

Chemical Analysis Report

SE-DIST-2020-12-17-01

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

Event Description: **SMP- Nubbin/Kissimmee Finish**

Request ID: **RQ-2020-11-16-26**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

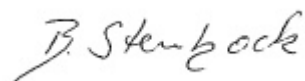
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Date Certified: 11-JAN-2021 10:32



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: Kissimmee Upstream Of 78

Collection Date/Time: 12/16/2020 14:20

Field ID: G4SE0131

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2214343	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P391377	
	EPA 300.0 Rev. 2.1	Chloride	28		mg Cl/L	P391845	
		Sulfate	11		mg SO4/L	P391848	
	SM 2120 B-2011	Color (true)	130		PCU	P391433	
	SM 2320 B-2011	Total Alkalinity	31		mg CaCO3/L	P391499	
	SM 2540 C-2011	TDS	110		mg/L	P391868	
	SM 2540 D-2011	TSS	3	I	mg/L	P391766	
	SM 4500 F-C-2011	Fluoride	0.080	I	mg F/L	P391500	
2214344	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P391737	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P391709	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P391512	
	EPA 365.1 Rev. 2.0	Total-P	0.063		mg P/L	P391517	
	SM 5310 B-2011	Organic Carbon	18		mg C/L	P391597	
2214345	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P391372	

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: Nubbin Slough Upstream Of Sta

Collection Date/Time: 12/16/2020 15:30

Field ID: G1SE0004

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2214346	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P391377	
	EPA 300.0 Rev. 2.1	Chloride	32		mg Cl/L	P391845	
		Sulfate	4.4		mg SO4/L	P391848	
		Color (true)	360		PCU	P391433	
	SM 2320 B-2011	Total Alkalinity	46		mg CaCO3/L	P391499	
	SM 2540 C-2011	TDS	166		mg/L	P391868	
	SM 2540 D-2011	TSS	3	I	mg/L	P391766	
	SM 4500 F-C-2011	Fluoride	0.098	I	mg F/L	P391500	
2214347	EPA 350.1 Rev. 2.0	Ammonia-N	0.15		mg N/L	P391737	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P391714	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.062		mg N/L	P391512	
	EPA 365.1 Rev. 2.0	Total-P	0.28		mg P/L	P391517	
	SM 5310 B-2011	Organic Carbon	37		mg C/L	P391597	
2214348	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.22		mg P/L	P391373	
2214362	EPA 200.7 Rev. 4.4	Barium	10.5		ug/L	P391540	
		Calcium	15.2		mg/L	P391540	
		Iron	630		ug/L	P391540	
		Magnesium	4.96		mg/L	P391540	
		Potassium	11.1		mg/L	P391540	
		Sodium	19.8		mg/L	P391540	
		Zinc	5.0	U	ug/L	P391540	
	EPA 200.8 Rev. 5.4	Aluminum	218		ug/L	P391540	
		Antimony	0.050	U	ug/L	P391540	
		Arsenic	0.81		ug/L	P391540	
		Boron**	34.6		ug/L	P391540	
		Cadmium	0.020	U	ug/L	P391540	
		Chromium	1.2	I	ug/L	P391540	
		Copper	0.40	U	ug/L	P391540	
		Lead	0.20	U	ug/L	P391540	
		Nickel	0.50	U	ug/L	P391540	
		Selenium	0.22	I	ug/L	P391540	
		Silver	0.010	U	ug/L	P391540	
		Thallium	0.10	U	ug/L	P391540	
		Hardness	58.3		mg/L	P391540	
	SM 2340B						

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for lead are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P391377

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P391540

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
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: P391540

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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: P391845

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391848

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391737

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391709

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391714

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391512

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391517

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391372

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391373

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

Reference Method: SM 2120 B-2011
Batch ID: P391433

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P391499

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

Reference Method: SM 2540 C-2011
Batch ID: P391868

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P391766

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P391500

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P391597

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: P391540

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	106		P	85 - 115
Calcium	109		P	85 - 115
Iron	109		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	102		P	85 - 115
Sodium	108		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P391540

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.9		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	95.6		P	85 - 115
Boron	99.0		P	85 - 115
Cadmium	94.4		P	85 - 115
Chromium	97.3		P	85 - 115
Copper	92.3		P	85 - 115
Lead	99.7		P	85 - 115
Nickel	90.9		P	85 - 115
Selenium	94.9		P	85 - 115
Silver	100		P	85 - 115
Thallium	98.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391845

