

Chemical Analysis Report

CEN-DIST-2018-05-18-02

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

Event Description: **Drawdy X2 / Silver / Fairhop**
Request ID: **RQ-2018-04-16-43**
Customer: **CEN-DIST**
Project ID: **SMP**

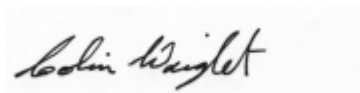
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Attn: Mike Linger

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Report Comment: Corrected sig figs.

Certified by: Colin Wright, Program Administrator

Date Certified: 12-JUN-2018 11:50

A handwritten signature in black ink, appearing to read "Colin Wright", 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 Drawdy @ 150m NNE of Center (3033D) Collection Date/Time: 05/17/2018 10:11

Field ID: G2CE0079

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993988	EPA 180.1 Rev. 2.0	Turbidity	3.5	A	NTU	P345597	
	EPA 300.0 Rev. 2.1	Chloride	27		mg Cl/L	P345792	
		Sulfate	13		mg SO4/L	P345794	
	SM 2120 B	Color (true)	160		PCU	P345593	
	SM 2320 B-97	Total Alkalinity	5.3		mg CaCO3/L	P345948	
	SM 2540 C-97	TDS	113		mg/L	P346046	
	SM 2540 D-97	TSS	3	I	mg/L	P346052	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P345951	
1993990	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P346069	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P345878	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.087		mg N/L	P345739	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P345813	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P346150	
1993992	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345602	
1994000	EPA 200.7 Rev. 4.4	Calcium	7.87		mg/L	P345773	
		Iron	90	I	ug/L	P345773	
		Magnesium	2.53		mg/L	P345773	
		Potassium	3.2		mg/L	P345773	
		Sodium	16.0		mg/L	P345773	
		Zinc	5.0	U	ug/L	P345773	
	EPA 200.8 Rev. 5.4	Arsenic	1.44		ug/L	P345773	
		Cadmium	0.020	U	ug/L	P345773	
		Chromium	0.56	I	ug/L	P345773	
		Copper	1.79		ug/L	P345773	
		Lead	0.14	I	ug/L	P345773	
		Nickel	0.20	I	ug/L	P345773	
		Silver	0.010	U	ug/L	P345773	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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

Sample Location: Lake Drawdy @ 150m S of Center (3033D) Collection Date/Time: 05/17/2018 10:21

Field ID: G2CE0078

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993989	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P345597	
	EPA 300.0 Rev. 2.1	Chloride	27		mg Cl/L	P345792	
		Sulfate	14		mg SO4/L	P345794	
	SM 2120 B	Color (true)	160		PCU	P345593	
	SM 2320 B-97	Total Alkalinity	5.5		mg CaCO3/L	P345948	
	SM 2540 C-97	TDS	106		mg/L	P346046	
	SM 2540 D-97	TSS	2	I	mg/L	P346052	
	SM 4500 F-C-97	Fluoride	0.039	I	mg F/L	P345951	
1993991	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P346069	

Field ID: G2CE0078

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993991	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P345878	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.089		mg N/L	P345740	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P345813	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P346150	
1993993	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345602	
1994001	EPA 200.7 Rev. 4.4	Calcium	7.96		mg/L	P345773	
		Iron	88	I	ug/L	P345773	
		Magnesium	2.51		mg/L	P345773	
		Potassium	3.2		mg/L	P345773	
		Sodium	15.9		mg/L	P345773	
		Zinc	5.0	U	ug/L	P345773	
	EPA 200.8 Rev. 5.4	Arsenic	1.46		ug/L	P345773	
		Cadmium	0.020	U	ug/L	P345773	
		Chromium	0.57	I	ug/L	P345773	
		Copper	1.79		ug/L	P345773	
		Lead	0.14	I	ug/L	P345773	
		Nickel	0.25	I	ug/L	P345773	
		Silver	0.010	U	ug/L	P345773	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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

Sample Location: Silver Lake @ Center (2982A)

Collection Date/Time: 05/17/2018 11:29

Field ID: G2CE0122

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993994	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P345597	
	EPA 300.0 Rev. 2.1	Chloride	51		mg Cl/L	P345792	
		Sulfate	27		mg SO4/L	P345794	
	SM 2120 B	Color (true)	5.9	I	PCU	P345594	
	SM 2320 B-97	Total Alkalinity	7.4	AJ	mg CaCO3/L	P345949	RPD
	SM 2540 C-97	TDS	142	A	mg/L	P346046	
	SM 2540 D-97	TSS	3	IA	mg/L	P346052	
	SM 4500 F-C-97	Fluoride	0.041	I	mg F/L	P345952	
1993995	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P346069	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P345981	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345740	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P345813	
	SM 5310 B-00	Organic Carbon	4.6		mg C/L	P346150	
1993996	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345602	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

SM 2320 B-97: Refer to the narrative for an explanation of QC Codes.

