Chemical Analysis Report

NE-DIST-2022-03-31-01

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

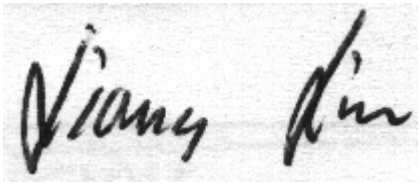
Event Description: **Vilano Boat**
Request ID: **RQ-2022-03-28-14**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256
Attn: Jeremy Parrish

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

Certified by: Liang Lin, Environmental Administrator

Date Certified: 26-APR-2022 13:32



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: Ximanies CR ~1mi upstrm of Mouth **Collection Date/Time: 03/30/2022 10:30**

Field ID: 27010968 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315613	EPA 180.1 Rev. 2.0	Turbidity	8.1		NTU	P411824	
	SM 2320 B-2011	Total Alkalinity	115		mg CaCO3/L	P412056	
	SM 2540 D-2011	TSS	15		mg/L	P412023	
	SM 4500-F- C-2011	Fluoride	1.1		mg F/L	P412058	
2315616	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P411977	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P412173	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P411950	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P411942	
	SM 5310 B-2011	Organic Carbon	5.3		mg C/L	P412109	

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: Sombrero Creek @ 1st North Bend Above the ICW **Collection Date/Time: 03/30/2022 11:25**

Field ID: 27010010 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315614	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P411824	
	SM 2320 B-2011	Total Alkalinity	111		mg CaCO3/L	P412056	
	SM 2540 D-2011	TSS	25		mg/L	P412023	
	SM 4500-F- C-2011	Fluoride	0.94		mg F/L	P412058	
2315617	EPA 350.1 Rev. 2.0	Ammonia-N	0.032		mg N/L	P411977	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P412173	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P411950	
	EPA 365.1 Rev. 2.0	Total-P	0.067		mg P/L	P411942	
	SM 5310 B-2011	Organic Carbon	7.0		mg C/L	P412109	

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: Guana River 1.3 miles upstream of matanzas river **Collection Date/Time: 03/30/2022 11:45**

Field ID: G5NE0607 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315631	EPA 200.7 Rev. 4.4	Calcium	290		mg/L	P412052	
		Iron	210	I	ug/L	P412052	
		Magnesium	924		mg/L	P412052	
		Strontium	5.32E+03		ug/L	P412052	
		Tin	150	U	ug/L	P412052	
		Titanium	7.7	I	ug/L	P412052	
		Vanadium	6.0	U	ug/L	P412052	
		Zinc	15	U	ug/L	P412052	
	EPA 200.8 Rev. 5.4	Aluminum	187		ug/L	P412052	
		Antimony	0.20	U	ug/L	P412052	
		Arsenic	2.41		ug/L	P412052	
		Beryllium	0.042	I	ug/L	P412052	
		Cadmium	0.080	U	ug/L	P412052	
		Chromium	1.6	U	ug/L	P412052	
		Cobalt	0.19	I	ug/L	P412052	
		Copper	1.6	U	ug/L	P412052	
		Lead	0.80	U	ug/L	P412052	
		Manganese	27.1		ug/L	P412052	
		Molybdenum	8.5		ug/L	P412052	
		Nickel	2.0	U	ug/L	P412052	
		Selenium	0.80	U	ug/L	P412052	
		Silver	0.040	U	ug/L	P412052	
		Thallium	0.40	U	ug/L	P412052	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium and strontium are unavailable because of high analyte concentration in the QC sample. Precision data and spike recoveries for tin are unavailable because sample matrix interference necessitated a high dilution.

Sample Location: Salt Run offshore from lighthouse **Collection Date/Time: 03/30/2022 11:40**

Field ID: 27010138 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315615	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P411824	
	SM 2320 B-2011	Total Alkalinity	127		mg CaCO3/L	P412056	
	SM 2540 D-2011	TSS	22		mg/L	P412023	
	SM 4500-F- C-2011	Fluoride	1.1		mg F/L	P412058	
2315618	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P411977	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P412173	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P411950	
	EPA 365.1 Rev. 2.0	Total-P	0.094		mg P/L	P411942	
	SM 5310 B-2011	Organic Carbon	4.3		mg C/L	P412109	

