

Chemical Analysis Report

CEN-DIST-2017-03-09-01

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-2017-03-06-41**
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
Attn: Mike Linger

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 05-APR-2017 14:49



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 @ CENTER OF NORTH LOBE

Collection Date/Time: 03/08/2017 11:05

Field ID: G4CE0139

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878887	EPA 180.1 Rev. 2.0	Turbidity	6.4	A	NTU	P321298	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P321809	
		Sulfate	8.6		mg SO4/L	P321813	
	SM 2120 B	Color (true)	19		PCU	P321286	
	SM 2320 B-97	Total Alkalinity	2.0	I	mg CaCO3/L	P321529	
	SM 2540 C-97	TDS	47		mg/L	P322086	
	SM 2540 D-97	TSS	7	I	mg/L	P321875	
	SM 4500 F-C-97	Fluoride	0.060	I	mg F/L	P321533	
1878890	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P321552	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P321576	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.059		mg N/L	P321593	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P321460	
	SM 5310 B-00	Organic Carbon	6.1		mg C/L	P321336	
1878893	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P321272	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

**Sample Location: LADY LAKE @ CENTER OF NORTH LOBE
(DUPLICATE)**

Collection Date/Time: 03/08/2017 11:10

Field ID: G4CE0139_D

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878888	EPA 180.1 Rev. 2.0	Turbidity	6.3		NTU	P321298	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P321809	
		Sulfate	8.6		mg SO4/L	P321813	
	SM 2120 B	Color (true)	17		PCU	P321286	
	SM 2320 B-97	Total Alkalinity	2.0	I	mg CaCO3/L	P321529	
	SM 2540 C-97	TDS	48		mg/L	P322086	
	SM 2540 D-97	TSS	6	I	mg/L	P321875	
	SM 4500 F-C-97	Fluoride	0.060	I	mg F/L	P321533	
1878891	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P321552	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P321576	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.061		mg N/L	P321593	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P321460	
	SM 5310 B-00	Organic Carbon	6.2		mg C/L	P321336	
1878894	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P321272	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: BLUE SPRINGS (LAKE CO.) @ WEIR

Collection Date/Time: 03/08/2017 12:55

Field ID: G1CE0024

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878889	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P321298	

Field ID: G1CE0024

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878889	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P321809	
		Sulfate	10		mg SO4/L	P321813	
	SM 2120 B	Color (true)	2.5	U	PCU	P321286	
	SM 2320 B-97	Total Alkalinity	105		mg CaCO3/L	P321529	
	SM 2540 C-97	TDS	152	A	mg/L	P322086	
	SM 2540 D-97	TSS	2	I	mg/L	P321875	
	SM 4500 F-C-97	Fluoride	0.088	I	mg F/L	P321533	
1878892	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P321552	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P321576	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.9		mg N/L	P321593	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P321460	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P321336	
1878895	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.031		mg P/L	P321272	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: FIELD BLANK

Collection Date/Time: 03/08/2017 11:25

Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878884	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P321298	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P321809	
		Sulfate	0.20	U	mg SO4/L	P321813	
	SM 2120 B	Color (true)	2.5	U	PCU	P321286	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P321528	
	SM 2540 C-97	TDS	15	U	mg/L	P321947	
	SM 2540 D-97	TSS	2	U	mg/L	P321861	
1878885	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P321532	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P321644	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P321576	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P321593	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P321460	
1878886	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P321336	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P321272	
1878900	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P321541	
		Iron	30	U	ug/L	P321541	
		Magnesium	0.040	U	mg/L	P321541	
		Potassium	0.30	U	mg/L	P321541	
		Sodium	0.50	U	mg/L	P321541	
		Zinc	5.0	U	ug/L	P321541	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P321541	
		Cadmium	0.020	U	ug/L	P321541	
		Chromium	0.40	U	ug/L	P321541	
		Copper	0.20	U	ug/L	P321541	

Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878900	EPA 200.8 Rev. 5.4	Lead	0.050	U	ug/L	P321541	
		Nickel	0.20	U	ug/L	P321541	
		Silver	0.010	U	ug/L	P321541	

