

Chemical Analysis Report

NW-DIST-2018-07-24-01

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

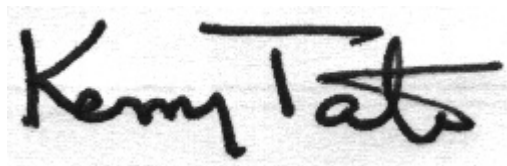
Event Description: **NW RUN**
Request ID: **RQ-2018-07-23-21**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
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Pensacola, FL 32502-5794
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 09-AUG-2018 13:13

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Little Pine Barren Creek Above CR 99

Collection Date/Time: 07/23/2018 10:55

Field ID: G4NW0420

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2009821	EPA 180.1 Rev. 2.0	Turbidity	7.2		NTU	P349081	
	EPA 300.0 Rev. 2.1	Chloride	7.0		mg Cl/L	P349260	
		Sulfate	0.38	I	mg SO4/L	P349264	
	SM 2120 B	Color (true)	43		PCU	P349052	
	SM 2320 B-97	Total Alkalinity	8.5		mg CaCO3/L	P349243	
	SM 2540 C-97	TDS	33		mg/L	P349345	
	SM 2540 D-97	TSS	6	I	mg/L	P349339	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P349245	
2009826	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P349214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31		mg N/L	P349181	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.51		mg N/L	P349121	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P349162	
	SM 5310 B-00	Organic Carbon	2.2		mg C/L	P349221	
2009831	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P349056	

Ref. Method and Comment:

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

Sample Location: Mitchell Creek upstream of HWY 29

Collection Date/Time: 07/23/2018 11:15

Field ID: G4NW0116

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2009818	EPA 180.1 Rev. 2.0	Turbidity	2.1	A	NTU	P349081	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P349260	
		Sulfate	0.70		mg SO4/L	P349264	
		Color (true)	47		PCU	P349052	
	SM 2120 B	Total Alkalinity	0.95	I	mg CaCO3/L	P349243	
	SM 2540 C-97	TDS	18	I	mg/L	P349345	
	SM 2540 D-97	TSS	3	I	mg/L	P349339	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P349245	
2009819	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P349214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P349181	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P349121	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P349162	
	SM 5310 B-00	Organic Carbon	3.6		mg C/L	P349221	
2009820	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P349056	
2009853	EPA 200.7 Rev. 4.4	Calcium	0.47		mg/L	P349107	
		Iron	1.10E+03		ug/L	P349107	
		Magnesium	0.53		mg/L	P349107	
		Potassium	0.30	U	mg/L	P349107	
		Sodium	1.9	I	mg/L	P349107	
		Zinc	5.0	U	ug/L	P349107	
	EPA 200.8 Rev. 5.4	Arsenic	0.32		ug/L	P349107	
		Cadmium	0.020	U	ug/L	P349107	
		Chromium	0.41	I	ug/L	P349107	
		Copper	0.20	U	ug/L	P349107	
		Lead	0.16	I	ug/L	P349107	
		Nickel	0.68	I	ug/L	P349107	
		Silver	0.010	U	ug/L	P349107	

Ref. Method and Comment:

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

Sample Location: Wiggins Branch below HWY 29

Collection Date/Time: 07/23/2018 11:30

Field ID: G4NW0163

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2009822	EPA 180.1 Rev. 2.0	Turbidity	8.1		NTU	P349081	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P349260	
		Sulfate	0.87		mg SO4/L	P349264	
	SM 2120 B	Color (true)	88	A	PCU	P349052	
	SM 2320 B-97	Total Alkalinity	12		mg CaCO3/L	P349243	
	SM 2540 C-97	TDS	37		mg/L	P349345	
	SM 2540 D-97	TSS	6	I	mg/L	P349339	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P349245	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.091		mg N/L	P349214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P349181	
2009827	EPA 353.2 Rev. 2.0	NO2NO3-N	0.078		mg N/L	P349121	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P349162	
	SM 5310 B-00	Organic Carbon	4.1		mg C/L	P349221	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.006	I	mg P/L	P349056	
	dissolved						

Ref. Method and Comment:

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

Sample Location: Big Escambia Creek downstream of Fannie Rd Collection Date/Time: 07/23/2018 11:45

