

Chemical Analysis Report

CEN-DIST-2023-01-06-01

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

Event Description: **Cow/Unnamed Slough/Addison x2**
Request ID: **RQ-2023-01-02-57**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Jessie Atchison

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: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 25-JAN-2023 12:20



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: Unnamed Slough @ Zoltan Drive

Collection Date/Time: 01/05/2023 12:52

Field ID: G3CE0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2378606	DEP SOP: NU-094-1	Color (true)	67	A	PCU	P424235	
	EPA 180.1 Rev. 2.0	Turbidity	34		NTU	P424244	
	EPA 300.0 Rev. 2.1	Chloride	91		mg Cl/L	P424533	
		Sulfate	61		mg SO4/L	P424536	
	SM 2320 B-2011	Total Alkalinity	107		mg CaCO3/L	P424597	
	SM 2540 C-2015	TDS	402		mg/L	P424662	
	SM 2540 D-2015	TSS	72		mg/L	P424518	
2378607	SM 4500-F- C-2011	Fluoride	0.048	I	mg F/L	P424763	RPD
	EPA 350.1 Rev. 2.0	Ammonia-N	0.10		mg N/L	P424563	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1	J	mg N/L	P424385	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P424524	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P424378	
2378622	SM 5310 B-2011	Organic Carbon	16		mg C/L	P424321	
	EPA 200.7 Rev. 4.4	Calcium	62.9		mg/L	P424285	
		Iron	2.38E+03		ug/L	P424285	
		Magnesium	6.96		mg/L	P424285	
		Potassium	4.9		mg/L	P424285	
		Sodium	55.2		mg/L	P424285	
		Strontium	541		ug/L	P424285	
		Tin	3.0	U	ug/L	P424285	
		Titanium	5.2		ug/L	P424285	
		Vanadium	4.1	I	ug/L	P424285	
		Zinc	5.0	U	ug/L	P424285	
	EPA 200.8 Rev. 5.4	Aluminum	433		ug/L	P424285	
		Antimony	0.19	I	ug/L	P424285	
		Arsenic	3.33		ug/L	P424285	
		Barium	17.1		ug/L	P424285	
		Beryllium	0.052		ug/L	P424285	
		Boron	72.8		ug/L	P424285	
		Cadmium	0.020	U	ug/L	P424285	
		Chromium	1.3	I	ug/L	P424285	
		Cobalt	0.155		ug/L	P424285	
		Copper	1.15		ug/L	P424285	
		Lead	0.91		ug/L	P424285	
		Manganese	23.0		ug/L	P424285	
		Molybdenum	1.45		ug/L	P424285	
		Nickel	0.61	I	ug/L	P424285	
		Selenium	0.29	I	ug/L	P424285	
		Silver	0.010	U	ug/L	P424285	
		Thallium	0.10	U	ug/L	P424285	
	SM 2340 B-2011	Hardness	186		mg/L	P424285	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Refer to the Lab Analysis Report for an explanation of QC Codes.

