

Chemical Analysis Report

SO-DIST-2021-08-12-01

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

Event Description: **2021 SMP : Smol Highlands**
Request ID: **RQ-2021-08-02-77**
Customer: **SO-DIST**
Project ID: **SMP**

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Date Certified: 07-SEP-2021 09:32



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 by the Florida Department of Health Environmental Laboratory Certification Program 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 Bonnet Lake @ Middle

Collection Date/Time: 08/11/2021 11:15

Field ID: G4SD0169

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2269231	EPA 180.1 Rev. 2.0	Turbidity	18		NTU	P402421	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P402926	
		Sulfate	37		mg SO4/L	P402927	
	SM 2120 B-2011	Color (true)	19	J	PCU	P402424	
	SM 2320 B-2011	Total Alkalinity	35		mg CaCO3/L	P402619	
	SM 2540 C-2011	TDS	155		mg/L	P402861	
	SM 2540 D-2011	TSS	18		mg/L	P402752	
2269234	SM 4500 F-C-2011	Fluoride	0.073	I	mg F/L	P402622	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P402572	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.3		mg N/L	P402968	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.026		mg N/L	P402506	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P402560	MS
2269237	SM 5310 B-2011	Organic Carbon	12		mg C/L	P403055	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P402400	

Ref. Method and Comment:

SM 2120 B-2011: The result may be biased high because of matrix interference.

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Denton

Collection Date/Time: 08/11/2021 11:55

Field ID: G4SD0180

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2269232	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P402421	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P402926	
		Sulfate	43		mg SO4/L	P402927	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P402424	
	SM 2320 B-2011	Total Alkalinity	39	A	mg CaCO3/L	P402619	
	SM 2540 C-2011	TDS	152		mg/L	P402861	
	SM 2540 D-2011	TSS	2	U	mg/L	P402752	
	SM 4500 F-C-2011	Fluoride	0.23		mg F/L	P402622	
2269235	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P402572	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.28		mg N/L	P402968	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.8		mg N/L	P402506	
	EPA 365.1 Rev. 2.0	Total-P	0.002	I	mg P/L	P402560	MS
	SM 5310 B-2011	Organic Carbon	1.8		mg C/L	P403055	
2269238	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P402401	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Apthorpe

Collection Date/Time: 08/11/2021 13:00

Field ID: G4SD0185

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2269233	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P402421	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P402926	
		Sulfate	26		mg SO4/L	P402927	
	SM 2120 B-2011	Color (true)	48	A	PCU	P402425	
	SM 2320 B-2011	Total Alkalinity	17		mg CaCO3/L	P402619	
	SM 2540 C-2011	TDS	107		mg/L	P402861	
	SM 2540 D-2011	TSS	3	I	mg/L	P402752	
	SM 4500 F-C-2011	Fluoride	0.046	I	mg F/L	P402622	
2269236	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P402572	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P402968	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P402506	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P402560	MS
	SM 5310 B-2011	Organic Carbon	9.9		mg C/L	P403055	
2269239	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P402401	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Damon @ Middle

Collection Date/Time: 08/11/2021 10:25

Field ID: G4SD0168

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2269240	EPA 180.1 Rev. 2.0	Turbidity	1.3	A	NTU	P402422	
	EPA 300.0 Rev. 2.1	Chloride	16	A	mg Cl/L	P402926	
		Sulfate	37	A	mg SO4/L	P402927	
		Color (true)	11		PCU	P402424	
	SM 2320 B-2011	Total Alkalinity	10		mg CaCO3/L	P402619	
	SM 2540 C-2011	TDS	106		mg/L	P402861	
	SM 2540 D-2011	TSS	2	I	mg/L	P402752	
	SM 4500 F-C-2011	Fluoride	0.11		mg F/L	P402622	
2269241	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P402706	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P402968	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P402506	
	EPA 365.1 Rev. 2.0	Total-P	0.64		mg P/L	P402560	MS
	SM 5310 B-2011	Organic Carbon	4.2		mg C/L	P403055	
2269242	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P402401	
2269248	EPA 200.7 Rev. 4.4	Barium	18.2		ug/L	P402557	
		Calcium	10.2		mg/L	P402557	
		Iron	30	U	ug/L	P402557	
		Magnesium	6.63		mg/L	P402557	
		Manganese	3.9	I	ug/L	P402557	
		Potassium	8.7		mg/L	P402557	
		Sodium	5.1		mg/L	P402557	
		Zinc	5.0	U	ug/L	P402557	
	EPA 200.8 Rev. 5.4	Aluminum	26		ug/L	P402557	
		Antimony	0.11	I	ug/L	P402557	
		Arsenic	0.83		ug/L	P402557	
		Beryllium	0.010	U	ug/L	P402557	
		Boron**	49.3		ug/L	P402557	
		Cadmium	0.020	U	ug/L	P402557	
		Chromium	0.40	U	ug/L	P402557	
		Copper	0.52	I	ug/L	P402557	
		Lead	0.20	U	ug/L	P402557	
		Nickel	0.50	U	ug/L	P402557	
		Selenium	0.20	U	ug/L	P402557	
		Silver	0.010	U	ug/L	P402557	
		Thallium	0.10	U	ug/L	P402557	
		Hardness	52.8		mg/L	P402557	

