

Chemical Analysis Report

WQAP-2016-07-13-03

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

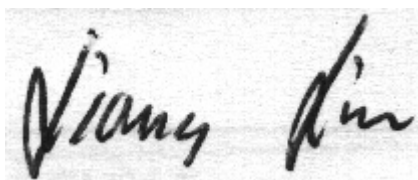
Event Description: **Lower Dianne Lake, Upper Dianne Lake, Lake Tom John,
Pine Hill Lake, Lake Monkey**
Request ID: **RQ-2016-07-11-27**
Customer: **WQAP**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
MS #3560
Tallahassee, FL 32399-2400
Attn: Katrina Sanders

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 05-AUG-2016 14:27

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Tom John Niddle

Collection Date/Time: 07/13/2016 08:35

Field ID: G1WA0043

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815824	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P307973	
	EPA 300.0 Rev. 2.1	Chloride	8.7		mg Cl/L	P308925	
	SM 2120 B	Color (true)	15		PCU	P307963	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P308419	
	SM 2540 C-97	TDS	32		mg/L	P308629	
	SM 2540 D-97	TSS	4	I	mg/L	P308595	
	SM 4500 F-C-97	Fluoride	0.053	I	mg F/L	P308423	
1815828	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P308345	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.74		mg N/L	P308112	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P308289	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P308066	
	SM 5310 B-00	Organic Carbon	6.3		mg C/L	P308413	
1815832	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307957	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Upper Dianne Lake Middle

Collection Date/Time: 07/13/2016 11:50

Field ID: G1WA0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815825	EPA 180.1 Rev. 2.0	Turbidity	1.0		NTU	P307973	
	EPA 300.0 Rev. 2.1	Chloride	7.8		mg Cl/L	P308925	
	SM 2120 B	Color (true)	7.1		PCU	P307963	
	SM 2320 B-97	Total Alkalinity	12		mg CaCO3/L	P308419	
	SM 2540 C-97	TDS	24	I	mg/L	P308629	
	SM 2540 D-97	TSS	3	I	mg/L	P308595	
	SM 4500 F-C-97	Fluoride	0.073	I	mg F/L	P308423	
1815829	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P308345	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P308112	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P308289	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P308066	
	SM 5310 B-00	Organic Carbon	3.6		mg C/L	P308413	
1815833	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307957	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Lower Dianne Lake Middle

Collection Date/Time: 07/13/2016 10:10

Field ID: G1WA0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815826	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P307973	

Field ID: G1WA0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815826	EPA 300.0 Rev. 2.1	Chloride	8.1		mg Cl/L	P308926	
	SM 2120 B	Color (true)	8.8	A	PCU	P307963	
	SM 2320 B-97	Total Alkalinity	21		mg CaCO3/L	P308419	
	SM 2540 C-97	TDS	41		mg/L	P308629	
	SM 2540 D-97	TSS	4	I	mg/L	P308595	
	SM 4500 F-C-97	Fluoride	0.065	I	mg F/L	P308423	
1815830	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P308345	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P308112	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P308289	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P308066	
	SM 5310 B-00	Organic Carbon	5.6		mg C/L	P308413	
1815834	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307957	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Pine Hill Lake Middle

Collection Date/Time: 07/13/2016 10:55

Field ID: G1WA0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815827	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P307973	
	EPA 300.0 Rev. 2.1	Chloride	6.4		mg Cl/L	P308926	
	SM 2120 B	Color (true)	10		PCU	P307963	
	SM 2320 B-97	Total Alkalinity	11		mg CaCO3/L	P308419	
	SM 2540 C-97	TDS	34		mg/L	P308630	
	SM 2540 D-97	TSS	3	I	mg/L	P308596	
1815831	SM 4500 F-C-97	Fluoride	0.049	I	mg F/L	P308423	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P308345	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P308113	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P308289	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P308066	
1815835	SM 5310 B-00	Organic Carbon	5.7		mg C/L	P308413	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307957	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Ochlockonee River upstream of SR 12

Collection Date/Time: 07/13/2016 14:05

Field ID: G1WA0038

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815818	EPA 180.1 Rev. 2.0	Turbidity	12	A	NTU	P307973	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P308925	
	SM 2120 B	Color (true)	120		PCU	P307963	