Sample Location: Addison Creek @ US1

Collection Date/Time: 01/05/2023 13:31

Field ID: G5CE0111

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2378608	EPA 180.1 Rev. 2.0	Turbidity	14		NTU	P424245	
	SM 2320 B-2011	Total Alkalinity	146		mg CaCO3/L	P424597	
	SM 2540 D-2015	TSS	4	I	mg/L	P424520	
	SM 4500-F- C-2011	Fluoride	0.084	I	mg F/L	P424473	
2378609	EPA 350.1 Rev. 2.0	Ammonia-N	0.051		mg N/L	P424563	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P424385	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P424524	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P424378	
	SM 5310 B-2011	Organic Carbon	16		mg C/L	P424321	
2378657	EPA 200.7 Rev. 4.4	Calcium	76.1		mg/L	P424285	
		Iron	2.54E+03		ug/L	P424285	
		Magnesium	14.6		mg/L	P424285	
		Potassium	4.1		mg/L	P424285	
		Sodium	126		mg/L	P424285	
		Strontium	879		ug/L	P424285	
		Tin	3.0	U	ug/L	P424285	
		Titanium	1.4	I	ug/L	P424285	
		Vanadium	2.0	U	ug/L	P424285	
		Zinc	5.0	U	ug/L	P424285	
	EPA 200.8 Rev. 5.4	Aluminum	54		ug/L	P424285	
		Antimony	0.050	U	ug/L	P424285	
		Arsenic	3.25		ug/L	P424285	
		Barium	18.9		ug/L	P424285	
		Beryllium	0.013	I	ug/L	P424285	
		Boron	45.5		ug/L	P424285	
		Cadmium	0.020	U	ug/L	P424285	
		Chromium	0.43	I	ug/L	P424285	
		Cobalt	0.082		ug/L	P424285	
		Copper	0.40	U	ug/L	P424285	
		Lead	0.22	I	ug/L	P424285	
		Manganese	40.1		ug/L	P424285	
		Molybdenum	0.95		ug/L	P424285	
		Nickel	0.50	U	ug/L	P424285	
		Selenium	0.20	U	ug/L	P424285	
		Silver	0.010	U	ug/L	P424285	
		Thallium	0.10	U	ug/L	P424285	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 4500-F- C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Cow Creek at Osteen-Maytown Road

Collection Date/Time: 01/05/2023 10:56

Field ID: G2CE0086

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2378623	EPA 200.7 Rev. 4.4	Calcium	4.35		mg/L	P424285	
		Iron	770		ug/L	P424285	
		Magnesium	1.29		mg/L	P424285	
		Potassium	0.30	U	mg/L	P424285	
		Sodium	8.6		mg/L	P424285	
		Strontium	24.6		ug/L	P424285	
		Tin	3.0	U	ug/L	P424285	
		Titanium	1.4	I	ug/L	P424285	
		Vanadium	2.0	U	ug/L	P424285	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P424285	
		Aluminum	242		ug/L	P424285	
		Antimony	0.050	U	ug/L	P424285	
		Arsenic	0.28		ug/L	P424285	
		Barium	7.62		ug/L	P424285	
		Beryllium	0.013	I	ug/L	P424285	
		Boron	20.1		ug/L	P424285	
		Cadmium	0.020	U	ug/L	P424285	
		Chromium	0.40	U	ug/L	P424285	
		Cobalt	0.100		ug/L	P424285	
		Copper	0.40	U	ug/L	P424285	
		Lead	0.29	I	ug/L	P424285	
		Manganese	10.3		ug/L	P424285	
		Molybdenum	0.15	U	ug/L	P424285	
		Nickel	0.50	U	ug/L	P424285	
		Selenium	0.20	U	ug/L	P424285	
		Silver	0.010	U	ug/L	P424285	
		Thallium	0.10	U	ug/L	P424285	
	SM 2340 B-2011	Hardness	16.2		mg/L	P424285	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P424235

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424244

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424245

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424285

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: P424285

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: P424533

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424536

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424563

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424385

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424524

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424378

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

Reference Method: SM 2320 B-2011
Batch ID: P424597

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

Reference Method: SM 2540 C-2015
Batch ID: P424662

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P424518

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P424520

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P424473

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 4500-F- C-2011
Batch ID: P424763

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P424321

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: P424235

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.1		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424244

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424245

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424285

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	104		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	99.8		P	85 - 115
Sodium	101		P	85 - 115
Strontium	102		P	85 - 115
Tin	100		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	99.1		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424285

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.3		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	103		P	85 - 115
Barium	103		P	85 - 115
Beryllium	96.6		P	85 - 115
Boron	98.2		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	98.8		P	85 - 115
Cobalt	97.3		P	85 - 115
Copper	99.2		P	85 - 115
Lead	94.6		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	99.1		P	85 - 115
Nickel	99.6		P	85 - 115
Selenium	101		P	85 - 115
Silver	102		P	85 - 115
Thallium	103		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424533

