Chemical Analysis Report

TLH-ROC-2022-11-14-01

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

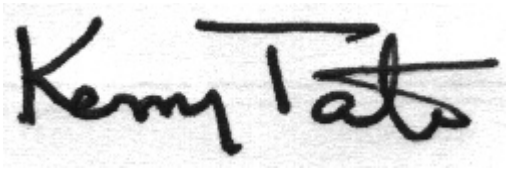
Event Description: **Run 5**
Request ID: **RQ-2022-07-25-20**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 07-DEC-2022 10:46



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: Welaunee Creek **Collection Date/Time: 11/14/2022 12:15**

Field ID: G1TLHR0149 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2369210	DEP SOP: NU-094-1	Color (true)	68		PCU	P422346	
	EPA 180.1 Rev. 2.0	Turbidity	3.4	A	NTU	P422351	
	EPA 300.0 Rev. 2.1	Chloride	8.2		mg Cl/L	P422829	
		Sulfate	0.74		mg SO4/L	P422833	
	SM 2320 B-2011	Total Alkalinity	8.0		mg CaCO3/L	P422640	
	SM 2540 C-2015	TDS	48		mg/L	P422852	
	SM 2540 D-2015	TSS	6	I	mg/L	P422705	
	SM 4500-F- C-2011	Fluoride	0.081	I	mg F/L	P422644	
2369211	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P422915	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P422453	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.31		mg N/L	P422485	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P422387	
	SM 5310 B-2011	Organic Carbon	5.8		mg C/L	P422752	
2369216	EPA 200.7 Rev. 4.4	Calcium	3.63		mg/L	P422380	
		Iron	780		ug/L	P422380	
		Magnesium	1.83		mg/L	P422380	
		Potassium	0.62	I	mg/L	P422380	
		Sodium	3.3		mg/L	P422380	
		Strontium	8.1		ug/L	P422380	
		Tin	3.0	U	ug/L	P422380	
		Titanium	1.5	I	ug/L	P422380	
		Vanadium	2.0	U	ug/L	P422380	
		Zinc	5.0	U	ug/L	P422380	
	EPA 200.8 Rev. 5.4	Aluminum	156		ug/L	P422380	
		Antimony	0.050	U	ug/L	P422380	
		Arsenic	0.30		ug/L	P422380	
		Barium	10.5		ug/L	P422380	
		Beryllium	0.020	I	ug/L	P422380	
		Boron	12.3		ug/L	P422380	
		Cadmium	0.020	U	ug/L	P422380	
		Chromium	0.40	U	ug/L	P422380	
		Cobalt	0.136		ug/L	P422380	
		Copper	0.40	U	ug/L	P422380	
		Lead	0.20	U	ug/L	P422380	
		Manganese	51.6		ug/L	P422380	
		Molybdenum	0.15	U	ug/L	P422380	
		Nickel	0.50	U	ug/L	P422380	
		Selenium	0.20	U	ug/L	P422380	
		Silver	0.010	U	ug/L	P422380	
		Thallium	0.10	U	ug/L	P422380	
	SM 2340 B-2011	Hardness	16.6		mg/L	P422380	

Field ID: G1TLHR0149 Matrix: W-SURF-FRH

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

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium, sodium and strontium are unavailable for one of two spiked samples because of high 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: P422346

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P422351

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422380

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: P422380

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: P422829

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: P422833

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422915

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422453

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422485

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422387

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

Reference Method: SM 2320 B-2011
Batch ID: P422640

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

Reference Method: SM 2540 C-2015
Batch ID: P422852

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P422705

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P422644

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P422752

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: P422346

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: P422351

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	99.4		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422380

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	100		P	85 - 115
Magnesium	100		P	85 - 115
Potassium	98.3		P	85 - 115
Sodium	97.8		P	85 - 115
Strontium	102		P	85 - 115
Tin	101		P	85 - 115
Titanium	97.6		P	85 - 115
Vanadium	98.6		P	85 - 115
Zinc	99.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422380

