Chemical Analysis Report

CEN-DIST-2023-10-25-02

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

Event Description: **Run 3**
Request ID: **RQ-2023-10-23-10**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 09-NOV-2023 10:05

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: Addison Creek at US1 **Collection Date/Time: 10/24/2023 10:22**

Field ID: G5CE0111 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2447040	DEP SOP: NU-094-1	Color (true)	74		PCU	P436997	
	EPA 180.1 Rev. 2.0	Turbidity	18		NTU	P436988	
	EPA 300.0 Rev. 2.1	Chloride	190		mg Cl/L	P437221	
		Sulfate	42		mg SO4/L	P437224	
	SM 2320 B-2011	Total Alkalinity	135		mg CaCO3/L	P437314	
	SM 2540 C-2015	TDS	509		mg/L	P437390	
	SM 2540 D-2015	TSS	7	I	mg/L	P437270	
	SM 4500-F- C-2011	Fluoride	0.070	I	mg F/L	P437316	
2447041	EPA 350.1 Rev. 2.0	Ammonia-N	0.059		mg N/L	P437035	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P437009	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P437167	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P437016	
	SM 5310 B-2011	Organic Carbon	16		mg C/L	P437107	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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: Unnamed Slough at Zoltan Drive **Collection Date/Time: 10/24/2023 10:44**

Field ID: G3CE0054 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2447038	DEP SOP: NU-094-1	Color (true)	100		PCU	P436995	
	EPA 180.1 Rev. 2.0	Turbidity	8.3		NTU	P436988	
	EPA 300.0 Rev. 2.1	Chloride	80		mg Cl/L	P437221	
		Sulfate	49		mg SO4/L	P437224	
	SM 2320 B-2011	Total Alkalinity	104		mg CaCO3/L	P437314	
	SM 2540 C-2015	TDS	342		mg/L	P437390	
	SM 2540 D-2015	TSS	8	I	mg/L	P437270	
	SM 4500-F- C-2011	Fluoride	0.046	I	mg F/L	P437316	
2447039	EPA 350.1 Rev. 2.0	Ammonia-N	0.23		mg N/L	P437035	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P437009	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P437165	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P437016	
	SM 5310 B-2011	Organic Carbon	18		mg C/L	P437107	
2447048	EPA 200.7 Rev. 4.4	Calcium	57.2		mg/L	P437091	
		Iron	1.48E+03		ug/L	P437091	
		Magnesium	6.18		mg/L	P437091	
		Potassium	4.4		mg/L	P437091	
		Sodium	47.4		mg/L	P437091	
		Strontium	431		ug/L	P437091	
		Tin	3.0	U	ug/L	P437091	
		Titanium	1.4	I	ug/L	P437091	
		Vanadium	2.2	I	ug/L	P437091	
		Zinc	5.0	U	ug/L	P437091	
	EPA 200.8 Rev. 5.4	Aluminum	149		ug/L	P437091	
		Antimony	0.12	I	ug/L	P437091	
		Arsenic	2.90		ug/L	P437091	
		Barium	16.2		ug/L	P437091	
		Beryllium	0.027	I	ug/L	P437091	
		Boron	67.1		ug/L	P437091	
		Cadmium	0.020	U	ug/L	P437091	
		Chromium	0.98	I	ug/L	P437091	
		Cobalt	0.097		ug/L	P437091	
		Copper	0.40	U	ug/L	P437091	
		Lead	0.26	I	ug/L	P437091	
		Manganese	27.5		ug/L	P437091	
		Molybdenum	0.95		ug/L	P437091	
		Nickel	0.50	U	ug/L	P437091	
		Selenium	0.20	U	ug/L	P437091	
		Silver	0.010	U	ug/L	P437091	
		Thallium	0.10	U	ug/L	P437091	
	SM 2340 B-2011	Hardness	168		mg/L	P437091	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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: 10/24/2023 11:48**