Ref. Method and Comment:

SM 2540 D-2011: 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: P402421

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P402422

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402557

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/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: P402557

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402926

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402927

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402572

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402706

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402968

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402506

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402560

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402400

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402401

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

Reference Method: SM 2120 B-2011
Batch ID: P402424

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P402425

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P402619

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

Reference Method: SM 2540 C-2011
Batch ID: P402861

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P402752

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P402622

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P403055

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: P402557

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	108		P	85 - 115
Calcium	103		P	85 - 115
Iron	108		P	85 - 115
Magnesium	108		P	85 - 115
Manganese	103		P	85 - 115
Potassium	104		P	85 - 115
Sodium	102		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P402557

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	98.3		P	85 - 115
Beryllium	94.3		P	85 - 115
Boron	102		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	96.1		P	85 - 115
Copper	95.2		P	85 - 115
Lead	102		P	85 - 115
Nickel	98.4		P	85 - 115
Selenium	96.8		P	85 - 115
Silver	104		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402926

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402927

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402572

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402706

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P402968

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P402506

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P402560

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P402400

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P402401

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

Reference Method: SM 2120 B-2011

Batch ID: P402424

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	85 - 115

Reference Method: SM 2120 B-2011

Batch ID: P402425

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-2011

Batch ID: P402619

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Reference Method: SM 4500 F-C-2011

Batch ID: P402622

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	92 - 107

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P403055

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P402557

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268535	Barium	105	107	P/P	80 - 120
2268535	Calcium	101		P	80 - 120
2268535	Iron	107	107	P/P	80 - 120
2268535	Magnesium	106	107	P/P	80 - 120
2268535	Manganese	102	103	P/P	80 - 120
2268535	Potassium	103	104	P/P	80 - 120
2268535	Sodium	99.9		P	80 - 120
2268535	Zinc	105	106	P/P	80 - 120
2269248	Barium	105		P	80 - 120
2269248	Calcium	101		P	80 - 120
2269248	Iron	108		P	80 - 120
2269248	Magnesium	101		P	80 - 120
2269248	Manganese	101		P	80 - 120
2269248	Potassium	101		P	80 - 120
2269248	Sodium	103		P	80 - 120
2269248	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P402557

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268535	Aluminum	101	101	P/P	80 - 120
2268535	Antimony	104	105	P/P	80 - 120
2268535	Arsenic	98.5	98.3	P/P	80 - 120
2268535	Beryllium	95.9	98.5	P/P	80 - 120
2268535	Boron	102	103	P/P	80 - 120
2268535	Cadmium	100	103	P/P	80 - 120
2268535	Chromium	103	102	P/P	80 - 120
2268535	Copper	95.5	96.0	P/P	80 - 120
2268535	Lead	102	103	P/P	80 - 120
2268535	Nickel	96.2	95.9	P/P	80 - 120
2268535	Selenium	97.9	99.2	P/P	80 - 120
2268535	Silver	101	102	P/P	80 - 120
2268535	Thallium	105	106	P/P	80 - 120
2269248	Aluminum	98.1		P	80 - 120
2269248	Antimony	103		P	80 - 120
2269248	Arsenic	99.3		P	80 - 120
2269248	Beryllium	96.5		P	80 - 120
2269248	Boron	104		P	80 - 120
2269248	Cadmium	102		P	80 - 120
2269248	Chromium	97.5		P	80 - 120
2269248	Copper	94.9		P	80 - 120
2269248	Lead	104		P	80 - 120
2269248	Nickel	97.3		P	80 - 120
2269248	Selenium	97.3		P	80 - 120
2269248	Silver	102		P	80 - 120
2269248	Thallium	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P402926

