Chemical Analysis Report

SO-DIST-2022-05-25-01

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

Event Description: **2022 SMP : Charlotte Cricks**
Request ID: **RQ-2022-05-23-31**
Customer: **SO-DIST**
Project ID: **SMP**

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FLDEP South District Office
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Certified by: Colin Wright, Program Administrator

Date Certified: 17-JUN-2022 11:08

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: Myrtle Slough @ Bermont **Collection Date/Time: 05/23/2022 11:05**

Field ID: G3SD0181 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2329731	EPA 200.7 Rev. 4.4	Calcium	41.7		mg/L	P414396	
		Iron	1.73E+03		ug/L	P414396	
		Magnesium	2.17		mg/L	P414396	
		Potassium	0.74	I	mg/L	P414396	
		Sodium	11.0		mg/L	P414396	
		Strontium	260		ug/L	P414396	
		Tin	3.0	U	ug/L	P414396	
		Titanium	0.84	I	ug/L	P414396	
		Vanadium	2.0	U	ug/L	P414396	
		Zinc	5.0	U	ug/L	P414396	
	EPA 200.8 Rev. 5.4	Aluminum	35		ug/L	P414396	
		Antimony	0.091	I	ug/L	P414396	
		Arsenic	1.02		ug/L	P414396	
		Barium	13.5		ug/L	P414396	
		Beryllium	0.020	I	ug/L	P414396	
		Boron**	29.0		ug/L	P414396	
		Cadmium	0.020	U	ug/L	P414396	
		Chromium	0.60	I	ug/L	P414396	
		Cobalt	0.083		ug/L	P414396	
		Copper	0.40	U	ug/L	P414396	
		Lead	0.20	U	ug/L	P414396	
		Manganese	13.0		ug/L	P414396	
		Molybdenum	0.96		ug/L	P414396	
		Nickel	0.50	U	ug/L	P414396	
		Selenium	0.20	U	ug/L	P414396	
		Silver	0.010	U	ug/L	P414396	
		Thallium	0.10	U	ug/L	P414396	
	SM 2340 B-2011	Hardness	113		mg/L	P414396	

Sample Location: LeeBranchAtRailroad **Collection Date/Time: 05/23/2022 11:45**

Field ID: G3SD0212 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2329728	DEP SOP: NU-094-1	Color (true)**	63	A	PCU	P414338	
	EPA 180.1 Rev. 2.0	Turbidity	8.7	A	NTU	P414377	
	EPA 300.0 Rev. 2.1	Chloride	4.6E+03		mg Cl/L	P414632	
		Sulfate	730		mg SO4/L	P414635	
	SM 2320 B-2011	Total Alkalinity	101	A	mg CaCO3/L	P414540	
	SM 2540 C-2011	TDS	8.67E+03		mg/L	P414671	
	SM 2540 D-2011	TSS	7	I A	mg/L	P414678	
	SM 4500-F- C-2011	Fluoride	0.79	J	mg F/L	P414544	LCS
2329729	EPA 350.1 Rev. 2.0	Ammonia-N	0.053		mg N/L	P414450	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P414617	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P414712	
	EPA 365.1 Rev. 2.0	Total-P	0.70		mg P/L	P414551	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P414507	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500-F- C-2011: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P414338

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414377

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P414396

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: P414396

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: P414632

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: P414635

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P414450

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414617

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414712

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414551

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

Reference Method: SM 2320 B-2011
Batch ID: P414540

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

Reference Method: SM 2540 C-2011
Batch ID: P414671

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P414678

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P414544

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P414507

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: P414338

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414377

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P414396

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	107		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	105		P	85 - 115
Sodium	103		P	85 - 115
Strontium	93.9		P	85 - 115
Tin	102		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	95.2		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P414396

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.9		P	85 - 115
Antimony	96.8		P	85 - 115
Arsenic	97.7		P	85 - 115
Barium	99.4		P	85 - 115
Beryllium	95.3		P	85 - 115
Boron	103		P	85 - 115
Cadmium	94.7		P	85 - 115
Chromium	95.7		P	85 - 115
Cobalt	96.9		P	85 - 115
Copper	96.2		P	85 - 115
Lead	97.8		P	85 - 115
Manganese	96.4		P	85 - 115
Molybdenum	96.2		P	85 - 115
Nickel	97.6		P	85 - 115
Selenium	96.7		P	85 - 115
Silver	97.2		P	85 - 115
Thallium	98.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414632

