

Chemical Analysis Report

CEN-DIST-2022-03-17-03

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Run 12**
Request ID: **RQ-2022-03-14-30**
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

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 04-APR-2022 14:36

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: 03/16/2022 10:35

Field ID: G3CE0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2313115	DEP SOP: NU-094-1	Color (true)**	73		PCU	P411440	
	EPA 180.1 Rev. 2.0	Turbidity	4.4		NTU	P411246	
	EPA 300.0 Rev. 2.1	Chloride	81		mg Cl/L	P411369	
		Sulfate	51		mg SO4/L	P411371	
	SM 2320 B-2011	Total Alkalinity	103		mg CaCO3/L	P411445	
	SM 2540 C-2011	TDS	355	A	mg/L	P411634	
	SM 2540 D-2011	TSS	9	IA	mg/L	P411430	
	SM 4500 F-C-2011	Fluoride	0.060	I	mg F/L	P411454	
2313117	EPA 350.1 Rev. 2.0	Ammonia-N	0.060		mg N/L	P411488	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P411466	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.085		mg N/L	P411335	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P411458	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P411402	
2313148	EPA 200.7 Rev. 4.4	Calcium	56.8		mg/L	P411263	
		Iron	1.13E+03		ug/L	P411263	
		Magnesium	6.19		mg/L	P411263	
		Potassium	4.7		mg/L	P411263	
		Sodium	51.0		mg/L	P411263	
		Strontium	475		ug/L	P411263	
		Tin	3.0	U	ug/L	P411263	
		Titanium	1.9	I	ug/L	P411263	
	EPA 200.8 Rev. 5.4	Vanadium	2.1	I	ug/L	P411263	
		Zinc	5.0	U	ug/L	P411263	
		Aluminum	143		ug/L	P411263	
		Antimony	0.13	I	ug/L	P411263	
		Arsenic	2.56		ug/L	P411263	
		Barium	17.9		ug/L	P411263	
		Beryllium	0.026	I	ug/L	P411263	
		Boron**	70.1		ug/L	P411263	
		Cadmium	0.020	U	ug/L	P411263	
		Chromium	0.77	I	ug/L	P411263	
		Cobalt	0.113		ug/L	P411263	
		Copper	0.47	I	ug/L	P411263	
		Lead	0.42		ug/L	P411263	
		Manganese	42.6		ug/L	P411263	
		Molybdenum	0.78		ug/L	P411263	
		Nickel	0.50	U	ug/L	P411263	
		Selenium	0.20	U	ug/L	P411263	
		Silver	0.010	U	ug/L	P411263	
		Thallium	0.10	U	ug/L	P411263	
	SM 2340B	Hardness	167		mg/L	P411263	
2313188	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P411243	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Unnamed Slough @ HWY 50, 225M West of Zoltan Drive

Collection Date/Time: 03/16/2022 10:52

Field ID: G3CE0053

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2313116	DEP SOP: NU-094-1	Color (true)**	130		PCU	P411440	
	EPA 180.1 Rev. 2.0	Turbidity	4.6		NTU	P411247	
	EPA 300.0 Rev. 2.1	Chloride	73		mg Cl/L	P411369	
		Sulfate	50		mg SO4/L	P411371	
	SM 2320 B-2011	Total Alkalinity	112		mg CaCO3/L	P411445	
	SM 2540 C-2011	TDS	355		mg/L	P411634	
	SM 2540 D-2011	TSS	2	U	mg/L	P411430	
2313118	SM 4500 F-C-2011	Fluoride	0.066	I	mg F/L	P411454	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.17		mg N/L	P411488	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P411466	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.089		mg N/L	P411336	
	EPA 365.1 Rev. 2.0	Total-P	0.074		mg P/L	P411458	
2313149	SM 5310 B-2011	Organic Carbon	18		mg C/L	P411402	
	EPA 200.7 Rev. 4.4	Calcium	61.6		mg/L	P411263	
		Iron	1.28E+03		ug/L	P411263	
		Magnesium	5.59		mg/L	P411263	
		Potassium	4.1		mg/L	P411263	
		Sodium	46.7		mg/L	P411263	
		Strontium	517		ug/L	P411263	
		Tin	3.0	U	ug/L	P411263	
		Titanium	1.6	I	ug/L	P411263	
		Vanadium	2.0	U	ug/L	P411263	
		Zinc	5.0	U	ug/L	P411263	
	EPA 200.8 Rev. 5.4	Aluminum	76		ug/L	P411263	
		Antimony	0.13	I	ug/L	P411263	
		Arsenic	2.02		ug/L	P411263	
		Barium	16.7		ug/L	P411263	
		Beryllium	0.022	I	ug/L	P411263	
		Boron**	62.7		ug/L	P411263	
		Cadmium	0.020	U	ug/L	P411263	
		Chromium	0.71	I	ug/L	P411263	
		Cobalt	0.116		ug/L	P411263	
		Copper	0.67	I	ug/L	P411263	
		Lead	0.24	I	ug/L	P411263	
		Manganese	30.6		ug/L	P411263	
		Molybdenum	0.79		ug/L	P411263	
		Nickel	0.51	I	ug/L	P411263	
		Selenium	0.20	U	ug/L	P411263	
		Silver	0.010	U	ug/L	P411263	
		Thallium	0.10	U	ug/L	P411263	
	SM 2340B	Hardness	177		mg/L	P411263	
2313187	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P411243	

