sample IDs: 1824536, 1824537

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 365.1 Rev. 2.0
Run ID: A71263
Included Lab Sample IDs: 1824537

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71267
Included Lab Sample IDs: 1824536

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71276
Included Lab Sample IDs: 1824536, 1824537

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	109	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71280
Included Lab Sample IDs: 1824534, 1824535

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

Reference Method: SM 2320 B-97
Run ID: A71291
Included Lab Sample IDs: 1824534, 1824535

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

Reference Method: SM 4500 F-C-97
Run ID: A71291
Included Lab Sample IDs: 1824534, 1824535

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71309
Included Lab Sample IDs: 1824543, 1824544

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71309
Included Lab Sample IDs: 1824543, 1824544

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71314
Included Lab Sample IDs: 1824543, 1824544

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	100	99.3	P/P	90 - 110
Cadmium	100	99.3	P/P	90 - 110
Chromium	103	104	P/P	90 - 110
Lead	97.3	97.2	P/P	90 - 110
Nickel	98.3	97.4	P/P	90 - 110
Silver	98.7	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71323
Included Lab Sample IDs: 1824536, 1824537

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.5	96.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A71332
Included Lab Sample IDs: 1824536, 1824537

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	92.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71367
Included Lab Sample IDs: 1824543, 1824544

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	97.8	95.5	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				5.11	
EPA 200.7 Rev. 4.4	Calcium	105	105			0.238

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 200.7 Rev. 4.4	Iron	107	107	108			1.05
	Magnesium	103	104				0.580
	Potassium	101	102	104			1.63
	Sodium	102	105				1.50
	Zinc	104	101	102			0.781
EPA 200.8 Rev. 5.4	Arsenic	100	101	101			0.244
	Cadmium	98.9	99.9	103			3.15
	Chromium	103	101	102			0.646
	Copper	96.0	92.3	92.1			0.285
	Lead	98.7	98.0	99.0			0.983
	Nickel	97.2	93.4	93.4			0.0365
	Silver	98.8	98.7	95.0			3.89
EPA 300.0 Rev. 2.1	Chloride	101	102	99.3		0.0675	
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	99.9			0.983
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	88.6	91.0			1.41
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	100			0.499
EPA 365.1 Rev. 2.0	Total-P	101					0.860
	Total-P	98.9	101	102			0.536
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	98.8	99.0			0.159
SM 2120 B	Color (true)					0.244	
SM 2320 B-97	Total Alkalinity	104				0.616	
SM 2540 C-97	TDS					5.49	
SM 4500 F-C-97	Fluoride	97.8	98.6	100			1.46
SM 5310 B-00	Organic Carbon	96.5	100	93.5			4.25

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1824534, 1824535
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1824543, 1824544
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1824543, 1824544
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1824534, 1824535
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1824536, 1824537
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1824536, 1824537
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1824536, 1824537
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1824536, 1824537
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1824538, 1824539
SM 2120 B / E31780	True Color measured at 450 nm	1824534, 1824535
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1824534, 1824535
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1824534, 1824535
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1824534, 1824535
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1824534, 1824535
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1824536, 1824537

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	08/17/2016			08/17/2016 15:44	Sima Feizi	1824534, 1824535
EPA 200.7 Rev. 4.4	08/17/2016	08/22/2016	Elliott D. Healy	08/24/2016	Joshua Ayres	1824543, 1824544
EPA 200.8 Rev. 5.4	08/17/2016	08/22/2016	Elliott D. Healy	08/24/2016	Charles J. Peterson	1824543, 1824544
	08/17/2016	08/22/2016	Elliott D. Healy	08/26/2016	Charles J. Peterson	1824543, 1824544
EPA 300.0 Rev. 2.1	08/17/2016			08/25/2016	Ping Hua	1824534, 1824535
EPA 350.1 Rev. 2.0	08/17/2016			08/21/2016	Julie Michelle Frank	1824536, 1824537
EPA 351.2 Rev. 2.0	08/17/2016	08/22/2016	Adrian Shelby	08/23/2016	Christopher Armour	1824536, 1824537
EPA 353.2 Rev. 2.0	08/17/2016			08/25/2016	Beverly Y. Sanders	1824536, 1824537
EPA 365.1 Rev. 2.0	08/17/2016	08/18/2016	Vijayalakshmi Reddy	08/23/2016	Lipi Saha	1824536
	08/17/2016	08/19/2016	Vijayalakshmi Reddy	08/23/2016	Lipi Saha	1824537
EPA 365.1 Rev. 2.0 dissolved	08/17/2016			08/18/2016 15:11	Julia Storbeck	1824538
	08/17/2016			08/18/2016 15:50	Julia Storbeck	1824539
SM 2120 B	08/17/2016			08/17/2016 17:29	Rochelle Y Jackson	1824534
	08/17/2016			08/17/2016 17:30	Rochelle Y Jackson	1824535
SM 2320 B-97	08/17/2016			08/23/2016	Dale L. Simmons	1824534, 1824535
SM 2540 C-97	08/17/2016			08/19/2016	Yijie Li	1824534, 1824535
SM 2540 D-97	08/17/2016			08/19/2016	Yijie Li	1824534, 1824535
SM 4500 F-C-97	08/17/2016			08/23/2016	Dale L. Simmons	1824534, 1824535
SM 5310 B-00	08/17/2016			08/25/2016	Sofia Elnemr	1824536, 1824537