

Chemical Analysis Report

NW-DIST-2018-10-04-02

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

Event Description: **Laurel Hill West**
Request ID: **RQ-2018-09-24-12**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 29-OCT-2018 13:54

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 group are included in this report: 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: TURKEY CREEK ABOVE WILLIAMS RD

Collection Date/Time: 10/03/2018 10:35

Field ID: G4NW0409

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2031391	EPA 180.1 Rev. 2.0	Turbidity	9.3	A	NTU	P352909	
	EPA 300.0 Rev. 2.1	Chloride	4.6		mg Cl/L	P353420	
		Sulfate	1.1		mg SO4/L	P353423	
	SM 2120 B	Color (true)	90	A	PCU	P352788	
	SM 2320 B-97	Total Alkalinity	3.8		mg CaCO3/L	P353271	
	SM 2540 C-97	TDS	43		mg/L	P353375	
	SM 2540 D-97	TSS	16		mg/L	P353360	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P353275	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P353413	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P353121	
2031397	EPA 353.2 Rev. 2.0	NO2NO3-N	0.26		mg N/L	P353142	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P352946	
	SM 5310 B-00	Organic Carbon	7.2		mg C/L	P353301	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.010		mg P/L	P352793	
	dissolved						

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

**Sample Location: EAST BRANCH PINE LOG CREEK ABOVE
 BEAR BAY FLATS ROAD**

Collection Date/Time: 10/03/2018 11:15

Field ID: G4NW0208

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2031392	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P352909	
	EPA 300.0 Rev. 2.1	Chloride	5.1		mg Cl/L	P353420	
		Sulfate	0.23	I	mg SO4/L	P353423	
	SM 2120 B	Color (true)	99		PCU	P352788	
	SM 2320 B-97	Total Alkalinity	10		mg CaCO3/L	P353271	
	SM 2540 C-97	TDS	50		mg/L	P353375	
	SM 2540 D-97	TSS	6	I	mg/L	P353360	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P353275	
2031398	EPA 350.1 Rev. 2.0	Ammonia-N	0.068		mg N/L	P353413	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P353121	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.024		mg N/L	P353142	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P352946	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P353301	
2031404	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.017		mg P/L	P352793	

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

Sample Location: PINE LOG CREEK UPSTREAM OF LONG ROAD Collection Date/Time: 10/03/2018 11:45

Field ID: G4NW0315

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2031393	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P352909	
	EPA 300.0 Rev. 2.1	Chloride	3.4		mg Cl/L	P353420	
		Sulfate	0.92		mg SO4/L	P353423	
	SM 2120 B	Color (true)	60		PCU	P352788	
	SM 2320 B-97	Total Alkalinity	6.3		mg CaCO3/L	P353271	
	SM 2540 C-97	TDS	34		mg/L	P353375	
	SM 2540 D-97	TSS	3	I	mg/L	P353360	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P353275	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P353414	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P353121	
2031399	EPA 353.2 Rev. 2.0	NO2NO3-N	0.17		mg N/L	P353142	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P352946	
	SM 5310 B-00	Organic Carbon	5.2		mg C/L	P353301	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.006	I	mg P/L	P352794	
	dissolved						

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

Sample Location: BEECH TREE CREEK ABOVE UN-NAMED ROAD

Collection Date/Time: 10/03/2018 12:10

Field ID: G4NW0330

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2031394	EPA 180.1 Rev. 2.0	Turbidity	4.7		NTU	P352909	
	EPA 300.0 Rev. 2.1	Chloride	2.4		mg Cl/L	P353420	
		Sulfate	0.65		mg SO4/L	P353423	
	SM 2120 B	Color (true)	31		PCU	P352788	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P353271	
	SM 2540 C-97	TDS	16	I	mg/L	P353375	
	SM 2540 D-97	TSS	7	IA	mg/L	P353360	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P353275	
2031400	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P353414	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.18	I	mg N/L	P353186	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.031		mg N/L	P353142	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P352946	
	SM 5310 B-00	Organic Carbon	2.9		mg C/L	P353301	
2031406	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P352794	

