

Chemical Analysis Report

SO-DIST-2018-01-24-01

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

Event Description: **NFM->LaBelle**
Request ID: **RQ-2018-01-22-55**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Maryann Dugan

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

Certified by: Colin Wright, Program Administrator

Date Certified: 12-FEB-2018 13:18

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular 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: Telegraph Swamp South

Collection Date/Time: 01/23/2018 09:45

Field ID: G3SD0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1961554	EPA 180.1 Rev. 2.0	Turbidity	19		NTU	P338720	
	EPA 300.0 Rev. 2.1	Chloride	170		mg Cl/L	P338846	
		Sulfate	39		mg SO4/L	P338848	
		Color (true)	60	A	PCU	P338736	
	SM 2320 B-97	Total Alkalinity	96		mg CaCO3/L	P339015	
	SM 2540 C-97	TDS	482		mg/L	P339139	
	SM 2540 D-97	TSS	38		mg/L	P339361	
	SM 4500 F-C-97	Fluoride	0.34		mg F/L	P339020	
1961555	EPA 350.1 Rev. 2.0	Ammonia-N	0.073		mg N/L	P339038	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.0		mg N/L	P338743	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P338782	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P338879	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P339205	
1961556	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P338757	
1961582	EPA 200.7 Rev. 4.4	Calcium	63.4		mg/L	P338791	
		Iron	520		ug/L	P338791	
		Magnesium	15.3		mg/L	P338791	
		Potassium	4.4		mg/L	P338791	
		Sodium	88.4		mg/L	P338791	
		Zinc	5.0	U	ug/L	P338791	
	EPA 200.8 Rev. 5.4	Arsenic	1.07		ug/L	P338791	
		Cadmium	0.020	U	ug/L	P338791	
		Chromium	0.71	I	ug/L	P338791	
		Copper	0.68	I	ug/L	P338791	
		Lead	0.34		ug/L	P338791	
		Nickel	0.53	I	ug/L	P338791	
		Silver	0.010	U	ug/L	P338791	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2320 B-97: Batch relative percent difference is unavailable because of low 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.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Bee Branch @ Loblolly Bay

Collection Date/Time: 01/23/2018 12:00

Field ID: G3SD0085

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1961548	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P338720	
	EPA 300.0 Rev. 2.1	Chloride	53		mg Cl/L	P338845	
		Sulfate	32		mg SO4/L	P338847	
		Color (true)	120		PCU	P338731	
	SM 2320 B-97	Total Alkalinity	24		mg CaCO3/L	P339015	
	SM 2540 C-97	TDS	198		mg/L	P339139	
	SM 2540 D-97	TSS	3	I	mg/L	P339361	

Field ID: G3SD0085

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1961548	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P339020	
1961550	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P339038	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P338742	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P338782	
	EPA 365.1 Rev. 2.0	Total-P	0.082		mg P/L	P338879	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P339205	
1961552	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.052		mg P/L	P338757	

Ref. Method and Comment:

SM 2320 B-97: Batch relative percent difference is unavailable because of low 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.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Pollywog Creek @ SR 78

Collection Date/Time: 01/23/2018 11:15

Field ID: G3SD0098

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1961549	EPA 180.1 Rev. 2.0	Turbidity	7.1		NTU	P338720	
	EPA 300.0 Rev. 2.1	Chloride	22		mg Cl/L	P338846	
		Sulfate	9.4		mg SO4/L	P338848	
	SM 2120 B	Color (true)	95		PCU	P338731	
	SM 2320 B-97	Total Alkalinity	41		mg CaCO3/L	P339015	
	SM 2540 C-97	TDS	148		mg/L	P339139	
	SM 2540 D-97	TSS	4	I	mg/L	P339361	
	SM 4500 F-C-97	Fluoride	0.29		mg F/L	P339020	
1961551	EPA 350.1 Rev. 2.0	Ammonia-N	0.050		mg N/L	P339038	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P338742	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.036		mg N/L	P338782	
	EPA 365.1 Rev. 2.0	Total-P	1.1		mg P/L	P338879	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P339205	
1961553	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.86		mg P/L	P338757	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2320 B-97: Batch relative percent difference is unavailable because of low 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.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P338720

