

Chemical Analysis Report

TLH-ROC-2022-10-19-01

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

Event Description: **Run 8**
Request ID: **RQ-2022-10-17-43**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 08-NOV-2022 12:47



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: Apalachicola River .8 miles upstream Owl Creek

Collection Date/Time: 10/18/2022 12:15

Field ID: G2TLHR0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2363186	DEP SOP: NU-094-1	Color (true)	11		PCU	P421080	
	EPA 180.1 Rev. 2.0	Turbidity	8.1	A	NTU	P421116	
	EPA 300.0 Rev. 2.1	Chloride	6.0	A	mg Cl/L	P421609	
		Sulfate	6.9	A	mg SO4/L	P421612	
	SM 2320 B-2011	Total Alkalinity	59		mg CaCO3/L	P421305	
	SM 2540 C-2015	TDS	89	A	mg/L	P421526	
	SM 2540 D-2015	TSS	10	A	mg/L	P421523	
	SM 4500-F- C-2011	Fluoride	0.078	I	mg F/L	P421310	
2363188	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P421407	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27		mg N/L	P421417	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.52		mg N/L	P421243	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P421088	
	SM 5310 B-2011	Organic Carbon	2.6		mg C/L	P421234	
2363192	EPA 200.7 Rev. 4.4	Calcium	20.2		mg/L	P421155	
		Iron	580		ug/L	P421155	
		Magnesium	2.49		mg/L	P421155	
		Potassium	1.8		mg/L	P421155	
		Sodium	7.5		mg/L	P421155	
		Strontium	43.5		ug/L	P421155	
		Tin	3.0	U	ug/L	P421155	
		Titanium	12.4		ug/L	P421155	
		Vanadium	2.0	U	ug/L	P421155	
		Zinc	5.0	U	ug/L	P421155	
	EPA 200.8 Rev. 5.4	Aluminum	402		ug/L	P421155	
		Antimony	0.062	I	ug/L	P421155	
		Arsenic	0.50		ug/L	P421155	
		Barium	21.7		ug/L	P421155	
		Beryllium	0.030	I	ug/L	P421155	
		Boron	17.6		ug/L	P421155	
		Cadmium	0.020	U	ug/L	P421155	
		Chromium	0.80	I	ug/L	P421155	
		Cobalt	0.241		ug/L	P421155	
		Copper	0.60	I	ug/L	P421155	
		Lead	0.32	I	ug/L	P421155	
		Manganese	56.9		ug/L	P421155	
		Molybdenum	0.41	I	ug/L	P421155	
		Nickel	0.50	U	ug/L	P421155	
		Selenium	0.20	U	ug/L	P421155	
		Silver	0.010	U	ug/L	P421155	
		Thallium	0.10	U	ug/L	P421155	
	SM 2340 B-2011	Hardness	60.7		mg/L	P421155	

Sample Location: Fort Gadsden Creek near SR65

Collection Date/Time: 10/18/2022 13:05

Field ID: G2TLHR0012

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2363187	DEP SOP: NU-094-1	Color (true)	230		PCU	P421080	
	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P421116	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P421609	
		Sulfate	1.1		mg SO4/L	P421612	
	SM 2320 B-2011	Total Alkalinity	13		mg CaCO3/L	P421305	
	SM 2540 C-2015	TDS	63		mg/L	P421526	
	SM 2540 D-2015	TSS	4	I	mg/L	P421523	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P421310	
2363189	EPA 350.1 Rev. 2.0	Ammonia-N	0.062		mg N/L	P421407	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P421504	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.021		mg N/L	P421243	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P421088	
	SM 5310 B-2011	Organic Carbon	17		mg C/L	P421234	
2363193	EPA 200.7 Rev. 4.4	Calcium	7.66		mg/L	P421155	
		Iron	1.58E+03		ug/L	P421155	
		Magnesium	0.72		mg/L	P421155	
		Potassium	0.37	I	mg/L	P421155	
		Sodium	2.4		mg/L	P421155	
		Strontium	43.5		ug/L	P421155	
		Tin	3.0	U	ug/L	P421155	
		Titanium	2.2	I	ug/L	P421668	
		Vanadium	2.0	U	ug/L	P421155	
		Zinc	5.0	U	ug/L	P421155	
	EPA 200.8 Rev. 5.4	Aluminum	360		ug/L	P421155	
		Antimony	0.050	U	ug/L	P421155	
		Arsenic	0.48		ug/L	P421155	
		Barium	8.97		ug/L	P421155	
		Beryllium	0.018	I	ug/L	P421155	
		Boron	9.7		ug/L	P421155	
		Cadmium	0.020	U	ug/L	P421155	
		Chromium	0.43	I	ug/L	P421155	
		Cobalt	0.123		ug/L	P421155	
		Copper	0.40	U	ug/L	P421155	
		Lead	0.43		ug/L	P421155	
		Manganese	8.05		ug/L	P421155	
		Molybdenum	0.15	U	ug/L	P421155	
		Nickel	0.50	U	ug/L	P421155	
		Selenium	0.20	U	ug/L	P421155	
		Silver	0.010	U	ug/L	P421155	
		Thallium	0.10	U	ug/L	P421155	
		Hardness	22.1		mg/L	P421155	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P421080

