Chemical Analysis Report

CEN-DIST-2023-07-21-01

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

Event Description: **Run 10 + Metals Blank**
Request ID: **RQ-2023-07-17-31**
Customer: **CEN-DIST**
Project ID: **SMP**

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

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

Certified by: Chris Bowen, Environmental Administrator

Date Certified: 07-AUG-2023 09:08

Chris Bowen

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: Lake Reams at Center **Collection Date/Time: 07/20/2023 10:46**

Field ID: G4CE0242 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2425799	EPA 200.7 Rev. 4.4	Calcium	7.50		mg/L	P432914	
		Iron	140		ug/L	P432914	
		Magnesium	3.73		mg/L	P432914	
		Potassium	6.8		mg/L	P432914	
		Sodium	27.1		mg/L	P432914	
		Strontium	26.9		ug/L	P432914	
		Tin	3.0	U	ug/L	P432914	
		Titanium	0.75	U	ug/L	P432914	
		Vanadium	2.0	U	ug/L	P432914	
		Zinc	5.0	U	ug/L	P432914	
	EPA 200.8 Rev. 5.4	Aluminum	46		ug/L	P432914	
		Antimony	0.18	I	ug/L	P432914	
		Arsenic	0.35		ug/L	P432914	
		Barium	9.43		ug/L	P432914	
		Beryllium	0.010	U	ug/L	P432914	
		Boron	50.1		ug/L	P432914	
		Cadmium	0.020	U	ug/L	P432914	
		Chromium	0.40	U	ug/L	P432914	
		Cobalt	0.039	I	ug/L	P432914	
		Copper	0.68	I	ug/L	P432914	
		Lead	0.20	U	ug/L	P432914	
		Manganese	9.65		ug/L	P432914	
		Molybdenum	0.15	U	ug/L	P432914	
		Nickel	0.50	U	ug/L	P432914	
		Selenium	0.20	U	ug/L	P432914	
		Silver	0.010	U	ug/L	P432914	
		Thallium	0.10	U	ug/L	P432914	
	SM 2340 B-2011	Hardness	34.1		mg/L	P432914	

Sample Location: FB **Collection Date/Time: 07/20/2023 11:02**

Field ID: FB_07202023 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2425800	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P432914	
		Iron	30	U	ug/L	P432914	
		Magnesium	0.040	U	mg/L	P432914	
		Potassium	0.30	U	mg/L	P432914	
		Sodium	0.50	U	mg/L	P432914	
		Strontium	2.0	U	ug/L	P432914	
		Tin	3.0	U	ug/L	P432914	
		Titanium	0.75	U	ug/L	P432914	
		Vanadium	2.0	U	ug/L	P432914	
		Zinc	5.0	U	ug/L	P432914	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P432914	
		Antimony	0.050	U	ug/L	P432914	
		Arsenic	0.050	U	ug/L	P432914	
		Barium	0.20	U	ug/L	P432914	
		Beryllium	0.010	U	ug/L	P432914	
		Boron	2.0	U	ug/L	P432914	
		Cadmium	0.020	U	ug/L	P432914	
		Chromium	0.40	U	ug/L	P432914	
		Cobalt	0.020	U	ug/L	P432914	
		Copper	0.46	I	ug/L	P432914	
		Lead	0.20	U	ug/L	P432914	
		Manganese	0.10	U	ug/L	P432914	
		Molybdenum	0.15	U	ug/L	P432914	
		Nickel	0.50	U	ug/L	P432914	
		Selenium	0.20	U	ug/L	P432914	
		Silver	0.010	U	ug/L	P432914	
		Thallium	0.10	U	ug/L	P432914	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The copper result was confirmed in the undigested sample on 07/25/2023.