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

Sample Location: LONG CREEK UPSTREAM OF LONG ROAD

Collection Date/Time: 10/03/2018 12:25

Field ID: G4NW0308

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2031395	EPA 180.1 Rev. 2.0	Turbidity	4.2		NTU	P352909	
	EPA 300.0 Rev. 2.1	Chloride	3.5		mg Cl/L	P353434	
		Sulfate	0.43	I	mg SO4/L	P353439	
	SM 2120 B	Color (true)	69		PCU	P352788	
	SM 2320 B-97	Total Alkalinity	3.2		mg CaCO3/L	P353271	
	SM 2540 C-97	TDS	30		mg/L	P353375	
	SM 2540 D-97	TSS	5	I	mg/L	P353361	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P353275	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P353414	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31		mg N/L	P353186	
2031401	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P353143	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P352946	
	SM 5310 B-00	Organic Carbon	5.3		mg C/L	P353301	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P352794	
	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: POND CREEK IN McCLOUD BAY UPSTREAM
 OF HWY 393**

Collection Date/Time: 10/03/2018 13:10

Field ID: G4NW0349

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2031396	EPA 180.1 Rev. 2.0	Turbidity	5.8		NTU	P352909	
	EPA 300.0 Rev. 2.1	Chloride	3.7		mg Cl/L	P353434	
		Sulfate	1.3		mg SO4/L	P353439	
		Color (true)	60		PCU	P352789	
	SM 2320 B-97	Total Alkalinity	5.0		mg CaCO3/L	P353271	
	SM 2540 C-97	TDS	31		mg/L	P353375	
	SM 2540 D-97	TSS	9	I	mg/L	P353361	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P353275	
2031402	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P353414	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32		mg N/L	P353186	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P353143	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P352946	
	SM 5310 B-00	Organic Carbon	5.2		mg C/L	P353301	
2031408	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P352794	

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: P352909

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353420

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353423

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353434

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353439

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353413

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353414

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353121

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353186

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353142

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353143

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352946

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352793

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352794

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

Reference Method: SM 2120 B
Batch ID: P352788

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P352789

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P353271

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

Reference Method: SM 2540 C-97
Batch ID: P353375

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P353360

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P353361

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P353275

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P353301

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353420

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353423

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353434

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353439

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353413

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353414

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353121

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353186

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353142

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	99.5		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353143

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352946

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352793

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352794

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

Reference Method: SM 2120 B
Batch ID: P352788

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2120 B
Batch ID: P352789

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

Reference Method: SM 2320 B-97
Batch ID: P353271

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

Reference Method: SM 4500 F-C-97
Batch ID: P353275

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.5		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P353301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353420

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031117	Chloride	100		P	90 - 110
2031350	Chloride	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353423

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031117	Sulfate	98.6		P	90 - 110
2031350	Sulfate	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031491	Chloride	95.0		P	90 - 110
2031539	Chloride	92.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353439

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031491	Sulfate	96.8		P	90 - 110
2031539	Sulfate	91.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353413

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031237	Ammonia-N	99.3	97.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031399	Ammonia-N	96.9	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031397	Kjeldahl Nitrogen	107	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353186

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031498	Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353142

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353142

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031312	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353143

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031401	NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352946

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031376	Total-P	104	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352793

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031315	O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031406	O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P353275

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031693	Fluoride	95.4	95.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P353301

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2031209	Organic Carbon	95.4	94.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P352909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031391	Turbidity	7.65	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031117	Chloride	2.82	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031491	Chloride	2.09	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P353439

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031491	Sulfate	2.13	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031237	Ammonia-N	1.83	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P353414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031399	Ammonia-N	1.74	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031397	Kjeldahl Nitrogen	0.679	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P353186

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031498	Kjeldahl Nitrogen	0.830	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031312	NO2NO3-N	0.491	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031401	NO2NO3-N	0.468	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352946

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031376	Total-P	3.81	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352793

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031315	O-Phosphate-P	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031406	O-Phosphate-P	0.901	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P352788

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031391	Color (true)	1.98	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P352789

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031451	Color (true)	1.75	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P353271

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031693	Total Alkalinity	0.695	Sample	P	0 - 1.6

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P353375

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031374	TDS	3.97	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P353275

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031693	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P353301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2031209	Organic Carbon	0.271	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: A86918

Included Lab Sample IDs: 2031391, 2031392, 2031393, 2031394, 2031395, 2031396

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115
Color (true)	101	99.7	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A86919

Included Lab Sample IDs: 2031403, 2031404, 2031405, 2031406, 2031407, 2031408

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.2	P/P	90 - 110
O-Phosphate-P	99.9	99.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A86964

