

Chemical Analysis Report

TLH-ROC-2022-01-12-01

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

Event Description: **Run 10**
Request ID: **RQ-2022-01-10-33**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 02-FEB-2022 11:42

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Stone Mill Creek Upstream S Dianna St.

Collection Date/Time: 01/12/2022 09:40

Field ID: G2TLHR0046

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2299339	EPA 180.1 Rev. 2.0	Turbidity	5.8	A	NTU	P408512	
	EPA 300.0 Rev. 2.1	Chloride	4.6		mg Cl/L	P409117	
		Sulfate	2.2		mg SO4/L	P409120	
		Color (true)**	67	A	PCU	P408451	
	SM 2320 B-2011	Total Alkalinity	17		mg CaCO3/L	P408610	
	SM 2540 C-2011	TDS	44		mg/L	P408874	
	SM 2540 D-2011	TSS	3	I	mg/L	P408774	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P408613	
2299340	EPA 350.1 Rev. 2.0	Ammonia-N	0.094		mg N/L	P408881	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33		mg N/L	P408853	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P408678	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P408646	MS
	SM 5310 B-2011	Organic Carbon	5.1		mg C/L	P408837	
2299341	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P408502	
2299353	EPA 200.7 Rev. 4.4	Calcium	7.27		mg/L	P408710	
		Iron	330		ug/L	P408710	
		Magnesium	0.95		mg/L	P408710	
		Potassium	0.45	I	mg/L	P408710	
		Sodium	2.8		mg/L	P408710	
		Strontium	224		ug/L	P408710	
		Tin	3.0	U	ug/L	P408710	
		Titanium	1.8	I	ug/L	P408710	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P408710	
		Zinc	5.0	U	ug/L	P408710	
		Aluminum	243		ug/L	P408710	
		Antimony	0.050	U	ug/L	P408710	
		Arsenic	0.15	I	ug/L	P408710	
		Barium	13.4		ug/L	P408710	
		Beryllium	0.016	I	ug/L	P408710	
		Boron**	9.6		ug/L	P408710	
		Cadmium	0.020	U	ug/L	P408710	
		Chromium	0.40	U	ug/L	P408710	
		Cobalt	0.138		ug/L	P408710	
		Copper	0.40	U	ug/L	P408710	
		Lead	0.22	I	ug/L	P408710	
		Manganese	9.51		ug/L	P408710	
		Molybdenum	0.15	U	ug/L	P408710	
		Nickel	0.50	U	ug/L	P408710	
		Selenium	0.20	U	ug/L	P408710	
		Silver	0.010	U	ug/L	P408710	
		Thallium	0.10	U	ug/L	P408710	
	SM 2340B	Hardness	22.0		mg/L	P408710	

Field ID: G2TLHR0046

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.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable because of high analyte concentration in the QC sample.

Sample Location: Big Branch @ Rd5

Collection Date/Time: 01/12/2022 10:05

Field ID: G2TLHR0049

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2299354	EPA 200.7 Rev. 4.4	Calcium	2.18		mg/L	P408710	
		Iron	310		ug/L	P408710	
		Magnesium	0.44		mg/L	P408710	
		Potassium	0.30	U	mg/L	P408710	
		Sodium	2.3		mg/L	P408710	
		Strontium	14.8		ug/L	P408710	
		Tin	3.0	U	ug/L	P408710	
		Titanium	1.9	I	ug/L	P408710	
		Vanadium	2.0	U	ug/L	P408710	
		Zinc	5.0	U	ug/L	P408710	
	EPA 200.8 Rev. 5.4	Aluminum	195		ug/L	P408710	
		Antimony	0.050	U	ug/L	P408710	
		Arsenic	0.088	I	ug/L	P408710	
		Barium	8.01		ug/L	P408710	
		Beryllium	0.015	I	ug/L	P408710	
		Boron**	6.7	I	ug/L	P408710	
		Cadmium	0.020	U	ug/L	P408710	
		Chromium	0.40	U	ug/L	P408710	
		Cobalt	0.101		ug/L	P408710	
		Copper	0.40	U	ug/L	P408710	
		Lead	0.22	I	ug/L	P408710	
		Manganese	8.41		ug/L	P408710	
		Molybdenum	0.15	U	ug/L	P408710	
		Nickel	0.50	U	ug/L	P408710	
		Selenium	0.20	U	ug/L	P408710	
		Silver	0.010	U	ug/L	P408710	
		Thallium	0.10	U	ug/L	P408710	
	SM 2340B	Hardness	7.24		mg/L	P408710	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable because of high analyte concentration in the QC sample.