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: P345597

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345773

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: P345773

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: P345792

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345794

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346069

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345878

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345981

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345739

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: P345740

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: P345813

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345602

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

Reference Method: SM 2120 B
Batch ID: P345593

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P345594

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P345948

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

Reference Method: SM 2320 B-97
Batch ID: P345949

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P346046

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P346052

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P345951

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P345952

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P346150

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: P345773

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	101		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	98.3		P	85 - 115
Sodium	101		P	85 - 115
Zinc	94.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345773

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	100		P	85 - 115
Copper	99.1		P	85 - 115
Lead	97.9		P	85 - 115
Nickel	102		P	85 - 115
Silver	101		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345792

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345794

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346069

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	92.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345878

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345981

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: P345739

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345740

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: P345813

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345602

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P345948

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P345949

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P345951

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.2		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P345952

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P346150

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993980	Calcium	103		P	80 - 120
1993980	Iron	104	102	P/P	80 - 120
1993980	Magnesium	106	104	P/P	80 - 120
1993980	Potassium	98.6		P	80 - 120
1993980	Sodium	101		P	80 - 120
1993980	Zinc	101	101	P/P	80 - 120
1994611	Calcium	103		P	80 - 120
1994611	Iron	104		P	80 - 120
1994611	Magnesium	107		P	80 - 120
1994611	Potassium	96.9		P	80 - 120
1994611	Sodium	95.6		P	80 - 120
1994611	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993980	Arsenic	103	102	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993980	Cadmium	101	98.4	P/P	80 - 120
1993980	Chromium	98.0	97.7	P/P	80 - 120
1993980	Copper	97.3	96.9	P/P	80 - 120
1993980	Lead	99.4	97.4	P/P	80 - 120
1993980	Nickel	101	99.7	P/P	80 - 120
1993980	Silver	100	99.5	P/P	80 - 120
1994611	Arsenic	102		P	80 - 120
1994611	Cadmium	98.5		P	80 - 120
1994611	Chromium	95.5		P	80 - 120
1994611	Copper	99.1		P	80 - 120
1994611	Lead	98.2		P	80 - 120
1994611	Nickel	103		P	80 - 120
1994611	Silver	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345792

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993938	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993897	Sulfate	96.7		P	90 - 110
1993938	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993932	Ammonia-N	94.5	94.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345878

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993931	Kjeldahl Nitrogen	104	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993995	Kjeldahl Nitrogen	96.4	93.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345739

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993914	NO2NO3-N	99.7	100	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345740

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993991	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993995	Total-P	94.8	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993992	O-Phosphate-P	96.5	96.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P345951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993923	Fluoride	100	100	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P345952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993994	Fluoride	96.3	94.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P346150

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993933	Organic Carbon	96.3	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P345597

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993988	Turbidity	0.571	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993980	Calcium	0.800	Spike	P	0 - 20
1993980	Iron	1.63	Spike	P	0 - 20
1993980	Magnesium	1.11	Spike	P	0 - 20
1993980	Potassium	0.436	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993980	Sodium	0.484	Spike	P	0 - 20
1993980	Zinc	0.826	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993980	Arsenic	1.35	Spike	P	0 - 20
1993980	Cadmium	2.65	Spike	P	0 - 20
1993980	Chromium	0.331	Spike	P	0 - 20
1993980	Copper	0.390	Spike	P	0 - 20
1993980	Lead	1.99	Spike	P	0 - 20
1993980	Nickel	1.24	Spike	P	0 - 20
1993980	Silver	0.930	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993938	Chloride	0.609	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993938	Sulfate	2.37	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993932	Ammonia-N	0.0550	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345878

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993931	Kjeldahl Nitrogen	0.717	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345981

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993995	Kjeldahl Nitrogen	2.44	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993914	NO2NO3-N	0.454	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345740

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993991	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993995	Total-P	5.06	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993992	O-Phosphate-P	0.104	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345593

