Chemical Analysis Report

CEN-DIST-2017-01-25-01

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

Event Description: **Lk Beauclair**
Request ID: **RQ-2017-01-16-26**
Customer: **CEN-DIST**
Project ID: **SMP**

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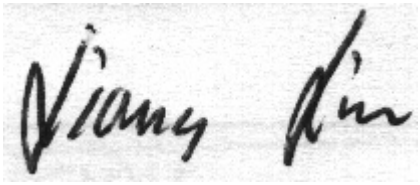
Certified by: Liang Lin, Environmental Administrator

Date Certified: 17-FEB-2017 11:33



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: LAKE BEAUCLAIR @ CENTER **Collection Date/Time: 01/24/2017 11:33**

Field ID: G1CE0047 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1866215	EPA 180.1 Rev. 2.0	Turbidity	14		NTU	P318723	
	EPA 300.0 Rev. 2.1	Chloride	42		mg Cl/L	P318934	
		Sulfate	45		mg SO4/L	P318933	
	SM 2120 B	Color (true)	17		PCU	P318733	
	SM 2320 B-97	Total Alkalinity	100		mg CaCO3/L	P318853	
	SM 2540 C-97	TDS	271	A	mg/L	P319149	
	SM 2540 D-97	TSS	10		mg/L	P319045	
	SM 4500 F-C-97	Fluoride	0.22		mg F/L	P318857	
1866218	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P318944	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.6		mg N/L	P318752	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P318881	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P318776	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P318781	
1866221	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P318727	
1866227	EPA 200.7 Rev. 4.4	Calcium	37.3		mg/L	P318799	
		Iron	57	I	ug/L	P318799	
		Magnesium	14.7		mg/L	P318799	
		Potassium	11.8		mg/L	P318799	
		Sodium	20.0		mg/L	P318799	
	EPA 200.8 Rev. 5.4	Arsenic	2.56		ug/L	P318799	
		Cadmium	0.020	U	ug/L	P318799	
		Chromium	0.40	U	ug/L	P318799	
		Copper	0.24	I	ug/L	P319621	
		Lead	0.20	I	ug/L	P318799	
		Nickel	0.20	U	ug/L	P318799	
		Silver	0.010	U	ug/L	P318799	
		Zinc	2.6	I	ug/L	P318799	

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: LAKE BEAUCLAIR @ NORTH END OF EAST LOBE **Collection Date/Time: 01/24/2017 11:55**

Field ID: G1CE0048 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1866216	EPA 180.1 Rev. 2.0	Turbidity	14		NTU	P318723	
	EPA 300.0 Rev. 2.1	Chloride	42		mg Cl/L	P318934	
		Sulfate	45		mg SO4/L	P318933	
	SM 2120 B	Color (true)	18		PCU	P318733	
	SM 2320 B-97	Total Alkalinity	99		mg CaCO3/L	P318853	
	SM 2540 C-97	TDS	246		mg/L	P319149	
	SM 2540 D-97	TSS	9	I	mg/L	P319045	
	SM 4500 F-C-97	Fluoride	0.23		mg F/L	P318857	
1866219	EPA 350.1 Rev. 2.0	Ammonia-N	0.087		mg N/L	P318944	

Field ID: G1CE0048 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1866219	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.6		mg N/L	P318752	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P318881	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P318776	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P318781	
1866222	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P318727	
1866228	EPA 200.7 Rev. 4.4	Calcium	36.2		mg/L	P318799	
		Iron	51	I	ug/L	P318799	
		Magnesium	14.2		mg/L	P318799	
		Potassium	11.5		mg/L	P318799	
		Sodium	19.7		mg/L	P318799	
	EPA 200.8 Rev. 5.4	Arsenic	2.55		ug/L	P318799	
		Cadmium	0.020	U	ug/L	P318799	
		Chromium	0.40	U	ug/L	P318799	
		Copper	0.20	U	ug/L	P318799	
		Lead	0.20		ug/L	P318799	
		Nickel	0.20	U	ug/L	P318799	
		Silver	0.010	U	ug/L	P318799	
		Zinc	1.7	I	ug/L	P318799	

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: LAKE BEAUCLAIR @ SOUTH END OF EAST LOBE **Collection Date/Time: 01/24/2017 12:17**

