Chemical Analysis Report

NE-DIST-2022-02-23-02

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

Event Description: **Nassau RPS LVS**
Request ID: **RQ-2022-01-17-28**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 18-MAR-2022 08:36

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: ST MARYS R @ STOKES RD **Collection Date/Time: 02/22/2022 11:00**

Field ID: 19010093 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2307732	DEP SOP: NU-094-1	Color (true)**	270		PCU	P410298	
	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P410270	
	EPA 300.0 Rev. 2.1	Chloride	9.3		mg Cl/L	P410516	
		Sulfate	1.1		mg SO4/L	P410517	
	SM 2320 B-2011	Total Alkalinity	3.7		mg CaCO3/L	P410659	
	SM 2540 C-2011	TDS	71		mg/L	P410774	
	SM 2540 D-2011	TSS	2	I	mg/L	P410803	
	SM 4500 F-C-2011	Fluoride	0.039	I	mg F/L	P410662	
2307733	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P410577	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.74		mg N/L	P410549	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.090		mg N/L	P410623	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P410485	
	SM 5310 B-2011	Organic Carbon	25		mg C/L	P410540	
2307734	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.025		mg P/L	P410263	
2307740	EPA 200.7 Rev. 4.4	Barium	15.2		ug/L	P410419	
		Calcium	3.73		mg/L	P410419	
		Iron	540		ug/L	P410419	
		Magnesium	1.61		mg/L	P410419	
		Manganese	9.2		ug/L	P410419	
		Potassium	0.43	I	mg/L	P410419	
		Sodium	5.3		mg/L	P410419	
		Zinc	5.0	U	ug/L	P410419	
	EPA 200.8 Rev. 5.4	Aluminum	334		ug/L	P410419	
		Antimony	0.050	U	ug/L	P410419	
		Arsenic	0.29		ug/L	P410419	
		Beryllium	0.032	I	ug/L	P410419	
		Boron**	14.3		ug/L	P410419	
		Cadmium	0.020	U	ug/L	P410419	
		Chromium	0.50	I	ug/L	P410595	
		Copper	0.40	U	ug/L	P410419	
		Lead	0.40	I	ug/L	P410419	
		Nickel	0.50	U	ug/L	P410595	
		Selenium	0.20	U	ug/L	P410419	
		Silver	0.010	U	ug/L	P410419	
		Thallium	0.10	U	ug/L	P410419	
	SM 2340B	Hardness	16.0		mg/L	P410419	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Field Blank **Collection Date/Time: 02/22/2022 11:15**

Field ID: FB_02222022 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2307735	DEP SOP: NU-094-1	Color (true)**	2.5	U	PCU	P410301	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P410516	
		Sulfate	0.20	U	mg SO4/L	P410517	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P410659	
	SM 2540 C-2011	TDS	15	U	mg/L	P410773	
	SM 2540 D-2011	TSS	2	U	mg/L	P410802	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P410662	
2307736	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P410577	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P410549	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P410623	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P410485	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P410540	
2307737	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P410263	
2307741	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P410419	
		Iron	30	U	ug/L	P410419	
		Magnesium	0.040	U	mg/L	P410419	
		Potassium	0.30	U	mg/L	P410419	
		Sodium	0.50	U	mg/L	P410419	
		Strontium	2.0	U	ug/L	P410419	
		Tin	3.0	U	ug/L	P410419	
		Titanium	0.75	U	ug/L	P410419	
		Vanadium	2.0	U	ug/L	P410419	
		Zinc	5.0	U	ug/L	P410419	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P410419	
		Antimony	0.050	U	ug/L	P410419	
		Arsenic	0.050	U	ug/L	P410419	
		Barium	0.20	U	ug/L	P410419	
		Beryllium	0.010	U	ug/L	P410419	
		Boron**	2.0	U	ug/L	P410419	
		Cadmium	0.020	U	ug/L	P410419	
		Chromium	0.40	U	ug/L	P410595	
		Cobalt	0.020	U	ug/L	P410419	
		Copper	0.40	U	ug/L	P410419	
		Lead	0.20	U	ug/L	P410419	
		Manganese	0.10	U	ug/L	P410595	
		Molybdenum	0.15	U	ug/L	P410595	
		Nickel	0.50	U	ug/L	P410595	
		Selenium	0.20	U	ug/L	P410419	
		Silver	0.010	U	ug/L	P410419	
		Thallium	0.10	U	ug/L	P410419	
	SM 2340B	Hardness	0.35	U	mg/L	P410419	