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P338791

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: P338791

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: P338845

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338846

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338847

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338848

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339038

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P338742

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P338743

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P338782

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P338879

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P338757

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

Reference Method: SM 2120 B
Batch ID: P338731

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P338736

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P339015

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

Reference Method: SM 2540 C-97
Batch ID: P339139

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P339361

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P339020

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P339205

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: P338791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	109		P	85 - 115
Iron	108		P	85 - 115
Magnesium	113		P	85 - 115
Potassium	104		P	85 - 115
Sodium	109		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P338791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.1		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	99.2		P	85 - 115
Copper	95.3		P	85 - 115
Lead	104		P	85 - 115
Nickel	97.8		P	85 - 115
Silver	99.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338845

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338846

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338847

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338848

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339038

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P338742

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P338743

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P338782

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P338879

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P338757

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

Reference Method: SM 2320 B-97
Batch ID: P339015

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P339020

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P339205

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P338791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961215	Calcium	107		P	80 - 120
1961215	Iron	112		P	80 - 120
1961215	Magnesium	115		P	80 - 120
1961215	Potassium	104		P	80 - 120
1961215	Sodium	109		P	80 - 120
1961215	Zinc	109		P	80 - 120
1961785	Calcium	106	106	P/P	80 - 120
1961785	Iron	106	106	P/P	80 - 120
1961785	Magnesium	110	111	P/P	80 - 120
1961785	Potassium	109	107	P/P	80 - 120
1961785	Sodium	104	103	P/P	80 - 120
1961785	Zinc	100	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P338791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961215	Arsenic	99.1		P	80 - 120
1961215	Cadmium	100		P	80 - 120
1961215	Chromium	100		P	80 - 120
1961215	Copper	98.1		P	80 - 120
1961215	Lead	105		P	80 - 120
1961215	Nickel	100		P	80 - 120
1961215	Silver	97.7		P	80 - 120
1961785	Arsenic	98.9	99.3	P/P	80 - 120
1961785	Cadmium	99.2	101	P/P	80 - 120
1961785	Chromium	101	99.2	P/P	80 - 120
1961785	Copper	96.3	96.9	P/P	80 - 120
1961785	Lead	105	106	P/P	80 - 120
1961785	Nickel	100	99.1	P/P	80 - 120
1961785	Silver	98.5	99.7	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338845

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961439	Chloride	102		P	90 - 110
1961483	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338846

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961731	Chloride	99.0		P	90 - 110
1961732	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338847

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961439	Sulfate	98.6		P	90 - 110
1961483	Sulfate	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338848

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961731	Sulfate	96.4		P	90 - 110
1961732	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961494	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P338742

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961488	Kjeldahl Nitrogen	97.7	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P338743

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961558	Kjeldahl Nitrogen	104	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P338782

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961485	NO2NO3-N	97.4	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P338879

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P338879

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961555	Total-P	96.1	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P339020

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961779	Fluoride	97.1	98.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P339205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961143	Organic Carbon	98.0	98.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P338720

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961493	Turbidity	5.40	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P338791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961785	Calcium	0.495	Spike	P	0 - 20
1961785	Iron	0.557	Spike	P	0 - 20
1961785	Magnesium	0.521	Spike	P	0 - 20
1961785	Potassium	2.20	Spike	P	0 - 20
1961785	Sodium	0.886	Spike	P	0 - 20
1961785	Zinc	1.61	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P338791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961785	Arsenic	0.396	Spike	P	0 - 20
1961785	Cadmium	1.73	Spike	P	0 - 20
1961785	Chromium	1.54	Spike	P	0 - 20
1961785	Copper	0.658	Spike	P	0 - 20
1961785	Lead	0.644	Spike	P	0 - 20
1961785	Nickel	1.30	Spike	P	0 - 20
1961785	Silver	1.29	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961439	Chloride	1.65	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338846