Sample Location: Lake Ingram East **Collection Date/Time: 07/20/2023 11:56**

Field ID: G4CE0155 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2425791	DEP SOP: NU-094-1	Color (true)	40		PCU	P432872	
	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P432876	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P433122	
		Sulfate	4.1		mg SO4/L	P433125	
	SM 2320 B-2011	Total Alkalinity	18		mg CaCO3/L	P432943	
	SM 2540 C-2015	TDS	76		mg/L	P433337	
	SM 2540 D-2015	TSS	2	I	mg/L	P433187	
	SM 4500-F- C-2011	Fluoride	0.044	I	mg F/L	P432945	
2425792	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P433105	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P433030	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P432952	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P432959	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P432968	

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

Sample Location: Lake Fairhope at Center **Collection Date/Time: 07/20/2023 13:11**

Field ID: G2CE0016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2425789	DEP SOP: NU-094-1	Color (true)	35		PCU	P432872	
	EPA 180.1 Rev. 2.0	Turbidity	9.8		NTU	P432876	
	EPA 300.0 Rev. 2.1	Chloride	9.6		mg Cl/L	P433122	
		Sulfate	2.2		mg SO4/L	P433125	
	SM 2320 B-2011	Total Alkalinity	45		mg CaCO3/L	P432943	
	SM 2540 C-2015	TDS	82		mg/L	P433337	
	SM 2540 D-2015	TSS	15	I	mg/L	P433187	
	SM 4500-F- C-2011	Fluoride	0.039	I	mg F/L	P432945	
2425790	EPA 350.1 Rev. 2.0	Ammonia-N	0.024		mg N/L	P433105	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P433030	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P432952	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P432959	
	SM 5310 B-2011	Organic Carbon	9.3		mg C/L	P432968	
2425798	EPA 200.7 Rev. 4.4	Calcium	18.9		mg/L	P432914	
		Iron	150		ug/L	P432914	
		Magnesium	1.20		mg/L	P432914	
		Potassium	1.3		mg/L	P432914	
		Sodium	6.2		mg/L	P432914	
		Strontium	46.4		ug/L	P432914	
		Tin	3.4	I	ug/L	P432914	
		Titanium	2.7	I	ug/L	P432914	
		Vanadium	2.0	U	ug/L	P432914	
		Zinc	7.5	I	ug/L	P432914	
	EPA 200.8 Rev. 5.4	Aluminum	170		ug/L	P432914	
		Antimony	0.97		ug/L	P432914	
		Arsenic	1.48		ug/L	P432914	
		Barium	10.3		ug/L	P432914	
		Beryllium	0.010	U	ug/L	P432914	
		Boron	22.8		ug/L	P432914	
		Cadmium	0.020	U	ug/L	P432914	
		Chromium	0.49	I	ug/L	P432914	
		Cobalt	0.058	I	ug/L	P432914	
		Copper	0.40	U	ug/L	P432914	
		Lead	2.72		ug/L	P432914	
		Manganese	14.0		ug/L	P432914	
		Molybdenum	0.33	I	ug/L	P432914	
		Nickel	0.50	U	ug/L	P432914	
		Selenium	0.20	U	ug/L	P432914	
		Silver	0.010	U	ug/L	P432914	
		Thallium	0.10	U	ug/L	P432914	
	SM 2340 B-2011	Hardness	52.2		mg/L	P432914	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated because of sample matrix interference.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 07/26/2023.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P432872

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P432876

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P432914

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: P432914

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: P433122

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: P433125

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433105

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433030

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432952

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432959

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

Reference Method: SM 2320 B-2011
Batch ID: P432943

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

Reference Method: SM 2540 C-2015
Batch ID: P433337

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P433187

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P432945

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: P432968

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: P432872

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.6		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P432876

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	99.7		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P432914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	96.6		P	85 - 115
Iron	94.6		P	85 - 115
Magnesium	96.5		P	85 - 115
Potassium	98.4		P	85 - 115
Sodium	101		P	85 - 115
Strontium	96.4		P	85 - 115
Tin	96.1		P	85 - 115
Titanium	98.0		P	85 - 115
Vanadium	98.1		P	85 - 115
Zinc	96.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	102		P	85 - 115
Barium	102		P	85 - 115
Beryllium	96.3		P	85 - 115
Boron	106		P	85 - 115
Cadmium	99.9		P	85 - 115
Chromium	97.8		P	85 - 115
Cobalt	100		P	85 - 115
Copper	93.9		P	85 - 115
Lead	103		P	85 - 115
Manganese	94.4		P	85 - 115
Molybdenum	100		P	85 - 115
Nickel	102		P	85 - 115
Selenium	100		P	85 - 115
Silver	113		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P433122

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P433125

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433105

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433030

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432952

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: P432959

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

Reference Method: SM 2320 B-2011
Batch ID: P432943

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	93.6		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P433337

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

Reference Method: SM 2540 D-2015
Batch ID: P433187

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	94.1		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P432945