Field ID: G1WA0038

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815818	SM 2320 B-97	Total Alkalinity	29		mg CaCO3/L	P308419	
	SM 2540 C-97	TDS	79		mg/L	P308629	
	SM 2540 D-97	TSS	10	I	mg/L	P308595	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P308423	
1815820	EPA 350.1 Rev. 2.0	Ammonia-N	0.041		mg N/L	P308345	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P308112	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.48		mg N/L	P308288	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P308066	
	SM 5310 B-00	Organic Carbon	8.7		mg C/L	P308413	
1815822	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P307957	
1815842	EPA 200.7 Rev. 4.4	Calcium	8.98		mg/L	P308038	
		Iron	1.82E+03		ug/L	P308038	
		Magnesium	4.21		mg/L	P308038	
		Potassium	2.9		mg/L	P308038	
		Sodium	7.6		mg/L	P308038	
		Zinc	5.0	U	ug/L	P308038	
	EPA 200.8 Rev. 5.4	Arsenic	1.53		ug/L	P308038	
		Cadmium	0.020	U	ug/L	P308038	
		Chromium	0.79		ug/L	P308038	
		Copper	0.79		ug/L	P308038	
		Lead	0.67		ug/L	P308038	
		Nickel	0.46		ug/L	P308038	
		Silver	0.0050	U	ug/L	P308038	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Ochlockonee River 300M upstream of SR 12 Collection Date/Time: 07/13/2016 13:45

Field ID: G1WA0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815819	EPA 180.1 Rev. 2.0	Turbidity	13		NTU	P307973	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P308925	
	SM 2120 B	Color (true)	120		PCU	P307963	
	SM 2320 B-97	Total Alkalinity	29		mg CaCO3/L	P308419	
	SM 2540 C-97	TDS	80		mg/L	P308629	
	SM 2540 D-97	TSS	10		mg/L	P308595	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P308423	
1815821	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P308345	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P308112	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.48		mg N/L	P308288	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P308066	
	SM 5310 B-00	Organic Carbon	8.6		mg C/L	P308413	
1815823	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P307957	

Field ID: G1WA0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1815843	EPA 200.7 Rev. 4.4	Calcium	8.90		mg/L	P308038	
		Iron	1.90E+03		ug/L	P308038	
		Magnesium	4.34		mg/L	P308038	
		Potassium	3.0		mg/L	P308038	
		Sodium	7.6		mg/L	P308038	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P308038	
		Arsenic	1.61		ug/L	P308038	
		Cadmium	0.020	U	ug/L	P308038	
		Chromium	0.93		ug/L	P308038	
		Copper	0.89		ug/L	P308038	
		Lead	0.73		ug/L	P308038	
		Nickel	0.44		ug/L	P308038	
		Silver	0.0050	U	ug/L	P308038	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P307973

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P308038

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: P308038

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: P308925

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308926

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308345

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308112

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308113

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P308288

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P308289

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P308066

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307957

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
Batch ID: P307963

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P308419

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P308629

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P308630

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P308595

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P308596

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P308423

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P308413

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: P308038

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308038

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	102		P	85 - 115
Sodium	104		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308038

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Cadmium	98.5		P	85 - 115
Chromium	97.8		P	85 - 115
Copper	99.5		P	85 - 115
Lead	96.4		P	85 - 115
Nickel	99.8		P	85 - 115
Silver	99.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308925

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308926

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308345

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308112

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308113

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P308288

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P308289

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: P308066

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P307957

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.7		P	90 - 110

Reference Method: SM 2320 B-97
 Batch ID: P308419

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	95 - 108

Reference Method: SM 4500 F-C-97
 Batch ID: P308423

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P308413

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P308038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815457	Calcium	104	103	P/P	80 - 120
1815457	Iron	107	105	P/P	80 - 120
1815457	Magnesium	108	105	P/P	80 - 120
1815457	Potassium	99.7	101	P/P	80 - 120
1815457	Sodium	99.0	98.8	P/P	80 - 120
1815457	Zinc	102	101	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P308038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815457	Arsenic	99.0	101	P/P	80 - 120
1815457	Cadmium	99.5	101	P/P	80 - 120
1815457	Chromium	97.5	98.7	P/P	80 - 120
1815457	Copper	99.2	99.7	P/P	80 - 120
1815457	Lead	94.9	96.6	P/P	80 - 120
1815457	Nickel	98.7	100	P/P	80 - 120
1815457	Silver	97.8	98.7	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P308925

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815569	Chloride	100		P	90 - 110
1815756	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P308926

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815826	Chloride	98.9		P	90 - 110
1820254	Chloride	98.8	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P308113

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815863	Kjeldahl Nitrogen	114	107	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P308288

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815747	NO2NO3-N	102	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P308289

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815828	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P308066

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815830	Total-P	99.8	97.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Batch ID: P308423

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815741	Fluoride	97.1	99.7	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P308413