Field ID: G2CE0086 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2447049	EPA 200.7 Rev. 4.4	Calcium	11.4		mg/L	P437091	
		Iron	1.48E+03		ug/L	P437091	
		Magnesium	1.33		mg/L	P437091	
		Potassium	0.30	U	mg/L	P437091	
		Sodium	7.7		mg/L	P437091	
		Strontium	47.4		ug/L	P437091	
		Tin	3.0	U	ug/L	P437091	
		Titanium	1.7	I	ug/L	P437091	
		Vanadium	2.0	U	ug/L	P437091	
		Zinc	5.0	U	ug/L	P437091	
	EPA 200.8 Rev. 5.4	Aluminum	284		ug/L	P437091	
		Antimony	0.050	U	ug/L	P437091	
		Arsenic	0.47		ug/L	P437091	
		Barium	7.78		ug/L	P437091	
		Beryllium	0.019	I	ug/L	P437091	
		Boron	23.8		ug/L	P437091	
		Cadmium	0.020	U	ug/L	P437091	
		Chromium	0.64	I	ug/L	P437091	
		Cobalt	0.133		ug/L	P437091	
		Copper	0.40	U	ug/L	P437091	
		Lead	0.38	I	ug/L	P437091	
		Manganese	6.90		ug/L	P437091	
		Molybdenum	0.15	I	ug/L	P437091	
		Nickel	0.50	U	ug/L	P437091	
		Selenium	0.20	U	ug/L	P437091	
		Silver	0.010	U	ug/L	P437091	
		Thallium	0.10	U	ug/L	P437091	
	SM 2340 B-2011	Hardness	33.8		mg/L	P437091	

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P436995

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P436997

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P436988

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437091

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: P437091

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: P437221

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437224

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437035

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P437009

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437165

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437167

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437016

Component	Result	Code	Units
Total-P	0.010	U	mg P/L

Reference Method: SM 2320 B-2011
Batch ID: P437314

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

Reference Method: SM 2540 C-2015
Batch ID: P437390

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P437270

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P437316

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P437107

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: P436995

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.4		P	90 - 110

Reference Method: DEP SOP: NU-094-1
Batch ID: P436997

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P436988

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437091

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	112		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	103		P	85 - 115
Sodium	107		P	85 - 115
Strontium	99.9		P	85 - 115
Tin	98.7		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	98.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437091

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.3		P	85 - 115
Antimony	97.3		P	85 - 115
Arsenic	97.1		P	85 - 115
Barium	101		P	85 - 115
Beryllium	93.8		P	85 - 115
Boron	102		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	98.9		P	85 - 115
Cobalt	95.2		P	85 - 115
Copper	93.9		P	85 - 115
Lead	91.9		P	85 - 115
Manganese	98.8		P	85 - 115
Molybdenum	96.9		P	85 - 115
Nickel	93.6		P	85 - 115
Selenium	99.2		P	85 - 115
Silver	105		P	85 - 115
Thallium	96.1		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437221

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437224

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	106		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437035

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P437009

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437165

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437167

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437016

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

Reference Method: SM 2320 B-2011
Batch ID: P437314

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P437390

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	93.2		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2540 D-2015
Batch ID: P437270

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	94.4		P	85 - 115

Reference Method: SM 4500-F- C-2011
Batch ID: P437316

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.6		P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P437107

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437091

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446928	Calcium	102		P	80 - 120
2446928	Iron	110	109	P/P	80 - 120
2446928	Magnesium	103		P	80 - 120
2446928	Potassium	102	101	P/P	80 - 120
2446928	Sodium	106	105	P/P	80 - 120
2446928	Strontium	98.2	97.4	P/P	80 - 120
2446928	Tin	95.5	95.4	P/P	80 - 120
2446928	Titanium	101	101	P/P	80 - 120
2446928	Vanadium	99.5	99.5	P/P	80 - 120
2446928	Zinc	94.0	94.0	P/P	80 - 120
2447188	Calcium	98.7		P	80 - 120
2447188	Iron	109		P	80 - 120
2447188	Magnesium	103		P	80 - 120
2447188	Potassium	102		P	80 - 120
2447188	Sodium	106		P	80 - 120
2447188	Strontium	98.0		P	80 - 120
2447188	Tin	95.2		P	80 - 120
2447188	Titanium	101		P	80 - 120
2447188	Vanadium	100		P	80 - 120
2447188	Zinc	97.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437091