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	94 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P432968

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P432914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425425	Calcium	95.7		P	80 - 120
2425425	Iron	98.7	99.6	P/P	80 - 120
2425425	Magnesium	95.9		P	80 - 120
2425425	Potassium	97.5		P	80 - 120
2425425	Sodium	102		P	80 - 120
2425425	Strontium	99.6	100	P/P	80 - 120
2425425	Tin	94.5	91.5	P/P	80 - 120
2425425	Titanium	95.2	95.3	P/P	80 - 120
2425425	Vanadium	94.3	94.5	P/P	80 - 120
2425425	Zinc	92.7	93.1	P/P	80 - 120
2425967	Calcium	101		P	80 - 120
2425967	Iron	103		P	80 - 120
2425967	Magnesium	104		P	80 - 120
2425967	Potassium	105		P	80 - 120
2425967	Sodium	107		P	80 - 120
2425967	Strontium	105		P	80 - 120
2425967	Tin	98.4		P	80 - 120
2425967	Titanium	100		P	80 - 120
2425967	Vanadium	101		P	80 - 120
2425967	Zinc	97.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425425	Aluminum	102	103	P/P	80 - 120
2425425	Antimony	101	101	P/P	80 - 120
2425425	Arsenic	102	102	P/P	80 - 120
2425425	Barium	103	104	P/P	80 - 120
2425425	Beryllium	96.8	98.5	P/P	80 - 120
2425425	Boron	106	108	P/P	80 - 120
2425425	Cadmium	100	101	P/P	80 - 120
2425425	Chromium	99.0	99.2	P/P	80 - 120
2425425	Cobalt	99.1	99.1	P/P	80 - 120
2425425	Copper	91.9	90.7	P/P	80 - 120
2425425	Lead	104	105	P/P	80 - 120
2425425	Manganese	90.9	94.1	P/P	80 - 120
2425425	Molybdenum	99.8	99.8	P/P	80 - 120
2425425	Nickel	101	102	P/P	80 - 120
2425425	Selenium	102	100	P/P	80 - 120
2425425	Silver	110	109	P/P	80 - 120
2425425	Thallium	106	106	P/P	80 - 120
2425967	Aluminum	103		P	80 - 120
2425967	Antimony	102		P	80 - 120
2425967	Arsenic	101		P	80 - 120
2425967	Barium	103		P	80 - 120
2425967	Beryllium	90.6		P	80 - 120
2425967	Boron	108		P	80 - 120
2425967	Cadmium	99.6		P	80 - 120
2425967	Chromium	99.0		P	80 - 120
2425967	Cobalt	98.8		P	80 - 120
2425967	Copper	98.3		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425967	Lead	103		P	80 - 120
2425967	Manganese	93.2		P	80 - 120
2425967	Molybdenum	99.2		P	80 - 120
2425967	Nickel	99.1		P	80 - 120
2425967	Selenium	98.0		P	80 - 120
2425967	Silver	108		P	80 - 120
2425967	Thallium	105		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P433122

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425743	Chloride	102		P	90 - 110
2425805	Chloride	97.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P433125

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425743	Sulfate	97.8		P	90 - 110
2425805	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433105

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425792	Ammonia-N	98.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433030

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425873	Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425753	NO2NO3-N	96.5	93.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432959

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425792	Total-P	101	102	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P432945

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425984	Fluoride	99.1	98.6	P/P	94 - 106