Field ID: G1CE0049 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1866217	EPA 180.1 Rev. 2.0	Turbidity	16		NTU	P318723	
	EPA 300.0 Rev. 2.1	Chloride	42		mg Cl/L	P318934	
		Sulfate	45		mg SO4/L	P318933	
	SM 2120 B	Color (true)	16		PCU	P318733	
	SM 2320 B-97	Total Alkalinity	99		mg CaCO3/L	P318853	
	SM 2540 C-97	TDS	274		mg/L	P319149	
	SM 2540 D-97	TSS	11		mg/L	P319045	
	SM 4500 F-C-97	Fluoride	0.23		mg F/L	P318857	
1866220	EPA 350.1 Rev. 2.0	Ammonia-N	0.10		mg N/L	P318944	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.6		mg N/L	P318752	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P318881	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P318776	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P318781	
1866223	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P318727	
1866229	EPA 200.7 Rev. 4.4	Calcium	37.2		mg/L	P318799	
		Iron	110	I	ug/L	P318799	
		Magnesium	15.1		mg/L	P318799	
		Potassium	11.8		mg/L	P318799	
		Sodium	20.2		mg/L	P318799	

Field ID: G1CE0049 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1866229	EPA 200.8 Rev. 5.4	Arsenic	2.73		ug/L	P318799	
		Cadmium	0.020	U	ug/L	P318799	
		Chromium	0.40	U	ug/L	P318799	
		Copper	0.59	I	ug/L	P319621	
		Lead	0.38		ug/L	P318799	
		Nickel	0.20	U	ug/L	P318799	
		Silver	0.010	U	ug/L	P318799	
		Zinc	2.5	I	ug/L	P318799	

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: P318723

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P318799

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318799

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.36	I	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P319621

Component	Result	Code	Units
Copper	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318933

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318934

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318944

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318752

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318881

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318776

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318727

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

Reference Method: SM 2120 B
Batch ID: P318733

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P318853

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

Reference Method: SM 2540 C-97
Batch ID: P319149

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P319045

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P318857

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P318781

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: P318799

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	102		P	85 - 115
Magnesium	99.0		P	85 - 115
Potassium	96.0		P	85 - 115
Sodium	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318799

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	105		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	102		P	85 - 115
Copper	90.9		P	85 - 115
Lead	101		P	85 - 115
Nickel	103		P	85 - 115
Silver	90.1		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P319621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	88.1		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318933

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318934

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318944

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318752

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318881

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318776

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	94.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318727

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

Reference Method: SM 2320 B-97
Batch ID: P318853

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

Reference Method: SM 4500 F-C-97
Batch ID: P318857

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

Reference Method: SM 5310 B-00
Batch ID: P318781

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P318799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866138	Calcium	95.4		P	80 - 120
1866138	Iron	100		P	80 - 120
1866138	Magnesium	96.9		P	80 - 120
1866138	Potassium	95.1		P	80 - 120
1866138	Sodium	98.2		P	80 - 120
1866192	Calcium	97.3		P	80 - 120
1866192	Iron	102	103	P/P	80 - 120
1866192	Magnesium	96.1		P	80 - 120
1866192	Potassium	98.3	96.5	P/P	80 - 120
1866192	Sodium	98.8	97.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866138	Arsenic	104		P	80 - 120
1866138	Cadmium	107		P	80 - 120
1866138	Chromium	104		P	80 - 120
1866138	Copper	88.6		P	80 - 120
1866138	Lead	102		P	80 - 120
1866138	Nickel	99.6		P	80 - 120
1866138	Silver	89.1		P	80 - 120
1866138	Zinc	103		P	80 - 120
1866192	Arsenic	104	103	P/P	80 - 120
1866192	Cadmium	106	104	P/P	80 - 120
1866192	Chromium	102	101	P/P	80 - 120
1866192	Copper	89.6	87.4	P/P	80 - 120
1866192	Lead	101	99.6	P/P	80 - 120
1866192	Nickel	98.1	97.9	P/P	80 - 120
1866192	Silver	89.0	87.6	P/P	80 - 120
1866192	Zinc	103	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P319621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866191	Copper	86.5	87.6	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318933

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866166	Sulfate	96.3		P	90 - 110
1866173	Sulfate	97.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318934

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866166	Chloride	102		P	90 - 110
1866173	Chloride	101		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318944

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866218	Ammonia-N	97.2	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866251	Kjeldahl Nitrogen	105	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866169	NO2NO3-N	94.5	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866234	Total-P	97.7	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318727