Field ID: G3CE0053

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P411440

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411246

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411247

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411263

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: P411263

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: P411369

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411371

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411488

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411466

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411335

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411336

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411458

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P411243

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2320 B-2011
Batch ID: P411445

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P411634

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P411430

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P411454

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P411402

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: P411440

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.8		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411246

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.9		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411247

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.5		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411263

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	103		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	102		P	85 - 115
Sodium	105		P	85 - 115
Strontium	106		P	85 - 115
Tin	105		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	97.2		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411263

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.1		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	101		P	85 - 115
Barium	105		P	85 - 115
Beryllium	98.2		P	85 - 115
Boron	103		P	85 - 115
Cadmium	99.6		P	85 - 115
Chromium	97.9		P	85 - 115
Cobalt	99.0		P	85 - 115
Copper	95.4		P	85 - 115
Lead	98.0		P	85 - 115
Manganese	97.3		P	85 - 115
Molybdenum	98.7		P	85 - 115
Nickel	96.8		P	85 - 115
Selenium	101		P	85 - 115
Silver	101		P	85 - 115
Thallium	99.6		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411369

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411371

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411488

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411466

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411335

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411336

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411458

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P411243

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

Reference Method: SM 2320 B-2011
Batch ID: P411445

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.4		P	94 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P411454

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P411402

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P411263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312824	Calcium	107		P	80 - 120
2312824	Iron	103		P	80 - 120
2312824	Magnesium	107		P	80 - 120
2312824	Potassium	103		P	80 - 120
2312824	Sodium	101		P	80 - 120
2312824	Strontium	108		P	80 - 120
2312824	Tin	105		P	80 - 120
2312824	Titanium	102		P	80 - 120
2312824	Vanadium	98.4		P	80 - 120
2312824	Zinc	107		P	80 - 120
2313051	Calcium	104	107	P/P	80 - 120
2313051	Iron	104	107	P/P	80 - 120
2313051	Magnesium	107	110	P/P	80 - 120
2313051	Potassium	107	109	P/P	80 - 120
2313051	Sodium	103	104	P/P	80 - 120
2313051	Strontium	108	110	P/P	80 - 120
2313051	Tin	103	105	P/P	80 - 120
2313051	Titanium	101	103	P/P	80 - 120
2313051	Vanadium	96.7	98.4	P/P	80 - 120
2313051	Zinc	105	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P411263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312824	Aluminum	99.8		P	80 - 120
2312824	Antimony	100		P	80 - 120
2312824	Arsenic	98.7		P	80 - 120
2312824	Barium	107		P	80 - 120
2312824	Beryllium	98.9		P	80 - 120
2312824	Boron	103		P	80 - 120
2312824	Cadmium	101		P	80 - 120
2312824	Chromium	100		P	80 - 120
2312824	Cobalt	97.4		P	80 - 120
2312824	Copper	94.2		P	80 - 120
2312824	Lead	98.7		P	80 - 120
2312824	Manganese	98.1		P	80 - 120
2312824	Molybdenum	97.9		P	80 - 120
2312824	Nickel	97.0		P	80 - 120
2312824	Selenium	98.0		P	80 - 120
2312824	Silver	100		P	80 - 120
2312824	Thallium	102		P	80 - 120
2313051	Aluminum	99.5	101	P/P	80 - 120
2313051	Antimony	99.9	101	P/P	80 - 120
2313051	Arsenic	100	101	P/P	80 - 120
2313051	Barium	105	106	P/P	80 - 120
2313051	Beryllium	95.7	98.1	P/P	80 - 120
2313051	Boron	99.4	101	P/P	80 - 120
2313051	Cadmium	99.2	101	P/P	80 - 120
2313051	Chromium	97.6	99.4	P/P	80 - 120
2313051	Cobalt	98.5	100	P/P	80 - 120
2313051	Copper	96.0	97.8	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P411263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313051	Lead	97.5	98.6	P/P	80 - 120
2313051	Manganese	97.9	99.7	P/P	80 - 120
2313051	Molybdenum	97.1	98.3	P/P	80 - 120
2313051	Nickel	97.9	99.3	P/P	80 - 120
2313051	Selenium	99.4	101	P/P	80 - 120
2313051	Silver	98.8	100	P/P	80 - 120
2313051	Thallium	99.5	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P411369