Field ID: G4NW0421

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2009823	EPA 180.1 Rev. 2.0	Turbidity	4.5		NTU	P349081	
	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P349260	
		Sulfate	0.91		mg SO4/L	P349264	
	SM 2120 B	Color (true)	37		PCU	P349052	
	SM 2320 B-97	Total Alkalinity	4.7		mg CaCO3/L	P349243	
	SM 2540 C-97	TDS	30		mg/L	P349345	
	SM 2540 D-97	TSS	4	I	mg/L	P349339	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P349245	
2009828	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P349214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.22		mg N/L	P349184	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.48		mg N/L	P349121	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P349162	
	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P349221	
2009833	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P349056	

Ref. Method and Comment:

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

Sample Location: McCostill Mill Creek West Ebenezer Rd

Collection Date/Time: 07/23/2018 12:25

Field ID: G4NW0320

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2009824	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P349081	
	EPA 300.0 Rev. 2.1	Chloride	6.0		mg Cl/L	P349260	
		Sulfate	0.44	I	mg SO4/L	P349264	
	SM 2120 B	Color (true)	3.2	I	PCU	P349052	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P349243	
	SM 2540 C-97	TDS	34		mg/L	P349345	
	SM 2540 D-97	TSS	3	I	mg/L	P349339	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P349245	
2009829	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P349214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P349184	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.3		mg N/L	P349121	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P349162	
	SM 5310 B-00	Organic Carbon	0.71	I	mg C/L	P349221	
2009834	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P349056	

Ref. Method and Comment:

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

Sample Location: Moore Creek above Chamuckla Springs Road Collection Date/Time: 07/23/2018 12:50

Field ID: G4NW0355

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2009825	EPA 180.1 Rev. 2.0	Turbidity	5.0		NTU	P349081	
	EPA 300.0 Rev. 2.1	Chloride	5.9		mg Cl/L	P349260	
		Sulfate	0.62		mg SO4/L	P349264	
	SM 2120 B	Color (true)	15		PCU	P349052	
	SM 2320 B-97	Total Alkalinity	3.4		mg CaCO3/L	P349243	
	SM 2540 C-97	TDS	33		mg/L	P349345	
	SM 2540 D-97	TSS	7	I	mg/L	P349339	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P349245	
2009830	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P349214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.17	I	mg N/L	P349184	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.4		mg N/L	P349121	
	EPA 365.1 Rev. 2.0	Total-P	0.007		mg P/L	P349162	
	SM 5310 B-00	Organic Carbon	1.3		mg C/L	P349222	
2009835	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P349056	

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: P349081

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349107

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: P349107

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: P349260

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349264

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P349214

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349181

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: P349184

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349121

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: P349162

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349056

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

Reference Method: SM 2120 B
Batch ID: P349052

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P349243

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

Reference Method: SM 2540 C-97
Batch ID: P349345

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P349339

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P349245

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P349221

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P349222

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: P349107

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	109		P	85 - 115
Iron	107		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	104		P	85 - 115
Sodium	104		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349107

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.9		P	85 - 115
Cadmium	98.3		P	85 - 115
Chromium	95.9		P	85 - 115
Copper	93.5		P	85 - 115
Lead	93.0		P	85 - 115
Nickel	96.5		P	85 - 115
Silver	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349260

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349264

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P349214

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349181

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349184

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349121

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: P349162

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349056

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

Reference Method: SM 2120 B
Batch ID: P349052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.3		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P349243

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P349245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.4		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P349221

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P349222

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009853	Calcium	109	109	P/P	80 - 120
2009853	Iron	106	105	P/P	80 - 120
2009853	Magnesium	111	110	P/P	80 - 120
2009853	Potassium	108	107	P/P	80 - 120
2009853	Sodium	103	102	P/P	80 - 120
2009853	Zinc	105	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009853	Arsenic	98.2	97.9	P/P	80 - 120
2009853	Cadmium	98.3	98.5	P/P	80 - 120
2009853	Chromium	97.2	97.0	P/P	80 - 120
2009853	Copper	96.4	95.0	P/P	80 - 120
2009853	Lead	94.0	93.4	P/P	80 - 120
2009853	Nickel	97.5	96.6	P/P	80 - 120
2009853	Silver	97.2	99.8	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349260

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009563	Chloride	107		P	90 - 110
2009601	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349264

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009563	Sulfate	106		P	90 - 110
2009601	Sulfate	98.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P349214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009715	Ammonia-N	98.4	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349181

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009714	Kjeldahl Nitrogen	93.8	93.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349184