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: P321298

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P321541

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: P321541

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: P321809

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P321813

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P321552

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321644

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321576

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321593

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321460

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321272

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

Reference Method: SM 2120 B
Batch ID: P321286

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P321528

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

Reference Method: SM 2320 B-97
Batch ID: P321529

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

Reference Method: SM 2540 C-97
Batch ID: P321947

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
 Batch ID: P322086

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P321861

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P321875

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P321532

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
 Batch ID: P321533

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P321336

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: P321541

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	103		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	98.3		P	85 - 115
Sodium	102		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P321541

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321541

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	97.3		P	85 - 115
Chromium	99.0		P	85 - 115
Copper	95.1		P	85 - 115
Lead	88.3		P	85 - 115
Nickel	97.7		P	85 - 115
Silver	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321809

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321813

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321552

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321644

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321576

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321593

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.3		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P321272

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

Reference Method: SM 2320 B-97
 Batch ID: P321528

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

Reference Method: SM 2320 B-97
 Batch ID: P321529

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

Reference Method: SM 4500 F-C-97
 Batch ID: P321532

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Reference Method: SM 4500 F-C-97
 Batch ID: P321533

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P321336

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P321541

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878908	Calcium	98.5		P	80 - 120
1878908	Iron	104		P	80 - 120
1878908	Magnesium	104		P	80 - 120
1878908	Potassium	98.6		P	80 - 120
1878908	Sodium	98.1		P	80 - 120
1878908	Zinc	98.1		P	80 - 120
1878944	Calcium	103		P	80 - 120
1878944	Iron	106	107	P/P	80 - 120
1878944	Magnesium	105	107	P/P	80 - 120
1878944	Potassium	98.0	99.4	P/P	80 - 120
1878944	Sodium	102		P	80 - 120
1878944	Zinc	104	105	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321541

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878908	Arsenic	97.9		P	80 - 120
1878908	Cadmium	98.3		P	80 - 120
1878908	Chromium	95.9		P	80 - 120
1878908	Copper	91.5		P	80 - 120
1878908	Lead	86.9		P	80 - 120
1878908	Nickel	94.1		P	80 - 120
1878908	Silver	105		P	80 - 120
1878944	Arsenic	98.7	98.1	P/P	80 - 120
1878944	Cadmium	99.9	97.4	P/P	80 - 120
1878944	Chromium	102	102	P/P	80 - 120
1878944	Copper	98.7	97.8	P/P	80 - 120
1878944	Lead	89.3	89.6	P/P	80 - 120
1878944	Nickel	99.5	99.4	P/P	80 - 120
1878944	Silver	104	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321809

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878916	Chloride	99.3		P	90 - 110
1879028	Chloride	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878916	Sulfate	93.4		P	90 - 110
1879028	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321552

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878892	Ammonia-N	101	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1879747	Ammonia-N	98.1	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321576

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878891	Kjeldahl Nitrogen	98.1	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321593

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878890	NO2NO3-N	105	105	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878868	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321272

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878872	O-Phosphate-P	101	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P321532

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878632	Fluoride	101	100	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P321336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1879029	Organic Carbon	99.8	97.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P321298

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878887	Turbidity	0.627	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P321541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878944	Calcium	0.987	Spike	P	0 - 20
1878944	Iron	0.801	Spike	P	0 - 20
1878944	Magnesium	1.39	Spike	P	0 - 20
1878944	Potassium	0.758	Spike	P	0 - 20
1878944	Sodium	1.80	Spike	P	0 - 20
1878944	Zinc	1.27	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878944	Arsenic	0.537	Spike	P	0 - 20
1878944	Cadmium	2.54	Spike	P	0 - 20
1878944	Chromium	0.432	Spike	P	0 - 20
1878944	Copper	0.895	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878944	Lead	0.289	Spike	P	0 - 20
1878944	Nickel	0.0966	Spike	P	0 - 20
1878944	Silver	1.79	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878916	Chloride	0.548	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878916	Sulfate	0.358	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321552

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878892	Ammonia-N	1.37	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1879747	Ammonia-N	0.750	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878891	Kjeldahl Nitrogen	3.57	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321593