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815746	Organic Carbon	94.9	94.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P307973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815818	Turbidity	5.00	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815457	Calcium	0.591	Spike	P	0 - 20
1815457	Iron	1.87	Spike	P	0 - 20
1815457	Magnesium	2.37	Spike	P	0 - 20
1815457	Potassium	0.734	Spike	P	0 - 20
1815457	Sodium	0.125	Spike	P	0 - 20
1815457	Zinc	0.702	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815457	Arsenic	1.81	Spike	P	0 - 20
1815457	Cadmium	1.09	Spike	P	0 - 20
1815457	Chromium	1.21	Spike	P	0 - 20
1815457	Copper	0.503	Spike	P	0 - 20
1815457	Lead	1.75	Spike	P	0 - 20
1815457	Nickel	1.58	Spike	P	0 - 20
1815457	Silver	0.917	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308925

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815569	Chloride	0.0930	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820254	Chloride	0.140	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815803	Ammonia-N	0.0810	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308112

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815750	Kjeldahl Nitrogen	0.801	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P308113

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815863	Kjeldahl Nitrogen	4.99	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P308288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815747	NO2NO3-N	2.99	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P308289

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815828	NO2NO3-N	0.995	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P308066

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815830	Total-P	2.72	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307957

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815822	O-Phosphate-P	0.907	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815826	Color (true)	3.21	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P308419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815741	Total Alkalinity	0.584	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P308629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815745	TDS	1.54	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P308630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815850	TDS	3.95	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P308423

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815741	Fluoride	1.92	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P308413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815746	Organic Carbon	0.314	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A70559
Included Lab Sample IDs: 1815822, 1815823, 1815832, 1815833, 1815834, 1815835

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.8	P/P	90 - 110
O-Phosphate-P	98.7	101	P/P	90 - 110
O-Phosphate-P	99.4	101	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A70560
Included Lab Sample IDs: 1815818, 1815819, 1815824, 1815825, 1815826, 1815827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A70560

Included Lab Sample IDs: 1815818, 1815819, 1815824, 1815825, 1815826, 1815827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	95.8	95.5	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A70563

Included Lab Sample IDs: 1815818, 1815819, 1815824, 1815825, 1815826, 1815827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	100	P/P	95 - 105

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A70612

Included Lab Sample IDs: 1815842, 1815843

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	101	100	P/P	90 - 110
Zinc	97.5	98.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A70615

Included Lab Sample IDs: 1815842, 1815843

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	98.7	P/P	90 - 110
Cadmium	98.7	99.5	P/P	90 - 110
Chromium	98.8	97.8	P/P	90 - 110
Copper	100	98.1	P/P	90 - 110
Lead	95.2	94.7	P/P	90 - 110
Nickel	100	98.6	P/P	90 - 110
Silver	98.8	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A70647

Included Lab Sample IDs: 1815820, 1815821

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.9	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A70648

Included Lab Sample IDs: 1815828, 1815829, 1815830, 1815831

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A70649

Included Lab Sample IDs: 1815820, 1815821, 1815828, 1815829, 1815830, 1815831

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	101	P/P	90 - 110
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A70675

Included Lab Sample IDs: 1815820, 1815821, 1815828, 1815829, 1815830, 1815831

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	102	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A70693

Included Lab Sample IDs: 1815820, 1815821, 1815828, 1815829, 1815830, 1815831

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.4	98.6	P/P	90 - 110
Organic Carbon	98.6	98.3	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A70694

Included Lab Sample IDs: 1815818, 1815819, 1815824, 1815825, 1815826, 1815827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	104	P/P	90 - 110
Total Alkalinity	104	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A70694

Included Lab Sample IDs: 1815818, 1815819, 1815824, 1815825, 1815826, 1815827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	98.6	P/P	90 - 110
Fluoride	99.5	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A70729

Included Lab Sample IDs: 1815820, 1815821, 1815828, 1815829, 1815830, 1815831

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	99.9	P/P	90 - 110
Kjeldahl Nitrogen	99.9	106	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A70802