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866178	O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P318857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866165	Fluoride	97.1	97.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P318781

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1866114	Organic Carbon	92.6	90.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P318723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866174	Turbidity	1.04	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P318799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866192	Calcium	1.35	Spike	P	0 - 20
1866192	Iron	0.568	Spike	P	0 - 20
1866192	Magnesium	0.373	Spike	P	0 - 20
1866192	Potassium	1.43	Spike	P	0 - 20
1866192	Sodium	0.586	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866192	Arsenic	0.341	Spike	P	0 - 20
1866192	Cadmium	2.13	Spike	P	0 - 20
1866192	Chromium	0.560	Spike	P	0 - 20
1866192	Copper	2.44	Spike	P	0 - 20
1866192	Lead	1.16	Spike	P	0 - 20
1866192	Nickel	0.229	Spike	P	0 - 20
1866192	Silver	1.54	Spike	P	0 - 20
1866192	Zinc	0.544	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P319621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866191	Copper	1.19	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866173	Sulfate	0.569	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P318934

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866173	Chloride	0.523	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318944

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866218	Ammonia-N	1.77	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866251	Kjeldahl Nitrogen	4.00	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866169	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866234	Total-P	0.422	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318727

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866178	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P318733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866261	Color (true)	1.48	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P318853

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866165	Total Alkalinity	0.491	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P319149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866215	TDS	4.43	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P318857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866165	Fluoride	0.492	Spike	P	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P318781

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1866114	Organic Carbon	1.48	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 300.0 Rev. 2.1
Run ID: A74088
Included Lab Sample IDs: 1866215, 1866216, 1866217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Sulfate	96.1	99.4	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A74103
Included Lab Sample IDs: 1866215, 1866216, 1866217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A74104
Included Lab Sample IDs: 1866221, 1866222, 1866223

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

Reference Method: SM 2120 B
Run ID: A74106
Included Lab Sample IDs: 1866215, 1866216, 1866217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	85 - 115

Reference Method: SM 5310 B-00
Run ID: A74125
Included Lab Sample IDs: 1866218, 1866219, 1866220

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.1	96.6	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A74143
Included Lab Sample IDs: 1866215, 1866216, 1866217

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A74143
Included Lab Sample IDs: 1866215, 1866216, 1866217

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

Reference Method: SM 4500 F-C-97
Run ID: A74143
Included Lab Sample IDs: 1866215, 1866216, 1866217

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A74144
Included Lab Sample IDs: 1866218, 1866219, 1866220

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A74147
Included Lab Sample IDs: 1866218, 1866219, 1866220

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.5	95.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A74157
Included Lab Sample IDs: 1866218, 1866219, 1866220

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.0	P/P	90 - 110
Kjeldahl Nitrogen	97.0	95.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A74164
Included Lab Sample IDs: 1866218, 1866219, 1866220

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A74175
Included Lab Sample IDs: 1866227, 1866228, 1866229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.3	96.6	P/P	90 - 110
Iron	98.9	97.4	P/P	90 - 110
Magnesium	98.1	97.0	P/P	90 - 110
Potassium	96.6	95.7	P/P	90 - 110
Sodium	97.2	97.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A74276
Included Lab Sample IDs: 1866227, 1866228, 1866229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.2	97.9	P/P	90 - 110
Cadmium	99.5	100	P/P	90 - 110
Chromium	98.6	99.5	P/P	90 - 110
Lead	97.0	97.2	P/P	90 - 110
Nickel	97.4	96.6	P/P	90 - 110
Zinc	100	98.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A74331
Included Lab Sample IDs: 1866227, 1866228, 1866229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	98.5	97.3	P/P	90 - 110
Silver	106	106	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A74443
Included Lab Sample IDs: 1866227, 1866229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	101	96.8	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						1.04	
EPA 200.7 Rev. 4.4	Calcium	101	95.4	97.3				1.35
	Iron	102	100	102	103			0.568
	Magnesium	99.0	96.9	96.1				0.373
	Potassium	96.0	95.1	98.3	96.5			1.43
	Sodium	100	98.2	98.8	97.8			0.586
EPA 200.8 Rev. 5.4	Arsenic	105	104	104	103			0.341
	Cadmium	102	107	106	104			2.13
	Chromium	102	104	102	101			0.560
	Copper	90.9	88.6	89.6	87.4			2.44
	Copper	88.1	86.5	87.6				1.19
	Lead	101	102	101	99.6			1.16
	Nickel	103	99.6	98.1	97.9			0.229
	Silver	90.1	89.1	89.0	87.6			1.54
	Zinc	104	103	103	103			0.544
EPA 300.0 Rev. 2.1	Chloride	103	101	102			0.523	
	Sulfate	98.5	97.1	96.3			0.569	
EPA 350.1 Rev. 2.0	Ammonia-N	103	97.2	100				1.77
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	105	101				4.00

