Chemical Analysis Report

NE-DIST-2022-02-25-02

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

Event Description: **LSJR Black Creek**
Request ID: **RQ-2022-02-21-30**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256
Attn: Jeremy Parrish

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 22-MAR-2022 08:59

NON-CONFORMANCE REPORT INCLUDED

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: Black CR South Fork @ CR218 **Collection Date/Time: 02/24/2022 11:45**

Field ID: 20030244 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2308306	DEP SOP: NU-094-1	Color (true)**	120		PCU	P410437	
	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P410381	
	EPA 300.0 Rev. 2.1	Chloride	9.7		mg Cl/L	P410851	
		Sulfate	3.2		mg SO4/L	P410855	
	SM 2320 B-2011	Total Alkalinity	11		mg CaCO3/L	P410660	
	SM 2540 C-2011	TDS	63		mg/L	P410754	
	SM 2540 D-2011	TSS	2	I	mg/L	P410897	
	SM 4500 F-C-2011	Fluoride	0.080	I	mg F/L	P410663	
2308307	EPA 350.1 Rev. 2.0	Ammonia-N	0.017	Y	mg N/L	P410632	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38	Y	mg N/L	P410430	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.032	Y	mg N/L	P410784	
	EPA 365.1 Rev. 2.0	Total-P	0.12	Y	mg P/L	P410933	
	SM 5310 B-2011	Organic Carbon	10	Y	mg C/L	P410673	
2308308	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.099		mg P/L	P410374	
2308311	EPA 200.7 Rev. 4.4	Calcium	6.01		mg/L	P410465	
		Iron	350		ug/L	P410465	
		Magnesium	1.77		mg/L	P410465	
		Potassium	0.30	U	mg/L	P410465	
		Sodium	5.7		mg/L	P410465	
		Strontium	22.8		ug/L	P410465	
		Tin	3.0	U	ug/L	P410465	
		Titanium	1.4	I	ug/L	P410465	
		Vanadium	2.0	U	ug/L	P410465	
		Zinc	5.0	U	ug/L	P410465	
	EPA 200.8 Rev. 5.4	Aluminum	224		ug/L	P410465	
		Antimony	0.050	U	ug/L	P410465	
		Arsenic	0.33		ug/L	P410465	
		Barium	7.08		ug/L	P410465	
		Beryllium	0.021	I	ug/L	P410465	
		Boron**	12.3		ug/L	P410465	
		Cadmium	0.020	U	ug/L	P410465	
		Chromium	0.40	U	ug/L	P410465	
		Cobalt	0.076	I	ug/L	P410465	
		Copper	0.40	U	ug/L	P410465	
		Lead	0.20	U	ug/L	P410465	
		Manganese	3.85		ug/L	P410465	
		Molybdenum	0.15	U	ug/L	P410465	
		Nickel	0.50	U	ug/L	P410465	
		Selenium	0.20	U	ug/L	P410465	
		Silver	0.010	U	ug/L	P410465	
		Thallium	0.10	U	ug/L	P410465	
	SM 2340B	Hardness	22.3		mg/L	P410465	

Field ID: 20030244 Matrix: W-SURF-FRH

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

Ref. Method and Comment:
DEP SOP: NU-094-1: Batch relative percent difference is unavailable because of low 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 350.1 Rev. 2.0: Sample was left out at room temperature overnight, should be stored below 6 degC.
EPA 351.2 Rev. 2.0: Sample was left out at room temperature overnight, should be stored below 6 degC.
EPA 353.2 Rev. 2.0: Sample was left out at room temperature overnight, should be stored below 6 degC.
EPA 365.1 Rev. 2.0: Total-P: Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 5310 B-2011: Sample was left out at room temperature overnight, should be stored below 6 degC.

Non-Conformance Report

NCR ID: 9282

Event(s)	Job(s)	Sample(s)	Test(s)
NE-DIST-2022-02-25-02	TLH-2022-02-25-35	2308307	

NCR Type: CUSTODY **NCR Category: General**

Observation: Samples were removed from the receiving room refrigerator on 02/27/2022 at 16:30. Samples left out overnight at room temperature.

Resolution: Customers contacted by receiving staff.
Samples were placed in appropriate refrigerators on 02/28/2022 at 09:45.
Samples poured for analysis after this date will be qualified.

