Chemical Analysis Report

CEN-DIST-2017-04-27-01

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

Event Description: **Lady Lake / Lk Blue Springs + D&B**
Request ID: **RQ-2017-04-24-60**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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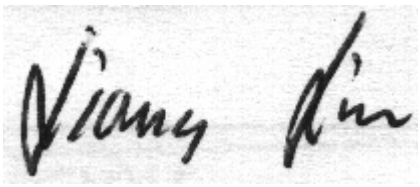
Certified by: Liang Lin, Environmental Administrator

Date Certified: 26-MAY-2017 16:41



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: LADY LAKE @ CENER OF NORTH LOBE **Collection Date/Time: 04/26/2017 11:05**

Field ID: G4CE0139 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893285	EPA 180.1 Rev. 2.0	Turbidity	6.3		NTU	P324190	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P324673	
		Sulfate	8.8		mg SO4/L	P324669	
	SM 2120 B	Color (true)	18		PCU	P324142	
	SM 2320 B-97	Total Alkalinity	2.2	I	mg CaCO3/L	P324823	
	SM 2540 C-97	TDS	55		mg/L	P325035	
	SM 2540 D-97	TSS	7	I	mg/L	P324590	
	SM 4500 F-C-97	Fluoride	0.067	I	mg F/L	P325523	
1893288	EPA 350.1 Rev. 2.0	Ammonia-N	0.080		mg N/L	P324259	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P324281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.042		mg N/L	P324387	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P324322	
	SM 5310 B-00	Organic Carbon	6.9		mg C/L	P324282	
1893291	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P324183	

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

Sample Location: FIELD BLANK **Collection Date/Time: 04/26/2017 12:10**

Field ID: FIELD BLANK Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893294	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P324190	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P324673	
		Sulfate	0.20	U	mg SO4/L	P324669	
	SM 2120 B	Color (true)	2.5	U	PCU	P324142	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P324823	
	SM 2540 C-97	TDS	15	U	mg/L	P325035	
	SM 2540 D-97	TSS	2	U	mg/L	P324590	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P325596	
1893295	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P324259	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P324281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P324387	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P324322	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P324282	
1893296	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P324183	
1893305	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P324493	
		Iron	30	U	ug/L	P324493	
		Magnesium	0.040	U	mg/L	P324493	
		Potassium	0.30	U	mg/L	P324493	
		Sodium	0.50	U	mg/L	P324493	
		Zinc	5.0	U	ug/L	P324493	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P324493	
		Cadmium	0.020	U	ug/L	P324493	
		Chromium	0.40	U	ug/L	P324493	

Field ID: FIELD BLANK Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893305	EPA 200.8 Rev. 5.4	Copper	0.20	U	ug/L	P324493	
		Lead	0.050	U	ug/L	P324493	
		Nickel	0.25	I	ug/L	P324493	
		Silver	0.010	U	ug/L	P324493	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The nickel result was confirmed in the undigested sample on 05/05/2017.

Sample Location: BLUE SPRINGS (LAKE CO.) @ WEIR **Collection Date/Time: 04/26/2017 12:20**

Field ID: G1CE0024 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893286	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P324190	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P324673	
		Sulfate	9.3		mg SO4/L	P324669	
	SM 2120 B	Color (true)	2.5	U	PCU	P324142	
	SM 2320 B-97	Total Alkalinity	105		mg CaCO3/L	P324823	
	SM 2540 C-97	TDS	150	A	mg/L	P325035	
	SM 2540 D-97	TSS	2	UA	mg/L	P324590	
	SM 4500 F-C-97	Fluoride	0.088	I	mg F/L	P325596	
1893289	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P324259	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P324281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	3.0		mg N/L	P324387	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P324322	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P324282	
1893292	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.031		mg P/L	P324183	

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

Sample Location: BLUE SPRINGS (LAKE CO.) @ WEIR **Collection Date/Time: 04/26/2017 12:25**