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424536

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424563

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424385

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424524

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424378

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

Reference Method: SM 2320 B-2011
Batch ID: P424597

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

Reference Method: SM 2540 C-2015
Batch ID: P424662

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

Reference Method: SM 2540 D-2015
Batch ID: P424518

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	91.1		P	85 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2540 D-2015
Batch ID: P424520

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	94.0		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P424473

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

Reference Method: SM 4500-F- C-2011
Batch ID: P424763

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P424321

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P424285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378506	Calcium	106	103	P/P	80 - 120
2378506	Iron	103	102	P/P	80 - 120
2378506	Magnesium	107	105	P/P	80 - 120
2378506	Potassium	96.6	95.1	P/P	80 - 120
2378506	Sodium	101		P	80 - 120
2378506	Strontium	101	101	P/P	80 - 120
2378506	Tin	98.9	97.5	P/P	80 - 120
2378506	Titanium	104	101	P/P	80 - 120
2378506	Vanadium	101	100	P/P	80 - 120
2378506	Zinc	100	99.2	P/P	80 - 120
2378651	Calcium	102		P	80 - 120
2378651	Iron	103		P	80 - 120
2378651	Magnesium	104		P	80 - 120
2378651	Potassium	94.6		P	80 - 120
2378651	Sodium	100		P	80 - 120
2378651	Strontium	101		P	80 - 120
2378651	Tin	97.6		P	80 - 120
2378651	Titanium	100		P	80 - 120
2378651	Vanadium	98.1		P	80 - 120
2378651	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P424285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378506	Aluminum	98.7	99.2	P/P	80 - 120
2378506	Antimony	103	103	P/P	80 - 120
2378506	Arsenic	103	104	P/P	80 - 120
2378506	Barium	101	102	P/P	80 - 120
2378506	Beryllium	94.9	94.6	P/P	80 - 120
2378506	Boron	100	99.7	P/P	80 - 120
2378506	Cadmium	103	104	P/P	80 - 120
2378506	Chromium	97.6	97.4	P/P	80 - 120
2378506	Cobalt	97.7	98.3	P/P	80 - 120
2378506	Copper	98.9	99.8	P/P	80 - 120
2378506	Lead	94.0	94.2	P/P	80 - 120
2378506	Manganese	99.5	100	P/P	80 - 120
2378506	Molybdenum	100	100	P/P	80 - 120
2378506	Nickel	100	100	P/P	80 - 120
2378506	Selenium	97.7	98.7	P/P	80 - 120
2378506	Silver	102	101	P/P	80 - 120
2378506	Thallium	102	102	P/P	80 - 120
2378651	Aluminum	99.2		P	80 - 120
2378651	Antimony	103		P	80 - 120
2378651	Arsenic	105		P	80 - 120
2378651	Barium	103		P	80 - 120
2378651	Beryllium	96.5		P	80 - 120
2378651	Boron	101		P	80 - 120
2378651	Cadmium	104		P	80 - 120
2378651	Chromium	98.2		P	80 - 120
2378651	Cobalt	102		P	80 - 120
2378651	Copper	103		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378651	Lead	94.5		P	80 - 120
2378651	Manganese	101		P	80 - 120
2378651	Molybdenum	99.3		P	80 - 120
2378651	Nickel	103		P	80 - 120
2378651	Selenium	102		P	80 - 120
2378651	Silver	101		P	80 - 120
2378651	Thallium	102		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378571	Chloride	100		P	90 - 110
2378600	Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378571	Sulfate	103		P	90 - 110
2378600	Sulfate	99.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424563

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378763	Ammonia-N	99.2	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424385

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378607	Kjeldahl Nitrogen	101	110	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378575	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378605	Total-P	104	101	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P424763

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2380019	Fluoride	94.6	97.6	P/P	94 - 104

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P424321

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378609	Organic Carbon	96.0	96.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P424235

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378606	Color (true)	3.97	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424244