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446928	Aluminum	96.6	97.7	P/P	80 - 120
2446928	Antimony	98.0	99.5	P/P	80 - 120
2446928	Arsenic	96.3	98.9	P/P	80 - 120
2446928	Barium	100	101	P/P	80 - 120
2446928	Beryllium	94.0	93.9	P/P	80 - 120
2446928	Boron	101	104	P/P	80 - 120
2446928	Cadmium	99.7	101	P/P	80 - 120
2446928	Chromium	99.2	100	P/P	80 - 120
2446928	Cobalt	91.3	93.1	P/P	80 - 120
2446928	Copper	91.4	92.3	P/P	80 - 120
2446928	Lead	90.6	92.8	P/P	80 - 120
2446928	Manganese	97.7	99.6	P/P	80 - 120
2446928	Molybdenum	97.2	100	P/P	80 - 120
2446928	Nickel	89.7	91.2	P/P	80 - 120
2446928	Selenium	97.3	98.0	P/P	80 - 120
2446928	Silver	105	106	P/P	80 - 120
2446928	Thallium	97.4	100	P/P	80 - 120
2447188	Aluminum	96.7		P	80 - 120
2447188	Antimony	99.5		P	80 - 120
2447188	Arsenic	95.8		P	80 - 120
2447188	Barium	99.7		P	80 - 120
2447188	Beryllium	94.9		P	80 - 120
2447188	Boron	105		P	80 - 120
2447188	Cadmium	101		P	80 - 120
2447188	Chromium	98.8		P	80 - 120
2447188	Cobalt	92.4		P	80 - 120
2447188	Copper	89.0		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437091

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447188	Lead	93.2		P	80 - 120
2447188	Manganese	96.1		P	80 - 120
2447188	Molybdenum	98.8		P	80 - 120
2447188	Nickel	90.4		P	80 - 120
2447188	Selenium	96.5		P	80 - 120
2447188	Silver	105		P	80 - 120
2447188	Thallium	100		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437221

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446899	Chloride	103		P	90 - 110
2447012	Chloride	107		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437224

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446899	Sulfate	104		P	90 - 110
2447012	Sulfate	106		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437035

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446992	Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P437009

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447041	Kjeldahl Nitrogen	99.4	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446992	NO2NO3-N	98.5	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437167

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447041	NO2NO3-N	95.5	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437016

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446992	Total-P	105	108	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P437107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446828	Organic Carbon	102		P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P436995

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447013	Color (true)	5.56	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P436997

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446943	Color (true)	4.48	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P436988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446930	Turbidity	19.1	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446928	Calcium	0.333	Spike	P	0 - 20
2446928	Iron	0.731	Spike	P	0 - 20
2446928	Magnesium	0.573	Spike	P	0 - 20
2446928	Potassium	0.824	Spike	P	0 - 20
2446928	Sodium	0.284	Spike	P	0 - 20
2446928	Strontium	0.749	Spike	P	0 - 20
2446928	Tin	0.0875	Spike	P	0 - 20
2446928	Titanium	0.0360	Spike	P	0 - 20
2446928	Vanadium	0.0142	Spike	P	0 - 20
2446928	Zinc	0.00372	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446928	Aluminum	1.12	Spike	P	0 - 20
2446928	Antimony	1.42	Spike	P	0 - 20
2446928	Arsenic	2.62	Spike	P	0 - 20
2446928	Barium	0.792	Spike	P	0 - 20
2446928	Beryllium	0.176	Spike	P	0 - 20
2446928	Boron	2.46	Spike	P	0 - 20
2446928	Cadmium	1.48	Spike	P	0 - 20
2446928	Chromium	1.02	Spike	P	0 - 20
2446928	Cobalt	2.00	Spike	P	0 - 20
2446928	Copper	1.02	Spike	P	0 - 20
2446928	Lead	2.41	Spike	P	0 - 20
2446928	Manganese	1.91	Spike	P	0 - 20
2446928	Molybdenum	2.64	Spike	P	0 - 20
2446928	Nickel	1.68	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446928	Selenium	0.691	Spike	P	0 - 20
2446928	Silver	1.23	Spike	P	0 - 20
2446928	Thallium	2.80	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437221

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446899	Chloride	0.436	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446992	Ammonia-N	0.462	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P437009

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447041	Kjeldahl Nitrogen	0.447	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446992	NO2NO3-N	1.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447041	NO2NO3-N	1.18	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437016