Included Lab Sample IDs: 1815818, 1815819, 1815824, 1815825, 1815826, 1815827

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

Quality Assurance Report Calibration Verification

* 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		LCS	Precision	
						SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					5.00	
EPA 200.7 Rev. 4.4	Calcium	106	104	103			0.591
	Iron	105	107	105			1.87
	Magnesium	107	108	105			2.37
	Potassium	102	99.7	101			0.734
	Sodium	104	99.0	98.8			0.125
	Zinc	101	102	101			0.702
EPA 200.8 Rev. 5.4	Arsenic	101	99.0	101			1.81
	Cadmium	98.5	99.5	101			1.09
	Chromium	97.8	97.5	98.7			1.21
	Copper	99.5	99.2	99.7			0.503
	Lead	96.4	94.9	96.6			1.75
	Nickel	99.8	98.7	100			1.58
	Silver	99.0	97.8	98.7			0.917
EPA 300.0 Rev. 2.1	Chloride	102	100	100		0.0930	
	Chloride	99.3	98.8	99.0	98.9		0.140
EPA 350.1 Rev. 2.0	Ammonia-N	98.7					0.0810
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110					0.801
	Kjeldahl Nitrogen	105	114	107			4.99
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	99.0	102			2.99
	NO ₂ NO ₃ -N	104	101	100			0.995
EPA 365.1 Rev. 2.0	Total-P	97.2	99.8	97.0			2.72
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7					0.907
SM 2120 B	Color (true)					3.21	
SM 2320 B-97	Total Alkalinity	105				0.584	
SM 2540 C-97	TDS					1.54	
	TDS					3.95	
SM 4500 F-C-97	Fluoride	99.3	97.1	99.7			1.92
SM 5310 B-00	Organic Carbon	96.2	94.9	94.4			0.314

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1815842, 1815843
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1815842, 1815843
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1815820, 1815821, 1815828, 1815829, 1815830, 1815831
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1815820, 1815821, 1815828, 1815829, 1815830, 1815831
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1815820, 1815821, 1815828, 1815829, 1815830, 1815831

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1815820, 1815821, 1815828, 1815829, 1815830, 1815831
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1815822, 1815823, 1815832, 1815833, 1815834, 1815835
SM 2120 B / E31780	True Color measured at 450 nm	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1815820, 1815821, 1815828, 1815829, 1815830, 1815831

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	07/13/2016			07/14/2016 14:48	Blanca Fach	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
EPA 200.7 Rev. 4.4	07/13/2016	07/15/2016	Elliott D. Healy	07/18/2016	Joshua Ayres	1815842, 1815843
EPA 200.8 Rev. 5.4	07/13/2016	07/15/2016	Elliott D. Healy	07/18/2016	Charles J. Peterson	1815842, 1815843
EPA 300.0 Rev. 2.1	07/13/2016			07/29/2016	Ping Hua	1815818, 1815819, 1815824, 1815825
	07/13/2016			07/30/2016	Ping Hua	1815826, 1815827
EPA 350.1 Rev. 2.0	07/13/2016			07/20/2016	Diana M. Turner	1815820, 1815821, 1815828, 1815829, 1815830, 1815831
EPA 351.2 Rev. 2.0	07/13/2016	07/18/2016	Sofia Elnemr	07/22/2016	Christopher Armour	1815820, 1815821, 1815828, 1815829, 1815830, 1815831
EPA 353.2 Rev. 2.0	07/13/2016			07/20/2016	Beverly Y. Sanders	1815820, 1815821, 1815828, 1815829, 1815830, 1815831
EPA 365.1 Rev. 2.0	07/13/2016	07/18/2016	Vijayalakshmi Reddy	07/19/2016	Lipi Saha	1815820, 1815821
	07/13/2016	07/18/2016	Vijayalakshmi Reddy	07/20/2016	Lipi Saha	1815828, 1815829, 1815830, 1815831
EPA 365.1 Rev. 2.0 dissolved	07/13/2016			07/14/2016 13:56	Julia Storbeck	1815822
	07/13/2016			07/14/2016 14:37	Julia Storbeck	1815823
	07/13/2016			07/14/2016 14:38	Julia Storbeck	1815832
	07/13/2016			07/14/2016 14:39	Julia Storbeck	1815833
	07/13/2016			07/14/2016 14:40	Julia Storbeck	1815834
	07/13/2016			07/14/2016 14:45	Julia Storbeck	1815835
SM 2120 B	07/13/2016			07/14/2016 13:54	Rochelle Y Jackson	1815818
	07/13/2016			07/14/2016 13:55	Rochelle Y Jackson	1815819
	07/13/2016			07/14/2016 13:56	Rochelle Y Jackson	1815824, 1815825
	07/13/2016			07/14/2016 13:58	Rochelle Y Jackson	1815826
	07/13/2016			07/14/2016 13:59	Rochelle Y Jackson	1815827
SM 2320 B-97	07/13/2016			07/20/2016	Dale L. Simmons	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 2540 C-97	07/13/2016			07/18/2016	Yijie Li	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 2540 D-97	07/13/2016			07/18/2016	Yijie Li	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 4500 F-C-97	07/13/2016			07/20/2016	Dale L. Simmons	1815818, 1815819, 1815824, 1815825, 1815826, 1815827
SM 5310 B-00	07/13/2016			07/21/2016	Sofia Elnemr	1815820, 1815821, 1815828, 1815829, 1815830, 1815831