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	107		P	85 - 115
Barium	108		P	85 - 115
Beryllium	102		P	85 - 115
Boron	97.7		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	107		P	85 - 115
Cobalt	106		P	85 - 115
Copper	105		P	85 - 115
Lead	96.5		P	85 - 115
Manganese	105		P	85 - 115
Molybdenum	101		P	85 - 115
Nickel	106		P	85 - 115
Selenium	106		P	85 - 115
Silver	101		P	85 - 115
Thallium	99.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422829

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422833

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422915

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422453

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422485

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422387

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	103		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P422640

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

Reference Method: SM 2540 C-2015
Batch ID: P422852

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

Reference Method: SM 2540 D-2015
Batch ID: P422705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	91.5		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P422644

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.9		P	96 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P422752

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.7		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422380

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369333	Iron	99.7		P	80 - 120
2369333	Tin	113		P	80 - 120
2369333	Titanium	96.2		P	80 - 120
2369333	Vanadium	102		P	80 - 120
2369333	Zinc	98.8		P	80 - 120
2369451	Calcium	91.2		P	80 - 120
2369451	Iron	88.4	105	P/P	80 - 120
2369451	Magnesium	93.7		P	80 - 120
2369451	Potassium	93.5	110	P/P	80 - 120
2369451	Sodium	96.6		P	80 - 120
2369451	Strontium	90.4	104	P/P	80 - 120
2369451	Tin	91.2	102	P/P	80 - 120
2369451	Titanium	94.6	104	P/P	80 - 120
2369451	Vanadium	94.0	103	P/P	80 - 120
2369451	Zinc	88.5	100	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422380

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369333	Aluminum	104		P	75 - 125
2369333	Antimony	112		P	75 - 125
2369333	Arsenic	111		P	75 - 125
2369333	Barium	112		P	75 - 125
2369333	Beryllium	87.4		P	75 - 125
2369333	Boron	78.2		P	75 - 125
2369333	Cadmium	101		P	75 - 125
2369333	Chromium	86.1		P	80 - 120
2369333	Cobalt	105		P	75 - 125
2369333	Copper	109		P	75 - 125
2369333	Lead	99.4		P	75 - 125
2369333	Molybdenum	109		P	75 - 125
2369333	Nickel	110		P	75 - 125
2369333	Selenium	108		P	75 - 125
2369333	Silver	92.9		P	75 - 125
2369333	Thallium	103		P	75 - 125
2369451	Aluminum	102	100	P/P	80 - 120
2369451	Antimony	107	105	P/P	80 - 120
2369451	Arsenic	104	103	P/P	80 - 120
2369451	Barium	106	105	P/P	80 - 120
2369451	Beryllium	93.7	92.1	P/P	80 - 120
2369451	Boron	105	107	P/P	80 - 120
2369451	Cadmium	104	103	P/P	80 - 120
2369451	Chromium	104	103	P/P	80 - 120
2369451	Cobalt	100	100	P/P	80 - 120
2369451	Copper	98.5	98.4	P/P	80 - 120
2369451	Lead	97.4	96.1	P/P	80 - 120
2369451	Manganese	106	105	P/P	80 - 120
2369451	Molybdenum	103	102	P/P	80 - 120
2369451	Nickel	100	100	P/P	80 - 120
2369451	Selenium	101	99.6	P/P	80 - 120
2369451	Silver	102	102	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422380

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369451	Thallium	101	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422829

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369118	Chloride	97.0		P	90 - 110
2369236	Chloride	98.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422833

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369118	Sulfate	94.4		P	90 - 110
2369236	Sulfate	95.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369182	Ammonia-N	94.4	95.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422453

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369211	Kjeldahl Nitrogen	98.9	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369182	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422387

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369156	Total-P	102	103	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P422644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369236	Fluoride	102	101	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P422752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2369219	Organic Carbon	95.3	95.9	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P422346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369390	Color (true)	0.0134	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P422351

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369210	Turbidity	9.02	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422380

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369451	Calcium	13.0	Spike	P	0 - 20
2369451	Iron	16.8	Spike	P	0 - 20
2369451	Magnesium	16.6	Spike	P	0 - 20
2369451	Potassium	15.9	Spike	P	0 - 20
2369451	Sodium	12.7	Spike	P	0 - 20
2369451	Strontium	13.4	Spike	P	0 - 20
2369451	Tin	11.1	Spike	P	0 - 20
2369451	Titanium	9.08	Spike	P	0 - 20
2369451	Vanadium	9.27	Spike	P	0 - 20
2369451	Zinc	9.68	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422380