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391848

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391737

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391709

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391714

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391512

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391517

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391372

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391373

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

Reference Method: SM 2120 B-2011
Batch ID: P391433

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

Reference Method: SM 2320 B-2011
Batch ID: P391499

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P391500

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P391597

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P391540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2213231	Barium	107		P	80 - 120
2213231	Calcium	99.3		P	80 - 120
2213231	Iron	111		P	80 - 120
2213231	Magnesium	109		P	80 - 120
2213231	Potassium	100		P	80 - 120
2213231	Sodium	107		P	80 - 120
2213231	Zinc	107		P	80 - 120
2213945	Barium	106	108	P/P	80 - 120
2213945	Calcium	107	105	P/P	80 - 120
2213945	Iron	108	107	P/P	80 - 120
2213945	Magnesium	107	106	P/P	80 - 120
2213945	Potassium	108	107	P/P	80 - 120
2213945	Sodium	103	104	P/P	80 - 120
2213945	Zinc	102	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P391540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2213231	Aluminum	92.5		P	80 - 120
2213231	Antimony	101		P	80 - 120
2213231	Arsenic	96.2		P	80 - 120
2213231	Boron	98.4		P	80 - 120
2213231	Cadmium	94.4		P	80 - 120
2213231	Chromium	99.7		P	80 - 120
2213231	Copper	90.6		P	80 - 120
2213231	Nickel	91.5		P	80 - 120
2213231	Selenium	94.9		P	80 - 120
2213231	Silver	99.8		P	80 - 120
2213231	Thallium	103		P	80 - 120
2213945	Aluminum	95.8	97.2	P/P	80 - 120
2213945	Antimony	101	100	P/P	80 - 120
2213945	Arsenic	94.8	95.3	P/P	80 - 120
2213945	Boron	98.6	100	P/P	80 - 120
2213945	Cadmium	96.4	94.0	P/P	80 - 120
2213945	Chromium	98.5	99.0	P/P	80 - 120
2213945	Copper	93.4	94.1	P/P	80 - 120
2213945	Lead	102	102	P/P	80 - 120
2213945	Nickel	92.7	93.0	P/P	80 - 120
2213945	Selenium	93.4	94.4	P/P	80 - 120
2213945	Silver	102	102	P/P	80 - 120
2213945	Thallium	101	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2213839	Chloride	102		P	90 - 110
2214346	Chloride	103		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391848

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2213839	Sulfate	104		P	90 - 110
2214346	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391737

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214327	Ammonia-N	97.8	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391709

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214243	Kjeldahl Nitrogen	94.6	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391714

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214543	Kjeldahl Nitrogen	115	112	F/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391512

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214262	NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214262	Total-P	103	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391372

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214244	O-Phosphate-P	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214394	O-Phosphate-P	99.6	95.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P391500

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214498	Fluoride	96.7	97.2	P/P	94 - 107

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P391597

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214344	Organic Carbon	96.8	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P391377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214381	Turbidity	2.12	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P391540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2213945	Barium	1.98	Spike	P	0 - 20
2213945	Calcium	0.935	Spike	P	0 - 20
2213945	Iron	1.18	Spike	P	0 - 20
2213945	Magnesium	0.889	Spike	P	0 - 20
2213945	Potassium	0.687	Spike	P	0 - 20
2213945	Sodium	0.964	Spike	P	0 - 20
2213945	Zinc	1.72	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P391540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2213945	Aluminum	1.25	Spike	P	0 - 20
2213945	Antimony	0.595	Spike	P	0 - 20
2213945	Arsenic	0.531	Spike	P	0 - 20
2213945	Boron	1.65	Spike	P	0 - 20
2213945	Cadmium	2.53	Spike	P	0 - 20
2213945	Chromium	0.512	Spike	P	0 - 20
2213945	Copper	0.762	Spike	P	0 - 20
2213945	Lead	0.269	Spike	P	0 - 20
2213945	Nickel	0.333	Spike	P	0 - 20
2213945	Selenium	1.10	Spike	P	0 - 20
2213945	Silver	0.360	Spike	P	0 - 20
2213945	Thallium	1.89	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2213839	Chloride	0.618	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391848

