

Chemical Analysis Report

SE-DIST-2023-06-01-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

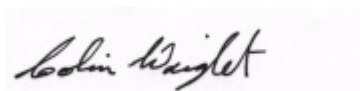
Event Description: **SMP - St. Sebastian River Run**
Request ID: **RQ-2023-05-08-64**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Andrew Luering

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Certified by: Colin Wright, Program Administrator

Date Certified: 21-JUN-2023 10:23

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: C 54 CONFLUENCE WITH SEBASTIAN NEAR
MOCKINGBIRD LANE DOCK**

Collection Date/Time: 05/31/2023 10:00

Field ID: G5SE0106

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2413961	DEP SOP: NU-094-1	Color (true)	31	A	PCU	P430698	
	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P430700	
	EPA 300.0 Rev. 2.1	Chloride	8.5E+03		mg Cl/L	P430854	
		Sulfate	1.2E+03		mg SO4/L	P430856	
	SM 2320 B-2011	Total Alkalinity	162		mg CaCO3/L	P431028	
	SM 2540 C-2015	TDS	1.44E+04		mg/L	P431042	
	SM 2540 D-2015	TSS	3	IA	mg/L	P431018	
	SM 4500-F- C-2011	Fluoride	0.74		mg F/L	P431430	
2413962	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P430847	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P431036	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P431212	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P430793	
	SM 5310 B-2011	Organic Carbon	7.9		mg C/L	P430900	
2413965	EPA 200.7 Rev. 4.4	Calcium	230		mg/L	P430808	
		Iron	110	I	ug/L	P430808	
		Magnesium	555		mg/L	P430808	
		Potassium	168		mg/L	P430808	
		Sodium	4.34E+03		mg/L	P430808	
		Strontium	6.20E+03		ug/L	P430808	
		Tin	60	U	ug/L	P430808	
		Titanium	2.2	U	ug/L	P430808	
		Vanadium	6.0	U	ug/L	P430808	
		Zinc	15	U	ug/L	P430808	
	EPA 200.8 Rev. 5.4	Aluminum	47	I	ug/L	P430808	
		Antimony	0.20	U	ug/L	P430808	
		Arsenic	1.99		ug/L	P430808	
		Barium	30.1		ug/L	P430808	
		Beryllium	0.040	U	ug/L	P430808	
		Boron	1.87E+03		ug/L	P430808	
		Cadmium	0.080	U	ug/L	P430808	
		Chromium	1.6	U	ug/L	P430808	
		Cobalt	0.080	U	ug/L	P430808	
		Copper	1.6	U	ug/L	P430808	
		Lead	0.80	U	ug/L	P430808	
		Manganese	11.8		ug/L	P430808	
		Molybdenum	5.9		ug/L	P430808	
		Nickel	2.0	U	ug/L	P430808	
		Selenium	0.80	U	ug/L	P430808	
		Silver	0.040	U	ug/L	P430808	
		Thallium	0.40	U	ug/L	P430808	
	SM 2340 B-2011	Hardness	2.86E+03		mg/L	P430808	

Field ID: G5SE0106

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium, sodium and strontium are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P430698

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P430700

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P430808

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430808

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	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
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	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: P430854

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430856

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430847

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431036

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431212

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430793

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

Reference Method: SM 2320 B-2011
Batch ID: P431028

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

Reference Method: SM 2540 C-2015
Batch ID: P431042

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P431018

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P431430

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P430900

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P430698

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.2		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P430700

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.5		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P430808

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	102		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	103		P	85 - 115
Sodium	100		P	85 - 115
Strontium	99.6		P	85 - 115
Tin	101		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	99.5		P	85 - 115
Zinc	97.1		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430808