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009829	Kjeldahl Nitrogen	108	107	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009797	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P349162

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009826	Total-P	95.4	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349056

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009820	O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P349245

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009796	Fluoride	95.2	95.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P349221

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009397	Organic Carbon	93.0	95.0	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P349222

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009830	Organic Carbon	92.6	93.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P349081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009818	Turbidity	2.34	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009853	Calcium	0.733	Spike	P	0 - 20
2009853	Iron	1.34	Spike	P	0 - 20
2009853	Magnesium	0.983	Spike	P	0 - 20
2009853	Potassium	1.23	Spike	P	0 - 20
2009853	Sodium	0.441	Spike	P	0 - 20
2009853	Zinc	1.41	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009853	Arsenic	0.327	Spike	P	0 - 20
2009853	Cadmium	0.242	Spike	P	0 - 20
2009853	Chromium	0.137	Spike	P	0 - 20
2009853	Copper	1.49	Spike	P	0 - 20
2009853	Lead	0.663	Spike	P	0 - 20
2009853	Nickel	0.852	Spike	P	0 - 20
2009853	Silver	2.71	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009563	Chloride	2.47	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349264

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009563	Sulfate	2.19	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P349214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009715	Ammonia-N	3.97	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349181

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009714	Kjeldahl Nitrogen	0.0548	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009829	Kjeldahl Nitrogen	0.443	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009797	NO2NO3-N	0.717	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P349162

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009826	Total-P	0.797	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349056

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009820	O-Phosphate-P	0.992	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P349052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009822	Color (true)	0.924	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P349243

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009796	Total Alkalinity	0.0271	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P349345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009796	TDS	7.32	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P349245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009796	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P349221

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009397	Organic Carbon	1.22	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P349222

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009830	Organic Carbon	1.30	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: A85417

Included Lab Sample IDs: 2009818, 2009821, 2009822, 2009823, 2009824, 2009825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	99.7	P/P	90 - 110
Chloride	99.7	101	P/P	90 - 110
Sulfate	102	104	P/P	90 - 110
Sulfate	107	102	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A85440

Included Lab Sample IDs: 2009818, 2009821, 2009822, 2009823, 2009824, 2009825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A85441

Included Lab Sample IDs: 2009820, 2009831, 2009832, 2009833, 2009834, 2009835

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	98.1	P/P	90 - 110
O-Phosphate-P	98.9	98.3	P/P	90 - 110
O-Phosphate-P	99.6	98.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A85446

Included Lab Sample IDs: 2009818, 2009821, 2009822, 2009823, 2009824, 2009825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.0	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A85471

Included Lab Sample IDs: 2009819, 2009826, 2009827, 2009828, 2009829, 2009830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110
NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A85497

Included Lab Sample IDs: 2009819, 2009826, 2009827, 2009828, 2009829, 2009830

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

Reference Method: SM 5310 B-00

Run ID: A85504

Included Lab Sample IDs: 2009819, 2009826, 2009827, 2009828, 2009829, 2009830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	96.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A85509

Included Lab Sample IDs: 2009818, 2009821, 2009822, 2009823, 2009824, 2009825

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

Reference Method: SM 4500 F-C-97

Run ID: A85509

Included Lab Sample IDs: 2009818, 2009821, 2009822, 2009823, 2009824, 2009825

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A85512

Included Lab Sample IDs: 2009853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	102	P/P	95 - 105
Iron	103	102	P/P	95 - 105
Magnesium	103	102	P/P	95 - 105
Potassium	102	101	P/P	95 - 105
Sodium	102	99.8	P/P	95 - 105
Zinc	103	104	P/P	95 - 105

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A85543

Included Lab Sample IDs: 2009819, 2009826, 2009827, 2009828, 2009829, 2009830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	96.0	P/P	90 - 110
Kjeldahl Nitrogen	93.9	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A85553