Authorized by/Date: Colin Wright 3/22/2022

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P410437

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410381

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410465

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: P410465

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: P410851

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: P410855

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410632

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410430

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410784

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410933

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410374

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

Reference Method: SM 2320 B-2011
Batch ID: P410660

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

Reference Method: SM 2540 C-2011
Batch ID: P410754

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P410897

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P410663

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P410673

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: P410437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.6		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410381

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.3		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	103		P	85 - 115
Magnesium	99.7		P	85 - 115
Potassium	101		P	85 - 115
Sodium	102		P	85 - 115
Strontium	98.1		P	85 - 115
Tin	97.5		P	85 - 115
Titanium	98.6		P	85 - 115
Vanadium	91.2		P	85 - 115
Zinc	93.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.9		P	85 - 115
Antimony	99.9		P	85 - 115
Arsenic	97.4		P	85 - 115
Barium	100		P	85 - 115
Beryllium	94.3		P	85 - 115
Boron	99.6		P	85 - 115
Cadmium	96.8		P	85 - 115
Chromium	96.2		P	85 - 115
Cobalt	95.6		P	85 - 115
Copper	93.7		P	85 - 115
Lead	92.7		P	85 - 115
Manganese	96.2		P	85 - 115
Molybdenum	95.7		P	85 - 115
Nickel	95.4		P	85 - 115
Selenium	96.4		P	85 - 115
Silver	94.0		P	85 - 115
Thallium	93.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410851

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410855

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410632

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410430

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410784

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: P410933

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410374

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

Reference Method: SM 2320 B-2011
Batch ID: P410660

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.7		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P410663

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.0		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P410673

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306557	Calcium	98.1		P	80 - 120
2306557	Iron	106	98.2	P/P	80 - 120
2306557	Magnesium	97.6		P	80 - 120
2306557	Potassium	103	95.7	P/P	80 - 120
2306557	Sodium	99.7		P	80 - 120
2306557	Strontium	98.5	92.2	P/P	80 - 120
2306557	Tin	96.3	91.1	P/P	80 - 120
2306557	Titanium	98.8	92.0	P/P	80 - 120
2306557	Vanadium	92.5	86.1	P/P	80 - 120
2306557	Zinc	91.4	85.7	P/P	80 - 120
2306559	Calcium	100		P	80 - 120
2306559	Iron	104		P	80 - 120
2306559	Magnesium	102		P	80 - 120
2306559	Potassium	101		P	80 - 120
2306559	Sodium	104		P	80 - 120
2306559	Strontium	98.1		P	80 - 120
2306559	Tin	97.1		P	80 - 120
2306559	Titanium	98.6		P	80 - 120
2306559	Vanadium	92.2		P	80 - 120
2306559	Zinc	91.1		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306557	Aluminum	95.3	94.6	P/P	80 - 120
2306557	Antimony	102	101	P/P	80 - 120
2306557	Arsenic	99.2	98.4	P/P	80 - 120
2306557	Barium	100	100	P/P	80 - 120
2306557	Beryllium	96.1	92.4	P/P	80 - 120
2306557	Boron	97.9	97.5	P/P	80 - 120
2306557	Cadmium	99.8	99.0	P/P	80 - 120
2306557	Chromium	96.7	94.8	P/P	80 - 120
2306557	Cobalt	95.8	94.8	P/P	80 - 120
2306557	Copper	93.3	92.8	P/P	80 - 120
2306557	Lead	93.5	92.0	P/P	80 - 120
2306557	Manganese	96.2	95.4	P/P	80 - 120
2306557	Molybdenum	98.4	96.9	P/P	80 - 120
2306557	Nickel	96.1	95.2	P/P	80 - 120
2306557	Selenium	98.0	97.6	P/P	80 - 120
2306557	Silver	93.9	93.0	P/P	80 - 120
2306557	Thallium	97.8	96.4	P/P	80 - 120
2306559	Aluminum	98.5		P	80 - 120
2306559	Antimony	103		P	80 - 120
2306559	Arsenic	101		P	80 - 120
2306559	Barium	101		P	80 - 120
2306559	Beryllium	95.9		P	80 - 120
2306559	Boron	103		P	80 - 120
2306559	Cadmium	100		P	80 - 120
2306559	Chromium	97.9		P	80 - 120
2306559	Cobalt	97.8		P	80 - 120
2306559	Copper	94.7		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306559	Lead	94.1		P	80 - 120
2306559	Manganese	97.8		P	80 - 120
2306559	Molybdenum	100		P	80 - 120
2306559	Nickel	98.5		P	80 - 120
2306559	Selenium	98.9		P	80 - 120
2306559	Silver	95.4		P	80 - 120
2306559	Thallium	96.6		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410851

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308284	Chloride	99.0		P	90 - 110
2308650	Chloride	97.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410855

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308284	Sulfate	97.1		P	90 - 110
2308650	Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410632