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: P402926

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269094	Chloride	98.3		P	90 - 110
2269240	Chloride	98.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402927

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269094	Sulfate	101		P	90 - 110
2269240	Sulfate	96.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269294	Ammonia-N	99.8	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269095	Ammonia-N	97.4	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269166	Kjeldahl Nitrogen	98.0	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402506

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269209	NO2NO3-N	97.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269284	Total-P	111	112	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269210	O-Phosphate-P	96.8	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269242	O-Phosphate-P	95.5	95.3	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P402622

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269232	Fluoride	100	102	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P403055

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269122	Organic Carbon	95.0	96.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P402421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269103	Turbidity	8.11	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P402422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269240	Turbidity	2.26	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402557

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268535	Barium	1.72	Spike	P	0 - 20
2268535	Calcium	1.62	Spike	P	0 - 20
2268535	Iron	0.256	Spike	P	0 - 20
2268535	Magnesium	0.129	Spike	P	0 - 20
2268535	Manganese	1.58	Spike	P	0 - 20
2268535	Potassium	0.621	Spike	P	0 - 20
2268535	Sodium	1.48	Spike	P	0 - 20
2268535	Zinc	0.377	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P402557

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268535	Aluminum	0.231	Spike	P	0 - 20
2268535	Antimony	0.821	Spike	P	0 - 20
2268535	Arsenic	0.192	Spike	P	0 - 20
2268535	Beryllium	2.69	Spike	P	0 - 20
2268535	Boron	0.467	Spike	P	0 - 20
2268535	Cadmium	2.14	Spike	P	0 - 20
2268535	Chromium	0.259	Spike	P	0 - 20
2268535	Copper	0.432	Spike	P	0 - 20
2268535	Lead	0.443	Spike	P	0 - 20
2268535	Nickel	0.300	Spike	P	0 - 20
2268535	Selenium	1.34	Spike	P	0 - 20
2268535	Silver	1.16	Spike	P	0 - 20
2268535	Thallium	1.34	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269240	Chloride	0.198	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402927

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269240	Sulfate	0.446	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269294	Ammonia-N	1.59	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269095	Ammonia-N	0.748	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269166	Kjeldahl Nitrogen	0.158	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402506

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269209	NO2NO3-N	0.199	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269284	Total-P	1.15	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402400

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269210	O-Phosphate-P	0.708	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269242	O-Phosphate-P	0.210	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
 Batch ID: P402424

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269121	Color (true)	1.82	Sample	P	0 - 20

Reference Method: SM 2120 B-2011
 Batch ID: P402425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269233	Color (true)	0.215	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
 Batch ID: P402619

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269232	Total Alkalinity	2.34	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
 Batch ID: P402861

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269208	TDS	2.33	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P402622

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269232	Fluoride	0.946	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
 Batch ID: P403055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269122	Organic Carbon	0.819	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A107220

Included Lab Sample IDs: 2269237, 2269238, 2269239, 2269242

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A107230

Included Lab Sample IDs: 2269231, 2269232, 2269233, 2269240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105
Turbidity	101	102	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A107231

Included Lab Sample IDs: 2269231, 2269232, 2269233, 2269240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115
Color (true)	101	101	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107268

Included Lab Sample IDs: 2269234, 2269235, 2269236, 2269241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	P/P	90 - 110
NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107292

Included Lab Sample IDs: 2269234, 2269235, 2269236

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.3	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A107310

Included Lab Sample IDs: 2269231, 2269232, 2269233, 2269240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	99.4	P/P	90 - 110
Total Alkalinity	99.4	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A107310

Included Lab Sample IDs: 2269231, 2269232, 2269233, 2269240

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107342

Included Lab Sample IDs: 2269241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	98.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107347

Included Lab Sample IDs: 2269248

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.1	96.6	P/P	90 - 110
Antimony	97.3	97.4	P/P	90 - 110
Arsenic	97.9	94.4	P/P	90 - 110
Beryllium	94.4	90.9	P/P	90 - 110
Boron	96.7	100	P/P	90 - 110
Cadmium	97.8	98.2	P/P	90 - 110
Chromium	92.9	91.6	P/P	90 - 110
Copper	93.9	90.2	P/P	90 - 110
Lead	97.7	97.1	P/P	90 - 110
Nickel	97.6	94.1	P/P	90 - 110
Selenium	96.2	95.2	P/P	90 - 110
Silver	96.3	95.6	P/P	90 - 110
Thallium	99.2	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107369