Field ID: G1CE0024 D Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893287	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P324190	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P324673	
		Sulfate	9.3		mg SO4/L	P324669	
	SM 2120 B	Color (true)	2.5	U	PCU	P324142	
	SM 2320 B-97	Total Alkalinity	106	A	mg CaCO3/L	P324823	
	SM 2540 C-97	TDS	146		mg/L	P325035	
	SM 2540 D-97	TSS	2	U	mg/L	P324590	
	SM 4500 F-C-97	Fluoride	0.090	I	mg F/L	P325596	
1893290	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P324259	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P324281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	3.0		mg N/L	P324387	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P324322	

Field ID: G1CE0024 D Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893290	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P324282	
1893293	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P324183	

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: P324190

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P324493

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: P324493

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: P324669

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324673

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324259

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: P324281

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324387

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324322

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P324183

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

Reference Method: SM 2120 B
Batch ID: P324142

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P324823

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

Reference Method: SM 2540 C-97
Batch ID: P325035

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P324590

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P325523

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P325596

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P324282

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: P324493

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	108		P	85 - 115
Iron	102		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	102		P	85 - 115
Sodium	105		P	85 - 115
Zinc	99.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P324493

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.8		P	85 - 115
Cadmium	107		P	85 - 115
Chromium	101		P	85 - 115
Copper	92.4		P	85 - 115
Lead	101		P	85 - 115
Nickel	94.1		P	85 - 115
Silver	97.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324669

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324673

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324259

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324281

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324387

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: P324322

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P324183

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

Reference Method: SM 2320 B-97
Batch ID: P324823

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

Reference Method: SM 4500 F-C-97
Batch ID: P325523

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P325596

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P324282

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P324493

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P324493

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893017	Calcium	109	106	P/P	80 - 120
1893017	Iron	107	104	P/P	80 - 120
1893017	Magnesium	113	105	P/P	80 - 120
1893017	Potassium	98.7	94.9	P/P	80 - 120
1893017	Sodium	104		P	80 - 120
1893017	Zinc	105	102	P/P	80 - 120
1893888	Calcium	100		P	80 - 120
1893888	Iron	99.4		P	80 - 120
1893888	Magnesium	97.0		P	80 - 120
1893888	Zinc	105		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P324493

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893017	Arsenic	101	98.3	P/P	80 - 120
1893017	Cadmium	109	105	P/P	80 - 120
1893017	Chromium	105	102	P/P	80 - 120
1893017	Copper	94.8	92.3	P/P	80 - 120
1893017	Lead	103	101	P/P	80 - 120
1893017	Nickel	96.1	93.5	P/P	80 - 120
1893017	Silver	98.2	95.6	P/P	80 - 120
1893888	Arsenic	104		P	80 - 120
1893888	Cadmium	100		P	80 - 120
1893888	Chromium	86.8		P	80 - 120
1893888	Copper	85.7		P	80 - 120
1893888	Lead	101		P	80 - 120
1893888	Nickel	90.7		P	80 - 120
1893888	Silver	96.0		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892987	Sulfate	98.8		P	90 - 110
1892988	Sulfate	98.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892987	Chloride	97.3		P	90 - 110
1892988	Chloride	95.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324259

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893289	Ammonia-N	105	104	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324281

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893289	Kjeldahl Nitrogen	108	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324387

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893384	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893290	Total-P	99.9	97.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P324183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893431	O-Phosphate-P	96.9	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P325523

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892759	Fluoride	101	102	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P325596

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893434	Fluoride	96.5	95.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P324282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893288	Organic Carbon	103	103	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P324190

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892987	Turbidity	10.6	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P324493

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893017	Calcium	1.88	Spike	P	0 - 20
1893017	Iron	3.65	Spike	P	0 - 20
1893017	Magnesium	4.94	Spike	P	0 - 20
1893017	Potassium	2.49	Spike	P	0 - 20
1893017	Sodium	2.02	Spike	P	0 - 20
1893017	Zinc	2.11	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P324493