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2213839	Sulfate	0.349	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391737

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214327	Ammonia-N	0.219	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391709

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214243	Kjeldahl Nitrogen	3.77	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214543	Kjeldahl Nitrogen	1.88	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214262	NO2NO3-N	0.393	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214262	Total-P	1.76	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391372

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214244	O-Phosphate-P	0.443	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214394	O-Phosphate-P	2.84	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P391433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214313	Color (true)	0.326	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P391499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214498	Total Alkalinity	4.83	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P391868

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214378	TDS	1.48	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P391500

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214498	Fluoride	0.474	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P391597

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214344	Organic Carbon	2.43	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: A102650

Included Lab Sample IDs: 2214345, 2214348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.6	P/P	90 - 110
O-Phosphate-P	99.1	98.1	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A102651

Included Lab Sample IDs: 2214343, 2214346

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

Reference Method: SM 2120 B-2011

Run ID: A102671

Included Lab Sample IDs: 2214343, 2214346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	105	P/P	90 - 115
Color (true)	103	102	P/P	90 - 115

Reference Method: SM 2320 B-2011

Run ID: A102688

Included Lab Sample IDs: 2214343, 2214346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.5	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A102688

Included Lab Sample IDs: 2214343, 2214346

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A102695

Included Lab Sample IDs: 2214344, 2214347

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

Reference Method: SM 5310 B-2011

Run ID: A102717

Included Lab Sample IDs: 2214344, 2214347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	97.3	P/P	90 - 110
Organic Carbon	97.4	97.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A102731

Included Lab Sample IDs: 2214344, 2214347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.0	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102772

Included Lab Sample IDs: 2214362

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.5	98.2	P/P	90 - 110
Antimony	98.5	101	P/P	90 - 110
Arsenic	96.2	97.5	P/P	90 - 110
Boron	102	102	P/P	90 - 110
Cadmium	96.2	98.6	P/P	90 - 110
Chromium	101	102	P/P	90 - 110
Copper	90.9	93.7	P/P	90 - 110
Lead	100	101	P/P	90 - 110
Nickel	90.6	92.5	P/P	90 - 110
Selenium	96.3	98.1	P/P	90 - 110
Thallium	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102784

Included Lab Sample IDs: 2214344, 2214347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.2	97.9	P/P	90 - 110
Ammonia-N	97.3	97.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102785

Included Lab Sample IDs: 2214362

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	99.3	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102804

Included Lab Sample IDs: 2214344, 2214347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	102	P/P	90 - 110
Kjeldahl Nitrogen	99.0	105	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A102806

Included Lab Sample IDs: 2214362

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	104	105	P/P	90 - 110
Calcium	102	101	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	102	99.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A102806

Included Lab Sample IDs: 2214362

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Potassium	101	99.6	P/P	90 - 110
Sodium	104	102	P/P	90 - 110
Zinc	103	99.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A102826

Included Lab Sample IDs: 2214343, 2214346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Chloride	102	102	P/P	90 - 110
Sulfate	103	104	P/P	90 - 110
Sulfate	103	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					2.12	
EPA 200.7 Rev. 4.4	Barium	106	107	106	108		1.98
	Calcium	109	99.3	107	105		0.935
	Iron	109	111	108	107		1.18
	Magnesium	109	109	107	106		0.889
	Potassium	102	100	108	107		0.687
	Sodium	108	107	103	104		0.964
	Zinc	105	107	102	104		1.72
EPA 200.8 Rev. 5.4	Aluminum	95.9	95.8	97.2	92.5		1.25
	Antimony	101	101	100	101		0.595
	Arsenic	95.6	94.8	95.3	96.2		0.531
	Boron	99.0	98.6	100	98.4		1.65
	Cadmium	94.4	96.4	94.0	94.4		2.53
	Chromium	97.3	98.5	99.0	99.7		0.512
	Copper	92.3	93.4	94.1	90.6		0.762
	Lead	99.7	102	102			0.269
	Nickel	90.9	92.7	93.0	91.5		0.333
	Selenium	94.9	93.4	94.4	94.9		1.10
	Silver	100	102	102	99.8		0.360
	Thallium	98.9	101	103	103		1.89
EPA 300.0 Rev. 2.1	Chloride	102	102	103		0.618	
	Sulfate	104	104	103		0.349	
EPA 350.1 Rev. 2.0	Ammonia-N	95.6	97.8	98.2			0.219
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4	94.6	100			3.77
	Kjeldahl Nitrogen	101	115	112			1.88
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	99.0	99.5			0.393
EPA 365.1 Rev. 2.0	Total-P	103	103	101			1.76
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.7	100	99.5			0.443
	O-Phosphate-P	98.9	99.6	95.7			2.84
SM 2120 B-2011	Color (true)	102				0.326	
SM 2320 B-2011	Total Alkalinity	104				4.83	
SM 2540 C-2011	TDS					1.48	
SM 4500 F-C-2011	Fluoride	97.3	96.7	97.2			0.474
SM 5310 B-2011	Organic Carbon	96.2	96.8	101			2.43