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878890	NO2NO3-N	0.372	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P321460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878868	Total-P	0.0192	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P321272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878872	O-Phosphate-P	0.866	Spike	P	0 - 20

Reference Method: SM 2120 B

Batch ID: P321286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878866	Color (true)	0.849	Sample	P	0 - 20

Reference Method: SM 2320 B-97

Batch ID: P321528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878632	Total Alkalinity	0.216	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97

Batch ID: P321529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1879042	Total Alkalinity	0.306	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97

Batch ID: P321947

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878866	TDS	2.00	Sample	P	0 - 10

Reference Method: SM 2540 C-97

Batch ID: P322086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878889	TDS	1.97	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97

Batch ID: P321532

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878632	Fluoride	0.480	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P321533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1879042	Fluoride	0.513	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P321336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1879029	Organic Carbon	2.02	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: A74989
Included Lab Sample IDs: 1878886, 1878893, 1878894, 1878895

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

Reference Method: SM 2120 B
Run ID: A74998
Included Lab Sample IDs: 1878884, 1878887, 1878888, 1878889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.0	97.6	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A75000
Included Lab Sample IDs: 1878884, 1878887, 1878888, 1878889

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

Reference Method: SM 5310 B-00
Run ID: A75011
Included Lab Sample IDs: 1878885, 1878890, 1878891, 1878892

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.4	98.2	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A75091
Included Lab Sample IDs: 1878884, 1878887, 1878888, 1878889

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

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A75091

Included Lab Sample IDs: 1878884, 1878887, 1878888, 1878889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	100	P/P	90 - 110
Fluoride	98.5	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A75099

Included Lab Sample IDs: 1878890, 1878891, 1878892

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A75112

Included Lab Sample IDs: 1878885, 1878890, 1878891, 1878892

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: A75137

Included Lab Sample IDs: 1878885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75146

Included Lab Sample IDs: 1878885, 1878890, 1878891, 1878892

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.5	P/P	90 - 110
Total-P	99.5	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75168

Included Lab Sample IDs: 1878885, 1878890, 1878891, 1878892

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	108	P/P	90 - 110
Kjeldahl Nitrogen	107	103	P/P	90 - 110
Kjeldahl Nitrogen	108	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75188

Included Lab Sample IDs: 1878900

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	103	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Chromium	105	105	P/P	90 - 110
Copper	104	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75188

Included Lab Sample IDs: 1878900

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	92.1	92.0	P/P	90 - 110
Nickel	104	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75193

Included Lab Sample IDs: 1878884, 1878887, 1878888, 1878889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	107	109	P/P	90 - 110
Sulfate	105	108	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A75224

Included Lab Sample IDs: 1878900

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	100	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	101	100	P/P	90 - 110
Zinc	99.5	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75247

Included Lab Sample IDs: 1878900

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

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				0.627	
EPA 200.7 Rev. 4.4	Calcium	102	98.5	103		0.987
	Iron	103	104	106	107	0.801
	Magnesium	103	104	105	107	1.39
	Potassium	98.3	98.6	98.0	99.4	0.758
	Sodium	102	98.1	102		1.80
	Zinc	100	98.1	104	105	1.27
EPA 200.8 Rev. 5.4	Arsenic	96.8	97.9	98.7	98.1	0.537
	Cadmium	97.3	98.3	99.9	97.4	2.54
	Chromium	99.0	95.9	102	102	0.432
	Copper	95.1	91.5	98.7	97.8	0.895

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.8 Rev. 5.4	Lead	88.3	86.9	89.3	89.6		0.289
	Nickel	97.7	94.1	99.5	99.4		0.0966
	Silver	103	105	104	103		1.79
EPA 300.0 Rev. 2.1	Chloride	105	99.3	106		0.548	
	Sulfate	102	93.4	100		0.358	
EPA 350.1 Rev. 2.0	Ammonia-N	103	101	99.6			1.37
	Ammonia-N	98.5	98.1	98.9			0.750
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	98.1	104			3.57
EPA 353.2 Rev. 2.0	NO2NO3-N	102	105	105			0.372
EPA 365.1 Rev. 2.0	Total-P	97.3	102	102			0.0192
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	101	99.7			0.866
SM 2120 B	Color (true)					0.849	
SM 2320 B-97	Total Alkalinity	104				0.216	
	Total Alkalinity	104				0.306	
SM 2540 C-97	TDS					2.00	
	TDS					1.97	
SM 4500 F-C-97	Fluoride	97.1	101	100			0.480
	Fluoride	97.1					0.513
SM 5310 B-00	Organic Carbon	94.4	99.8	97.8			2.02