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378463	Turbidity	1.68	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378601	Turbidity	5.09	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378506	Calcium	1.32	Spike	P	0 - 20
2378506	Iron	0.920	Spike	P	0 - 20
2378506	Magnesium	1.29	Spike	P	0 - 20
2378506	Potassium	1.35	Spike	P	0 - 20
2378506	Sodium	0.946	Spike	P	0 - 20
2378506	Strontium	0.631	Spike	P	0 - 20
2378506	Tin	1.41	Spike	P	0 - 20
2378506	Titanium	2.20	Spike	P	0 - 20
2378506	Vanadium	0.790	Spike	P	0 - 20
2378506	Zinc	1.12	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378506	Aluminum	0.449	Spike	P	0 - 20
2378506	Antimony	0.276	Spike	P	0 - 20
2378506	Arsenic	0.647	Spike	P	0 - 20
2378506	Barium	0.680	Spike	P	0 - 20
2378506	Beryllium	0.209	Spike	P	0 - 20
2378506	Boron	0.204	Spike	P	0 - 20
2378506	Cadmium	1.75	Spike	P	0 - 20
2378506	Chromium	0.165	Spike	P	0 - 20
2378506	Cobalt	0.593	Spike	P	0 - 20
2378506	Copper	0.956	Spike	P	0 - 20
2378506	Lead	0.160	Spike	P	0 - 20
2378506	Manganese	0.456	Spike	P	0 - 20
2378506	Molybdenum	0.0713	Spike	P	0 - 20
2378506	Nickel	0.175	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378506	Selenium	0.926	Spike	P	0 - 20
2378506	Silver	0.471	Spike	P	0 - 20
2378506	Thallium	0.0271	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378571	Chloride	0.0481	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378571	Sulfate	1.29	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378763	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378607	Kjeldahl Nitrogen	5.70	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378575	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378605	Total-P	1.92	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P424597

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

Reference Method: SM 2320 B-2011
Batch ID: P424597

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378716	Total Alkalinity	1.49	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P424662

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378463	TDS	4.76	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P424473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378640	Fluoride	0.999	Spike	P	0 - 1.6

Reference Method: SM 4500-F- C-2011
Batch ID: P424763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2380019	Fluoride	2.48	Spike	F	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P424321

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378609	Organic Carbon	0.510	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: A116778

Included Lab Sample IDs: 2378606

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.4	98.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A116783

Included Lab Sample IDs: 2378606, 2378608

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

Reference Method: SM 5310 B-2011

Run ID: A116820

Included Lab Sample IDs: 2378607, 2378609

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.3	99.8	P/P	90 - 110
Organic Carbon	99.8	99.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A116833

Included Lab Sample IDs: 2378606

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	103	P/P	90 - 110
Sulfate	103	104	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A116866

Included Lab Sample IDs: 2378608

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A116870

Included Lab Sample IDs: 2378607, 2378609

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A116885

Included Lab Sample IDs: 2378607, 2378609

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	105	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A116902

Included Lab Sample IDs: 2378607, 2378609

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A116902

Included Lab Sample IDs: 2378607, 2378609

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	99.1	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A116916

Included Lab Sample IDs: 2378606, 2378608

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.2	95.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A116926

Included Lab Sample IDs: 2378607, 2378609

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	106	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A116999

Included Lab Sample IDs: 2378622, 2378623, 2378657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.2	98.3	P/P	90 - 110
Aluminum	98.3	96.9	P/P	90 - 110
Antimony	103	101	P/P	90 - 110
Antimony	103	103	P/P	90 - 110
Arsenic	102	103	P/P	90 - 110
Arsenic	103	104	P/P	90 - 110
Barium	99.3	99.2	P/P	90 - 110
Barium	99.8	99.3	P/P	90 - 110
Beryllium	98.5	99.1	P/P	90 - 110
Beryllium	99.1	97.7	P/P	90 - 110
Boron	95.4	95.7	P/P	90 - 110
Boron	95.7	94.9	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Cadmium	102	100	P/P	90 - 110
Chromium	96.9	96.3	P/P	90 - 110
Chromium	97.5	96.9	P/P	90 - 110
Cobalt	95.2	96.7	P/P	90 - 110
Cobalt	96.7	98.2	P/P	90 - 110
Copper	97.1	98.4	P/P	90 - 110
Copper	98.4	100	P/P	90 - 110
Lead	92.3	91.6	P/P	90 - 110
Lead	92.6	92.3	P/P	90 - 110
Manganese	99.3	99.5	P/P	90 - 110
Manganese	99.5	98.0	P/P	90 - 110
Molybdenum	98.0	98.4	P/P	90 - 110
Molybdenum	98.4	98.5	P/P	90 - 110
Nickel	97.5	98.7	P/P	90 - 110
Nickel	98.7	101	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Selenium	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A116999