Field ID: FB_02222022 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
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 manganese 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: DEP SOP: NU-094-1
Batch ID: P410298

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P410301

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410270

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410419

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
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: P410419

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
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410595

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410516

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410517

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410577

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410549

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410623

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410485

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410263

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

Reference Method: SM 2320 B-2011
Batch ID: P410659

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P410773

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P410774

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P410802

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P410803

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P410662

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P410540

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: P410298

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.7		P	85 - 115

Reference Method: DEP SOP: NU-094-1
Batch ID: P410301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.1		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410270

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.8		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410419

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	102		P	85 - 115
Iron	106		P	85 - 115
Magnesium	107		P	85 - 115
Manganese	106		P	85 - 115
Potassium	105		P	85 - 115
Sodium	99.5		P	85 - 115
Strontium	101		P	85 - 115
Tin	102		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	96.9		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410419

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	102		P	85 - 115
Barium	103		P	85 - 115
Beryllium	97.8		P	85 - 115
Boron	107		P	85 - 115
Cadmium	101		P	85 - 115
Cobalt	98.8		P	85 - 115
Copper	98.9		P	85 - 115
Lead	101		P	85 - 115
Selenium	99.5		P	85 - 115
Silver	99.0		P	85 - 115
Thallium	100		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	95.7		P	85 - 115
Manganese	96.6		P	85 - 115
Molybdenum	98.3		P	85 - 115
Nickel	98.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410516

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410517

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410577

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410549

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: P410623

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410485

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410263

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

Reference Method: SM 2320 B-2011
Batch ID: P410659

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.8		P	94 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P410662

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P410540

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410419

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307789	Barium	101	97.8	P/P	80 - 120
2307789	Calcium	101		P	80 - 120
2307789	Iron	105	104	P/P	80 - 120
2307789	Magnesium	107	101	P/P	80 - 120
2307789	Manganese	104	101	P/P	80 - 120
2307789	Potassium	105	101	P/P	80 - 120
2307789	Sodium	101		P	80 - 120
2307789	Strontium	99.3	97.3	P/P	80 - 120
2307789	Tin	102	99.9	P/P	80 - 120
2307789	Titanium	102	100	P/P	80 - 120
2307789	Vanadium	97.4	94.8	P/P	80 - 120
2307789	Zinc	98.4	95.0	P/P	80 - 120
2307790	Barium	103		P	80 - 120
2307790	Calcium	99.1		P	80 - 120
2307790	Iron	109		P	80 - 120
2307790	Magnesium	103		P	80 - 120
2307790	Manganese	107		P	80 - 120
2307790	Potassium	107		P	80 - 120
2307790	Sodium	101		P	80 - 120
2307790	Strontium	101		P	80 - 120
2307790	Tin	102		P	80 - 120
2307790	Titanium	106		P	80 - 120
2307790	Vanadium	99.1		P	80 - 120
2307790	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410419

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307789	Aluminum	87.1	102	P/P	80 - 120
2307789	Antimony	88.4	103	P/P	80 - 120
2307789	Arsenic	88.5	102	P/P	80 - 120
2307789	Barium	90.0	104	P/P	80 - 120
2307789	Beryllium	88.4	100	P/P	80 - 120
2307789	Boron	87.6	107	P/P	80 - 120
2307789	Cadmium	87.2	99.9	P/P	80 - 120
2307789	Cobalt	86.0	100	P/P	80 - 120
2307789	Copper	84.0	97.8	P/P	80 - 120
2307789	Lead	87.1	102	P/P	80 - 120
2307789	Selenium	84.5	96.6	P/P	80 - 120
2307789	Silver	98.4	98.7	P/P	80 - 120
2307789	Thallium	89.4	106	P/P	80 - 120
2307790	Aluminum	102		P	80 - 120
2307790	Antimony	103		P	80 - 120
2307790	Arsenic	101		P	80 - 120
2307790	Barium	103		P	80 - 120
2307790	Beryllium	100		P	80 - 120
2307790	Boron	108		P	80 - 120
2307790	Cadmium	105		P	80 - 120
2307790	Cobalt	98.5		P	80 - 120
2307790	Copper	96.0		P	80 - 120
2307790	Lead	102		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410419