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893017	Arsenic	2.51	Spike	P	0 - 20
1893017	Cadmium	3.59	Spike	P	0 - 20
1893017	Chromium	2.82	Spike	P	0 - 20
1893017	Copper	2.55	Spike	P	0 - 20
1893017	Lead	1.56	Spike	P	0 - 20
1893017	Nickel	2.73	Spike	P	0 - 20
1893017	Silver	2.64	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892987	Sulfate	0.593	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892987	Chloride	0.0770	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893289	Ammonia-N	1.50	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893289	Kjeldahl Nitrogen	0.0845	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893384	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893290	Total-P	2.56	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P324183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893431	O-Phosphate-P	0.658	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P324142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892987	Color (true)	1.52	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P324823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893287	Total Alkalinity	0.653	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P325035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893286	TDS	2.01	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P325523

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892759	Fluoride	0.947	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P325596

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893434	Fluoride	0.480	Spike	P	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P324282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893288	Organic Carbon	0.146	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: A76035
Included Lab Sample IDs: 1893285, 1893286, 1893287, 1893294

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.5	98.0	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A76048
Included Lab Sample IDs: 1893291, 1893292, 1893293, 1893296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	97.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A76055
Included Lab Sample IDs: 1893285, 1893286, 1893287, 1893294

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A76071
Included Lab Sample IDs: 1893288, 1893289, 1893290, 1893295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	103	P/P	90 - 110
Ammonia-N	103	104	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A76081
Included Lab Sample IDs: 1893288, 1893289, 1893290, 1893295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.7	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A76115
Included Lab Sample IDs: 1893288, 1893289, 1893290, 1893295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.3	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A76115
Included Lab Sample IDs: 1893288, 1893289, 1893290, 1893295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.0	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A76117
Included Lab Sample IDs: 1893288, 1893289, 1893290, 1893295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A76148
Included Lab Sample IDs: 1893285, 1893286, 1893287, 1893294

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	106	P/P	90 - 110
Sulfate	100	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A76173
Included Lab Sample IDs: 1893288, 1893289, 1893290, 1893295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	97.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A76229
Included Lab Sample IDs: 1893305

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.1	97.2	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Chromium	99.4	102	P/P	90 - 110
Copper	94.3	92.3	P/P	90 - 110
Lead	99.8	100	P/P	90 - 110
Nickel	94.6	93.7	P/P	90 - 110
Silver	99.1	99.5	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A76242
Included Lab Sample IDs: 1893285, 1893286, 1893287, 1893294

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A76346
Included Lab Sample IDs: 1893305

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A76346
Included Lab Sample IDs: 1893305

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

Reference Method: SM 4500 F-C-97
Run ID: A76528
Included Lab Sample IDs: 1893285

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

Reference Method: SM 4500 F-C-97
Run ID: A76561
Included Lab Sample IDs: 1893286, 1893287, 1893294

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	100	P/P	90 - 110
Fluoride	99.5	98.0	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						10.6	
EPA 200.7 Rev. 4.4	Calcium	108	109	106	100			1.88
	Iron	102	107	104	99.4			3.65
	Magnesium	108	113	105	97.0			4.94
	Potassium	102	98.7	94.9				2.49
	Sodium	105	104					2.02
	Zinc	99.6	105	102	105			2.11
EPA 200.8 Rev. 5.4	Arsenic	97.8	101	98.3	104			2.51
	Cadmium	107	109	105	100			3.59
	Chromium	101	105	102	86.8			2.82
	Copper	92.4	94.8	92.3	85.7			2.55
	Lead	101	101	103	101			1.56
	Nickel	94.1	96.1	93.5	90.7			2.73
	Silver	97.0	98.2	95.6	96.0			2.64
EPA 300.0 Rev. 2.1	Chloride	101	97.3	95.5			0.0770	
	Sulfate	99.8	98.8	98.4			0.593	
EPA 350.1 Rev. 2.0	Ammonia-N	101	105	104				1.50
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	108	108				0.0845
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	101				0.0