Included Lab Sample IDs: 2378622, 2378623, 2378657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	101	102	P/P	90 - 110
Silver	102	101	P/P	90 - 110
Thallium	100	98.9	P/P	90 - 110
Thallium	101	100	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A117000

Included Lab Sample IDs: 2378606

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A117038

Included Lab Sample IDs: 2378622, 2378623, 2378657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.9	98.8	P/P	90 - 110
Calcium	98.8	98.5	P/P	90 - 110
Iron	98.0	99.0	P/P	90 - 110
Iron	99.0	98.2	P/P	90 - 110
Magnesium	98.1	99.0	P/P	90 - 110
Magnesium	99.0	98.2	P/P	90 - 110
Potassium	97.4	98.7	P/P	90 - 110
Potassium	98.7	98.4	P/P	90 - 110
Sodium	97.8	98.9	P/P	90 - 110
Sodium	98.9	98.7	P/P	90 - 110
Strontium	102	102	P/P	90 - 110
Strontium	103	102	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	101	102	P/P	90 - 110
Titanium	102	102	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	101	101	P/P	90 - 110
Zinc	101	103	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			LCS	Precision	MS
							SMP	
DEP SOP: NU-094-1	Color (true)	98.1					3.97	
EPA 180.1 Rev. 2.0	Turbidity	101					1.68	
	Turbidity	101					5.09	
EPA 200.7 Rev. 4.4	Calcium	104	106	103	102			1.32
	Iron	104	103	102	103			0.920
	Magnesium	107	107	105	104			1.29
	Potassium	99.8	96.6	95.1	94.6			1.35
	Sodium	101	101	100				0.946
	Strontium	102	101	101	101			0.631
	Tin	100	98.9	97.5	97.6			1.41
	Titanium	101	104	101	100			2.20
	Vanadium	99.1	101	100	98.1			0.790
	Zinc	100	100	99.2	102			1.12
EPA 200.8 Rev. 5.4	Aluminum	99.3	98.7	99.2	99.2			0.449
	Antimony	104	103	103	103			0.276
	Arsenic	103	103	104	105			0.647
	Barium	103	101	102	103			0.680
	Beryllium	96.6	94.9	94.6	96.5			0.209
	Boron	98.2	100	99.7	101			0.204
	Cadmium	103	103	104	104			1.75
	Chromium	98.8	97.6	97.4	98.2			0.165
	Cobalt	97.3	97.7	98.3	102			0.593
	Copper	99.2	98.9	99.8	103			0.956
	Lead	94.6	94.0	94.2	94.5			0.160
	Manganese	101	99.5	100	101			0.456
	Molybdenum	99.1	100	100	99.3			0.0713
	Nickel	99.6	100	100	103			0.175
	Selenium	101	97.7	98.7	102			0.926
	Silver	102	102	101	101			0.471
	Thallium	103	102	102	102			0.0271
EPA 300.0 Rev. 2.1	Chloride	103	100	99.3			0.0481	
	Sulfate	104	103	99.3			1.29	
EPA 350.1 Rev. 2.0	Ammonia-N	98.0	99.2	99.2				0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.0	101	110				5.70
EPA 353.2 Rev. 2.0	NO2NO3-N	105	106	106				0.0
EPA 365.1 Rev. 2.0	Total-P	103	104	101				1.92
SM 2320 B-2011	Total Alkalinity	103					1.49	
SM 2540 C-2015	TDS	102					4.76	
SM 2540 D-2015	TSS	91.1						
	TSS	94.0						
SM 4500-F- C-2011	Fluoride	101						0.999
	Fluoride	100	94.6	97.6				2.48
SM 5310 B-2011	Organic Carbon	97.0	96.0	96.8				0.510