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: FB03302022 **Collection Date/Time: 03/30/2022 11:50**

Field ID: FB03302022 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315619	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P411824	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P412136	
	SM 2540 D-2011	TSS	2	U	mg/L	P412021	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P412139	
2315620	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P412705	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P412508	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P411953	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P411941	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P412046	
2315750	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P411932	
		Iron	30	U	ug/L	P411932	
		Magnesium	0.040	U	mg/L	P411932	
		Strontium	2.0	U	ug/L	P411932	
		Tin	3.0	U	ug/L	P411932	
		Titanium	0.75	U	ug/L	P411932	
		Vanadium	2.0	U	ug/L	P411932	
		Zinc	5.0	U	ug/L	P411932	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P411932	
		Antimony	0.050	U	ug/L	P411932	
		Arsenic	0.050	U	ug/L	P411932	
		Beryllium	0.010	U	ug/L	P411932	
		Cadmium	0.020	U	ug/L	P411932	
		Chromium	0.40	U	ug/L	P411932	
		Cobalt	0.020	U	ug/L	P411932	
		Copper	0.40	U	ug/L	P411932	
		Lead	0.20	U	ug/L	P411932	
		Manganese	0.10	U	ug/L	P411932	
		Molybdenum	0.15	U	ug/L	P411932	
		Nickel	0.50	U	ug/L	P411932	
		Selenium	0.20	U	ug/L	P411932	
		Silver	0.010	U	ug/L	P411932	
		Thallium	0.10	U	ug/L	P411932	

Ref. Method and Comment:
SM 2540 D-2011: 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: Guana River above the Dam **Collection Date/Time: 03/30/2022 10:35**

Field ID: G5NE0608 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315632	EPA 200.7 Rev. 4.4	Calcium	263		mg/L	P412052	
		Iron	460		ug/L	P412052	
		Magnesium	821		mg/L	P412052	
		Strontium	4.72E+03		ug/L	P412052	
		Tin	150	U	ug/L	P412052	
		Titanium	7.7	I	ug/L	P412052	
		Vanadium	6.0	U	ug/L	P412052	
		Zinc	15	U	ug/L	P412052	
	EPA 200.8 Rev. 5.4	Aluminum	280		ug/L	P412052	
		Antimony	0.20	U	ug/L	P412052	
		Arsenic	2.67		ug/L	P412052	
		Beryllium	0.057	I	ug/L	P412052	
		Cadmium	0.080	U	ug/L	P412052	
		Chromium	1.6	U	ug/L	P412052	
		Cobalt	0.28	I	ug/L	P412052	
		Copper	1.6	U	ug/L	P412052	
		Lead	1.2	I	ug/L	P412052	
		Manganese	47.7		ug/L	P412052	
		Molybdenum	6.7		ug/L	P412052	
		Nickel	2.0	U	ug/L	P412052	
		Selenium	0.80	U	ug/L	P412052	
		Silver	0.040	U	ug/L	P412052	
		Thallium	0.40	U	ug/L	P412052	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium and strontium are unavailable because of high analyte concentration in the QC sample. Precision data and spike recoveries for tin are unavailable because sample matrix interference necessitated a high dilution.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411824

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411932

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	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 200.7 Rev. 4.4
Batch ID: P412052

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	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: P411932

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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 200.8 Rev. 5.4
Batch ID: P412052

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412052

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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 350.1 Rev. 2.0
Batch ID: P411977

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P412705

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P412173

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P412508

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411950

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411953

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411941

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411942

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

Reference Method: SM 2320 B-2011
Batch ID: P412056

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

Reference Method: SM 2320 B-2011
Batch ID: P412136

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

Reference Method: SM 2540 D-2011
Batch ID: P412021

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P412023

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P412058

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500-F- C-2011
Batch ID: P412139

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P412046

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P412109

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411824

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.0		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411932

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	102		P	85 - 115
Strontium	102		P	85 - 115
Tin	105		P	85 - 115
Titanium	104		P	85 - 115
Vanadium	98.7		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	107		P	85 - 115
Magnesium	104		P	85 - 115
Strontium	107		P	85 - 115
Tin	110		P	85 - 115
Titanium	107		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411932