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313153	Chloride	100		P	90 - 110
2313263	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P411371

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313153	Sulfate	99.8		P	90 - 110
2313263	Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P411488

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313089	Ammonia-N	96.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P411466

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313040	Kjeldahl Nitrogen	109	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P411335

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313045	NO2NO3-N	99.4	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P411336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313158	NO2NO3-N	94.8	95.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P411458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313158	Total-P	106	101	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P411243

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313046	O-Phosphate-P	99.6	99.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P411454

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313039	Fluoride	99.3	99.3	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P411402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312784	Organic Carbon	95.4	94.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P411440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313153	Color (true)	0.453	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313103	Turbidity	16.7	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411247

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313155	Turbidity	6.35	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313051	Calcium	2.64	Spike	P	0 - 20
2313051	Iron	2.79	Spike	P	0 - 20
2313051	Magnesium	2.45	Spike	P	0 - 20
2313051	Potassium	2.25	Spike	P	0 - 20
2313051	Sodium	1.28	Spike	P	0 - 20
2313051	Strontium	2.00	Spike	P	0 - 20
2313051	Tin	2.37	Spike	P	0 - 20
2313051	Titanium	1.96	Spike	P	0 - 20
2313051	Vanadium	1.74	Spike	P	0 - 20
2313051	Zinc	1.76	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313051	Aluminum	1.60	Spike	P	0 - 20
2313051	Antimony	0.714	Spike	P	0 - 20
2313051	Arsenic	0.600	Spike	P	0 - 20
2313051	Barium	1.30	Spike	P	0 - 20
2313051	Beryllium	2.36	Spike	P	0 - 20
2313051	Boron	1.42	Spike	P	0 - 20
2313051	Cadmium	1.59	Spike	P	0 - 20
2313051	Chromium	1.87	Spike	P	0 - 20
2313051	Cobalt	1.86	Spike	P	0 - 20
2313051	Copper	1.90	Spike	P	0 - 20
2313051	Lead	1.04	Spike	P	0 - 20
2313051	Manganese	1.80	Spike	P	0 - 20
2313051	Molybdenum	1.19	Spike	P	0 - 20
2313051	Nickel	1.40	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P411263

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313051	Selenium	1.79	Spike	P	0 - 20
2313051	Silver	1.61	Spike	P	0 - 20
2313051	Thallium	1.96	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P411369

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313153	Chloride	0.134	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P411371

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313153	Sulfate	0.689	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P411488

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313089	Ammonia-N	2.42	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P411466

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313040	Kjeldahl Nitrogen	2.44	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P411335

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313045	NO2NO3-N	0.355	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P411336

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313158	NO2NO3-N	0.368	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P411458

Replicated

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

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P411458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313158	Total-P	5.12	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P411243

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313046	O-Phosphate-P	0.301	Spike	P	0 - 20

Reference Method: SM 2320 B-2011

Batch ID: P411445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313039	Total Alkalinity	1.78	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011

Batch ID: P411634

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313115	TDS	0.563	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011

Batch ID: P411454

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313039	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011

Batch ID: P411402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312784	Organic Carbon	0.938	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A111002