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307790	Selenium	96.0		P	80 - 120
2307790	Silver	101		P	80 - 120
2307790	Thallium	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307546	Chromium	101		P	75 - 125
2307546	Manganese	101		P	75 - 125
2307546	Molybdenum	105		P	75 - 125
2307546	Nickel	98.9		P	75 - 125
2308895	Chromium	97.8	97.9	P/P	80 - 120
2308895	Molybdenum	99.6	100	P/P	80 - 120
2308895	Nickel	99.5	100	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410516

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307923	Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307913	Sulfate	99.4		P	90 - 110
2307923	Sulfate	99.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307670	Ammonia-N	97.2	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307334	Kjeldahl Nitrogen	98.0	99.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410623

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307633	NO2NO3-N	92.0	93.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307726	Total-P	106	104	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307668	O-Phosphate-P	94.2	95.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P410662

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308113	Fluoride	96.7	96.7	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P410540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307632	Organic Carbon	97.2	99.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P410298

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307327	Color (true)	4.72	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P410301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307325	Color (true)	6.76	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307585	Turbidity	7.31	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307789	Barium	3.52	Spike	P	0 - 20
2307789	Calcium	5.22	Spike	P	0 - 20
2307789	Iron	0.746	Spike	P	0 - 20
2307789	Magnesium	3.30	Spike	P	0 - 20
2307789	Manganese	2.95	Spike	P	0 - 20
2307789	Potassium	2.51	Spike	P	0 - 20
2307789	Sodium	3.79	Spike	P	0 - 20
2307789	Strontium	1.95	Spike	P	0 - 20
2307789	Tin	1.98	Spike	P	0 - 20
2307789	Titanium	2.00	Spike	P	0 - 20
2307789	Vanadium	2.59	Spike	P	0 - 20
2307789	Zinc	3.46	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307789	Aluminum	15.7	Spike	P	0 - 20
2307789	Antimony	14.8	Spike	P	0 - 20
2307789	Arsenic	13.8	Spike	P	0 - 20
2307789	Barium	13.9	Spike	P	0 - 20
2307789	Beryllium	12.6	Spike	P	0 - 20
2307789	Boron	17.9	Spike	P	0 - 20
2307789	Cadmium	13.4	Spike	P	0 - 20
2307789	Cobalt	15.1	Spike	P	0 - 20
2307789	Copper	15.3	Spike	P	0 - 20
2307789	Lead	15.3	Spike	P	0 - 20
2307789	Selenium	13.4	Spike	P	0 - 20
2307789	Silver	0.307	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307789	Thallium	16.8	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308895	Chromium	0.187	Spike	P	0 - 20
2308895	Manganese	1.23	Spike	P	0 - 20
2308895	Molybdenum	0.326	Spike	P	0 - 20
2308895	Nickel	0.481	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410516

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307913	Chloride	0.640	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307913	Sulfate	0.689	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307670	Ammonia-N	0.763	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307334	Kjeldahl Nitrogen	1.84	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307633	NO2NO3-N	1.08	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307726	Total-P	1.93	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307668	O-Phosphate-P	1.68	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P410659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308113	Total Alkalinity	2.96	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P410773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307333	TDS	2.22	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
Batch ID: P410774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307666	TDS	5.66	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P410662

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308113	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P410540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307632	Organic Carbon	1.51	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: A110574
Included Lab Sample IDs: 2307734, 2307737

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	99.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A110576
Included Lab Sample IDs: 2307732

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

Reference Method: DEP SOP: NU-094-1
Run ID: A110593
Included Lab Sample IDs: 2307732, 2307735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110666
Included Lab Sample IDs: 2307740, 2307741

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	101	P/P	90 - 110
Aluminum	101	99.7	P/P	90 - 110
Antimony	94.6	94.7	P/P	90 - 110
Antimony	95.1	95.4	P/P	90 - 110
Arsenic	97.2	96.7	P/P	90 - 110
Arsenic	98.6	98.2	P/P	90 - 110
Barium	97.2	96.4	P/P	90 - 110
Beryllium	101	100	P/P	90 - 110
Boron	104	103	P/P	90 - 110
Boron	105	99.7	P/P	90 - 110
Cadmium	97.9	98.7	P/P	90 - 110
Cadmium	99.3	98.8	P/P	90 - 110
Cobalt	94.9	96.0	P/P	90 - 110
Copper	95.0	93.7	P/P	90 - 110
Copper	95.9	96.3	P/P	90 - 110
Lead	96.9	96.9	P/P	90 - 110
Lead	97.4	97.5	P/P	90 - 110
Selenium	96.3	96.3	P/P	90 - 110
Selenium	97.9	96.2	P/P	90 - 110
Silver	94.6	95.2	P/P	90 - 110
Silver	95.2	94.9	P/P	90 - 110
Thallium	100	99.8	P/P	90 - 110
Thallium	101	98.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A110693
Included Lab Sample IDs: 2307732, 2307735