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	99.7		P	85 - 115
Arsenic	100		P	85 - 115
Beryllium	95.4		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	95.4		P	85 - 115
Cobalt	98.1		P	85 - 115
Copper	95.6		P	85 - 115
Lead	97.1		P	85 - 115
Manganese	96.5		P	85 - 115
Molybdenum	98.2		P	85 - 115
Nickel	97.4		P	85 - 115
Selenium	98.8		P	85 - 115
Silver	99.3		P	85 - 115
Thallium	98.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412052

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.3		P	85 - 115
Antimony	99.4		P	85 - 115
Arsenic	98.2		P	85 - 115
Beryllium	91.3		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	96.4		P	85 - 115
Cobalt	98.3		P	85 - 115
Copper	94.2		P	85 - 115
Lead	98.2		P	85 - 115
Manganese	98.0		P	85 - 115
Molybdenum	98.0		P	85 - 115
Nickel	95.9		P	85 - 115
Selenium	96.1		P	85 - 115
Silver	101		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411977

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	93.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P412705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P412173

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P412508

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411950

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411953

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411941

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411942

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

Reference Method: SM 2320 B-2011
Batch ID: P412056

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.1		P	94 - 106

Reference Method: SM 2320 B-2011
Batch ID: P412136

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.9		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P412058

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.9		P	93 - 104

Reference Method: SM 4500-F- C-2011
Batch ID: P412139

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P412046

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.4		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P412109

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: P411932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315462	Calcium	105	104	P/P	80 - 120
2315462	Iron	105	105	P/P	80 - 120
2315462	Magnesium	106	106	P/P	80 - 120
2315462	Strontium	106	104	P/P	80 - 120
2315462	Tin	105	106	P/P	80 - 120
2315462	Titanium	102	104	P/P	80 - 120
2315462	Vanadium	98.4	99.9	P/P	80 - 120
2315462	Zinc	105	105	P/P	80 - 120
2315465	Calcium	102		P	80 - 120
2315465	Iron	103		P	80 - 120
2315465	Magnesium	104		P	80 - 120
2315465	Strontium	104		P	80 - 120
2315465	Tin	106		P	80 - 120
2315465	Titanium	104		P	80 - 120
2315465	Vanadium	99.6		P	80 - 120
2315465	Zinc	105		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315632	Iron	105	106	P/P	70 - 130
2315632	Titanium	102	103	P/P	70 - 130
2315632	Vanadium	103	103	P/P	70 - 130
2315632	Zinc	97.6	97.7	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315462	Aluminum	106	108	P/P	80 - 120
2315462	Antimony	101	101	P/P	80 - 120
2315462	Arsenic	102	102	P/P	80 - 120
2315462	Beryllium	95.5	98.9	P/P	80 - 120
2315462	Cadmium	102	103	P/P	80 - 120
2315462	Chromium	99.6	100	P/P	80 - 120
2315462	Cobalt	100	101	P/P	80 - 120
2315462	Copper	100	101	P/P	80 - 120
2315462	Lead	100	100	P/P	80 - 120
2315462	Manganese	97.5	101	P/P	80 - 120
2315462	Molybdenum	101	101	P/P	80 - 120
2315462	Nickel	100	100	P/P	80 - 120
2315462	Selenium	101	102	P/P	80 - 120
2315462	Silver	101	101	P/P	80 - 120
2315462	Thallium	102	103	P/P	80 - 120
2315465	Aluminum	103		P	80 - 120
2315465	Antimony	102		P	80 - 120
2315465	Arsenic	103		P	80 - 120
2315465	Beryllium	98.3		P	80 - 120
2315465	Cadmium	102		P	80 - 120
2315465	Chromium	98.9		P	80 - 120
2315465	Cobalt	102		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315465	Copper	102		P	80 - 120
2315465	Lead	99.5		P	80 - 120
2315465	Manganese	100		P	80 - 120
2315465	Molybdenum	102		P	80 - 120
2315465	Nickel	103		P	80 - 120
2315465	Selenium	99.9		P	80 - 120
2315465	Silver	101		P	80 - 120
2315465	Thallium	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315632	Aluminum	103	103	P/P	70 - 130
2315632	Antimony	96.5	97.3	P/P	70 - 130
2315632	Arsenic	111	114	P/P	70 - 130
2315632	Beryllium	105	104	P/P	70 - 130
2315632	Cadmium	89.0	93.5	P/P	70 - 130
2315632	Chromium	97.6	102	P/P	70 - 130
2315632	Cobalt	113	117	P/P	70 - 130
2315632	Copper	106	109	P/P	70 - 130
2315632	Lead	106	109	P/P	70 - 130
2315632	Manganese	92.4	99.3	P/P	70 - 130
2315632	Molybdenum	113	120	P/P	70 - 130
2315632	Nickel	116	121	P/P	70 - 130
2315632	Selenium	97.7	99.2	P/P	70 - 130
2315632	Silver	89.4	91.8	P/P	70 - 130
2315632	Thallium	107	112	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411977