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446992	Total-P	2.80	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P437314

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P437314

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447072	Total Alkalinity	1.41	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P437390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446954	TDS	4.70	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P437316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447072	Fluoride	0.477	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P437107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446828	Organic Carbon	0.151	Sample	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A122354
Included Lab Sample IDs: 2447038, 2447040

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

Reference Method: DEP SOP: NU-094-1
Run ID: A122356
Included Lab Sample IDs: 2447038, 2447040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100		P	90 - 110
Color (true)	100	98.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A122380
Included Lab Sample IDs: 2447039, 2447041

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A122399
Included Lab Sample IDs: 2447039, 2447041

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A122418
Included Lab Sample IDs: 2447039, 2447041

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.3	93.8	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A122423
Included Lab Sample IDs: 2447039, 2447041

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A122446
Included Lab Sample IDs: 2447039

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A122447
Included Lab Sample IDs: 2447041

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A122477
Included Lab Sample IDs: 2447048, 2447049

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	104	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	102	99.5	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Strontium	98.2	98.7	P/P	90 - 110
Tin	99.8	100	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Vanadium	99.6	99.9	P/P	90 - 110
Zinc	99.4	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A122479
Included Lab Sample IDs: 2447038, 2447040

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A122498
Included Lab Sample IDs: 2447048, 2447049

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.8	102	P/P	90 - 110
Antimony	96.5	98.7	P/P	90 - 110
Arsenic	99.5	96.0	P/P	90 - 110
Barium	98.4	98.8	P/P	90 - 110
Beryllium	99.8	99.1	P/P	90 - 110
Boron	98.9	104	P/P	90 - 110
Cadmium	99.6	102	P/P	90 - 110
Chromium	99.0	102	P/P	90 - 110
Cobalt	97.2	94.6	P/P	90 - 110
Copper	97.6	93.1	P/P	90 - 110
Lead	94.3	94.2	P/P	90 - 110
Manganese	97.9	102	P/P	90 - 110
Molybdenum	97.9	98.2	P/P	90 - 110
Nickel	97.2	93.6	P/P	90 - 110
Selenium	100	98.7	P/P	90 - 110
Silver	99.1	99.5	P/P	90 - 110
Thallium	97.9	98.4	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A122537
Included Lab Sample IDs: 2447038, 2447040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.0	95.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500-F- C-2011
Run ID: A122537
Included Lab Sample IDs: 2447038, 2447040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	100	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)	99.4					5.56	
	Color (true)	100					4.48	
EPA 180.1 Rev. 2.0	Turbidity	104					19.1	
EPA 200.7 Rev. 4.4	Calcium	106	102	98.7				0.333
	Iron	112	110	109	109			0.731
	Magnesium	105	103	103				0.573
	Potassium	103	102	101	102			0.824
	Sodium	107	106	105	106			0.284
	Strontium	99.9	98.2	97.4	98.0			0.749
	Tin	98.7	95.5	95.4	95.2			0.0875
	Titanium	102	101	101	101			0.0360
	Vanadium	101	99.5	99.5	100			0.0142
	Zinc	98.2	94.0	94.0	97.5			0.0037
EPA 200.8 Rev. 5.4	Aluminum	99.3	96.7	96.6	97.7			1.12
	Antimony	97.3	99.5	98.0	99.5			1.42
	Arsenic	97.1	95.8	96.3	98.9			2.62
	Barium	101	99.7	100	101			0.792
	Beryllium	93.8	94.9	94.0	93.9			0.176
	Boron	102	105	101	104			2.46
	Cadmium	100	101	99.7	101			1.48
	Chromium	98.9	98.8	99.2	100			1.02
	Cobalt	95.2	92.4	91.3	93.1			2.00
	Copper	93.9	89.0	91.4	92.3			1.02
	Lead	91.9	93.2	90.6	92.8			2.41
	Manganese	98.8	96.1	97.7	99.6			1.91
	Molybdenum	96.9	98.8	97.2	100			2.64
	Nickel	93.6	90.4	89.7	91.2			1.68
	Selenium	99.2	96.5	97.3	98.0			0.691
	Silver	105	105	105	106			1.23
	Thallium	96.1	100	97.4	100			2.80
EPA 300.0 Rev. 2.1	Chloride	106	103	107			0.436	
	Sulfate	106	104	106				
EPA 350.1 Rev. 2.0	Ammonia-N	100	100	101				0.462
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.6	99.4	100				0.447
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	98.5	100				1.35
	NO2NO3-N	99.0	95.5	97.5				1.18
EPA 365.1 Rev. 2.0	Total-P	106	105	108				2.80
SM 2320 B-2011	Total Alkalinity	100					1.41	
SM 2540 C-2015	TDS	93.2					4.70	
SM 2540 D-2015	TSS	94.4						
SM 4500-F- C-2011	Fluoride	99.6						0.477
SM 5310 B-2011	Organic Carbon	99.0	102				0.151	