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961731	Chloride	1.62	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P338847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961439	Sulfate	2.59	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961494	Ammonia-N	1.32	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P338742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961488	Kjeldahl Nitrogen	1.03	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P338743

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961558	Kjeldahl Nitrogen	2.50	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P338782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961485	NO2NO3-N	0.966	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P338879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961555	Total-P	4.25	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P338757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961489	O-Phosphate-P	0.805	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P338731

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961484	Color (true)	0.955	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P338736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961554	Color (true)	0.598	Sample	P	0 - 20

Reference Method: SM 2540 C-97
Batch ID: P339139

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961493	TDS	4.94	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P339020

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961779	Fluoride	0.938	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P339205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961143	Organic Carbon	0.503	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A81616
Included Lab Sample IDs: 1961548, 1961549, 1961554

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A81616

Included Lab Sample IDs: 1961548, 1961549, 1961554

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A81628

Included Lab Sample IDs: 1961548, 1961549, 1961554

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

Reference Method: SM 2120 B

Run ID: A81630

Included Lab Sample IDs: 1961548, 1961549, 1961554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	85 - 115
Color (true)	103	103	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A81635

Included Lab Sample IDs: 1961552, 1961553, 1961556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.6	P/P	90 - 110
O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A81644

Included Lab Sample IDs: 1961550, 1961551, 1961555

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A81684

Included Lab Sample IDs: 1961550, 1961551, 1961555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	95.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A81688

Included Lab Sample IDs: 1961582

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	103	P/P	90 - 110
Iron	101	99.0	P/P	90 - 110
Magnesium	101	99.1	P/P	90 - 110
Potassium	98.9	101	P/P	90 - 110
Sodium	102	105	P/P	90 - 110
Zinc	99.3	97.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A81703

Included Lab Sample IDs: 1961550, 1961551

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	101	P/P	90 - 110
Total-P	99.4	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A81706

Included Lab Sample IDs: 1961555

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

Reference Method: SM 2320 B-97

Run ID: A81736

Included Lab Sample IDs: 1961548, 1961549, 1961554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.0	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A81736

Included Lab Sample IDs: 1961548, 1961549, 1961554

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A81740

Included Lab Sample IDs: 1961550, 1961551, 1961555

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A81741

Included Lab Sample IDs: 1961582

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.2	98.2	P/P	90 - 110
Cadmium	97.4	99.3	P/P	90 - 110
Chromium	96.9	98.1	P/P	90 - 110
Copper	97.1	96.4	P/P	90 - 110
Lead	103	104	P/P	90 - 110
Nickel	97.8	97.6	P/P	90 - 110
Silver	99.1	101	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A81806