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P432968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2425760	Organic Carbon	99.2		P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P432872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425767	Color (true)	0.00247	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P432876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425766	Turbidity	2.09	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P432914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425425	Calcium	1.64	Spike	P	0 - 20
2425425	Iron	0.869	Spike	P	0 - 20
2425425	Magnesium	1.73	Spike	P	0 - 20
2425425	Potassium	0.803	Spike	P	0 - 20
2425425	Sodium	0.711	Spike	P	0 - 20
2425425	Strontium	0.522	Spike	P	0 - 20
2425425	Tin	3.17	Spike	P	0 - 20
2425425	Titanium	0.0979	Spike	P	0 - 20
2425425	Vanadium	0.230	Spike	P	0 - 20
2425425	Zinc	0.488	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425425	Aluminum	0.963	Spike	P	0 - 20
2425425	Antimony	0.116	Spike	P	0 - 20
2425425	Arsenic	0.0813	Spike	P	0 - 20
2425425	Barium	0.408	Spike	P	0 - 20
2425425	Beryllium	1.67	Spike	P	0 - 20
2425425	Boron	1.39	Spike	P	0 - 20
2425425	Cadmium	0.480	Spike	P	0 - 20
2425425	Chromium	0.176	Spike	P	0 - 20
2425425	Cobalt	0.0474	Spike	P	0 - 20
2425425	Copper	1.38	Spike	P	0 - 20
2425425	Lead	0.625	Spike	P	0 - 20
2425425	Manganese	1.68	Spike	P	0 - 20
2425425	Molybdenum	0.0305	Spike	P	0 - 20
2425425	Nickel	1.24	Spike	P	0 - 20
2425425	Selenium	1.59	Spike	P	0 - 20
2425425	Silver	0.833	Spike	P	0 - 20
2425425	Thallium	0.528	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P433122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425743	Chloride	0.246	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P433125

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425743	Sulfate	0.0255	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425792	Ammonia-N	2.29	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433030

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425873	Kjeldahl Nitrogen	0.752	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425753	NO2NO3-N	3.16	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432959

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425792	Total-P	0.647	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P432943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425984	Total Alkalinity	0.713	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P433337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425293	TDS	5.13	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P432945

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425984	Fluoride	0.498	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P432968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2425760	Organic Carbon	1.63	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: A120563
Included Lab Sample IDs: 2425789, 2425791

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.1	98.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A120564
Included Lab Sample IDs: 2425789, 2425791

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

Reference Method: SM 2320 B-2011
Run ID: A120602
Included Lab Sample IDs: 2425789, 2425791

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	92.9	96.2	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A120602
Included Lab Sample IDs: 2425789, 2425791

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A120608
Included Lab Sample IDs: 2425790, 2425792

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

Reference Method: SM 5310 B-2011
Run ID: A120614
Included Lab Sample IDs: 2425790, 2425792

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	99.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A120632
Included Lab Sample IDs: 2425798, 2425799, 2425800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.9	98.7	P/P	90 - 110
Aluminum	98.7	98.2	P/P	90 - 110
Antimony	96.8	96.9	P/P	90 - 110
Antimony	96.9	95.5	P/P	90 - 110
Arsenic	99.1	99.4	P/P	90 - 110
Arsenic	99.4	96.0	P/P	90 - 110
Barium	97.6	98.3	P/P	90 - 110
Barium	98.3	95.6	P/P	90 - 110
Beryllium	97.6	97.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A120632
Included Lab Sample IDs: 2425798, 2425799, 2425800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	96.6	97.8	P/P	90 - 110
Boron	97.8	101	P/P	90 - 110
Cadmium	96.7	95.7	P/P	90 - 110
Cadmium	97.2	96.7	P/P	90 - 110
Chromium	97.0	97.1	P/P	90 - 110
Chromium	97.1	96.5	P/P	90 - 110
Cobalt	96.7	96.8	P/P	90 - 110
Cobalt	96.8	94.9	P/P	90 - 110
Lead	98.9	99.1	P/P	90 - 110
Lead	99.1	98.3	P/P	90 - 110
Molybdenum	96.3	97.3	P/P	90 - 110
Molybdenum	97.3	94.3	P/P	90 - 110
Nickel	98.1	98.2	P/P	90 - 110
Nickel	98.2	95.6	P/P	90 - 110
Selenium	97.7	98.8	P/P	90 - 110
Selenium	98.8	95.7	P/P	90 - 110
Thallium	98.1	98.8	P/P	90 - 110
Thallium	98.8	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A120647
Included Lab Sample IDs: 2425790

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A120671
Included Lab Sample IDs: 2425798, 2425799, 2425800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.4	95.3	P/P	90 - 110
Beryllium	94.8	93.7	P/P	90 - 110
Copper	96.1	91.5	P/P	90 - 110
Manganese	95.0	95.8	P/P	90 - 110
Manganese	96.2	95.0	P/P	90 - 110
Silver	97.0	96.2	P/P	90 - 110
Silver	98.4	97.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A120681
Included Lab Sample IDs: 2425790, 2425792

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	98.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A120686
Included Lab Sample IDs: 2425789, 2425791

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A120686
Included Lab Sample IDs: 2425789, 2425791