Included Lab Sample IDs: 2031391, 2031392, 2031393, 2031394, 2031395, 2031396

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A87067

Included Lab Sample IDs: 2031397, 2031398, 2031399, 2031400, 2031401, 2031402

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A87074

Included Lab Sample IDs: 2031397, 2031399, 2031400, 2031401, 2031402

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A87101

Included Lab Sample IDs: 2031398

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A87105

Included Lab Sample IDs: 2031391, 2031392, 2031393, 2031394, 2031395, 2031396

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	98.3	P/P	90 - 110
Chloride	96.0	100	P/P	90 - 110
Chloride	99.8	100	P/P	90 - 110
Sulfate	95.8	99.7	P/P	90 - 110
Sulfate	99.3	99.4	P/P	90 - 110
Sulfate	99.4	97.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A87109

Included Lab Sample IDs: 2031391, 2031392, 2031393, 2031394, 2031395, 2031396

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A87109

Included Lab Sample IDs: 2031391, 2031392, 2031393, 2031394, 2031395, 2031396

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87112

Included Lab Sample IDs: 2031397, 2031398, 2031399, 2031400, 2031401, 2031402

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	100	P/P	90 - 110
Kjeldahl Nitrogen	98.4	102	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A87126

Included Lab Sample IDs: 2031397, 2031398, 2031399, 2031400, 2031401, 2031402

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	96.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87188

Included Lab Sample IDs: 2031397, 2031398, 2031399, 2031400, 2031401, 2031402

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	103	P/P	90 - 110
Ammonia-N	99.7	103	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	MS
EPA 180.1 Rev. 2.0	Turbidity				7.65	
EPA 300.0 Rev. 2.1	Chloride	99.3	100	98.2	2.82	
	Chloride	98.8	95.0	92.7	2.09	
	Sulfate	99.4	98.6	97.5		
	Sulfate	98.4	96.8	91.2	2.13	
	Ammonia-N	101	99.3	97.4		1.83
EPA 350.1 Rev. 2.0	Ammonia-N	97.7	96.9	98.8		1.74
	Kjeldahl Nitrogen	105	107	108		0.679
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	101	102		0.830
	NO2NO3-N	99.5	102	102		0.491
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100			0.468
	Total-P	105	104	108		3.81
EPA 365.1 Rev. 2.0	O-Phosphate-P	98.9	99.4	100		1.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	99.4	100		0.901
SM 2120 B	Color (true)	104			1.98	
	Color (true)	103			1.75	
SM 2320 B-97	Total Alkalinity	103			0.695	
SM 2540 C-97	TDS				3.97	
SM 4500 F-C-97	Fluoride	96.5	95.4	95.4		0.0
SM 5310 B-00	Organic Carbon	93.1	95.4	94.8		0.271

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2031397, 2031398, 2031399, 2031400, 2031401, 2031402
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2031397, 2031398, 2031399, 2031400, 2031401, 2031402
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2031397, 2031398, 2031399, 2031400, 2031401, 2031402
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2031397, 2031398, 2031399, 2031400, 2031401, 2031402
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2031403, 2031404, 2031405, 2031406, 2031407, 2031408
SM 2120 B / E31780	True Color measured at 450 nm	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2031397, 2031398, 2031399, 2031400, 2031401, 2031402