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315618	Ammonia-N	101	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P412705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315512	Ammonia-N	99.2	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P412173

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315365	Kjeldahl Nitrogen	96.6	94.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P412508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2316919	Kjeldahl Nitrogen	92.1	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411950

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315548	NO2NO3-N	95.9	95.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411953

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2316206	NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411941

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315647	Total-P	104	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2316139	Total-P	95.4	93.2	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P412058

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315608	Fluoride	93.4	95.6	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P412046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315649	Organic Carbon	95.5	96.4	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P412109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315572	Organic Carbon	94.1	97.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315608	Turbidity	3.97	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315462	Calcium	0.761	Spike	P	0 - 20
2315462	Iron	0.371	Spike	P	0 - 20
2315462	Magnesium	0.153	Spike	P	0 - 20
2315462	Strontium	2.12	Spike	P	0 - 20
2315462	Tin	1.19	Spike	P	0 - 20
2315462	Titanium	1.84	Spike	P	0 - 20
2315462	Vanadium	1.53	Spike	P	0 - 20
2315462	Zinc	0.00727	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315632	Calcium	1.68	Spike	P	0 - 20
2315632	Iron	1.31	Spike	P	0 - 20
2315632	Magnesium	0.787	Spike	P	0 - 20
2315632	Strontium	1.21	Spike	P	0 - 20
2315632	Titanium	0.788	Spike	P	0 - 20
2315632	Vanadium	0.350	Spike	P	0 - 20
2315632	Zinc	0.118	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315462	Aluminum	1.56	Spike	P	0 - 20
2315462	Antimony	0.0923	Spike	P	0 - 20
2315462	Arsenic	0.204	Spike	P	0 - 20
2315462	Beryllium	2.85	Spike	P	0 - 20
2315462	Cadmium	1.66	Spike	P	0 - 20
2315462	Chromium	0.354	Spike	P	0 - 20
2315462	Cobalt	0.564	Spike	P	0 - 20
2315462	Copper	0.627	Spike	P	0 - 20
2315462	Lead	0.131	Spike	P	0 - 20
2315462	Manganese	1.77	Spike	P	0 - 20
2315462	Molybdenum	0.248	Spike	P	0 - 20
2315462	Nickel	0.0905	Spike	P	0 - 20
2315462	Selenium	0.789	Spike	P	0 - 20
2315462	Silver	0.551	Spike	P	0 - 20
2315462	Thallium	0.567	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315632	Aluminum	0.0791	Spike	P	0 - 20
2315632	Antimony	0.836	Spike	P	0 - 20
2315632	Arsenic	2.40	Spike	P	0 - 20
2315632	Beryllium	1.45	Spike	P	0 - 20
2315632	Cadmium	4.90	Spike	P	0 - 20
2315632	Chromium	4.66	Spike	P	0 - 20
2315632	Cobalt	3.65	Spike	P	0 - 20
2315632	Copper	3.49	Spike	P	0 - 20
2315632	Lead	2.86	Spike	P	0 - 20
2315632	Manganese	4.42	Spike	P	0 - 20
2315632	Molybdenum	4.54	Spike	P	0 - 20
2315632	Nickel	4.34	Spike	P	0 - 20
2315632	Selenium	1.53	Spike	P	0 - 20
2315632	Silver	2.70	Spike	P	0 - 20
2315632	Thallium	4.25	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411977

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315618	Ammonia-N	1.66	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P412705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315512	Ammonia-N	2.00	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P412173

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315365	Kjeldahl Nitrogen	1.96	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P412508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2316919	Kjeldahl Nitrogen	5.40	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411950

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315548	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2316206	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315647	Total-P	1.77	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2316139	Total-P	2.08	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P412056