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421116

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421155

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	1.2	I	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421668

Component	Result	Code	Units
Titanium	0.75	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421155

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421609

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421612

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421407

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421417

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421504

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421243

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421088

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

Reference Method: SM 2320 B-2011
Batch ID: P421305

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

Reference Method: SM 2540 C-2015
Batch ID: P421526

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P421523

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P421310

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P421234

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: P421080

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.7		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421116

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421155

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	95.9		P	80 - 120
Iron	101		P	80 - 120
Magnesium	103		P	80 - 120
Potassium	102		P	80 - 120
Sodium	94.1		P	80 - 120
Strontium	103		P	80 - 120
Tin	104		P	80 - 120
Titanium	95.8		P	80 - 120
Vanadium	110		P	85 - 115
Zinc	98.7		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421668

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Titanium	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421155

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.9		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	103		P	85 - 115
Barium	101		P	85 - 115
Beryllium	91.1		P	85 - 115
Boron	108		P	85 - 115
Cadmium	99.6		P	85 - 115
Chromium	96.8		P	85 - 115
Cobalt	99.4		P	85 - 115
Copper	101		P	85 - 115
Lead	94.7		P	85 - 115
Manganese	97.2		P	85 - 115
Molybdenum	98.8		P	85 - 115
Nickel	101		P	85 - 115
Selenium	99.6		P	85 - 115
Silver	104		P	85 - 115
Thallium	95.4		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421609

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421612

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421407

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421417

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421504

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: P421243

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421088

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P421305

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P421526

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	95.8		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2540 D-2015
Batch ID: P421523

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	91.9		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P421310

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P421234

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: P421155

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362929	Calcium	98.6		P	80 - 120
2362929	Iron	99.1	102	P/P	80 - 120
2362929	Magnesium	98.4	103	P/P	80 - 120
2362929	Potassium	98.0	98.0	P/P	80 - 120
2362929	Sodium	97.0		P	80 - 120
2362929	Strontium	100	101	P/P	80 - 120
2362929	Tin	102	103	P/P	80 - 120
2362929	Titanium	99.2	97.2	P/P	80 - 120
2362929	Vanadium	97.7	97.7	P/P	80 - 120
2362929	Zinc	96.4	95.8	P/P	80 - 120
2363082	Calcium	101		P	80 - 120
2363082	Iron	102		P	80 - 120
2363082	Magnesium	103		P	80 - 120
2363082	Potassium	100		P	80 - 120
2363082	Sodium	96.2		P	80 - 120
2363082	Strontium	98.3		P	80 - 120
2363082	Tin	98.1		P	80 - 120
2363082	Titanium	96.7		P	80 - 120
2363082	Vanadium	94.1		P	80 - 120
2363082	Zinc	93.9		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P421668

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365710	Titanium	104		P	80 - 120
2366127	Titanium	104	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P421155

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362929	Aluminum	93.8	93.5	P/P	80 - 120
2362929	Antimony	101	102	P/P	80 - 120
2362929	Arsenic	101	102	P/P	80 - 120
2362929	Barium	101	102	P/P	80 - 120
2362929	Beryllium	84.2	83.5	P/P	80 - 120
2362929	Boron	103	103	P/P	80 - 120
2362929	Cadmium	102	102	P/P	80 - 120
2362929	Chromium	96.1	96.1	P/P	80 - 120
2362929	Cobalt	96.9	96.6	P/P	80 - 120
2362929	Copper	98.2	97.9	P/P	80 - 120
2362929	Lead	96.3	96.5	P/P	80 - 120
2362929	Manganese	96.5	97.5	P/P	80 - 120
2362929	Molybdenum	102	101	P/P	80 - 120
2362929	Nickel	98.8	97.8	P/P	80 - 120
2362929	Selenium	91.5	91.9	P/P	80 - 120
2362929	Silver	105	105	P/P	80 - 120
2362929	Thallium	98.4	99.1	P/P	80 - 120
2363082	Aluminum	96.1		P	80 - 120
2363082	Antimony	104		P	80 - 120
2363082	Arsenic	101		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P421155