Included Lab Sample IDs: 2269234, 2269235, 2269236

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	99.2	P/P	90 - 110
Total-P	99.8	98.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107416

Included Lab Sample IDs: 2269248

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	105	P/P	90 - 110
Calcium	98.8	96.6	P/P	90 - 110
Iron	99.9	98.0	P/P	90 - 110
Magnesium	99.1	96.8	P/P	90 - 110
Manganese	99.9	103	P/P	90 - 110
Potassium	100	99.6	P/P	90 - 110
Sodium	98.8	98.9	P/P	90 - 110
Zinc	98.7	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107424

Included Lab Sample IDs: 2269241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	107	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107449

Included Lab Sample IDs: 2269231, 2269232, 2269233, 2269240

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107494

Included Lab Sample IDs: 2269234, 2269235, 2269236, 2269241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	102	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A107501

Included Lab Sample IDs: 2269234, 2269235, 2269236, 2269241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	96.4	P/P	90 - 110
Organic Carbon	96.4	97.0	P/P	90 - 110
Organic Carbon	97.0	96.9	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					8.11	
	Turbidity					2.26	
EPA 200.7 Rev. 4.4	Barium	108	105	107	105		1.72
	Calcium	103	101	101			1.62
	Iron	108	107	107	108		0.256
	Magnesium	108	106	107	101		0.129
	Manganese	103	102	103	101		1.58
	Potassium	104	103	104	101		0.621
	Sodium	102	99.9	103			1.48
	Zinc	105	105	106	101		0.377
EPA 200.8 Rev. 5.4	Aluminum	100	98.1	101	101		0.231
	Antimony	102	103	104	105		0.821
	Arsenic	98.3	99.3	98.5	98.3		0.192
	Beryllium	94.3	96.5	95.9	98.5		2.69
	Boron	102	104	102	103		0.467
	Cadmium	102	102	100	103		2.14
	Chromium	96.1	97.5	103	102		0.259
	Copper	95.2	94.9	95.5	96.0		0.432
	Lead	102	104	102	103		0.443
	Nickel	98.4	97.3	96.2	95.9		0.300
	Selenium	96.8	97.3	97.9	99.2		1.34
	Silver	104	102	101	102		1.16
	Thallium	103	107	105	106		1.34
EPA 300.0 Rev. 2.1	Chloride	101	98.8	98.3		0.198	
	Sulfate	102	96.1	101		0.446	
EPA 350.1 Rev. 2.0	Ammonia-N	102	99.8	101			1.59
	Ammonia-N	101	97.4	98.2			0.748
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	98.0	98.2			0.158
EPA 353.2 Rev. 2.0	NO2NO3-N	104	97.8				0.199
EPA 365.1 Rev. 2.0	Total-P	109	111	112			1.15
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	96.8	97.8			0.708
	O-Phosphate-P	98.7	95.5	95.3			0.210
SM 2120 B-2011	Color (true)	99.6				1.82	
	Color (true)	100				0.215	
SM 2320 B-2011	Total Alkalinity	102				2.34	
SM 2540 C-2011	TDS					2.33	
SM 4500 F-C-2011	Fluoride	101	100	102			0.946
SM 5310 B-2011	Organic Carbon	95.0	95.0	96.3			0.819

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2269231, 2269232, 2269233, 2269240
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2269248
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2269248
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2269231, 2269232, 2269233, 2269240
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2269231, 2269232, 2269233, 2269240
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2269234, 2269235, 2269236, 2269241
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2269234, 2269235, 2269236, 2269241
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2269234, 2269235, 2269236, 2269241
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2269234, 2269235, 2269236, 2269241

Reference Method Descriptions

Method	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2269237, 2269238, 2269239, 2269242
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2269231, 2269232, 2269233, 2269240
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2269231, 2269232, 2269233, 2269240
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2269248
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2269231, 2269232, 2269233, 2269240
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2269231, 2269232, 2269233, 2269240
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2269231, 2269232, 2269233, 2269240
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2269234, 2269235, 2269236, 2269241