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315608	Total Alkalinity	1.38	Sample	P	0 - 5.2

Reference Method: SM 2320 B-2011
Batch ID: P412136

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2316812	Total Alkalinity	0.997	Sample	P	0 - 5.2

Reference Method: SM 4500-F- C-2011
Batch ID: P412058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315608	Fluoride	1.50	Spike	P	0 - 2.1

Reference Method: SM 4500-F- C-2011
Batch ID: P412139

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2316812	Fluoride	0.475	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P412046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315649	Organic Carbon	0.471	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P412109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315572	Organic Carbon	2.50	Spike	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: A111257
Included Lab Sample IDs: 2315613, 2315614, 2315615, 2315619

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: A111301
Included Lab Sample IDs: 2315620

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111302
Included Lab Sample IDs: 2315616, 2315617, 2315618

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111307
Included Lab Sample IDs: 2315616, 2315617, 2315618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.3	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111321
Included Lab Sample IDs: 2315750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	100	P/P	90 - 110
Antimony	102	103	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Beryllium	98.4	98.3	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	97.7	98.0	P/P	90 - 110
Cobalt	99.6	98.3	P/P	90 - 110
Copper	99.5	97.3	P/P	90 - 110
Lead	97.4	96.0	P/P	90 - 110
Manganese	98.8	98.4	P/P	90 - 110
Molybdenum	99.6	98.6	P/P	90 - 110
Nickel	99.6	97.7	P/P	90 - 110
Selenium	102	101	P/P	90 - 110
Silver	104	103	P/P	90 - 110
Thallium	98.7	95.5	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A111353
Included Lab Sample IDs: 2315620

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.6	96.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A111357
Included Lab Sample IDs: 2315613, 2315614, 2315615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.4	98.7	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A111357
Included Lab Sample IDs: 2315613, 2315614, 2315615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	99.5	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A111373
Included Lab Sample IDs: 2315616, 2315617, 2315618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.7	95.4	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A111388
Included Lab Sample IDs: 2315619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.9	95.5	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A111388
Included Lab Sample IDs: 2315619

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111389
Included Lab Sample IDs: 2315616, 2315617, 2315618, 2315620

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111401
Included Lab Sample IDs: 2315631, 2315632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	P/P	90 - 110
Antimony	100	101	P/P	90 - 110
Arsenic	103	102	P/P	90 - 110
Beryllium	99.5	97.7	P/P	90 - 110
Cadmium	98.9	99.5	P/P	90 - 110
Chromium	98.4	98.1	P/P	90 - 110
Cobalt	104	102	P/P	90 - 110
Copper	103	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111401
Included Lab Sample IDs: 2315631, 2315632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	98.2	98.0	P/P	90 - 110
Manganese	98.9	98.7	P/P	90 - 110
Molybdenum	98.8	99.3	P/P	90 - 110
Nickel	103	102	P/P	90 - 110
Selenium	100	99.6	P/P	90 - 110
Silver	104	105	P/P	90 - 110
Thallium	98.7	97.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111402
Included Lab Sample IDs: 2315750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Strontium	100	104	P/P	90 - 110
Tin	105	104	P/P	90 - 110
Titanium	104	103	P/P	90 - 110
Vanadium	104	103	P/P	90 - 110
Zinc	104	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111420
Included Lab Sample IDs: 2315632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.4	97.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111501
Included Lab Sample IDs: 2315750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.0	102	P/P	90 - 110
Iron	98.7	101	P/P	90 - 110
Magnesium	98.9	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111510
Included Lab Sample IDs: 2315631, 2315632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	103	P/P	90 - 110
Iron	104	106	P/P	90 - 110
Magnesium	104	105	P/P	90 - 110
Strontium	103	99.6	P/P	90 - 110
Tin	99.3	101	P/P	90 - 110
Titanium	98.7	98.4	P/P	90 - 110
Vanadium	101	100	P/P	90 - 110
Zinc	100	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A111515
Included Lab Sample IDs: 2315616, 2315617, 2315618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.5	93.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111601
Included Lab Sample IDs: 2315620

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A111610
Included Lab Sample IDs: 2315620