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308285	Ammonia-N	96.8	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307820	Kjeldahl Nitrogen	100	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410784

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308275	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410933

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308314	Total-P	106	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410374

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308279	O-Phosphate-P	98.6	99.6	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P410663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307772	Fluoride	94.9	94.4	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P410673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307775	Organic Carbon	87.9	90.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308129	Turbidity	14.2	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306557	Calcium	0.677	Spike	P	0 - 20
2306557	Iron	7.20	Spike	P	0 - 20
2306557	Magnesium	2.11	Spike	P	0 - 20
2306557	Potassium	6.48	Spike	P	0 - 20
2306557	Sodium	2.90	Spike	P	0 - 20
2306557	Strontium	6.19	Spike	P	0 - 20
2306557	Tin	5.55	Spike	P	0 - 20
2306557	Titanium	6.96	Spike	P	0 - 20
2306557	Vanadium	7.02	Spike	P	0 - 20
2306557	Zinc	6.39	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306557	Aluminum	0.783	Spike	P	0 - 20
2306557	Antimony	1.15	Spike	P	0 - 20
2306557	Arsenic	0.854	Spike	P	0 - 20
2306557	Barium	0.0526	Spike	P	0 - 20
2306557	Beryllium	3.91	Spike	P	0 - 20
2306557	Boron	0.313	Spike	P	0 - 20
2306557	Cadmium	0.849	Spike	P	0 - 20
2306557	Chromium	1.86	Spike	P	0 - 20
2306557	Cobalt	1.10	Spike	P	0 - 20
2306557	Copper	0.582	Spike	P	0 - 20
2306557	Lead	1.64	Spike	P	0 - 20
2306557	Manganese	0.741	Spike	P	0 - 20
2306557	Molybdenum	1.32	Spike	P	0 - 20
2306557	Nickel	0.929	Spike	P	0 - 20
2306557	Selenium	0.398	Spike	P	0 - 20
2306557	Silver	1.04	Spike	P	0 - 20
2306557	Thallium	1.47	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308284	Chloride	2.10	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308284	Sulfate	0.525	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410632

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308285	Ammonia-N	1.53	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307820	Kjeldahl Nitrogen	2.10	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410784

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308275	NO2NO3-N	0.995	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308314	Total-P	3.56	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410374

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308279	O-Phosphate-P	1.01	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P410660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307772	Total Alkalinity	1.80	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P410754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308284	TDS	3.31	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P410663

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307772	Fluoride	0.498	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P410673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307775	Organic Carbon	2.23	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: A110631
Included Lab Sample IDs: 2308308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A110635
Included Lab Sample IDs: 2308306

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: A110661
Included Lab Sample IDs: 2308306

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110695
Included Lab Sample IDs: 2308311

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	P/P	90 - 110
Antimony	101	100	P/P	90 - 110
Arsenic	101	102	P/P	90 - 110
Barium	101	101	P/P	90 - 110
Beryllium	97.0	97.2	P/P	90 - 110
Boron	101	100	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Chromium	99.2	99.2	P/P	90 - 110
Cobalt	99.3	99.5	P/P	90 - 110
Copper	100	101	P/P	90 - 110
Lead	95.4	95.8	P/P	90 - 110
Manganese	99.3	99.1	P/P	90 - 110
Molybdenum	100	100	P/P	90 - 110
Nickel	100	102	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	93.7	94.0	P/P	90 - 110
Thallium	99.4	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110697
Included Lab Sample IDs: 2308307

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110734
Included Lab Sample IDs: 2308307

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110734
Included Lab Sample IDs: 2308307

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	99.5	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A110751
Included Lab Sample IDs: 2308306

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.7	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A110751
Included Lab Sample IDs: 2308306

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A110758
Included Lab Sample IDs: 2308307

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.3	91.3	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110770
Included Lab Sample IDs: 2308311

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	100	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	99.7	99.6	P/P	90 - 110
Potassium	98.0	98.7	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Strontium	93.3	92.8	P/P	90 - 110
Tin	95.8	95.0	P/P	90 - 110
Titanium	95.8	94.7	P/P	90 - 110
Vanadium	94.6	93.5	P/P	90 - 110
Zinc	94.5	94.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A110807
Included Lab Sample IDs: 2308307

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A110831
Included Lab Sample IDs: 2308306

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A110831
Included Lab Sample IDs: 2308306

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110899
Included Lab Sample IDs: 2308307