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1878884, 1878887, 1878888, 1878889
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1878900
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1878900
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1878884, 1878887, 1878888, 1878889
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1878884, 1878887, 1878888, 1878889
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1878885, 1878890, 1878891, 1878892
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1878885, 1878890, 1878891, 1878892
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1878885, 1878890, 1878891, 1878892
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1878885, 1878890, 1878891, 1878892
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1878886, 1878893, 1878894, 1878895
SM 2120 B / E31780	True Color measured at 450 nm	1878884, 1878887, 1878888, 1878889
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1878884, 1878887, 1878888, 1878889
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1878884, 1878887, 1878888, 1878889
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1878884, 1878887, 1878888, 1878889
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1878884, 1878887, 1878888, 1878889
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1878885, 1878890, 1878891, 1878892

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	03/09/2017			03/09/2017 15:16	Sima Feizi	1878884, 1878887, 1878888, 1878889
EPA 200.7 Rev. 4.4	03/09/2017	03/14/2017	Elliott D. Healy	03/20/2017	Martin Acosta	1878900
EPA 200.8 Rev. 5.4	03/09/2017	03/14/2017	Elliott D. Healy	03/17/2017	Betina Topolski	1878900
	03/09/2017	03/14/2017	Elliott D. Healy	03/21/2017	Betina Topolski	1878900
EPA 300.0 Rev. 2.1	03/09/2017			03/18/2017	Elisa J Lutz	1878884, 1878887, 1878888, 1878889
EPA 350.1 Rev. 2.0	03/09/2017			03/14/2017	Sofia Elnemr	1878890, 1878891, 1878892
	03/09/2017			03/15/2017	Sofia Elnemr	1878885
EPA 351.2 Rev. 2.0	03/09/2017	03/15/2017	Adrian Shelby	03/17/2017	Joseph Suarez	1878885, 1878890, 1878891, 1878892
EPA 353.2 Rev. 2.0	03/09/2017			03/15/2017	Beverly Y. Sanders	1878885, 1878890, 1878891, 1878892
EPA 365.1 Rev. 2.0	03/09/2017	03/13/2017	Vijayalakshmi Reddy	03/16/2017	Lipi Saha	1878885, 1878890, 1878891, 1878892
EPA 365.1 Rev. 2.0 dissolved	03/09/2017			03/09/2017 12:31	Virginia P. Brown	1878886
	03/09/2017			03/09/2017 12:32	Virginia P. Brown	1878893
	03/09/2017			03/09/2017 12:33	Virginia P. Brown	1878894, 1878895
SM 2120 B	03/09/2017			03/09/2017 15:05	Julia Storbeck	1878884
	03/09/2017			03/09/2017 15:06	Julia Storbeck	1878887
	03/09/2017			03/09/2017 15:07	Julia Storbeck	1878888, 1878889
SM 2320 B-97	03/09/2017			03/14/2017	Dale L. Simmons	1878884, 1878887, 1878888, 1878889
SM 2540 C-97	03/09/2017			03/13/2017	Sima Feizi	1878884
	03/09/2017			03/14/2017	Sima Feizi	1878887, 1878888, 1878889
SM 2540 D-97	03/09/2017			03/13/2017	Sima Feizi	1878884
	03/09/2017			03/14/2017	Sima Feizi	1878887, 1878888, 1878889
SM 4500 F-C-97	03/09/2017			03/14/2017	Dale L. Simmons	1878884, 1878887, 1878888, 1878889
SM 5310 B-00	03/09/2017			03/09/2017	Julie Michelle Frank	1878885, 1878890, 1878891, 1878892