Included Lab Sample IDs: 2009819, 2009826, 2009827, 2009828, 2009829, 2009830

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A85598

Included Lab Sample IDs: 2009853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.3	99.1	P/P	90 - 110
Cadmium	97.4	98.1	P/P	90 - 110
Chromium	98.4	98.2	P/P	90 - 110
Copper	97.2	97.5	P/P	90 - 110
Lead	96.3	96.7	P/P	90 - 110
Nickel	97.0	97.1	P/P	90 - 110
Silver	99.0	99.9	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	
					LCS	MS
EPA 180.1 Rev. 2.0	Turbidity				2.34	
EPA 200.7 Rev. 4.4	Calcium	109	109	109		0.733
	Iron	107	106	105		1.34
	Magnesium	110	111	110		0.983
	Potassium	104	108	107		1.23
	Sodium	104	103	102		0.441
	Zinc	102	105	103		1.41
EPA 200.8 Rev. 5.4	Arsenic	97.9	98.2	97.9		0.327
	Cadmium	98.3	98.3	98.5		0.242
	Chromium	95.9	97.2	97.0		0.137
	Copper	93.5	96.4	95.0		1.49
	Lead	93.0	94.0	93.4		0.663
	Nickel	96.5	97.5	96.6		0.852
	Silver	100	97.2	99.8		2.71
EPA 300.0 Rev. 2.1	Chloride	101	107	100	2.47	
	Sulfate	103	106	98.6	2.19	
EPA 350.1 Rev. 2.0	Ammonia-N	102	98.4	103		3.97
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	93.8	93.7		0.0548
	Kjeldahl Nitrogen	105	108	107		0.443
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	101		0.717
EPA 365.1 Rev. 2.0	Total-P	96.2	95.4	96.2		0.797
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	100	101		0.992
SM 2120 B	Color (true)	98.3			0.924	
SM 2320 B-97	Total Alkalinity	103			0.0271	
SM 2540 C-97	TDS				7.32	
SM 4500 F-C-97	Fluoride	96.4	95.2	95.2		0.0
SM 5310 B-00	Organic Carbon	95.2	93.0	95.0		1.22
	Organic Carbon	93.6	92.6	93.9		1.30

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2009853
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2009853
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2009819, 2009826, 2009827, 2009828, 2009829, 2009830
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2009819, 2009826, 2009827, 2009828, 2009829, 2009830
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2009819, 2009826, 2009827, 2009828, 2009829, 2009830
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2009819, 2009826, 2009827, 2009828, 2009829, 2009830
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2009820, 2009831, 2009832, 2009833, 2009834, 2009835
SM 2120 B / E31780	True Color measured at 450 nm	2009818, 2009821, 2009822, 2009823, 2009824, 2009825

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2009819, 2009826, 2009827, 2009828, 2009829, 2009830