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363082	Barium	103		P	80 - 120
2363082	Beryllium	91.3		P	80 - 120
2363082	Boron	104		P	80 - 120
2363082	Cadmium	102		P	80 - 120
2363082	Chromium	97.1		P	80 - 120
2363082	Cobalt	96.3		P	80 - 120
2363082	Copper	99.5		P	80 - 120
2363082	Lead	97.9		P	80 - 120
2363082	Manganese	96.9		P	80 - 120
2363082	Molybdenum	99.4		P	80 - 120
2363082	Nickel	98.1		P	80 - 120
2363082	Selenium	95.9		P	80 - 120
2363082	Silver	105		P	80 - 120
2363082	Thallium	99.2		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P421609

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363186	Chloride	98.1		P	90 - 110
2363196	Chloride	94.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P421612

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363186	Sulfate	99.5		P	90 - 110
2363196	Sulfate	94.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P421407

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363188	Ammonia-N	98.4	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P421417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363188	Kjeldahl Nitrogen	101	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P421504

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363343	Kjeldahl Nitrogen	96.8	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P421243

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363189	NO2NO3-N	96.5	97.5	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362985	Total-P	107	107	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P421310

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363803	Fluoride	96.8	97.4	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P421234

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363238	Organic Carbon	97.0	98.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P421080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363069	Color (true)	1.46	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421116

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363186	Turbidity	0.860	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421155

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362929	Calcium	0.552	Spike	P	0 - 20
2362929	Iron	1.92	Spike	P	0 - 20
2362929	Magnesium	2.53	Spike	P	0 - 20
2362929	Potassium	0.0349	Spike	P	0 - 20
2362929	Sodium	0.628	Spike	P	0 - 20
2362929	Strontium	1.15	Spike	P	0 - 20
2362929	Tin	1.16	Spike	P	0 - 20
2362929	Titanium	1.99	Spike	P	0 - 20
2362929	Vanadium	0.0291	Spike	P	0 - 20
2362929	Zinc	0.637	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366127	Titanium	1.83	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421155

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362929	Aluminum	0.288	Spike	P	0 - 20
2362929	Antimony	0.943	Spike	P	0 - 20
2362929	Arsenic	0.616	Spike	P	0 - 20
2362929	Barium	0.452	Spike	P	0 - 20
2362929	Beryllium	0.718	Spike	P	0 - 20
2362929	Boron	0.0997	Spike	P	0 - 20
2362929	Cadmium	0.0767	Spike	P	0 - 20
2362929	Chromium	0.0375	Spike	P	0 - 20
2362929	Cobalt	0.290	Spike	P	0 - 20
2362929	Copper	0.314	Spike	P	0 - 20
2362929	Lead	0.216	Spike	P	0 - 20
2362929	Manganese	0.952	Spike	P	0 - 20
2362929	Molybdenum	0.612	Spike	P	0 - 20
2362929	Nickel	0.966	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P421155

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362929	Selenium	0.384	Spike	P	0 - 20
2362929	Silver	0.566	Spike	P	0 - 20
2362929	Thallium	0.783	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P421609

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363186	Chloride	0.0789	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P421612

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363186	Sulfate	0.888	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P421407

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363188	Ammonia-N	2.67	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P421417

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363188	Kjeldahl Nitrogen	3.92	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P421504

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363343	Kjeldahl Nitrogen	1.63	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P421243

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363189	NO2NO3-N	0.930	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P421088

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362985	Total-P	0.0227	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P421305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363803	Total Alkalinity	0.742	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P421526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363186	TDS	2.25	Sample	P	0 - 10

Reference Method: SM 2540 D-2015
Batch ID: P421523

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363186	TSS	7.69	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P421310

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363803	Fluoride	0.490	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P421234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363238	Organic Carbon	0.722	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: A115387

Included Lab Sample IDs: 2363186, 2363187

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	99.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A115399

Included Lab Sample IDs: 2363186, 2363187

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: SM 5310 B-2011

Run ID: A115451

Included Lab Sample IDs: 2363188, 2363189

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A115453

Included Lab Sample IDs: 2363188, 2363189

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	96.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A115473