Included Lab Sample IDs: 1961550, 1961551, 1961555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.4	96.8	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			Precision SMP	MS
			LCS	MS	MS		
EPA 180.1 Rev. 2.0	Turbidity					5.40	
EPA 200.7 Rev. 4.4	Calcium	109	107	106	106		0.495
	Iron	108	112	106	106		0.557
	Magnesium	113	115	110	111		0.521
	Potassium	104	104	109	107		2.20
	Sodium	109	109	104	103		0.886
	Zinc	102	109	100	102		1.61
EPA 200.8 Rev. 5.4	Arsenic	98.1	99.1	98.9	99.3		0.396
	Cadmium	98.9	100	99.2	101		1.73
	Chromium	99.2	100	101	99.2		1.54
	Copper	95.3	98.1	96.3	96.9		0.658
	Lead	104	105	105	106		0.644
	Nickel	97.8	100	100	99.1		1.30
	Silver	99.0	97.7	98.5	99.7		1.29
EPA 300.0 Rev. 2.1	Chloride	101	102	100		1.65	
	Chloride	100	99.0	101		1.62	
	Sulfate	98.5	98.6	98.3		2.59	
	Sulfate	98.7	96.4	101			
EPA 350.1 Rev. 2.0	Ammonia-N	101	101	102			1.32
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4	97.7	99.1			1.03
	Kjeldahl Nitrogen	102	104	100			2.50
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	97.4	96.4			0.966
EPA 365.1 Rev. 2.0	Total-P	101	96.1	101			4.25
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5					0.805
SM 2120 B	Color (true)					0.955	
	Color (true)					0.598	
SM 2320 B-97	Total Alkalinity	101					
SM 2540 C-97	TDS					4.94	
SM 4500 F-C-97	Fluoride	96.1	97.1	98.0			0.938
SM 5310 B-00	Organic Carbon	96.1	98.0	98.7			0.503

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1961548, 1961549, 1961554
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1961582
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1961582
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1961548, 1961549, 1961554
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1961548, 1961549, 1961554
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1961550, 1961551, 1961555

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1961550, 1961551, 1961555
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1961550, 1961551, 1961555
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1961550, 1961551, 1961555
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1961552, 1961553, 1961556
SM 2120 B / E31780	True Color measured at 450 nm	1961548, 1961549, 1961554
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1961548, 1961549, 1961554
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1961548, 1961549, 1961554
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1961548, 1961549, 1961554
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1961548, 1961549, 1961554
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1961550, 1961551, 1961555

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	01/24/2018			01/24/2018 15:22	DeAsia Armster	1961548, 1961549, 1961554
EPA 200.7 Rev. 4.4	01/24/2018	01/25/2018	Elliott D. Healy	01/26/2018	Martin Acosta	1961582
EPA 200.8 Rev. 5.4	01/24/2018	01/25/2018	Elliott D. Healy	01/30/2018	Nadine Brooks	1961582
EPA 300.0 Rev. 2.1	01/24/2018			01/25/2018	Julia Storbeck	1961548, 1961549, 1961554
EPA 350.1 Rev. 2.0	01/24/2018			01/30/2018	Julia Storbeck	1961550, 1961551, 1961555
EPA 351.2 Rev. 2.0	01/24/2018	01/25/2018	Adrian Shelby	01/26/2018	Joseph Suarez	1961550, 1961551, 1961555
EPA 353.2 Rev. 2.0	01/24/2018			01/25/2018	Beverly Y. Sanders	1961550, 1961551, 1961555
EPA 365.1 Rev. 2.0	01/24/2018	01/26/2018	Sima Feizi	01/29/2018	Lipi Saha	1961550, 1961551, 1961555
EPA 365.1 Rev. 2.0 dissolved	01/24/2018			01/24/2018 15:33	Megan Treadwell	1961552
	01/24/2018			01/24/2018 16:03	Megan Treadwell	1961553
	01/24/2018			01/24/2018 16:04	Megan Treadwell	1961556
SM 2120 B	01/24/2018			01/24/2018 15:57	Tanya Welborn	1961548
	01/24/2018			01/24/2018 15:58	Tanya Welborn	1961549
	01/24/2018			01/24/2018 16:40	Tanya Welborn	1961554
SM 2320 B-97	01/24/2018			01/30/2018	Lauren Bottorf	1961548, 1961549, 1961554
SM 2540 C-97	01/24/2018			01/26/2018	Yijie Li	1961548, 1961549, 1961554
SM 2540 D-97	01/24/2018			01/26/2018	Yijie Li	1961548, 1961549, 1961554
SM 4500 F-C-97	01/24/2018			01/30/2018	Lauren Bottorf	1961548, 1961549, 1961554
SM 5310 B-00	01/24/2018			01/31/2018	Megan Treadwell	1961550, 1961551, 1961555