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369451	Aluminum	1.85	Spike	P	0 - 20
2369451	Antimony	1.23	Spike	P	0 - 20
2369451	Arsenic	0.941	Spike	P	0 - 20
2369451	Barium	0.977	Spike	P	0 - 20
2369451	Beryllium	1.72	Spike	P	0 - 20
2369451	Boron	1.29	Spike	P	0 - 20
2369451	Cadmium	1.80	Spike	P	0 - 20
2369451	Chromium	0.765	Spike	P	0 - 20
2369451	Cobalt	0.0171	Spike	P	0 - 20
2369451	Copper	0.0431	Spike	P	0 - 20
2369451	Lead	1.36	Spike	P	0 - 20
2369451	Manganese	1.03	Spike	P	0 - 20
2369451	Molybdenum	0.828	Spike	P	0 - 20
2369451	Nickel	0.0895	Spike	P	0 - 20
2369451	Selenium	1.36	Spike	P	0 - 20
2369451	Silver	0.433	Spike	P	0 - 20
2369451	Thallium	1.01	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369118	Chloride	0.152	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369118	Sulfate	0.0331	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369182	Ammonia-N	0.670	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422453

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369211	Kjeldahl Nitrogen	3.27	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369182	NO2NO3-N	0.454	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369156	Total-P	0.761	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P422640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369236	Total Alkalinity	0.521	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P422852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369236	TDS	6.84	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P422644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369236	Fluoride	0.490	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P422752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369219	Organic Carbon	0.472	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: A115938
Included Lab Sample IDs: 2369210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	95.8	97.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A115942
Included Lab Sample IDs: 2369210

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115956
Included Lab Sample IDs: 2369211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116013
Included Lab Sample IDs: 2369211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	98.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116017
Included Lab Sample IDs: 2369216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.6	98.8	P/P	90 - 110
Antimony	102	101	P/P	90 - 110
Arsenic	103	101	P/P	90 - 110
Barium	105	101	P/P	90 - 110
Boron	104	107	P/P	90 - 110
Cadmium	103	102	P/P	90 - 110
Chromium	106	100	P/P	90 - 110
Cobalt	104	99.1	P/P	90 - 110
Copper	104	98.0	P/P	90 - 110
Lead	94.9	95.6	P/P	90 - 110
Manganese	103	104	P/P	90 - 110
Molybdenum	101	99.6	P/P	90 - 110
Nickel	105	99.1	P/P	90 - 110
Selenium	103	101	P/P	90 - 110
Silver	99.1	98.6	P/P	90 - 110
Thallium	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116026
Included Lab Sample IDs: 2369211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	105	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116043
Included Lab Sample IDs: 2369216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	101	99.4	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A116057
Included Lab Sample IDs: 2369210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.7	94.8	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A116057
Included Lab Sample IDs: 2369210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A116108
Included Lab Sample IDs: 2369210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.2	102	P/P	90 - 110
Sulfate	98.8	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A116116
Included Lab Sample IDs: 2369216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.3	98.3	P/P	90 - 110
Iron	99.6	98.8	P/P	90 - 110
Magnesium	99.6	98.8	P/P	90 - 110
Potassium	96.9	99.6	P/P	90 - 110
Sodium	96.6	98.8	P/P	90 - 110
Strontium	101	99.8	P/P	90 - 110
Tin	100	100	P/P	90 - 110
Titanium	98.4	98.3	P/P	90 - 110
Vanadium	100	99.8	P/P	90 - 110
Zinc	102	101	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A116127
Included Lab Sample IDs: 2369211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.4	97.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116189
Included Lab Sample IDs: 2369211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	101	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					0.0134	
EPA 180.1 Rev. 2.0	Turbidity	99.4					9.02	
EPA 200.7 Rev. 4.4	Calcium	101	91.2					13.0
	Iron	100	99.7	88.4	105			16.8
	Magnesium	100	93.7					16.6
	Potassium	98.3	93.5	110				15.9
	Sodium	97.8	96.6					12.7
	Strontium	102	90.4	104				13.4
	Tin	101	91.2	102	113			11.1
	Titanium	97.6	96.2	94.6	104			9.08
	Vanadium	98.6	102	94.0	103			9.27
	Zinc	99.7	98.8	88.5	100			9.68
EPA 200.8 Rev. 5.4	Aluminum	100	102	100	104			1.85
	Antimony	105	112	107	105			1.23
	Arsenic	107	111	104	103			0.941
	Barium	108	112	106	105			0.977
	Beryllium	102	87.4	93.7	92.1			1.72
	Boron	97.7	78.2	105	107			1.29
	Cadmium	101	101	104	103			1.80
	Chromium	107	104	103	86.1			0.765
	Cobalt	106	105	100	100			0.0171
	Copper	105	109	98.5	98.4			0.0431
	Lead	96.5	99.4	97.4	96.1			1.36
	Manganese	105	106	105				1.03
	Molybdenum	101	109	103	102			0.828
	Nickel	106	110	100	100			0.0895
	Selenium	106	108	101	99.6			1.36
	Silver	101	92.9	102	102			0.433
	Thallium	99.9	103	101	102			1.01
EPA 300.0 Rev. 2.1	Chloride	99.5	97.0	98.4			0.152	
	Sulfate	98.7	94.4	95.8			0.0331	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	94.4	95.2				0.670
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.9	98.9	103				3.27
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	103				0.454
EPA 365.1 Rev. 2.0	Total-P	103	102	103				0.761
SM 2320 B-2011	Total Alkalinity	96.8					0.521	
SM 2540 C-2015	TDS	99.3					6.84	
SM 2540 D-2015	TSS	91.5						
SM 4500-F- C-2011	Fluoride	99.9	102	101				0.490
SM 5310 B-2011	Organic Carbon	96.7	95.3	95.9				0.472