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	08/12/2021			08/12/2021 16:06	Sarah A Nixon	2269231, 2269232, 2269233, 2269240
EPA 200.7 Rev. 4.4	08/12/2021	08/17/2021 15:35	Elliott D. Healy	08/23/2021 20:44	Josef B Mick	2269248
EPA 200.8 Rev. 5.4	08/12/2021	08/17/2021 15:35	Elliott D. Healy	08/19/2021 15:13	Alexander Thompson	2269248
EPA 300.0 Rev. 2.1	08/12/2021			08/24/2021 00:11	Lipi Saha	2269240
	08/12/2021			08/24/2021 03:26	Lipi Saha	2269231
	08/12/2021			08/24/2021 03:38	Lipi Saha	2269232
	08/12/2021			08/24/2021 03:50	Lipi Saha	2269233
EPA 350.1 Rev. 2.0	08/12/2021			08/17/2021 12:13	Roberta Tatti	2269234
	08/12/2021			08/17/2021 12:14	Roberta Tatti	2269235
	08/12/2021			08/17/2021 12:16	Roberta Tatti	2269236
	08/12/2021			08/19/2021 13:51	Roberta Tatti	2269241
EPA 351.2 Rev. 2.0	08/12/2021	08/25/2021 13:58	Benjamin T. Nordmann	08/26/2021 13:20	Virginia P. Brown	2269234
	08/12/2021	08/25/2021 13:58	Benjamin T. Nordmann	08/26/2021 13:22	Virginia P. Brown	2269235
	08/12/2021	08/25/2021 13:58	Benjamin T. Nordmann	08/26/2021 13:23	Virginia P. Brown	2269236
	08/12/2021	08/25/2021 13:58	Benjamin T. Nordmann	08/26/2021 13:25	Virginia P. Brown	2269241
EPA 353.2 Rev. 2.0	08/12/2021			08/16/2021 11:29	Beverly Y. Sanders	2269234
	08/12/2021			08/16/2021 11:32	Beverly Y. Sanders	2269241
	08/12/2021			08/16/2021 12:02	Beverly Y. Sanders	2269235
	08/12/2021			08/16/2021 12:03	Beverly Y. Sanders	2269236
EPA 365.1 Rev. 2.0	08/12/2021	08/17/2021 14:55	Simonne.V. Calhoun	08/20/2021 13:57	Shengyu Ding	2269235
	08/12/2021	08/17/2021 14:55	Simonne.V. Calhoun	08/20/2021 13:58	Shengyu Ding	2269236
	08/12/2021	08/17/2021 14:55	Simonne.V. Calhoun	08/20/2021 14:16	Shengyu Ding	2269234
	08/12/2021	08/17/2021 14:55	Simonne.V. Calhoun	08/24/2021 10:53	Lipi Saha	2269241
EPA 365.1 Rev. 2.0 dissolved	08/12/2021			08/12/2021 15:25	Blanca Fach	2269237
	08/12/2021			08/12/2021 15:28	Blanca Fach	2269242
	08/12/2021			08/12/2021 15:31	Blanca Fach	2269238
	08/12/2021			08/12/2021 15:36	Blanca Fach	2269239
SM 2120 B-2011	08/12/2021			08/12/2021 16:47	Sarah A Nixon	2269231
	08/12/2021			08/12/2021 16:48	Sarah A Nixon	2269232
	08/12/2021			08/12/2021 16:49	Sarah A Nixon	2269240
	08/12/2021			08/12/2021 16:54	Sarah A Nixon	2269233
SM 2320 B-2011	08/12/2021			08/17/2021 22:36	Dale L. Simmons	2269232
	08/12/2021			08/17/2021 22:58	Dale L. Simmons	2269231
	08/12/2021			08/17/2021 23:11	Dale L. Simmons	2269233
	08/12/2021			08/17/2021 23:58	Dale L. Simmons	2269240
SM 2340B	08/12/2021			08/23/2021 20:44	Josef B Mick	2269248
SM 2540 C-2011	08/12/2021			08/16/2021 15:36	Yijie Li	2269231, 2269232, 2269233, 2269240
SM 2540 D-2011	08/12/2021			08/16/2021 15:36	Yijie Li	2269231, 2269232, 2269233, 2269240
SM 4500 F-C-2011	08/12/2021			08/17/2021 22:24	Dale L. Simmons	2269232
	08/12/2021			08/17/2021 22:58	Dale L. Simmons	2269231

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-2011	08/12/2021			08/17/2021 23:11	Dale L. Simmons	2269233
	08/12/2021			08/17/2021 23:58	Dale L. Simmons	2269240
SM 5310 B-2011	08/12/2021			08/25/2021 22:19	Madeline Gruver	2269236
	08/12/2021			08/26/2021 01:46	Madeline Gruver	2269234
	08/12/2021			08/26/2021 02:25	Madeline Gruver	2269235
	08/12/2021			08/26/2021 02:38	Madeline Gruver	2269241