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	10/04/2018			10/04/2018 16:07	Megan Treadwell	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
EPA 300.0 Rev. 2.1	10/04/2018			10/19/2018 01:47	Lipi Saha	2031391
	10/04/2018			10/19/2018 02:23	Lipi Saha	2031392
	10/04/2018			10/19/2018 02:35	Lipi Saha	2031393
	10/04/2018			10/19/2018 02:47	Lipi Saha	2031394
	10/04/2018			10/19/2018 20:37	Lipi Saha	2031395
	10/04/2018			10/19/2018 20:49	Lipi Saha	2031396
EPA 350.1 Rev. 2.0	10/04/2018			10/19/2018 11:22	Ping Hua	2031397
	10/04/2018			10/19/2018 11:23	Ping Hua	2031398
	10/04/2018			10/19/2018 11:35	Ping Hua	2031399
	10/04/2018			10/19/2018 11:40	Ping Hua	2031400
	10/04/2018			10/19/2018 11:41	Ping Hua	2031401
	10/04/2018			10/19/2018 11:43	Ping Hua	2031402
EPA 351.2 Rev. 2.0	10/04/2018	10/16/2018 16:30	Adrian Shelby	10/18/2018 10:10	Joseph Suarez	2031397
	10/04/2018	10/16/2018 16:30	Adrian Shelby	10/18/2018 10:15	Joseph Suarez	2031398
	10/04/2018	10/16/2018 16:30	Adrian Shelby	10/18/2018 10:16	Joseph Suarez	2031399
	10/04/2018	10/17/2018 11:30	Adrian Shelby	10/18/2018 10:50	Joseph Suarez	2031400
	10/04/2018	10/17/2018 11:30	Adrian Shelby	10/18/2018 10:52	Joseph Suarez	2031401
	10/04/2018	10/17/2018 11:30	Adrian Shelby	10/18/2018 10:53	Joseph Suarez	2031402
EPA 353.2 Rev. 2.0	10/04/2018			10/16/2018 11:16	Lauren Bottorf	2031397
	10/04/2018			10/16/2018 11:18	Lauren Bottorf	2031398
	10/04/2018			10/16/2018 11:19	Lauren Bottorf	2031399
	10/04/2018			10/16/2018 11:20	Lauren Bottorf	2031400
	10/04/2018			10/16/2018 11:27	Lauren Bottorf	2031401
	10/04/2018			10/16/2018 11:33	Lauren Bottorf	2031402
EPA 365.1 Rev. 2.0	10/04/2018	10/08/2018 13:30	Sima Feizi	10/16/2018 14:59	Beverly Y. Sanders	2031397
	10/04/2018	10/08/2018 13:30	Sima Feizi	10/16/2018 15:00	Beverly Y. Sanders	2031399
	10/04/2018	10/08/2018 13:30	Sima Feizi	10/16/2018 15:01	Beverly Y. Sanders	2031400
	10/04/2018	10/08/2018 13:30	Sima Feizi	10/16/2018 15:02	Beverly Y. Sanders	2031401
	10/04/2018	10/08/2018 13:30	Sima Feizi	10/16/2018 15:03	Beverly Y. Sanders	2031402
	10/04/2018	10/08/2018 13:30	Sima Feizi	10/17/2018 09:45	Beverly Y. Sanders	2031398
EPA 365.1 Rev. 2.0 dissolved	10/04/2018			10/04/2018 15:33	Julia Storbeck	2031406
	10/04/2018			10/04/2018 16:48	Julia Storbeck	2031403
	10/04/2018			10/04/2018 16:49	Julia Storbeck	2031404
	10/04/2018			10/04/2018 16:50	Julia Storbeck	2031405, 2031407
	10/04/2018			10/04/2018 16:51	Julia Storbeck	2031408
SM 2120 B	10/04/2018			10/04/2018 16:57	Chelsea Hernandez	2031391
	10/04/2018			10/04/2018 16:58	Chelsea Hernandez	2031392
	10/04/2018			10/04/2018 16:59	Chelsea Hernandez	2031393

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2120 B	10/04/2018			10/04/2018 17:00	Chelsea Hernandez	2031394, 2031395
	10/04/2018			10/04/2018 17:04	Chelsea Hernandez	2031396
SM 2320 B-97	10/04/2018			10/17/2018 02:33	Dale L. Simmons	2031391
	10/04/2018			10/17/2018 02:44	Dale L. Simmons	2031392
	10/04/2018			10/17/2018 02:56	Dale L. Simmons	2031393
	10/04/2018			10/17/2018 03:05	Dale L. Simmons	2031394
	10/04/2018			10/17/2018 03:16	Dale L. Simmons	2031395
	10/04/2018			10/17/2018 03:26	Dale L. Simmons	2031396
SM 2540 C-97	10/04/2018			10/08/2018 15:30	DeAsia Armster	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
SM 2540 D-97	10/04/2018			10/08/2018 15:30	DeAsia Armster	2031391, 2031392, 2031393, 2031394, 2031395, 2031396
SM 4500 F-C-97	10/04/2018			10/17/2018 02:33	Dale L. Simmons	2031391
	10/04/2018			10/17/2018 02:44	Dale L. Simmons	2031392
	10/04/2018			10/17/2018 02:56	Dale L. Simmons	2031393
	10/04/2018			10/17/2018 03:05	Dale L. Simmons	2031394
	10/04/2018			10/17/2018 03:16	Dale L. Simmons	2031395
	10/04/2018			10/17/2018 03:26	Dale L. Simmons	2031396
SM 5310 B-00	10/04/2018			10/18/2018 02:47	Megan Treadwell	2031397
	10/04/2018			10/18/2018 03:00	Megan Treadwell	2031398
	10/04/2018			10/18/2018 03:12	Megan Treadwell	2031399
	10/04/2018			10/18/2018 03:24	Megan Treadwell	2031400
	10/04/2018			10/18/2018 03:36	Megan Treadwell	2031401
	10/04/2018			10/18/2018 03:49	Megan Treadwell	2031402