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993913	Color (true)	0.113	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993813	Color (true)	2.86	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P345948

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993923	Total Alkalinity	0.823	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P345949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993994	Total Alkalinity	4.47	Sample	F	0 - 1.6

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P346046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993994	TDS	7.72	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P345951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993923	Fluoride	0.477	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P345952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993994	Fluoride	1.95	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P346150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993933	Organic Carbon	0.0994	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A84019
Included Lab Sample IDs: 1993988, 1993989, 1993994

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	90 - 115
Color (true)	103	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A84020
Included Lab Sample IDs: 1993988, 1993989, 1993994

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A84023
Included Lab Sample IDs: 1993992, 1993993, 1993996

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A84023

Included Lab Sample IDs: 1993992, 1993993, 1993996

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	100	P/P	90 - 110
O-Phosphate-P	99.9	99.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A84061

Included Lab Sample IDs: 1993988, 1993989, 1993994

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A84080

Included Lab Sample IDs: 1993990, 1993991, 1993995

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A84148

Included Lab Sample IDs: 1994000, 1994001

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	101	P/P	90 - 110
Cadmium	98.9	98.8	P/P	90 - 110
Chromium	99.1	101	P/P	90 - 110
Copper	102	101	P/P	90 - 110
Lead	99.1	98.5	P/P	90 - 110
Nickel	101	99.7	P/P	90 - 110
Silver	99.6	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A84152

Included Lab Sample IDs: 1993990, 1993991

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.8	98.9	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A84156

Included Lab Sample IDs: 1993988, 1993989, 1993994

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A84156

Included Lab Sample IDs: 1993988, 1993989, 1993994

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A84158

Included Lab Sample IDs: 1993990, 1993991, 1993995

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A84200

Included Lab Sample IDs: 1993995

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A84210

Included Lab Sample IDs: 1993990, 1993991, 1993995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A84216

Included Lab Sample IDs: 1994000, 1994001

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	99.4	P/P	90 - 110
Iron	102	99.1	P/P	90 - 110
Magnesium	102	100	P/P	90 - 110
Potassium	101	99.1	P/P	90 - 110
Sodium	102	102	P/P	90 - 110
Zinc	97.5	98.3	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A84243

Included Lab Sample IDs: 1993990, 1993991, 1993995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.4	98.6	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
EPA 180.1 Rev. 2.0	Turbidity					0.571
EPA 200.7 Rev. 4.4	Calcium	101	103	103		0.800
	Iron	101	104	102	104	1.63
	Magnesium	104	106	104	107	1.11
	Potassium	98.3	98.6	96.9		0.436
	Sodium	101	101	95.6		0.484

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision LCS	SMP	MS
EPA 200.7 Rev. 4.4	Zinc	94.3	101	101	101			0.826
EPA 200.8 Rev. 5.4	Arsenic	102	103	102	102			1.35
	Cadmium	100	101	98.4	98.5			2.65
	Chromium	100	98.0	97.7	95.5			0.331
	Copper	99.1	97.3	96.9	99.1			0.390
	Lead	97.9	99.4	97.4	98.2			1.99
	Nickel	102	101	99.7	103			1.24
	Silver	101	100	99.5	101			0.930
EPA 300.0 Rev. 2.1	Chloride	100	104				0.609	
	Sulfate	99.6	103	96.7			2.37	
EPA 350.1 Rev. 2.0	Ammonia-N	92.2	94.5	94.5				0.0550
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	104	103				0.717
	Kjeldahl Nitrogen	103	96.4	93.2				2.44
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	99.7	100				0.454
	NO ₂ NO ₃ -N	102	101	101				0.0
EPA 365.1 Rev. 2.0	Total-P	102	94.8	99.9				5.06
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	96.5	96.6				0.104
SM 2120 B	Color (true)						0.113	
	Color (true)						2.86	
SM 2320 B-97	Total Alkalinity	102					0.823	
	Total Alkalinity	102					4.47	
SM 2540 C-97	TDS						7.72	
SM 4500 F-C-97	Fluoride	96.2	100	100				0.477
	Fluoride	96.7	96.3	94.2				1.95
SM 5310 B-00	Organic Carbon	94.7	96.3	96.4				0.0994