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	94.5	94.5			0.0
EPA 365.1 Rev. 2.0	Total-P	94.3	97.7	97.0			0.422
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	101	101			0.0
SM 2120 B	Color (true)					1.48	
SM 2320 B-97	Total Alkalinity	104				0.491	
SM 2540 C-97	TDS					4.43	
SM 4500 F-C-97	Fluoride	97.8	97.1	97.6			0.492
SM 5310 B-00	Organic Carbon	96.8	92.6	90.8			1.48

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1866215, 1866216, 1866217
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1866227, 1866228, 1866229
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1866227, 1866228, 1866229
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1866215, 1866216, 1866217
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1866215, 1866216, 1866217
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1866218, 1866219, 1866220
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1866218, 1866219, 1866220
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1866218, 1866219, 1866220
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1866218, 1866219, 1866220
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1866221, 1866222, 1866223
SM 2120 B / E31780	True Color measured at 450 nm	1866215, 1866216, 1866217
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1866215, 1866216, 1866217
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1866215, 1866216, 1866217
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1866215, 1866216, 1866217
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1866215, 1866216, 1866217
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1866218, 1866219, 1866220

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	01/25/2017			01/25/2017 15:28	Sima Feizi	1866215, 1866216, 1866217
EPA 200.7 Rev. 4.4	01/25/2017	01/26/2017	Elliott D. Healy	01/30/2017	Joshua Ayres	1866227, 1866228, 1866229
EPA 200.8 Rev. 5.4	01/25/2017	01/26/2017	Elliott D. Healy	02/04/2017	Betina Topolski	1866227, 1866228, 1866229
	01/25/2017	01/26/2017	Elliott D. Healy	02/07/2017	Betina Topolski	1866227, 1866228, 1866229
	01/25/2017	02/09/2017	Elliott D. Healy	02/13/2017	Betina Topolski	1866227, 1866229
EPA 300.0 Rev. 2.1	01/25/2017			01/27/2017	Ping Hua	1866215, 1866216, 1866217
EPA 350.1 Rev. 2.0	01/25/2017			01/27/2017	Sofia Elnemr	1866218, 1866219, 1866220
EPA 351.2 Rev. 2.0	01/25/2017	01/26/2017	Adrian Shelby	01/27/2017	Joseph Suarez	1866218, 1866219, 1866220
EPA 353.2 Rev. 2.0	01/25/2017			01/27/2017	Beverly Y. Sanders	1866218, 1866219, 1866220
EPA 365.1 Rev. 2.0	01/25/2017	01/26/2017	Vijayalakshmi Reddy	01/27/2017	Lipi Saha	1866218, 1866219, 1866220
EPA 365.1 Rev. 2.0 dissolved	01/25/2017			01/25/2017 16:13	Julia Storbeck	1866221
	01/25/2017			01/25/2017 16:21	Julia Storbeck	1866223
	01/25/2017			01/25/2017 16:24	Julia Storbeck	1866222
SM 2120 B	01/25/2017			01/25/2017 16:43	Jared I. Manley	1866215
	01/25/2017			01/25/2017 16:44	Jared I. Manley	1866216
	01/25/2017			01/25/2017 16:45	Jared I. Manley	1866217
SM 2320 B-97	01/25/2017			01/27/2017	Dale L. Simmons	1866215, 1866216, 1866217
SM 2540 C-97	01/25/2017			01/27/2017	Blanca Fach	1866215, 1866216, 1866217
SM 2540 D-97	01/25/2017			01/27/2017	Blanca Fach	1866215, 1866216, 1866217
SM 4500 F-C-97	01/25/2017			01/27/2017	Dale L. Simmons	1866215, 1866216, 1866217
SM 5310 B-00	01/25/2017			01/26/2017	Julie Michelle Frank	1866218, 1866219, 1866220