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	102	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
EPA 180.1 Rev. 2.0	Turbidity	96.0					3.97	
EPA 200.7 Rev. 4.4	Calcium	106	105	104	102			0.761
	Calcium	106						1.68
	Iron	105	105	105	103			0.371
	Iron	107	105	106				1.31
	Magnesium	102	106	106	104			0.153
	Magnesium	104						0.787
	Strontium	102	106	104	104			2.12
	Strontium	107						1.21
	Tin	105	105	106	106			1.19
	Tin	110						
	Titanium	104	102	104	104			1.84
	Titanium	107	102	103				0.788
	Vanadium	98.7	98.4	99.9	99.6			1.53
	Vanadium	101	103	103				0.350
	Zinc	104	105	105	105			0.0072
	Zinc	106	97.6	97.7				0.118
EPA 200.8 Rev. 5.4	Aluminum	101	106	108	103			1.56
	Aluminum	98.3	103	103				0.0791
	Antimony	99.7	101	101	102			0.0923
	Antimony	99.4	96.5	97.3				0.836
	Arsenic	100	102	102	103			0.204
	Arsenic	98.2	111	114				2.40
	Beryllium	95.4	95.5	98.9	98.3			2.85
	Beryllium	91.3	105	104				1.45
	Cadmium	101	102	103	102			1.66
	Cadmium	98.9	89.0	93.5				4.90
	Chromium	95.4	99.6	100	98.9			0.354
	Chromium	96.4	97.6	102				4.66
	Cobalt	98.1	100	101	102			0.564
	Cobalt	98.3	113	117				3.65
	Copper	95.6	100	101	102			0.627
	Copper	94.2	106	109				3.49
	Lead	97.1	100	100	99.5			0.131
	Lead	98.2	106	109				2.86
	Manganese	96.5	97.5	101	100			1.77
	Manganese	98.0	92.4	99.3				4.42
	Molybdenum	98.2	101	101	102			0.248
	Molybdenum	98.0	113	120				4.54
	Nickel	97.4	100	100	103			0.0905
	Nickel	95.9	116	121				4.34
	Selenium	98.8	101	102	99.9			0.789
	Selenium	96.1	97.7	99.2				1.53
	Silver	99.3	101	101	101			0.551
	Silver	101	89.4	91.8				2.70
	Thallium	98.9	102	103	102			0.567
	Thallium	102	107	112				4.25
EPA 350.1 Rev. 2.0	Ammonia-N	93.4	101	99.0				1.66
	Ammonia-N	98.4	99.2	101				2.00
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.6	96.6	94.4				1.96
	Kjeldahl Nitrogen	98.9	92.1	101				5.40
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	95.9	95.9				0.0
	NO2NO3-N	100	99.5	100				0.501
EPA 365.1 Rev. 2.0	Total-P	101	104	101				1.77

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 365.1 Rev. 2.0	Total-P	102	95.4	93.2			2.08
SM 2320 B-2011	Total Alkalinity	98.1				1.38	
	Total Alkalinity	97.9				0.997	
SM 4500-F- C-2011	Fluoride	96.9	93.4	95.6			1.50
	Fluoride	98.8					0.475
SM 5310 B-2011	Organic Carbon	97.4	95.5	96.4			0.471
	Organic Carbon	99.0	94.1	97.0			2.50

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2315613, 2315614, 2315615, 2315619
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2315631, 2315632, 2315750
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2315631, 2315632, 2315750
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2315616, 2315617, 2315618, 2315620
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2315616, 2315617, 2315618, 2315620
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2315616, 2315617, 2315618, 2315620
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2315616, 2315617, 2315618, 2315620
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2315613, 2315614, 2315615, 2315619
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2315613, 2315614, 2315615, 2315619
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2315613, 2315614, 2315615, 2315619
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2315616, 2315617, 2315618, 2315620