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.6		P	85 - 115
Antimony	96.7		P	85 - 115
Arsenic	97.6		P	85 - 115
Barium	97.3		P	85 - 115
Beryllium	93.9		P	85 - 115
Boron	104		P	85 - 115
Cadmium	97.1		P	85 - 115
Chromium	94.9		P	85 - 115
Cobalt	98.6		P	85 - 115
Copper	97.1		P	85 - 115
Lead	94.8		P	85 - 115
Manganese	95.3		P	85 - 115
Molybdenum	95.9		P	85 - 115
Nickel	96.9		P	85 - 115
Selenium	94.4		P	85 - 115
Silver	103		P	85 - 115
Thallium	97.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430854

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.9		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430856

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430847

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431036

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431212

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	96.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430793

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

Reference Method: SM 2320 B-2011
Batch ID: P431028

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P431042

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	96.3		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P431018

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	102		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P431430

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	94 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P430900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P430808

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413965	Iron	98.8	98.5	P/P	80 - 120
2413965	Tin	98.0	107	P/P	80 - 120
2413965	Titanium	103	104	P/P	80 - 120
2413965	Vanadium	98.3	99.0	P/P	80 - 120
2413965	Zinc	88.5	92.5	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P430808

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413965	Aluminum	102	106	P/P	70 - 130
2413965	Antimony	97.6	99.4	P/P	70 - 130
2413965	Arsenic	103	105	P/P	70 - 130
2413965	Barium	96.1	99.2	P/P	70 - 130
2413965	Beryllium	90.5	89.9	P/P	70 - 130
2413965	Cadmium	89.9	90.4	P/P	70 - 130
2413965	Chromium	88.1	90.0	P/P	70 - 130
2413965	Cobalt	95.3	97.7	P/P	70 - 130
2413965	Copper	91.7	92.7	P/P	70 - 130
2413965	Lead	100	100	P/P	70 - 130
2413965	Manganese	84.2	81.9	P/P	70 - 130
2413965	Molybdenum	107	111	P/P	70 - 130
2413965	Nickel	92.0	93.8	P/P	70 - 130
2413965	Selenium	94.5	93.4	P/P	70 - 130
2413965	Silver	92.9	95.5	P/P	70 - 130
2413965	Thallium	100	102	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P430854

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414039	Chloride	105		P	90 - 110
2414161	Chloride	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P430856

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414039	Sulfate	101		P	90 - 110
2414161	Sulfate	94.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P430847

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413792	Ammonia-N	98.0	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P431036

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413962	Kjeldahl Nitrogen	99.2	98.4	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413657	NO2NO3-N	97.6	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430793

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413962	Total-P	99.6	99.9	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P431430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2414949	Fluoride	105	104	P/P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P430900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413962	Organic Carbon	89.3	92.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P430698

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413961	Color (true)	3.02	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P430700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413897	Turbidity	1.22	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P430808

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413965	Calcium	0.280	Spike	P	0 - 20
2413965	Iron	0.303	Spike	P	0 - 20
2413965	Magnesium	0.00423	Spike	P	0 - 20
2413965	Potassium	1.89	Spike	P	0 - 20
2413965	Sodium	0.526	Spike	P	0 - 20
2413965	Strontium	1.12	Spike	P	0 - 20
2413965	Tin	8.77	Spike	P	0 - 20
2413965	Titanium	0.459	Spike	P	0 - 20
2413965	Vanadium	0.646	Spike	P	0 - 20
2413965	Zinc	4.48	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430808

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413965	Aluminum	2.92	Spike	P	0 - 20
2413965	Antimony	1.81	Spike	P	0 - 20
2413965	Arsenic	1.54	Spike	P	0 - 20
2413965	Barium	2.64	Spike	P	0 - 20
2413965	Beryllium	0.699	Spike	P	0 - 20
2413965	Boron	2.69	Spike	P	0 - 20
2413965	Cadmium	0.536	Spike	P	0 - 20
2413965	Chromium	2.07	Spike	P	0 - 20
2413965	Cobalt	2.49	Spike	P	0 - 20
2413965	Copper	1.08	Spike	P	0 - 20
2413965	Lead	0.0273	Spike	P	0 - 20
2413965	Manganese	2.34	Spike	P	0 - 20
2413965	Molybdenum	2.18	Spike	P	0 - 20
2413965	Nickel	1.98	Spike	P	0 - 20
2413965	Selenium	1.16	Spike	P	0 - 20
2413965	Silver	2.86	Spike	P	0 - 20
2413965	Thallium	2.03	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414039	Chloride	0.454	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430856