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	07/24/2018			07/24/2018 15:17	Blanca Fach	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
EPA 200.7 Rev. 4.4	07/24/2018	07/25/2018 14:10	Elliott D. Healy	07/26/2018 12:54	Betina Topolski	2009853
EPA 200.8 Rev. 5.4	07/24/2018	07/25/2018 14:10	Elliott D. Healy	07/31/2018 19:45	Robert K Palmer	2009853
EPA 300.0 Rev. 2.1	07/24/2018			07/26/2018 03:32	Lipi Saha	2009818
	07/24/2018			07/26/2018 03:44	Lipi Saha	2009821
	07/24/2018			07/26/2018 03:56	Lipi Saha	2009822
	07/24/2018			07/26/2018 04:08	Lipi Saha	2009823
	07/24/2018			07/26/2018 04:44	Lipi Saha	2009824
	07/24/2018			07/26/2018 04:56	Lipi Saha	2009825
EPA 350.1 Rev. 2.0	07/24/2018			07/26/2018 11:26	Ping Hua	2009819
	07/24/2018			07/26/2018 11:28	Ping Hua	2009826
	07/24/2018			07/26/2018 11:29	Ping Hua	2009827
	07/24/2018			07/26/2018 11:31	Ping Hua	2009828
	07/24/2018			07/26/2018 11:32	Ping Hua	2009829
	07/24/2018			07/26/2018 11:34	Ping Hua	2009830
EPA 351.2 Rev. 2.0	07/24/2018	07/26/2018 11:30	Adrian Shelby	07/27/2018 14:52	Joseph Suarez	2009819
	07/24/2018	07/26/2018 11:30	Adrian Shelby	07/27/2018 14:54	Joseph Suarez	2009826
	07/24/2018	07/26/2018 11:30	Adrian Shelby	07/27/2018 14:55	Joseph Suarez	2009827
	07/24/2018	07/26/2018 11:30	Adrian Shelby	07/27/2018 15:29	Joseph Suarez	2009828
	07/24/2018	07/26/2018 11:30	Adrian Shelby	07/27/2018 15:31	Joseph Suarez	2009829
	07/24/2018	07/26/2018 11:30	Adrian Shelby	07/27/2018 15:36	Joseph Suarez	2009830
EPA 353.2 Rev. 2.0	07/24/2018			07/25/2018 12:54	Lauren Bottorf	2009819
	07/24/2018			07/25/2018 12:55	Lauren Bottorf	2009826
	07/24/2018			07/25/2018 12:56	Lauren Bottorf	2009827
	07/24/2018			07/25/2018 12:57	Lauren Bottorf	2009828
	07/24/2018			07/25/2018 14:09	Lauren Bottorf	2009829
	07/24/2018			07/25/2018 14:10	Lauren Bottorf	2009830
EPA 365.1 Rev. 2.0	07/24/2018	07/26/2018 12:35	Sima Feizi	07/30/2018 10:25	Beverly Y. Sanders	2009819
	07/24/2018	07/26/2018 12:35	Sima Feizi	07/30/2018 10:26	Beverly Y. Sanders	2009826
	07/24/2018	07/26/2018 12:35	Sima Feizi	07/30/2018 10:27	Beverly Y. Sanders	2009827
	07/24/2018	07/26/2018 12:35	Sima Feizi	07/30/2018 10:28	Beverly Y. Sanders	2009828
	07/24/2018	07/26/2018 12:35	Sima Feizi	07/30/2018 10:29	Beverly Y. Sanders	2009829
	07/24/2018	07/26/2018 12:35	Sima Feizi	07/30/2018 10:30	Beverly Y. Sanders	2009830
EPA 365.1 Rev. 2.0 dissolved	07/24/2018			07/24/2018 16:06	Julia Storbeck	2009820
	07/24/2018			07/24/2018 16:37	Julia Storbeck	2009831
	07/24/2018			07/24/2018 16:47	Julia Storbeck	2009832
	07/24/2018			07/24/2018 16:48	Julia Storbeck	2009833
	07/24/2018			07/24/2018 16:49	Julia Storbeck	2009834, 2009835
SM 2120 B	07/24/2018			07/24/2018 16:01	Tanya Welborn	2009818

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2120 B	07/24/2018			07/24/2018 16:02	Tanya Welborn	2009821
	07/24/2018			07/24/2018 16:03	Tanya Welborn	2009822
	07/24/2018			07/24/2018 16:04	Tanya Welborn	2009823
	07/24/2018			07/24/2018 16:05	Tanya Welborn	2009824
	07/24/2018			07/24/2018 16:06	Tanya Welborn	2009825
SM 2320 B-97	07/24/2018			07/25/2018 22:16	Dale L. Simmons	2009818
	07/24/2018			07/25/2018 22:27	Dale L. Simmons	2009821
	07/24/2018			07/25/2018 22:37	Dale L. Simmons	2009822
	07/24/2018			07/25/2018 22:48	Dale L. Simmons	2009823
	07/24/2018			07/25/2018 22:58	Dale L. Simmons	2009824
SM 2540 C-97	07/24/2018			07/25/2018 23:10	Dale L. Simmons	2009825
	07/24/2018			07/26/2018 15:35	Yijie Li	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
SM 2540 D-97	07/24/2018			07/26/2018 15:35	Yijie Li	2009818, 2009821, 2009822, 2009823, 2009824, 2009825
SM 4500 F-C-97	07/24/2018			07/25/2018 22:16	Dale L. Simmons	2009818
	07/24/2018			07/25/2018 22:27	Dale L. Simmons	2009821
	07/24/2018			07/25/2018 22:37	Dale L. Simmons	2009822
	07/24/2018			07/25/2018 22:48	Dale L. Simmons	2009823
	07/24/2018			07/25/2018 22:58	Dale L. Simmons	2009824
SM 5310 B-00	07/24/2018			07/25/2018 23:10	Dale L. Simmons	2009825
	07/24/2018			07/25/2018 21:49	Megan Treadwell	2009819
	07/24/2018			07/25/2018 22:04	Megan Treadwell	2009826
	07/24/2018			07/25/2018 22:17	Megan Treadwell	2009827
	07/24/2018			07/25/2018 22:30	Megan Treadwell	2009828
	07/24/2018			07/25/2018 22:43	Megan Treadwell	2009829
	07/24/2018			07/25/2018 23:24	Megan Treadwell	2009830