Included Lab Sample IDs: 2313187, 2313188

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A111005

Included Lab Sample IDs: 2313115, 2313116

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A111053

Included Lab Sample IDs: 2313117, 2313118

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A111067

Included Lab Sample IDs: 2313148, 2313149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.5	99.1	P/P	90 - 110
Antimony	97.4	95.5	P/P	90 - 110
Arsenic	98.5	97.1	P/P	90 - 110
Beryllium	96.6	93.6	P/P	90 - 110
Boron	97.8	102	P/P	90 - 110
Cadmium	99.3	98.5	P/P	90 - 110
Chromium	98.5	96.9	P/P	90 - 110
Cobalt	96.0	95.3	P/P	90 - 110
Copper	94.3	94.2	P/P	90 - 110
Lead	96.4	96.4	P/P	90 - 110
Manganese	97.4	96.8	P/P	90 - 110
Molybdenum	97.6	97.2	P/P	90 - 110
Nickel	94.6	94.0	P/P	90 - 110
Selenium	99.3	97.6	P/P	90 - 110
Silver	97.3	97.3	P/P	90 - 110
Thallium	99.9	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A111070

Included Lab Sample IDs: 2313115, 2313116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	100	P/P	90 - 110
Sulfate	100	101	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A111082

Included Lab Sample IDs: 2313117, 2313118

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

Reference Method: SM 5310 B-2011

Run ID: A111082

Included Lab Sample IDs: 2313117, 2313118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	97.4	P/P	90 - 110
Organic Carbon	97.4	97.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A111091

Included Lab Sample IDs: 2313148, 2313149

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A111094

Included Lab Sample IDs: 2313148, 2313149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	101	P/P	90 - 110
Iron	100	99.9	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	104	104	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Strontium	101	102	P/P	90 - 110
Tin	97.2	99.8	P/P	90 - 110
Titanium	96.2	97.2	P/P	90 - 110
Vanadium	98.1	99.4	P/P	90 - 110
Zinc	102	105	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A111097

Included Lab Sample IDs: 2313115, 2313116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	100	P/P	85 - 115

Reference Method: SM 2320 B-2011

Run ID: A111098

Included Lab Sample IDs: 2313115, 2313116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.1	97.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A111098

Included Lab Sample IDs: 2313115, 2313116

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A111108

Included Lab Sample IDs: 2313117, 2313118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	98.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A111157

Included Lab Sample IDs: 2313117, 2313118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A111178

Included Lab Sample IDs: 2313117, 2313118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	105	P/P	90 - 110
Kjeldahl Nitrogen	105	104	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 SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	98.8				0.453	
EPA 180.1 Rev. 2.0	Turbidity	96.9				16.7	
	Turbidity	97.5				6.35	
EPA 200.7 Rev. 4.4	Calcium	106	107	107	104		2.64
	Iron	103	103	104	107		2.79
	Magnesium	106	107	107	110		2.45
	Potassium	102	103	107	109		2.25
	Sodium	105	101	103	104		1.28
	Strontium	106	108	108	110		2.00
	Tin	105	105	103	105		2.37
	Titanium	102	102	101	103		1.96
	Vanadium	97.2	98.4	96.7	98.4		1.74
	Zinc	106	107	105	107		1.76
EPA 200.8 Rev. 5.4	Aluminum	99.1	99.5	101	99.8		1.60
	Antimony	102	99.9	101	100		0.714
	Arsenic	101	100	101	98.7		0.600
	Barium	105	105	106	107		1.30
	Beryllium	98.2	95.7	98.1	98.9		2.36
	Boron	103	99.4	101	103		1.42
	Cadmium	99.6	99.2	101	101		1.59
	Chromium	97.9	97.6	99.4	100		1.87
	Cobalt	99.0	98.5	100	97.4		1.86
	Copper	95.4	96.0	97.8	94.2		1.90
	Lead	98.0	97.5	98.6	98.7		1.04
	Manganese	97.3	97.9	99.7	98.1		1.80
	Molybdenum	98.7	97.1	98.3	97.9		1.19
	Nickel	96.8	97.9	99.3	97.0		1.40
	Selenium	101	99.4	101	98.0		1.79
	Silver	101	98.8	100	100		1.61
	Thallium	99.6	99.5	101	102		1.96
EPA 300.0 Rev. 2.1	Chloride	100	100	99.5		0.134	
	Sulfate	101	99.8	99.6		0.689	
EPA 350.1 Rev. 2.0	Ammonia-N	95.8	96.8	100			2.42
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	109	105			2.44
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	99.4	98.9			0.355
	NO2NO3-N	98.5	94.8	95.3			0.368
EPA 365.1 Rev. 2.0	Total-P	103	106	101			5.12
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	99.6	99.9			0.301
SM 2320 B-2011	Total Alkalinity	97.4				1.78	
SM 2540 C-2011	TDS					0.563	
SM 4500 F-C-2011	Fluoride	101	99.3	99.3			0.0
SM 5310 B-2011	Organic Carbon	93.9	95.4	94.3			0.938