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A120687
Included Lab Sample IDs: 2425790, 2425792

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.1	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A120688
Included Lab Sample IDs: 2425792

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A120693
Included Lab Sample IDs: 2425798, 2425799, 2425800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	95.9	96.7	P/P	90 - 110
Calcium	95.9	97.7	P/P	90 - 110
Calcium	96.7	95.9	P/P	90 - 110
Iron	94.3	95.5	P/P	90 - 110
Iron	94.5	99.4	P/P	90 - 110
Iron	95.5	94.5	P/P	90 - 110
Magnesium	94.0	95.4	P/P	90 - 110
Magnesium	94.2	98.8	P/P	90 - 110
Magnesium	95.4	94.2	P/P	90 - 110
Potassium	96.6	97.4	P/P	90 - 110
Potassium	97.4	97.4	P/P	90 - 110
Potassium	97.4	103	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Sodium	101	105	P/P	90 - 110
Sodium	99.3	101	P/P	90 - 110
Strontium	105	102	P/P	90 - 110
Strontium	96.6	99.3	P/P	90 - 110
Strontium	99.3	105	P/P	90 - 110
Tin	90.1	98.4	P/P	90 - 110
Tin	98.4	99.7	P/P	90 - 110
Tin	99.7	95.5	P/P	90 - 110
Titanium	101	97.1	P/P	90 - 110
Titanium	91.3	99.1	P/P	90 - 110
Titanium	99.1	101	P/P	90 - 110
Vanadium	101	96.8	P/P	90 - 110
Vanadium	91.5	99.5	P/P	90 - 110
Vanadium	99.5	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A120693
Included Lab Sample IDs: 2425798, 2425799, 2425800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	101	96.9	P/P	90 - 110
Zinc	91.2	99.5	P/P	90 - 110
Zinc	99.5	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A120694
Included Lab Sample IDs: 2425798, 2425799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	96.4	94.0	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	98.6					0.0024	
EPA 180.1 Rev. 2.0	Turbidity	99.7					2.09	
EPA 200.7 Rev. 4.4	Calcium	96.6	95.7	101				1.64
	Iron	94.6	98.7	99.6	103			0.869
	Magnesium	96.5	95.9	104				1.73
	Potassium	98.4	97.5	105				0.803
	Sodium	101	102	107				0.711
	Strontium	96.4	99.6	100	105			0.522
	Tin	96.1	94.5	91.5	98.4			3.17
	Titanium	98.0	95.2	95.3	100			0.0979
	Vanadium	98.1	94.3	94.5	101			0.230
	Zinc	96.9	92.7	93.1	97.9			0.488
EPA 200.8 Rev. 5.4	Aluminum	102	102	103	103			0.963
	Antimony	101	101	101	102			0.116
	Arsenic	102	102	102	101			0.0813
	Barium	102	103	104	103			0.408
	Beryllium	96.3	96.8	98.5	90.6			1.67
	Boron	106	106	108	108			1.39
	Cadmium	99.9	100	101	99.6			0.480
	Chromium	97.8	99.0	99.2	99.0			0.176
	Cobalt	100	99.1	99.1	98.8			0.0474
	Copper	93.9	98.3	91.9	90.7			1.38
	Lead	103	104	105	103			0.625
	Manganese	94.4	90.9	94.1	93.2			1.68
	Molybdenum	100	99.8	99.8	99.2			0.0305
	Nickel	102	101	102	99.1			1.24
	Selenium	100	102	100	98.0			1.59
	Silver	113	110	109	108			0.833
	Thallium	101	106	106	105			0.528
EPA 300.0 Rev. 2.1	Chloride	103	102	97.8			0.246	
	Sulfate	101	97.8	100			0.0255	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	98.8	101				2.29
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	103	102				0.752
EPA 353.2 Rev. 2.0	NO2NO3-N	104	96.5	93.5				3.16
EPA 365.1 Rev. 2.0	Total-P	98.1	101	102				0.647
SM 2320 B-2011	Total Alkalinity	93.6					0.713	
SM 2540 C-2015	TDS	104					5.13	
SM 2540 D-2015	TSS	94.1						
SM 4500-F- C-2011	Fluoride	97.5	99.1	98.6				0.498
SM 5310 B-2011	Organic Carbon	96.2	99.2					1.63