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1993988, 1993989, 1993994
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1994000, 1994001
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1994000, 1994001
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1993988, 1993989, 1993994
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1993988, 1993989, 1993994
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1993990, 1993991, 1993995
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1993990, 1993991, 1993995
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1993990, 1993991, 1993995
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1993990, 1993991, 1993995
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1993992, 1993993, 1993996
SM 2120 B / E31780	True Color measured at 450 nm	1993988, 1993989, 1993994
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1993988, 1993989, 1993994
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1993988, 1993989, 1993994
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	1993988, 1993989, 1993994
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1993988, 1993989, 1993994
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1993990, 1993991, 1993995

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	05/18/2018			05/18/2018 14:20	DeAsia Armster	1993988, 1993989, 1993994
EPA 200.7 Rev. 4.4	05/18/2018	05/23/2018 14:33	Allison Taylor	05/29/2018 18:52	Betina Topolski	1994000
	05/18/2018	05/23/2018 14:33	Allison Taylor	05/29/2018 18:59	Betina Topolski	1994001
EPA 200.8 Rev. 5.4	05/18/2018	05/23/2018 14:33	Allison Taylor	05/24/2018 18:53	Nadine Brooks	1994000
	05/18/2018	05/23/2018 14:33	Allison Taylor	05/24/2018 19:03	Nadine Brooks	1994001
EPA 300.0 Rev. 2.1	05/18/2018			05/23/2018 01:43	Lipi Saha	1993988
	05/18/2018			05/23/2018 01:55	Lipi Saha	1993989
	05/18/2018			05/23/2018 02:07	Lipi Saha	1993994
EPA 350.1 Rev. 2.0	05/18/2018			05/25/2018 11:04	Ping Hua	1993990
	05/18/2018			05/25/2018 11:05	Ping Hua	1993991
	05/18/2018			05/25/2018 11:07	Ping Hua	1993995
EPA 351.2 Rev. 2.0	05/18/2018	05/24/2018 13:00	Adrian Shelby	05/25/2018 08:26	Joseph Suarez	1993990
	05/18/2018	05/24/2018 13:00	Adrian Shelby	05/25/2018 08:27	Joseph Suarez	1993991
	05/18/2018	05/25/2018 11:00	Adrian Shelby	05/29/2018 12:13	Joseph Suarez	1993995
EPA 353.2 Rev. 2.0	05/18/2018			05/22/2018 13:33	Lauren Bottorf	1993990
	05/18/2018			05/22/2018 13:40	Lauren Bottorf	1993991
	05/18/2018			05/22/2018 13:47	Lauren Bottorf	1993995
EPA 365.1 Rev. 2.0	05/18/2018	05/23/2018 13:05	Sima Feizi	05/25/2018 09:47	Beverly Y. Sanders	1993990
	05/18/2018	05/23/2018 13:05	Sima Feizi	05/25/2018 09:48	Beverly Y. Sanders	1993991
	05/18/2018	05/23/2018 13:05	Sima Feizi	05/25/2018 09:49	Beverly Y. Sanders	1993995
EPA 365.1 Rev. 2.0 dissolved	05/18/2018			05/18/2018 15:03	Megan Treadwell	1993992
	05/18/2018			05/18/2018 15:43	Megan Treadwell	1993993
	05/18/2018			05/18/2018 15:48	Megan Treadwell	1993996
SM 2120 B	05/18/2018			05/18/2018 15:58	Tanya Welborn	1993994
	05/18/2018			05/18/2018 16:11	Tanya Welborn	1993988, 1993989
SM 2320 B-97	05/18/2018			05/25/2018 05:47	Dale L. Simmons	1993988
	05/18/2018			05/25/2018 05:57	Dale L. Simmons	1993989
	05/18/2018			05/25/2018 06:40	Dale L. Simmons	1993994
SM 2540 C-97	05/18/2018			05/23/2018 10:15	Yijie Li	1993988, 1993989, 1993994
SM 2540 D-97	05/18/2018			05/23/2018 10:15	Yijie Li	1993988, 1993989, 1993994
SM 4500 F-C-97	05/18/2018			05/25/2018 05:47	Dale L. Simmons	1993988
	05/18/2018			05/25/2018 05:57	Dale L. Simmons	1993989
	05/18/2018			05/25/2018 06:33	Dale L. Simmons	1993994
SM 5310 B-00	05/18/2018			05/29/2018 18:00	Megan Treadwell	1993990
	05/18/2018			05/29/2018 18:15	Megan Treadwell	1993991
	05/18/2018			05/29/2018 18:34	Megan Treadwell	1993995