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A110693
Included Lab Sample IDs: 2307732, 2307735

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110695
Included Lab Sample IDs: 2307740

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	95.1	96.4	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A110701
Included Lab Sample IDs: 2307733, 2307736

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.5	96.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110711
Included Lab Sample IDs: 2307733, 2307736

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.1	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A110732
Included Lab Sample IDs: 2307733, 2307736

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	96.0	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A110751
Included Lab Sample IDs: 2307732, 2307735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.7	95.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A110751
Included Lab Sample IDs: 2307732, 2307735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	98.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110759
Included Lab Sample IDs: 2307740, 2307741

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	104	101	P/P	90 - 110
Calcium	100	99.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110759
Included Lab Sample IDs: 2307740, 2307741

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	99.1	P/P	90 - 110
Iron	101	103	P/P	90 - 110
Iron	103	101	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Magnesium	102	99.6	P/P	90 - 110
Manganese	104	102	P/P	90 - 110
Potassium	99.0	100	P/P	90 - 110
Potassium	99.7	98.0	P/P	90 - 110
Sodium	98.1	98.4	P/P	90 - 110
Sodium	99.6	98.7	P/P	90 - 110
Strontium	97.0	98.6	P/P	90 - 110
Tin	99.4	102	P/P	90 - 110
Titanium	100	102	P/P	90 - 110
Vanadium	99.9	102	P/P	90 - 110
Zinc	102	104	P/P	90 - 110
Zinc	104	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110768
Included Lab Sample IDs: 2307733, 2307736

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110775
Included Lab Sample IDs: 2307740, 2307741

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	96.1	96.5	P/P	90 - 110
Chromium	96.3	94.5	P/P	90 - 110
Manganese	96.1	96.4	P/P	90 - 110
Molybdenum	99.6	96.7	P/P	90 - 110
Nickel	95.1	95.2	P/P	90 - 110
Nickel	99.3	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110781
Included Lab Sample IDs: 2307733, 2307736

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	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)	98.7					4.72	
	Color (true)	99.1					6.76	
EPA 180.1 Rev. 2.0	Turbidity	97.8					7.31	
EPA 200.7 Rev. 4.4	Barium	104	101	97.8	103			3.52
	Calcium	102	101	99.1				5.22
	Iron	106	105	104	109			0.746
	Magnesium	107	107	101	103			3.30
	Manganese	106	104	101	107			2.95
	Potassium	105	105	101	107			2.51
	Sodium	99.5	101	101				3.79
	Strontium	101	99.3	97.3	101			1.95
	Tin	102	102	99.9	102			1.98
	Titanium	103	102	100	106			2.00
	Vanadium	96.9	97.4	94.8	99.1			2.59
	Zinc	101	98.4	95.0	101			3.46
EPA 200.8 Rev. 5.4	Aluminum	103	87.1	102	102			15.7
	Antimony	101	88.4	103	103			14.8
	Arsenic	102	88.5	102	101			13.8
	Barium	103	90.0	104	103			13.9
	Beryllium	97.8	88.4	100	100			12.6
	Boron	107	87.6	107	108			17.9
	Cadmium	101	87.2	99.9	105			13.4
	Chromium	95.7	97.8	97.9	101			0.187
	Cobalt	98.8	86.0	100	98.5			15.1
	Copper	98.9	84.0	97.8	96.0			15.3
	Lead	101	87.1	102	102			15.3
	Manganese	96.6	101					1.23
	Molybdenum	98.3	99.6	100	105			0.326
	Nickel	98.0	99.5	100	98.9			0.481
	Selenium	99.5	84.5	96.6	96.0			13.4
	Silver	99.0	98.4	98.7	101			0.307
	Thallium	100	89.4	106	102			16.8
EPA 300.0 Rev. 2.1	Chloride	100	98.3				0.640	
	Sulfate	100	99.4	99.0			0.689	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	97.2	98.0				0.763
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	98.0	99.9				1.84
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	92.0	93.0				1.08
EPA 365.1 Rev. 2.0	Total-P	102	106	104				1.93
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	94.2	95.8				1.68
SM 2320 B-2011	Total Alkalinity	96.8					2.96	
SM 2540 C-2011	TDS						2.22	
	TDS						5.66	
SM 4500 F-C-2011	Fluoride	97.6	96.7	96.7				0.0
SM 5310 B-2011	Organic Carbon	95.2	97.2	99.4				1.51