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2447038, 2447040
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2447038, 2447040
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2447048, 2447049
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2447048, 2447049
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2447038, 2447040

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2447038, 2447040
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2447039, 2447041
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2447039, 2447041
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2447039, 2447041
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2447039, 2447041
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2447038, 2447040
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2447048, 2447049
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2447038, 2447040
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2447038, 2447040
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2447038, 2447040
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2447039, 2447041

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	10/25/2023			10/25/2023 14:06	Anna M. Plaviak	2447038
	10/25/2023			10/25/2023 14:39	Anna M. Plaviak	2447040
EPA 180.1 Rev. 2.0	10/25/2023			10/25/2023 14:28	Khloe J Berg	2447038
	10/25/2023			10/25/2023 14:30	Khloe J Berg	2447040
EPA 200.7 Rev. 4.4	10/25/2023	10/27/2023 13:55	George D Taylor	10/31/2023 16:25	Chase Roberts	2447048
	10/25/2023	10/27/2023 13:55	George D Taylor	10/31/2023 16:32	Chase Roberts	2447049
EPA 200.8 Rev. 5.4	10/25/2023	10/27/2023 13:55	George D Taylor	11/01/2023 17:42	Conrad Hartmann	2447048
	10/25/2023	10/27/2023 13:55	George D Taylor	11/01/2023 17:52	Conrad Hartmann	2447049
EPA 300.0 Rev. 2.1	10/25/2023			10/31/2023 19:18	James L Waggerby	2447038
	10/25/2023			10/31/2023 19:33	James L Waggerby	2447040
EPA 350.1 Rev. 2.0	10/25/2023			10/26/2023 12:17	Ping Hua	2447039
	10/25/2023			10/26/2023 12:18	Ping Hua	2447041
EPA 351.2 Rev. 2.0	10/25/2023	10/26/2023 11:38	Simonne.V. Calhoun	10/27/2023 13:49	Ping Hua	2447039
	10/25/2023	10/26/2023 11:38	Simonne.V. Calhoun	10/27/2023 13:51	Ping Hua	2447041
EPA 353.2 Rev. 2.0	10/25/2023			10/30/2023 13:01	Anna M. Plaviak	2447039
	10/25/2023			10/30/2023 15:35	Anna M. Plaviak	2447041
EPA 365.1 Rev. 2.0	10/25/2023	10/26/2023 12:20	Adam P Silver	10/27/2023 08:56	Simonne.V. Calhoun	2447039
	10/25/2023	10/26/2023 12:20	Adam P Silver	10/27/2023 08:57	Simonne.V. Calhoun	2447041
SM 2320 B-2011	10/25/2023			11/02/2023 20:36	Dale L. Simmons	2447038
	10/25/2023			11/02/2023 20:50	Dale L. Simmons	2447040
SM 2340 B-2011	10/25/2023			10/31/2023 16:25	Chase Roberts	2447048
	10/25/2023			10/31/2023 16:32	Chase Roberts	2447049
SM 2540 C-2015	10/25/2023			10/27/2023 16:33	Yijie Li	2447038, 2447040
SM 2540 D-2015	10/25/2023			10/27/2023 16:33	Yijie Li	2447038, 2447040
SM 4500-F- C-2011	10/25/2023			11/02/2023 20:36	Dale L. Simmons	2447038
	10/25/2023			11/02/2023 20:50	Dale L. Simmons	2447040
SM 5310 B-2011	10/25/2023			10/27/2023 14:08	Khloe J Berg	2447039
	10/25/2023			10/27/2023 14:22	Khloe J Berg	2447041