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2378606
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2378606, 2378608
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2378622, 2378623, 2378657
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2378622, 2378623, 2378657

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2378606
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2378606
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2378607, 2378609
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2378607, 2378609
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2378607, 2378609
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2378607, 2378609
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2378606, 2378608
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2378622, 2378623
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2378606
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2378606, 2378608
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2378606, 2378608
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2378607, 2378609

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	01/06/2023			01/06/2023 14:18	Alexis Price	2378606
EPA 180.1 Rev. 2.0	01/06/2023			01/06/2023 13:16	Khloe J Berg	2378606
	01/06/2023			01/06/2023 13:53	Khloe J Berg	2378608
EPA 200.7 Rev. 4.4	01/06/2023	01/09/2023 11:50	George D Taylor	01/23/2023 16:24	McKinley C Carter	2378622
	01/06/2023	01/09/2023 11:50	George D Taylor	01/23/2023 16:30	McKinley C Carter	2378623
	01/06/2023	01/09/2023 11:50	George D Taylor	01/23/2023 17:50	McKinley C Carter	2378657
EPA 200.8 Rev. 5.4	01/06/2023	01/09/2023 11:50	George D Taylor	01/19/2023 22:19	Emily M Philpot	2378622
	01/06/2023	01/09/2023 11:50	George D Taylor	01/19/2023 22:29	Emily M Philpot	2378623
	01/06/2023	01/09/2023 11:50	George D Taylor	01/19/2023 23:36	Emily M Philpot	2378657
EPA 300.0 Rev. 2.1	01/06/2023			01/13/2023 01:01	Anna M. Plaviak	2378606
EPA 350.1 Rev. 2.0	01/06/2023			01/13/2023 12:50	Ping Hua	2378607
	01/06/2023			01/13/2023 12:51	Ping Hua	2378609
EPA 351.2 Rev. 2.0	01/06/2023	01/12/2023 12:15	Samantha L Bates	01/17/2023 10:50	Samantha L Bates	2378607
	01/06/2023	01/12/2023 12:15	Samantha L Bates	01/17/2023 10:54	Samantha L Bates	2378609
EPA 353.2 Rev. 2.0	01/06/2023			01/12/2023 11:19	Beverly Y. Sanders	2378607
	01/06/2023			01/12/2023 11:20	Beverly Y. Sanders	2378609
EPA 365.1 Rev. 2.0	01/06/2023	01/11/2023 13:40	Simonne.V. Calhoun	01/12/2023 12:06	Simonne.V. Calhoun	2378607
	01/06/2023	01/11/2023 13:40	Simonne.V. Calhoun	01/12/2023 12:07	Simonne.V. Calhoun	2378609
SM 2320 B-2011	01/06/2023			01/14/2023 01:22	Dale L. Simmons	2378606
	01/06/2023			01/14/2023 01:36	Dale L. Simmons	2378608
SM 2340 B-2011	01/06/2023			01/23/2023 16:24	McKinley C Carter	2378622
	01/06/2023			01/23/2023 16:30	McKinley C Carter	2378623
SM 2540 C-2015	01/06/2023			01/09/2023 16:29	Yijie Li	2378606
SM 2540 D-2015	01/06/2023			01/09/2023 16:29	Yijie Li	2378606, 2378608
SM 4500-F- C-2011	01/06/2023			01/12/2023 01:09	Adam P Silver	2378608
	01/06/2023			01/19/2023 23:51	Adam P Silver	2378606
SM 5310 B-2011	01/06/2023			01/10/2023 00:32	Khloe J Berg	2378609
	01/06/2023			01/10/2023 05:01	Khloe J Berg	2378607