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2307732, 2307735
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2307732
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2307740, 2307741

Reference Method Descriptions

Method	Description	Associated Samples
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2307740, 2307741
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2307732, 2307735
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2307732, 2307735
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2307733, 2307736
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2307733, 2307736
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2307733, 2307736
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2307733, 2307736
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2307734, 2307737
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2307732, 2307735
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2307740, 2307741
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2307732, 2307735
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2307732, 2307735
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2307732, 2307735
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2307733, 2307736

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	02/23/2022			02/23/2022 16:53	Anna M. Plaviak	2307735
	02/23/2022			02/23/2022 16:54	Anna M. Plaviak	2307732
EPA 180.1 Rev. 2.0	02/23/2022			02/23/2022 15:48	Khloe J Berg	2307732
EPA 200.7 Rev. 4.4	02/23/2022	02/28/2022 10:30	Megan Whitefoot	03/03/2022 19:29	Josef B Mick	2307741
	02/23/2022	02/28/2022 10:30	Megan Whitefoot	03/03/2022 22:28	Josef B Mick	2307740
EPA 200.8 Rev. 5.4	02/23/2022	02/28/2022 10:30	Megan Whitefoot	02/28/2022 17:28	Emily M Philpot	2307741
	02/23/2022	02/28/2022 10:30	Megan Whitefoot	02/28/2022 21:14	Emily M Philpot	2307740
	02/23/2022	02/28/2022 10:30	Megan Whitefoot	03/01/2022 13:03	Emily M Philpot	2307740
	02/23/2022	03/03/2022 10:15	Megan Whitefoot	03/04/2022 13:48	Alexander Thompson	2307741
	02/23/2022	03/03/2022 10:15	Megan Whitefoot	03/04/2022 18:35	Alexander Thompson	2307740
EPA 300.0 Rev. 2.1	02/23/2022			02/28/2022 19:53	James L Waggerby	2307732
	02/23/2022			02/28/2022 20:05	James L Waggerby	2307735
EPA 350.1 Rev. 2.0	02/23/2022			03/02/2022 12:32	Ping Hua	2307733
	02/23/2022			03/02/2022 12:38	Ping Hua	2307736
EPA 351.2 Rev. 2.0	02/23/2022	03/03/2022 12:56	Samantha L Bates	03/04/2022 15:47	Alexandra J Mattheus	2307733
	02/23/2022	03/03/2022 12:56	Samantha L Bates	03/04/2022 15:48	Alexandra J Mattheus	2307736
EPA 353.2 Rev. 2.0	02/23/2022			03/03/2022 09:47	Beverly Y. Sanders	2307733
	02/23/2022			03/03/2022 09:48	Beverly Y. Sanders	2307736
EPA 365.1 Rev. 2.0	02/23/2022	03/02/2022 15:00	Simonne.V. Calhoun	03/04/2022 15:36	Sarah A Nixon	2307736
	02/23/2022	03/02/2022 15:00	Simonne.V. Calhoun	03/04/2022 15:40	Sarah A Nixon	2307733
EPA 365.1 Rev. 2.0 dissolved	02/23/2022			02/23/2022 17:25	James L Waggerby	2307734, 2307737
SM 2320 B-2011	02/23/2022			03/02/2022 20:54	Dale L. Simmons	2307732
	02/23/2022			03/02/2022 21:03	Dale L. Simmons	2307735
SM 2340B	02/23/2022			03/03/2022 19:29	Josef B Mick	2307741
	02/23/2022			03/03/2022 22:28	Josef B Mick	2307740
SM 2540 C-2011	02/23/2022			02/28/2022 15:12	Yijie Li	2307732, 2307735
SM 2540 D-2011	02/23/2022			02/28/2022 15:12	Yijie Li	2307732, 2307735
SM 4500 F-C-2011	02/23/2022			03/02/2022 20:54	Dale L. Simmons	2307732
	02/23/2022			03/02/2022 21:03	Dale L. Simmons	2307735
SM 5310 B-2011	02/23/2022			03/01/2022 22:43	Khloe J Berg	2307733
	02/23/2022			03/01/2022 23:12	Khloe J Berg	2307736