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.3		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414635

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P414450

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414617

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414712

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414551

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

Reference Method: SM 2320 B-2011
Batch ID: P414540

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.2		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P414544

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	104		F	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P414507

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P414396

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2329260	Calcium	103		P	80 - 120
2329260	Iron	108	108	P/P	80 - 120
2329260	Magnesium	111	109	P/P	80 - 120
2329260	Potassium	102	102	P/P	80 - 120
2329260	Sodium	102		P	80 - 120
2329260	Strontium	94.1	99.4	P/P	80 - 120
2329260	Tin	101	103	P/P	80 - 120
2329260	Titanium	103	104	P/P	80 - 120
2329260	Vanadium	98.4	99.6	P/P	80 - 120
2329260	Zinc	102	104	P/P	80 - 120
2330030	Calcium	104		P	80 - 120
2330030	Iron	111		P	80 - 120
2330030	Magnesium	114		P	80 - 120
2330030	Potassium	105		P	80 - 120
2330030	Sodium	110		P	80 - 120
2330030	Strontium	111		P	80 - 120
2330030	Tin	104		P	80 - 120
2330030	Titanium	104		P	80 - 120
2330030	Vanadium	99.7		P	80 - 120
2330030	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P414396

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2329260	Aluminum	102	102	P/P	80 - 120
2329260	Antimony	101	101	P/P	80 - 120
2329260	Arsenic	100	99.7	P/P	80 - 120
2329260	Barium	103	102	P/P	80 - 120
2329260	Beryllium	86.1	98.1	P/P	80 - 120
2329260	Boron	107	107	P/P	80 - 120
2329260	Cadmium	100	97.9	P/P	80 - 120
2329260	Chromium	100	98.9	P/P	80 - 120
2329260	Cobalt	99.4	97.8	P/P	80 - 120
2329260	Copper	99.6	98.9	P/P	80 - 120
2329260	Lead	102	102	P/P	80 - 120
2329260	Manganese	101	98.5	P/P	80 - 120
2329260	Molybdenum	103	101	P/P	80 - 120
2329260	Nickel	99.1	98.5	P/P	80 - 120
2329260	Selenium	96.4	98.5	P/P	80 - 120
2329260	Silver	99.0	97.4	P/P	80 - 120
2329260	Thallium	104	107	P/P	80 - 120
2330030	Aluminum	103		P	80 - 120
2330030	Antimony	99.4		P	80 - 120
2330030	Arsenic	99.6		P	80 - 120
2330030	Barium	103		P	80 - 120
2330030	Beryllium	93.3		P	80 - 120
2330030	Boron	104		P	80 - 120
2330030	Cadmium	99.5		P	80 - 120
2330030	Chromium	98.0		P	80 - 120
2330030	Cobalt	98.3		P	80 - 120
2330030	Copper	98.6		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P414396

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330030	Lead	101		P	80 - 120
2330030	Manganese	104		P	80 - 120
2330030	Molybdenum	101		P	80 - 120
2330030	Nickel	99.8		P	80 - 120
2330030	Selenium	96.7		P	80 - 120
2330030	Silver	98.4		P	80 - 120
2330030	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414632

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2329409	Chloride	95.6		P	90 - 110
2329911	Chloride	94.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2329409	Sulfate	96.1		P	90 - 110
2329911	Sulfate	94.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P414450

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2329737	Ammonia-N	98.4	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2327402	Kjeldahl Nitrogen	95.1	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414712

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2328964	NO2NO3-N	98.3	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414551

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2329807	Total-P	95.0	95.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P414544

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2329728	Fluoride	103	104	P/P	94 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P414507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2329729	Organic Carbon	94.0	93.3	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P414338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329728	Color (true)	1.26	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329728	Turbidity	4.95	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P414396

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329260	Calcium	0.719	Spike	P	0 - 20
2329260	Iron	0.126	Spike	P	0 - 20
2329260	Magnesium	0.675	Spike	P	0 - 20
2329260	Potassium	0.102	Spike	P	0 - 20
2329260	Sodium	1.48	Spike	P	0 - 20
2329260	Strontium	5.41	Spike	P	0 - 20
2329260	Tin	1.34	Spike	P	0 - 20
2329260	Titanium	1.19	Spike	P	0 - 20
2329260	Vanadium	1.22	Spike	P	0 - 20
2329260	Zinc	1.41	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P414396