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2369210
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2369210
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2369216
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2369216
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2369210
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2369210
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2369211

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2369211
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2369211
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2369211
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2369210
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2369216
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2369210
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2369210
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2369210
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2369211

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	11/14/2022			11/15/2022 14:47	Chandler E Cox	2369210
EPA 180.1 Rev. 2.0	11/14/2022			11/15/2022 14:07	Anna M. Plaviak	2369210
EPA 200.7 Rev. 4.4	11/14/2022	11/16/2022 11:10	George D Taylor	11/23/2022 05:48	McKinley C Carter	2369216
EPA 200.8 Rev. 5.4	11/14/2022	11/16/2022 11:10	George D Taylor	11/17/2022 16:50	Megan Whitefoot	2369216
	11/14/2022	11/16/2022 11:10	George D Taylor	11/18/2022 18:04	Megan Whitefoot	2369216
EPA 300.0 Rev. 2.1	11/14/2022			11/23/2022 00:57	James L Waggerby	2369210
EPA 350.1 Rev. 2.0	11/14/2022			11/29/2022 12:06	Ping Hua	2369211
EPA 351.2 Rev. 2.0	11/14/2022	11/17/2022 10:30	Samantha L Bates	11/18/2022 09:07	Samantha L Bates	2369211
EPA 353.2 Rev. 2.0	11/14/2022			11/16/2022 11:54	Beverly Y. Sanders	2369211
EPA 365.1 Rev. 2.0	11/14/2022	11/16/2022 13:00	Simonne.V. Calhoun	11/17/2022 15:40	James L Waggerby	2369211
SM 2320 B-2011	11/14/2022			11/19/2022 16:15	Dale L. Simmons	2369210
SM 2340 B-2011	11/14/2022			11/23/2022 05:48	McKinley C Carter	2369216
SM 2540 C-2015	11/14/2022			11/18/2022 16:39	Yijie Li	2369210
SM 2540 D-2015	11/14/2022			11/18/2022 16:39	Yijie Li	2369210
SM 4500-F- C-2011	11/14/2022			11/19/2022 16:15	Dale L. Simmons	2369210
SM 5310 B-2011	11/14/2022			11/21/2022 22:23	Khloe J Berg	2369211