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2214343, 2214346
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2214362
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2214362
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2214343, 2214346
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2214343, 2214346
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2214344, 2214347
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2214344, 2214347
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2214344, 2214347
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2214344, 2214347
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2214345, 2214348
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2214343, 2214346
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2214343, 2214346

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2214362
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2214343, 2214346
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2214343, 2214346
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2214343, 2214346
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2214344, 2214347

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	12/17/2020			12/17/2020 15:51	Yen Ta	2214343, 2214346
EPA 200.7 Rev. 4.4	12/17/2020	12/21/2020 15:00	Elliott D. Healy	12/28/2020 19:58	Betina Topolski	2214362
EPA 200.8 Rev. 5.4	12/17/2020	12/21/2020 15:00	Elliott D. Healy	12/23/2020 19:20	Alexander Thompson	2214362
	12/17/2020	12/21/2020 15:00	Elliott D. Healy	12/24/2020 16:41	Alexander Thompson	2214362
EPA 300.0 Rev. 2.1	12/17/2020			12/30/2020 00:59	Lipi Saha	2214346
	12/17/2020			12/30/2020 03:36	Lipi Saha	2214343
EPA 350.1 Rev. 2.0	12/17/2020			12/27/2020 17:39	Ping Hua	2214344
	12/17/2020			12/27/2020 17:47	Ping Hua	2214347
EPA 351.2 Rev. 2.0	12/17/2020	12/23/2020 15:00	David Boose	12/28/2020 18:02	Julia Storbeck	2214344
	12/17/2020	12/23/2020 15:00	David Boose	12/28/2020 18:41	Julia Storbeck	2214347
EPA 353.2 Rev. 2.0	12/17/2020			12/21/2020 09:31	Beverly Y. Sanders	2214344
	12/17/2020			12/21/2020 09:33	Beverly Y. Sanders	2214347
EPA 365.1 Rev. 2.0	12/17/2020	12/21/2020 12:50	Yen Ta	12/22/2020 14:20	Benjamin T. Nordmann	2214344
	12/17/2020	12/21/2020 12:50	Yen Ta	12/22/2020 14:21	Benjamin T. Nordmann	2214347
EPA 365.1 Rev. 2.0 dissolved	12/17/2020			12/17/2020 15:18	Blanca Fach	2214345
	12/17/2020			12/17/2020 15:55	Blanca Fach	2214348
SM 2120 B-2011	12/17/2020			12/17/2020 16:15	Benjamin T. Nordmann	2214343
	12/17/2020			12/17/2020 16:25	Benjamin T. Nordmann	2214346
SM 2320 B-2011	12/17/2020			12/18/2020 23:49	Dale L. Simmons	2214343
	12/17/2020			12/19/2020 00:01	Dale L. Simmons	2214346
SM 2340B	12/17/2020			12/28/2020 19:58	Betina Topolski	2214362
SM 2540 C-2011	12/17/2020			12/22/2020 13:52	Yijie Li	2214343, 2214346
SM 2540 D-2011	12/17/2020			12/22/2020 13:52	Yijie Li	2214343, 2214346
SM 4500 F-C-2011	12/17/2020			12/18/2020 23:49	Dale L. Simmons	2214343
	12/17/2020			12/19/2020 00:01	Dale L. Simmons	2214346
SM 5310 B-2011	12/17/2020			12/21/2020 19:10	Madeline Gruver	2214344
	12/17/2020			12/22/2020 00:17	Madeline Gruver	2214347