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329260	Aluminum	0.235	Spike	P	0 - 20
2329260	Antimony	0.545	Spike	P	0 - 20
2329260	Arsenic	0.655	Spike	P	0 - 20
2329260	Barium	0.534	Spike	P	0 - 20
2329260	Beryllium	13.1	Spike	P	0 - 20
2329260	Boron	0.398	Spike	P	0 - 20
2329260	Cadmium	2.64	Spike	P	0 - 20
2329260	Chromium	1.41	Spike	P	0 - 20
2329260	Cobalt	1.67	Spike	P	0 - 20
2329260	Copper	0.632	Spike	P	0 - 20
2329260	Lead	0.258	Spike	P	0 - 20
2329260	Manganese	1.84	Spike	P	0 - 20
2329260	Molybdenum	1.90	Spike	P	0 - 20
2329260	Nickel	0.622	Spike	P	0 - 20
2329260	Selenium	2.06	Spike	P	0 - 20
2329260	Silver	1.60	Spike	P	0 - 20
2329260	Thallium	2.72	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414632

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329409	Chloride	0.438	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329409	Sulfate	0.403	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P414450

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329737	Ammonia-N	0.892	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2327402	Kjeldahl Nitrogen	9.56	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414712

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2328964	NO2NO3-N	0.361	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329807	Total-P	0.0790	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P414540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329728	Total Alkalinity	0.703	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P414671

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330107	TDS	4.15	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P414544

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329728	Fluoride	0.483	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P414507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2329729	Organic Carbon	0.533	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: A112388
Included Lab Sample IDs: 2329728

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A112403
Included Lab Sample IDs: 2329728

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A112440
Included Lab Sample IDs: 2329729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.0	97.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A112457
Included Lab Sample IDs: 2329731

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	99.3	P/P	90 - 110
Antimony	98.6	97.4	P/P	90 - 110
Arsenic	98.4	98.3	P/P	90 - 110
Barium	98.5	97.6	P/P	90 - 110
Beryllium	94.3	92.7	P/P	90 - 110
Boron	102	100	P/P	90 - 110
Cadmium	98.3	98.1	P/P	90 - 110
Chromium	98.4	97.7	P/P	90 - 110
Cobalt	97.0	97.5	P/P	90 - 110
Copper	97.7	97.9	P/P	90 - 110
Lead	98.9	98.4	P/P	90 - 110
Manganese	98.1	97.9	P/P	90 - 110
Molybdenum	98.1	98.4	P/P	90 - 110
Nickel	98.0	98.3	P/P	90 - 110
Selenium	95.7	95.7	P/P	90 - 110
Silver	98.8	99.4	P/P	90 - 110
Thallium	97.8	98.5	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A112482
Included Lab Sample IDs: 2329729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	97.0	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A112501
Included Lab Sample IDs: 2329728

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A112501
Included Lab Sample IDs: 2329728

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.0	95.3	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A112501
Included Lab Sample IDs: 2329728

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A112541
Included Lab Sample IDs: 2329731

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	103	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Potassium	102	104	P/P	90 - 110
Sodium	103	104	P/P	90 - 110
Tin	103	99.6	P/P	90 - 110
Titanium	102	101	P/P	90 - 110
Vanadium	103	101	P/P	90 - 110
Zinc	103	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A112552
Included Lab Sample IDs: 2329728

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.4	98.3	P/P	90 - 110
Sulfate	99.2	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A112569
Included Lab Sample IDs: 2329729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A112598
Included Lab Sample IDs: 2329729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A112599
Included Lab Sample IDs: 2329731

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A112599
Included Lab Sample IDs: 2329731