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414039	Sulfate	0.0318	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413792	Ammonia-N	0.987	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431036

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413962	Kjeldahl Nitrogen	0.709	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413657	NO2NO3-N	0.466	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430793

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413962	Total-P	0.240	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P431028

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414186	Total Alkalinity	0.863	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P431042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413223	TDS	4.68	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P431430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2414949	Fluoride	0.480	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P430900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413962	Organic Carbon	2.49	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A119524

Included Lab Sample IDs: 2413961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.6	98.1	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A119525

Included Lab Sample IDs: 2413961

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A119595

Included Lab Sample IDs: 2413962

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A119602

Included Lab Sample IDs: 2413962

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	98.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A119605

Included Lab Sample IDs: 2413961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.6	96.9	P/P	90 - 110
Sulfate	99.2	98.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A119622

Included Lab Sample IDs: 2413965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.8	96.2	P/P	90 - 110
Antimony	95.6	96.1	P/P	90 - 110
Arsenic	97.8	98.4	P/P	90 - 110
Barium	95.1	96.0	P/P	90 - 110
Boron	99.8	100	P/P	90 - 110
Cadmium	95.0	95.4	P/P	90 - 110
Chromium	94.3	94.0	P/P	90 - 110
Cobalt	98.9	99.7	P/P	90 - 110
Copper	97.0	97.1	P/P	90 - 110
Lead	92.9	92.5	P/P	90 - 110
Manganese	97.4	94.6	P/P	90 - 110
Molybdenum	95.8	95.4	P/P	90 - 110
Nickel	97.4	97.3	P/P	90 - 110
Selenium	95.2	96.8	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A119622

Included Lab Sample IDs: 2413965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	98.2	99.1	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A119626

Included Lab Sample IDs: 2413962

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.8	94.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A119647

Included Lab Sample IDs: 2413965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	98.9	100	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A119676

Included Lab Sample IDs: 2413961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.9	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A119727

Included Lab Sample IDs: 2413962

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A119728

Included Lab Sample IDs: 2413965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.3	99.0	P/P	90 - 110
Iron	102	98.2	P/P	90 - 110
Magnesium	96.4	99.9	P/P	90 - 110
Potassium	98.1	99.6	P/P	90 - 110
Strontium	97.7	97.3	P/P	90 - 110
Tin	94.1	94.7	P/P	90 - 110
Titanium	98.9	99.2	P/P	90 - 110
Vanadium	97.8	98.2	P/P	90 - 110
Zinc	92.8	93.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A119777

Included Lab Sample IDs: 2413962

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	95.0	96.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A119811

Included Lab Sample IDs: 2413965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	98.8	97.5	P/P	95 - 105