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2425789, 2425791
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2425789, 2425791
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2425798, 2425799, 2425800
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2425798, 2425799, 2425800
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2425789, 2425791
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2425789, 2425791
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2425790, 2425792

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2425790, 2425792
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2425790, 2425792
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2425790, 2425792
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2425789, 2425791
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2425798, 2425799
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2425789, 2425791
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2425789, 2425791
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2425789, 2425791
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2425790, 2425792

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	07/21/2023			07/21/2023 14:23	Anna M. Plaviak	2425789, 2425791
EPA 180.1 Rev. 2.0	07/21/2023			07/21/2023 13:40	Alexis Price	2425789
	07/21/2023			07/21/2023 13:41	Alexis Price	2425791
EPA 200.7 Rev. 4.4	07/21/2023	07/24/2023 12:50	George D Taylor	07/27/2023 17:35	Samatha Luckman	2425800
	07/21/2023	07/24/2023 12:50	George D Taylor	07/27/2023 19:58	Samatha Luckman	2425798
	07/21/2023	07/24/2023 12:50	George D Taylor	07/27/2023 20:33	Samatha Luckman	2425799
EPA 200.8 Rev. 5.4	07/21/2023	07/24/2023 12:50	George D Taylor	07/25/2023 19:45	Conrad Hartmann	2425800
	07/21/2023	07/24/2023 12:50	George D Taylor	07/25/2023 21:59	Conrad Hartmann	2425798
	07/21/2023	07/24/2023 12:50	George D Taylor	07/25/2023 22:08	Conrad Hartmann	2425799
	07/21/2023	07/24/2023 12:50	George D Taylor	07/26/2023 14:09	Emily M Philpot	2425800
	07/21/2023	07/24/2023 12:50	George D Taylor	07/26/2023 16:23	Emily M Philpot	2425798
	07/21/2023	07/24/2023 12:50	George D Taylor	07/26/2023 16:32	Emily M Philpot	2425799
	07/21/2023	07/24/2023 12:50	George D Taylor	07/27/2023 14:59	Conrad Hartmann	2425798
	07/21/2023	07/24/2023 12:50	George D Taylor	07/27/2023 15:06	Conrad Hartmann	2425799
EPA 300.0 Rev. 2.1	07/21/2023			07/26/2023 09:48	James L Waggerby	2425789
	07/21/2023			07/26/2023 10:33	James L Waggerby	2425791
EPA 350.1 Rev. 2.0	07/21/2023			07/27/2023 11:32	Ping Hua	2425792
	07/21/2023			07/27/2023 11:37	Ping Hua	2425790
EPA 351.2 Rev. 2.0	07/21/2023	07/26/2023 10:21	Dana G. Hughes	07/27/2023 14:03	Samantha L Bates	2425790
	07/21/2023	07/26/2023 10:21	Dana G. Hughes	07/27/2023 14:05	Samantha L Bates	2425792
EPA 353.2 Rev. 2.0	07/21/2023			07/24/2023 14:07	Judith K. Clark	2425790
	07/21/2023			07/24/2023 14:08	Judith K. Clark	2425792
EPA 365.1 Rev. 2.0	07/21/2023	07/25/2023 14:03	Alexis Price	07/26/2023 11:02	Simonne.V. Calhoun	2425790
	07/21/2023	07/25/2023 14:03	Alexis Price	07/27/2023 14:50	James L Waggerby	2425792
SM 2320 B-2011	07/21/2023			07/25/2023 01:57	Dale L. Simmons	2425789
	07/21/2023			07/25/2023 02:09	Dale L. Simmons	2425791
SM 2340 B-2011	07/21/2023			07/27/2023 19:58	Samatha Luckman	2425798
	07/21/2023			07/27/2023 20:33	Samatha Luckman	2425799
SM 2540 C-2015	07/21/2023			07/25/2023 15:46	Yijie Li	2425789, 2425791
SM 2540 D-2015	07/21/2023			07/25/2023 15:46	Yijie Li	2425789, 2425791
SM 4500-F- C-2011	07/21/2023			07/25/2023 01:57	Dale L. Simmons	2425789
	07/21/2023			07/25/2023 02:09	Dale L. Simmons	2425791
SM 5310 B-2011	07/21/2023			07/25/2023 04:08	Khloe J Berg	2425790
	07/21/2023			07/25/2023 04:23	Khloe J Berg	2425792