Included Lab Sample IDs: 2363192, 2363193

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.1	96.9	P/P	90 - 110
Antimony	98.3	100	P/P	90 - 110
Arsenic	100	100	P/P	90 - 110
Barium	97.6	100	P/P	90 - 110
Beryllium	94.7	97.3	P/P	90 - 110
Boron	101	104	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Chromium	93.6	94.7	P/P	90 - 110
Cobalt	95.0	94.4	P/P	90 - 110
Copper	96.8	96.9	P/P	90 - 110
Lead	97.3	98.5	P/P	90 - 110
Manganese	93.6	94.9	P/P	90 - 110
Molybdenum	101	102	P/P	90 - 110
Nickel	96.1	96.1	P/P	90 - 110
Selenium	99.5	99.5	P/P	90 - 110
Silver	103	104	P/P	90 - 110
Thallium	99.3	99.7	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A115475

Included Lab Sample IDs: 2363186, 2363187

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-2011

Run ID: A115475

Included Lab Sample IDs: 2363186, 2363187

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	95.7	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A115475

Included Lab Sample IDs: 2363186, 2363187

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A115477

Included Lab Sample IDs: 2363188, 2363189

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A115496

Included Lab Sample IDs: 2363192, 2363193

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	92.7	96.5	P/P	90 - 110
Iron	93.2	97.2	P/P	90 - 110
Magnesium	93.4	97.4	P/P	90 - 110
Potassium	92.8	95.7	P/P	90 - 110
Sodium	92.0	95.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A115509

Included Lab Sample IDs: 2363188, 2363189

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	98.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A115528

Included Lab Sample IDs: 2363192, 2363193

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Tin	94.6	93.2	P/P	90 - 110
Vanadium	92.7	91.5	P/P	90 - 110
Zinc	91.5	90.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A115558

Included Lab Sample IDs: 2363186, 2363187

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.1	99.7	P/P	90 - 110
Chloride	99.7	100	P/P	90 - 110
Sulfate	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A115558

Included Lab Sample IDs: 2363186, 2363187

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	96.4	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A115567

Included Lab Sample IDs: 2363188

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A115613

Included Lab Sample IDs: 2363192, 2363193

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Strontium	102	102	P/P	90 - 110
Titanium	101	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A115618

Included Lab Sample IDs: 2363189

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A115662

Included Lab Sample IDs: 2363193

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Titanium	99.9	102	P/P	95 - 105

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	98.7				1.46	
EPA 180.1 Rev. 2.0	Turbidity	101				0.860	
EPA 200.7 Rev. 4.4	Calcium	95.9	98.6	101			0.552
	Iron	101	99.1	102	102		1.92
	Magnesium	103	98.4	103	103		2.53
	Potassium	102	98.0	98.0	100		0.0349
	Sodium	94.1	97.0	96.2			0.628
	Strontium	103	100	101	98.3		1.15
	Tin	104	102	103	98.1		1.16
	Titanium	95.8	99.2	97.2	96.7		1.99
	Titanium	103	104	104	102		1.83
	Vanadium	110	97.7	97.7	94.1		0.0291
	Zinc	98.7	96.4	95.8	93.9		0.637
EPA 200.8 Rev. 5.4	Aluminum	97.9	93.8	93.5	96.1		0.288
	Antimony	100	101	102	104		0.943
	Arsenic	103	101	102	101		0.616
	Barium	101	101	102	103		0.452
	Beryllium	91.1	91.3	84.2	83.5		0.718
	Boron	108	103	103	104		0.0997
	Cadmium	99.6	102	102	102		0.0767
	Chromium	96.8	96.1	96.1	97.1		0.0375
	Cobalt	99.4	96.9	96.6	96.3		0.290
	Copper	101	98.2	97.9	99.5		0.314
	Lead	94.7	96.3	96.5	97.9		0.216
	Manganese	97.2	96.5	97.5	96.9		0.952
	Molybdenum	98.8	102	101	99.4		0.612
	Nickel	101	98.8	97.8	98.1		0.966
	Selenium	99.6	91.5	91.9	95.9		0.384
	Silver	104	105	105	105		0.566
	Thallium	95.4	98.4	99.1	99.2		0.783
EPA 300.0 Rev. 2.1	Chloride	95.8	98.1	94.1		0.0789	
	Sulfate	96.5	99.5	94.1		0.888	
EPA 350.1 Rev. 2.0	Ammonia-N	105	98.4	102			2.67
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	101	106			3.92
	Kjeldahl Nitrogen	105	96.8	98.8			1.63
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	96.5	97.5			0.930
EPA 365.1 Rev. 2.0	Total-P	108	107	107			0.0227
SM 2320 B-2011	Total Alkalinity	103				0.742	
SM 2540 C-2015	TDS	95.8				2.25	
SM 2540 D-2015	TSS	91.9				7.69	
SM 4500-F- C-2011	Fluoride	99.2	96.8	97.4			0.490
SM 5310 B-2011	Organic Carbon	97.2	97.0	98.3			0.722