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	03/31/2022			03/31/2022 15:38	Khloe J Berg	2315613
	03/31/2022			03/31/2022 15:39	Khloe J Berg	2315614
	03/31/2022			03/31/2022 15:40	Khloe J Berg	2315615
	03/31/2022			03/31/2022 15:41	Khloe J Berg	2315619
EPA 200.7 Rev. 4.4	03/31/2022	04/05/2022 10:26	Megan Whitefoot	04/09/2022 00:00	McKinley C Carter	2315750
	03/31/2022	04/05/2022 10:26	Megan Whitefoot	04/13/2022 16:28	McKinley C Carter	2315750
	03/31/2022	04/07/2022 10:25	Megan Whitefoot	04/13/2022 21:36	Josef B Mick	2315631
	03/31/2022	04/07/2022 10:25	Megan Whitefoot	04/13/2022 21:44	Josef B Mick	2315631
	03/31/2022	04/07/2022 10:25	Megan Whitefoot	04/13/2022 21:52	Josef B Mick	2315632
	03/31/2022	04/07/2022 10:25	Megan Whitefoot	04/13/2022 22:24	Josef B Mick	2315632
EPA 200.8 Rev. 5.4	03/31/2022	04/05/2022 10:26	Megan Whitefoot	04/05/2022 18:15	Alexander Thompson	2315750
	03/31/2022	04/07/2022 10:25	Megan Whitefoot	04/08/2022 16:44	Alexander Thompson	2315631
	03/31/2022	04/07/2022 10:25	Megan Whitefoot	04/08/2022 17:03	Alexander Thompson	2315632
	03/31/2022	04/07/2022 10:25	Megan Whitefoot	04/11/2022 12:19	Alexander Thompson	2315632
EPA 350.1 Rev. 2.0	03/31/2022			04/05/2022 13:07	Ping Hua	2315618
	03/31/2022			04/05/2022 13:19	Ping Hua	2315616
	03/31/2022			04/05/2022 13:20	Ping Hua	2315617
	03/31/2022			04/21/2022 10:37	Ping Hua	2315620
EPA 351.2 Rev. 2.0	03/31/2022	04/12/2022 17:00	Samantha L Bates	04/15/2022 14:34	Alexandra J Mattheus	2315616
	03/31/2022	04/12/2022 17:00	Samantha L Bates	04/15/2022 14:36	Alexandra J Mattheus	2315617
	03/31/2022	04/12/2022 17:00	Samantha L Bates	04/15/2022 14:38	Alexandra J Mattheus	2315618
	03/31/2022	04/20/2022 14:20	Samantha L Bates	04/21/2022 12:19	Samantha L Bates	2315620
EPA 353.2 Rev. 2.0	03/31/2022			04/04/2022 17:40	Nathaniel J Jones	2315620
	03/31/2022			04/05/2022 09:35	Beverly Y. Sanders	2315616
	03/31/2022			04/05/2022 09:36	Beverly Y. Sanders	2315617
	03/31/2022			04/05/2022 09:38	Beverly Y. Sanders	2315618
EPA 365.1 Rev. 2.0	03/31/2022	04/07/2022 10:00	Simonne.V. Calhoun	04/08/2022 11:50	James L Waggerby	2315620
	03/31/2022	04/07/2022 10:00	Simonne.V. Calhoun	04/08/2022 12:03	James L Waggerby	2315616
	03/31/2022	04/07/2022 10:00	Simonne.V. Calhoun	04/08/2022 12:04	James L Waggerby	2315617
	03/31/2022	04/07/2022 10:00	Simonne.V. Calhoun	04/08/2022 12:05	James L Waggerby	2315618
SM 2320 B-2011	03/31/2022			04/06/2022 22:14	Dale L. Simmons	2315613
	03/31/2022			04/06/2022 22:28	Dale L. Simmons	2315614
	03/31/2022			04/06/2022 22:42	Dale L. Simmons	2315615
	03/31/2022			04/08/2022 01:56	Dale L. Simmons	2315619
SM 2540 D-2011	03/31/2022			04/05/2022 14:26	Blanca Fach	2315613, 2315614, 2315615, 2315619
SM 4500-F- C-2011	03/31/2022			04/06/2022 18:18	Dale L. Simmons	2315613
	03/31/2022			04/06/2022 18:23	Dale L. Simmons	2315614
	03/31/2022			04/06/2022 18:28	Dale L. Simmons	2315615
	03/31/2022			04/08/2022 01:56	Dale L. Simmons	2315619
SM 5310 B-2011	03/31/2022			04/07/2022 00:12	Khloe J Berg	2315620

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	03/31/2022			04/07/2022 22:33	Khloe J Berg	2315616
	03/31/2022			04/07/2022 22:51	Khloe J Berg	2315617
	03/31/2022			04/07/2022 23:32	Khloe J Berg	2315618