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 365.1 Rev. 2.0	Total-P	103	99.9	97.2			2.56
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.2	96.9	98.0			0.658
SM 2120 B	Color (true)					1.52	
SM 2320 B-97	Total Alkalinity	103				0.653	
SM 2540 C-97	TDS					2.01	
SM 4500 F-C-97	Fluoride	102	101	102			0.947
	Fluoride	98.6	96.5	95.8			0.480
SM 5310 B-00	Organic Carbon	102	103	103			0.146

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1893285, 1893286, 1893287, 1893294
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1893305
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1893305
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1893285, 1893286, 1893287, 1893294
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1893285, 1893286, 1893287, 1893294
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1893288, 1893289, 1893290, 1893295
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1893288, 1893289, 1893290, 1893295
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1893288, 1893289, 1893290, 1893295
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1893288, 1893289, 1893290, 1893295
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1893291, 1893292, 1893293, 1893296
SM 2120 B / E31780	True Color measured at 450 nm	1893285, 1893286, 1893287, 1893294
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1893285, 1893286, 1893287, 1893294
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1893285, 1893286, 1893287, 1893294
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1893285, 1893286, 1893287, 1893294
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1893285, 1893286, 1893287, 1893294
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1893288, 1893289, 1893290, 1893295

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	04/27/2017			04/27/2017 16:59	Sima Feizi	1893285, 1893286, 1893287, 1893294
EPA 200.7 Rev. 4.4	04/27/2017	05/03/2017	Robert K Palmer	05/10/2017	Martin Acosta	1893305
EPA 200.8 Rev. 5.4	04/27/2017	05/03/2017	Robert K Palmer	05/05/2017	Betina Topolski	1893305
EPA 300.0 Rev. 2.1	04/27/2017			05/04/2017	Ping Hua	1893285, 1893286, 1893287, 1893294
EPA 350.1 Rev. 2.0	04/27/2017			04/28/2017	Julie Michelle Frank	1893288, 1893289, 1893290, 1893295
EPA 351.2 Rev. 2.0	04/27/2017	05/01/2017	Adrian Shelby	05/02/2017	Joseph Suarez	1893288, 1893289, 1893290, 1893295
EPA 353.2 Rev. 2.0	04/27/2017			05/02/2017	Beverly Y. Sanders	1893288, 1893289, 1893290, 1893295
EPA 365.1 Rev. 2.0	04/27/2017	05/01/2017	Vijayalakshmi Reddy	05/02/2017	Lipi Saha	1893288, 1893289, 1893290, 1893295
EPA 365.1 Rev. 2.0 dissolved	04/27/2017			04/27/2017 16:09	Anthony C. Onicha	1893291
	04/27/2017			04/27/2017 16:10	Anthony C. Onicha	1893292
	04/27/2017			04/27/2017 16:11	Anthony C. Onicha	1893293
	04/27/2017			04/27/2017 16:12	Anthony C. Onicha	1893296
SM 2120 B	04/27/2017			04/27/2017 15:17	Julia Storbeck	1893285
	04/27/2017			04/27/2017 15:18	Julia Storbeck	1893286
	04/27/2017			04/27/2017 15:19	Julia Storbeck	1893287, 1893294
SM 2320 B-97	04/27/2017			05/06/2017	Dale L. Simmons	1893285, 1893286, 1893287, 1893294
SM 2540 C-97	04/27/2017			05/01/2017	Sima Feizi	1893285, 1893286, 1893287, 1893294
SM 2540 D-97	04/27/2017			05/01/2017	Sima Feizi	1893285, 1893286, 1893287, 1893294
SM 4500 F-C-97	04/27/2017			05/19/2017	Dale L. Simmons	1893285
	04/27/2017			05/20/2017	Dale L. Simmons	1893286, 1893287, 1893294
SM 5310 B-00	04/27/2017			04/28/2017	Julie Michelle Frank	1893288, 1893289, 1893290, 1893295