Sample Location: Dead Lakes SR22

Collection Date/Time: 01/12/2022 11:25

Field ID: G2TLHR0047

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2299336	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P408512	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P409117	
		Sulfate	1.4		mg SO4/L	P409120	
	SM 2120 B-2011	Color (true)**	30		PCU	P408450	
	SM 2320 B-2011	Total Alkalinity	83		mg CaCO3/L	P408610	
	SM 2540 C-2011	TDS	114	A	mg/L	P408874	
	SM 2540 D-2011	TSS	2	UA	mg/L	P408774	
	SM 4500 F-C-2011	Fluoride	0.043	I	mg F/L	P408613	
2299337	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P408881	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P408849	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.53		mg N/L	P408677	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P408646	MS
	SM 5310 B-2011	Organic Carbon	3.4		mg C/L	P408837	
2299338	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P408502	

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: Apalachicola River 500m from Lola Landing Boat Ramp

Collection Date/Time: 01/12/2022 10:45

Field ID: G2TLHR0044

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2299330	EPA 180.1 Rev. 2.0	Turbidity	8.8		NTU	P408512	
	EPA 300.0 Rev. 2.1	Chloride	6.0		mg Cl/L	P409117	
		Sulfate	5.8		mg SO4/L	P409120	
	SM 2120 B-2011	Color (true)**	30		PCU	P408450	
	SM 2320 B-2011	Total Alkalinity	36		mg CaCO3/L	P408610	
	SM 2540 C-2011	TDS	72		mg/L	P408874	
	SM 2540 D-2011	TSS	7	I	mg/L	P408774	
	SM 4500 F-C-2011	Fluoride	0.063	I	mg F/L	P408613	
2299332	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P408831	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.28		mg N/L	P408854	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.51		mg N/L	P408677	
	EPA 365.1 Rev. 2.0	Total-P	0.036		mg P/L	P408646	MS
	SM 5310 B-2011	Organic Carbon	3.4		mg C/L	P408837	
2299334	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P408502	
2299351	EPA 200.7 Rev. 4.4	Calcium	12.3		mg/L	P408710	
		Iron	520		ug/L	P408710	
		Magnesium	1.85		mg/L	P408710	
		Potassium	2.3		mg/L	P408710	
		Sodium	6.5		mg/L	P408710	
		Strontium	29.7		ug/L	P408710	
		Tin	3.0	U	ug/L	P408710	
	EPA 200.8 Rev. 5.4	Titanium	3.1		ug/L	P408710	
		Vanadium	2.0	U	ug/L	P408710	
		Zinc	5.0	U	ug/L	P408710	
		Aluminum	141		ug/L	P408710	
		Antimony	0.069	I	ug/L	P408710	
		Arsenic	0.31		ug/L	P408710	
		Barium	19.9		ug/L	P408710	
		Beryllium	0.022	I	ug/L	P408710	
		Boron**	17.2		ug/L	P408710	
		Cadmium	0.020	U	ug/L	P408710	
		Chromium	0.62	I	ug/L	P408710	
		Cobalt	0.142		ug/L	P408710	
		Copper	0.64	I	ug/L	P408710	
		Lead	0.24	I	ug/L	P408710	
		Manganese	31.7		ug/L	P408710	
		Molybdenum	0.19	I	ug/L	P408710	
		Nickel	0.59	I	ug/L	P408710	
		Selenium	0.20	U	ug/L	P408710	
		Silver	0.010	U	ug/L	P408710	
		Thallium	0.10	U	ug/L	P408710	
	SM 2340B	Hardness	38.3		mg/L	P408710	

Field ID: G2TLHR0044

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.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable because of high analyte concentration in the QC sample.