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2363186, 2363187
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2363186, 2363187
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2363192, 2363193
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2363192, 2363193
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2363186, 2363187

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2363186, 2363187
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2363188, 2363189
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2363188, 2363189
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2363188, 2363189
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2363188, 2363189
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2363186, 2363187
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2363192, 2363193
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2363186, 2363187
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2363186, 2363187
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2363186, 2363187
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2363188, 2363189

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	10/19/2022			10/19/2022 10:58	Blanca Fach	2363186
	10/19/2022			10/19/2022 10:59	Blanca Fach	2363187
EPA 180.1 Rev. 2.0	10/19/2022			10/19/2022 14:08	Khloe J Berg	2363186
	10/19/2022			10/19/2022 14:09	Khloe J Berg	2363187
EPA 200.7 Rev. 4.4	10/19/2022	10/20/2022 11:37	George D Taylor	10/25/2022 05:29	McKinley C Carter	2363192
	10/19/2022	10/20/2022 11:37	George D Taylor	10/25/2022 05:36	McKinley C Carter	2363193
	10/19/2022	10/20/2022 11:37	George D Taylor	10/25/2022 23:36	McKinley C Carter	2363192
	10/19/2022	10/20/2022 11:37	George D Taylor	10/25/2022 23:44	McKinley C Carter	2363193
	10/19/2022	10/20/2022 11:37	George D Taylor	10/29/2022 04:09	McKinley C Carter	2363192
	10/19/2022	10/20/2022 11:37	George D Taylor	10/29/2022 04:17	McKinley C Carter	2363193
	10/19/2022	10/31/2022 12:20	George D Taylor	11/01/2022 12:06	Betina Topolski	2363193
EPA 200.8 Rev. 5.4	10/19/2022	10/20/2022 11:37	George D Taylor	10/21/2022 18:43	Emily M Philpot	2363192
	10/19/2022	10/20/2022 11:37	George D Taylor	10/21/2022 18:53	Emily M Philpot	2363193
EPA 300.0 Rev. 2.1	10/19/2022			10/27/2022 13:28	Anna M. Plaviak	2363186
	10/19/2022			10/27/2022 18:45	Anna M. Plaviak	2363187
EPA 350.1 Rev. 2.0	10/19/2022			10/25/2022 15:58	Judith K. Clark	2363188
	10/19/2022			10/25/2022 16:02	Judith K. Clark	2363189
EPA 351.2 Rev. 2.0	10/19/2022	10/26/2022 14:10	Samantha L Bates	10/27/2022 10:46	Samantha L Bates	2363188
	10/19/2022	10/27/2022 11:24	Alexandra J Mattheus	10/28/2022 13:08	Alexandra J Mattheus	2363189
EPA 353.2 Rev. 2.0	10/19/2022			10/21/2022 09:18	Beverly Y. Sanders	2363189
	10/19/2022			10/21/2022 09:23	Beverly Y. Sanders	2363188
EPA 365.1 Rev. 2.0	10/19/2022	10/20/2022 15:06	Adam P Silver	10/24/2022 10:43	James L Waggeberby	2363188
	10/19/2022	10/20/2022 15:06	Adam P Silver	10/24/2022 10:44	James L Waggeberby	2363189
SM 2320 B-2011	10/19/2022			10/22/2022 10:17	Dale L. Simmons	2363186
	10/19/2022			10/22/2022 10:29	Dale L. Simmons	2363187
SM 2340 B-2011	10/19/2022			10/25/2022 05:29	McKinley C Carter	2363192
	10/19/2022			10/25/2022 05:36	McKinley C Carter	2363193
SM 2540 C-2015	10/19/2022			10/21/2022 14:05	Ping Hua	2363186, 2363187
SM 2540 D-2015	10/19/2022			10/21/2022 14:05	Ping Hua	2363186, 2363187
SM 4500-F- C-2011	10/19/2022			10/22/2022 10:17	Dale L. Simmons	2363186
	10/19/2022			10/22/2022 10:29	Dale L. Simmons	2363187
SM 5310 B-2011	10/19/2022			10/20/2022 20:01	Khloe J Berg	2363188
	10/19/2022			10/20/2022 20:19	Khloe J Berg	2363189