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2313115, 2313116
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2313115, 2313116
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2313148, 2313149
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2313148, 2313149
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2313115, 2313116

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2313115, 2313116
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2313117, 2313118
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2313117, 2313118
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2313117, 2313118
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2313117, 2313118
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2313187, 2313188
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2313115, 2313116
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2313148, 2313149
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2313115, 2313116
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2313115, 2313116
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2313115, 2313116
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2313117, 2313118

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	03/17/2022			03/17/2022 16:40	Anna M. Plaviak	2313115
	03/17/2022			03/17/2022 16:41	Anna M. Plaviak	2313116
EPA 180.1 Rev. 2.0	03/17/2022			03/17/2022 15:29	Khloe J Berg	2313115
	03/17/2022			03/17/2022 15:40	Khloe J Berg	2313116
EPA 200.7 Rev. 4.4	03/17/2022	03/18/2022 10:25	Megan Whitefoot	03/23/2022 02:08	Josef B Mick	2313148
	03/17/2022	03/18/2022 10:25	Megan Whitefoot	03/23/2022 02:16	Josef B Mick	2313149
EPA 200.8 Rev. 5.4	03/17/2022	03/18/2022 10:25	Megan Whitefoot	03/21/2022 20:41	Emily M Philpot	2313148
	03/17/2022	03/18/2022 10:25	Megan Whitefoot	03/21/2022 20:51	Emily M Philpot	2313149
	03/17/2022	03/18/2022 10:25	Megan Whitefoot	03/22/2022 12:31	Alexander Thompson	2313148
	03/17/2022	03/18/2022 10:25	Megan Whitefoot	03/22/2022 12:37	Alexander Thompson	2313149
EPA 300.0 Rev. 2.1	03/17/2022			03/22/2022 00:29	James L Waggeberby	2313115
	03/17/2022			03/22/2022 00:41	James L Waggeberby	2313116
EPA 350.1 Rev. 2.0	03/17/2022			03/23/2022 12:08	Judith K. Clark	2313117
	03/17/2022			03/23/2022 12:09	Judith K. Clark	2313118
EPA 351.2 Rev. 2.0	03/17/2022	03/24/2022 16:16	Samantha L Bates	03/25/2022 16:41	Alexandra J Mattheus	2313117
	03/17/2022	03/24/2022 16:16	Samantha L Bates	03/25/2022 16:46	Alexandra J Mattheus	2313118
EPA 353.2 Rev. 2.0	03/17/2022			03/21/2022 09:39	Beverly Y. Sanders	2313117
	03/17/2022			03/21/2022 09:55	Beverly Y. Sanders	2313118
EPA 365.1 Rev. 2.0	03/17/2022	03/23/2022 17:20	Simonne.V. Calhoun	03/25/2022 12:07	Sarah A Nixon	2313117
	03/17/2022	03/23/2022 17:20	Simonne.V. Calhoun	03/25/2022 12:08	Sarah A Nixon	2313118
EPA 365.1 Rev. 2.0 dissolved SM 2320 B-2011	03/17/2022			03/17/2022 14:57	James L Waggeberby	2313187, 2313188
	03/17/2022			03/22/2022 20:42	Dale L. Simmons	2313115
	03/17/2022			03/22/2022 20:56	Dale L. Simmons	2313116
SM 2340B	03/17/2022			03/23/2022 02:08	Josef B Mick	2313148
	03/17/2022			03/23/2022 02:16	Josef B Mick	2313149
SM 2540 C-2011	03/17/2022			03/18/2022 16:00	Simonne.V. Calhoun	2313115, 2313116
SM 2540 D-2011	03/17/2022			03/18/2022 16:00	Simonne.V. Calhoun	2313115, 2313116
SM 4500 F-C-2011	03/17/2022			03/22/2022 20:42	Dale L. Simmons	2313115
	03/17/2022			03/22/2022 20:56	Dale L. Simmons	2313116
SM 5310 B-2011	03/17/2022			03/22/2022 01:21	Touraj Touran	2313117
	03/17/2022			03/22/2022 02:03	Touraj Touran	2313118