Reference Method: SM 4500-F- C-2011

Run ID: A119876

Included Lab Sample IDs: 2413961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	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	SMP
DEP SOP: NU-094-1	Color (true)	98.2					3.02
EPA 180.1 Rev. 2.0	Turbidity	97.5					1.22
EPA 200.7 Rev. 4.4	Calcium	100					
	Iron	102	98.8	98.5			0.280
	Magnesium	102					0.303
	Potassium	103					0.0042
	Sodium	100					1.89
	Strontium	99.6					0.526
	Tin	101	107	98.0			1.12
	Titanium	101	103	104			8.77
	Vanadium	99.5	98.3	99.0			0.459
	Zinc	97.1	88.5	92.5			0.646
EPA 200.8 Rev. 5.4	Aluminum	94.6	102	106			4.48
	Antimony	96.7	97.6	99.4			2.92
	Arsenic	97.6	103	105			1.81
	Barium	97.3	96.1	99.2			1.54
	Beryllium	93.9	90.5	89.9			2.64
	Boron	104					0.699
	Cadmium	97.1	89.9	90.4			2.69
	Chromium	94.9	88.1	90.0			0.536
	Cobalt	98.6	95.3	97.7			2.07
	Copper	97.1	91.7	92.7			2.49
	Lead	94.8	100	100			1.08
	Manganese	95.3	84.2	81.9			0.0273
	Molybdenum	95.9	107	111			2.34
	Nickel	96.9	92.0	93.8			2.18
	Selenium	94.4	94.5	93.4			1.98
	Silver	103	92.9	95.5			1.16
	Thallium	97.3	100	102			2.86
EPA 300.0 Rev. 2.1	Chloride	99.9	105	106		0.454	2.03
	Sulfate	98.2	101	94.1		0.0318	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	98.0	99.2			0.987
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.0	99.2	98.4			0.709
EPA 353.2 Rev. 2.0	NO2NO3-N	96.5	97.6	97.0			0.466
EPA 365.1 Rev. 2.0	Total-P	99.0	99.6	99.9			0.240
SM 2320 B-2011	Total Alkalinity	99.4				0.863	
SM 2540 C-2015	TDS	96.3				4.68	
SM 2540 D-2015	TSS	102					
SM 4500-F- C-2011	Fluoride	99.3	105	104			0.480
SM 5310 B-2011	Organic Carbon	96.6	89.3	92.1			2.49

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2413961
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2413961
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2413965
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2413965
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2413961
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2413961
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2413962

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2413962
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2413962
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2413962
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2413961
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2413965
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2413961
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2413961
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2413961
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2413962

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	06/01/2023			06/01/2023 14:18	Anna M. Plaviak	2413961
EPA 180.1 Rev. 2.0	06/01/2023			06/01/2023 13:50	Chandler E Cox	2413961
EPA 200.7 Rev. 4.4	06/01/2023	06/05/2023 12:00	George D Taylor	06/10/2023 02:30	McKinley C Carter	2413965
	06/01/2023	06/05/2023 12:00	George D Taylor	06/10/2023 03:28	McKinley C Carter	2413965
	06/01/2023	06/05/2023 12:00	George D Taylor	06/14/2023 17:58	McKinley C Carter	2413965
EPA 200.8 Rev. 5.4	06/01/2023	06/05/2023 12:00	George D Taylor	06/06/2023 16:45	Emily M Philpot	2413965
	06/01/2023	06/05/2023 12:00	George D Taylor	06/06/2023 18:02	Emily M Philpot	2413965
	06/01/2023	06/05/2023 12:00	George D Taylor	06/07/2023 13:58	Emily M Philpot	2413965
EPA 300.0 Rev. 2.1	06/01/2023			06/06/2023 05:26	James L Waggeberby	2413961
EPA 350.1 Rev. 2.0	06/01/2023			06/06/2023 11:18	Khloe J Berg	2413962
EPA 351.2 Rev. 2.0	06/01/2023	06/09/2023 11:22	Ping Hua	06/12/2023 11:08	Samantha L Bates	2413962
EPA 353.2 Rev. 2.0	06/01/2023			06/13/2023 14:40	Anna M. Plaviak	2413962
EPA 365.1 Rev. 2.0	06/01/2023	06/05/2023 14:34	Adam P Silver	06/06/2023 10:03	James L Waggeberby	2413962
SM 2320 B-2011	06/01/2023			06/08/2023 19:19	Chandler E Cox	2413961
SM 2340 B-2011	06/01/2023			06/10/2023 03:28	McKinley C Carter	2413965
SM 2540 C-2015	06/01/2023			06/02/2023 15:32	Yijie Li	2413961
SM 2540 D-2015	06/01/2023			06/02/2023 15:32	Yijie Li	2413961
SM 4500-F- C-2011	06/01/2023			06/16/2023 22:25	Adam P Silver	2413961
SM 5310 B-2011	06/01/2023			06/06/2023 20:37	Elise M. Gillis	2413962