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.6	96.9	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	98.6						
EPA 180.1 Rev. 2.0	Turbidity	97.3					14.2	
EPA 200.7 Rev. 4.4	Calcium	101	98.1	100				0.677
	Iron	103	106	98.2	104			7.20
	Magnesium	99.7	97.6	102				2.11
	Potassium	101	103	95.7	101			6.48
	Sodium	102	99.7	104				2.90
	Strontium	98.1	98.5	92.2	98.1			6.19
	Tin	97.5	96.3	91.1	97.1			5.55
	Titanium	98.6	98.8	92.0	98.6			6.96
	Vanadium	91.2	92.5	86.1	92.2			7.02
	Zinc	93.7	91.4	85.7	91.1			6.39
EPA 200.8 Rev. 5.4	Aluminum	96.9	95.3	94.6	98.5			0.783
	Antimony	99.9	102	101	103			1.15
	Arsenic	97.4	99.2	98.4	101			0.854
	Barium	100	100	100	101			0.0526
	Beryllium	94.3	96.1	92.4	95.9			3.91
	Boron	99.6	97.9	97.5	103			0.313
	Cadmium	96.8	99.8	99.0	100			0.849
	Chromium	96.2	96.7	94.8	97.9			1.86
	Cobalt	95.6	95.8	94.8	97.8			1.10
	Copper	93.7	93.3	92.8	94.7			0.582
	Lead	92.7	93.5	92.0	94.1			1.64
	Manganese	96.2	96.2	95.4	97.8			0.741
	Molybdenum	95.7	98.4	96.9	100			1.32
	Nickel	95.4	96.1	95.2	98.5			0.929
	Selenium	96.4	98.0	97.6	98.9			0.398
	Silver	94.0	93.9	93.0	95.4			1.04
	Thallium	93.8	97.8	96.4	96.6			1.47
EPA 300.0 Rev. 2.1	Chloride	100	99.0	97.1			2.10	
	Sulfate	101	97.1	98.9			0.525	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	96.8	98.4				1.53
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.9	100	103				2.10
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	102				0.995
EPA 365.1 Rev. 2.0	Total-P	98.0	106	101				3.56
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	98.6	99.6				1.01
SM 2320 B-2011	Total Alkalinity	95.7					1.80	
SM 2540 C-2011	TDS						3.31	
SM 4500 F-C-2011	Fluoride	98.0	94.9	94.4				0.498
SM 5310 B-2011	Organic Carbon	96.3	87.9	90.0				2.23

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2308306
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2308306
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2308311
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2308311
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2308306
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2308306
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2308307

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2308307
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2308307
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2308307
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2308308
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2308306
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2308311
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2308306
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2308306
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2308306
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2308307

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	02/25/2022			02/25/2022 16:40	Anna M. Plaviak	2308306
EPA 180.1 Rev. 2.0	02/25/2022			02/25/2022 15:42	Khloe J Berg	2308306
EPA 200.7 Rev. 4.4	02/25/2022	03/01/2022 10:35	Megan Whitefoot	03/05/2022 04:22	Josef B Mick	2308311
EPA 200.8 Rev. 5.4	02/25/2022	03/01/2022 10:35	Megan Whitefoot	03/01/2022 20:32	Emily M Philpot	2308311
EPA 300.0 Rev. 2.1	02/25/2022			03/07/2022 19:28	James L Waggerby	2308306
EPA 350.1 Rev. 2.0	02/25/2022			03/03/2022 12:03	Judith K. Clark	2308307
EPA 351.2 Rev. 2.0	02/25/2022	03/01/2022 10:02	Samantha L Bates	03/01/2022 16:26	Alexandra J Mattheus	2308307
EPA 353.2 Rev. 2.0	02/25/2022			03/08/2022 11:28	Beverly Y. Sanders	2308307
EPA 365.1 Rev. 2.0	02/25/2022	03/11/2022 12:25	Simonne.V. Calhoun	03/11/2022 17:19	Sarah A Nixon	2308307
EPA 365.1 Rev. 2.0 dissolved	02/25/2022			02/25/2022 15:16	James L Waggerby	2308308
SM 2320 B-2011	02/25/2022			03/03/2022 03:12	Dale L. Simmons	2308306
SM 2340B	02/25/2022			03/05/2022 04:22	Josef B Mick	2308311
SM 2540 C-2011	02/25/2022			03/02/2022 14:21	Yijie Li	2308306
SM 2540 D-2011	02/25/2022			03/02/2022 14:26	Yijie Li	2308306
SM 4500 F-C-2011	02/25/2022			03/03/2022 03:12	Dale L. Simmons	2308306
SM 5310 B-2011	02/25/2022			03/02/2022 22:39	Nathaniel J Jones	2308307