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Strontium	91.6	96.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A112636
Included Lab Sample IDs: 2329729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.4	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	MS
DEP SOP: NU-094-1	Color (true)	101					1.26	
EPA 180.1 Rev. 2.0	Turbidity	97.0					4.95	
EPA 200.7 Rev. 4.4	Calcium	104	103	104				0.719
	Iron	107	108	108	111			0.126
	Magnesium	110	111	109	114			0.675
	Potassium	105	102	102	105			0.102
	Sodium	103	102	110				1.48
	Strontium	93.9	94.1	99.4	111			5.41
	Tin	102	101	103	104			1.34
	Titanium	102	103	104	104			1.19
	Vanadium	95.2	98.4	99.6	99.7			1.22
	Zinc	100	102	104	102			1.41
EPA 200.8 Rev. 5.4	Aluminum	97.9	102	102	103			0.235
	Antimony	96.8	101	101	99.4			0.545
	Arsenic	97.7	100	99.7	99.6			0.655
	Barium	99.4	103	102	103			0.534
	Beryllium	95.3	86.1	98.1	93.3			13.1
	Boron	103	107	107	104			0.398
	Cadmium	94.7	100	97.9	99.5			2.64
	Chromium	95.7	100	98.9	98.0			1.41
	Cobalt	96.9	99.4	97.8	98.3			1.67
	Copper	96.2	99.6	98.9	98.6			0.632
	Lead	97.8	102	102	101			0.258
	Manganese	96.4	101	98.5	104			1.84
	Molybdenum	96.2	103	101	101			1.90
	Nickel	97.6	99.1	98.5	99.8			0.622
	Selenium	96.7	96.4	98.5	96.7			2.06
	Silver	97.2	99.0	97.4	98.4			1.60
	Thallium	98.7	104	107	103			2.72
EPA 300.0 Rev. 2.1	Chloride	95.3	95.6	94.8			0.438	
	Sulfate	97.1	96.1	94.4			0.403	
EPA 350.1 Rev. 2.0	Ammonia-N	98.0	98.4	97.2				0.892
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	95.1	106				9.56
EPA 353.2 Rev. 2.0	NO2NO3-N	100	98.3	98.8				0.361
EPA 365.1 Rev. 2.0	Total-P	104	95.0	95.0				0.0790
SM 2320 B-2011	Total Alkalinity	95.2					0.703	
SM 2540 C-2011	TDS						4.15	
SM 4500-F- C-2011	Fluoride	104	103	104				0.483
SM 5310 B-2011	Organic Carbon	97.2	94.0	93.3				0.533

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2329728
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2329728
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2329731
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2329731
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2329728
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2329728
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2329729
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2329729

Reference Method Descriptions

Method	Description	Associated Samples
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2329729
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2329729
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2329728
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2329731
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2329728
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2329728
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2329728
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2329729

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	05/25/2022			05/25/2022 10:50	Samantha L Bates	2329728
EPA 180.1 Rev. 2.0	05/25/2022			05/25/2022 10:18	Khloe J Berg	2329728
EPA 200.7 Rev. 4.4	05/25/2022	05/26/2022 10:15	Megan Whitefoot	05/31/2022 22:17	McKinley C Carter	2329731
	05/25/2022	05/26/2022 10:15	Megan Whitefoot	06/02/2022 19:42	McKinley C Carter	2329731
EPA 200.8 Rev. 5.4	05/25/2022	05/26/2022 10:15	Megan Whitefoot	05/26/2022 18:24	Alexander Thompson	2329731
EPA 300.0 Rev. 2.1	05/25/2022			06/01/2022 19:37	Anna M. Plaviak	2329728
EPA 350.1 Rev. 2.0	05/25/2022			05/26/2022 13:39	Ping Hua	2329729
EPA 351.2 Rev. 2.0	05/25/2022	06/03/2022 11:24	Samantha L Bates	06/07/2022 10:21	Alexandra J Mattheus	2329729
EPA 353.2 Rev. 2.0	05/25/2022			06/02/2022 15:17	Nathaniel J Jones	2329729
EPA 365.1 Rev. 2.0	05/25/2022	06/01/2022 16:00	Adam P Silver	06/02/2022 10:57	James L Waggerby	2329729
SM 2320 B-2011	05/25/2022			05/27/2022 16:09	Dale L. Simmons	2329728
SM 2340 B-2011	05/25/2022			05/31/2022 22:17	McKinley C Carter	2329731
SM 2540 C-2011	05/25/2022			05/27/2022 14:56	Yijie Li	2329728
SM 2540 D-2011	05/25/2022			05/27/2022 14:56	Yijie Li	2329728
SM 4500-F- C-2011	05/25/2022			05/27/2022 15:14	Dale L. Simmons	2329728
SM 5310 B-2011	05/25/2022			05/27/2022 09:04	Khloe J Berg	2329729