Sample Location: Apalachicola River @ Bristol Landing

Collection Date/Time: 01/12/2022 12:10

Field ID: G2TLHR0043

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2299331	EPA 180.1 Rev. 2.0	Turbidity	9.1		NTU	P408512	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P409117	
		Sulfate	6.6		mg SO4/L	P409120	
	SM 2120 B-2011	Color (true)**	27		PCU	P408450	
	SM 2320 B-2011	Total Alkalinity	34		mg CaCO3/L	P408610	
	SM 2540 C-2011	TDS	65		mg/L	P408874	
	SM 2540 D-2011	TSS	8	I	mg/L	P408774	
	SM 4500 F-C-2011	Fluoride	0.067	I	mg F/L	P408613	
2299333	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P408881	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.34		mg N/L	P408849	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.51		mg N/L	P408677	
	EPA 365.1 Rev. 2.0	Total-P	0.057	J	mg P/L	P408646	MS
	SM 5310 B-2011	Organic Carbon	3.4		mg C/L	P408837	
2299335	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P408502	
2299352	EPA 200.7 Rev. 4.4	Calcium	11.2		mg/L	P408710	
		Iron	670		ug/L	P408710	
		Magnesium	1.91		mg/L	P408710	
		Potassium	2.2		mg/L	P408710	
		Sodium	6.9		mg/L	P408710	
		Strontium	29.8		ug/L	P408710	
		Tin	3.0	U	ug/L	P408710	
	EPA 200.8 Rev. 5.4	Titanium	2.2	I	ug/L	P408710	
		Vanadium	2.0	U	ug/L	P408710	
		Zinc	5.0	U	ug/L	P408710	
		Aluminum	122		ug/L	P408710	
		Antimony	0.076	I	ug/L	P408710	
		Arsenic	0.35		ug/L	P408710	
		Barium	20.9		ug/L	P408710	
		Beryllium	0.028	I	ug/L	P408710	
		Boron**	18.5		ug/L	P408710	
		Cadmium	0.020	U	ug/L	P408710	
		Chromium	0.40	U	ug/L	P408710	
		Cobalt	0.197		ug/L	P408710	
		Copper	0.66	I	ug/L	P408710	
		Lead	0.30	I	ug/L	P408710	
		Manganese	81.8		ug/L	P408710	
		Molybdenum	0.20	I	ug/L	P408710	
		Nickel	0.50	U	ug/L	P408710	
		Selenium	0.20	U	ug/L	P408710	
		Silver	0.010	U	ug/L	P408710	
		Thallium	0.10	U	ug/L	P408710	
	SM 2340B	Hardness	35.9		mg/L	P408710	

Field ID: G2TLHR0043

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.
EPA 365.1 Rev. 2.0: Total-P: Refer to the Lab Analysis Report for an explanation of QC Codes.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable because of high analyte concentration in the QC sample.

Sample Location: FB

Collection Date/Time: 01/12/2022 12:55

Field ID: FB_01122022

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2299342	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P408512	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P409117	
		Sulfate	0.20	U	mg SO4/L	P409120	
		Color (true)**	2.5	U	PCU	P408451	
	SM 2120 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P408610	
	SM 2540 C-2011	TDS	15	U	mg/L	P408872	
	SM 2540 D-2011	TSS	2	U	mg/L	P408772	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P408613	
2299343	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P408881	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P408850	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P408678	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P408646	MS
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P408837	
2299344	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P408502	
2299355	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P408710	
		Iron	30	U	ug/L	P408710	
		Magnesium	0.040	U	mg/L	P408710	
		Potassium	0.30	U	mg/L	P408710	
		Sodium	0.50	U	mg/L	P408710	
		Strontium	2.0	U	ug/L	P408710	
		Tin	3.0	U	ug/L	P408710	
		Titanium	0.75	U	ug/L	P408710	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P408710	
		Zinc	5.0	U	ug/L	P408710	
		Aluminum	5.0	U	ug/L	P408710	
		Antimony	0.050	U	ug/L	P408710	
		Arsenic	0.050	U	ug/L	P408710	
		Barium	0.20	U	ug/L	P408710	
		Beryllium	0.010	U	ug/L	P408710	
		Boron**	2.0	U	ug/L	P408710	
		Cadmium	0.020	U	ug/L	P408710	
		Chromium	0.40	U	ug/L	P408710	
		Cobalt	0.020	U	ug/L	P408710	
		Copper	0.40	U	ug/L	P408710	
		Lead	0.20	U	ug/L	P408710	
		Manganese	0.10	U	ug/L	P408710	
		Molybdenum	0.15	U	ug/L	P408710	
		Nickel	0.50	U	ug/L	P408710	
		Selenium	0.20	U	ug/L	P408710	
		Silver	0.010	U	ug/L	P408710	
		Thallium	0.10	U	ug/L	P408710	
	SM 2340B	Hardness	0.35	U	mg/L	P408710	

Field ID: FB_01122022

Matrix: W-FIELD-BK

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.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P408512

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P408710

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: P408710

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409117

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409120

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408831

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408881

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408849

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408853

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408854

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408677

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408678

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408646

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408502

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

Reference Method: SM 2120 B-2011
Batch ID: P408450

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P408451

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P408610

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P408872

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P408874

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P408772

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P408774

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P408613

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P408837

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P408710

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	106		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	103		P	85 - 115
Sodium	102		P	85 - 115
Strontium	104		P	85 - 115
Tin	108		P	85 - 115
Titanium	107		P	85 - 115
Vanadium	106		P	85 - 115
Zinc	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P408710

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	99.2		P	85 - 115
Arsenic	102		P	85 - 115
Barium	105		P	85 - 115
Beryllium	102		P	85 - 115
Boron	97.6		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	102		P	85 - 115
Cobalt	99.3		P	85 - 115
Copper	102		P	85 - 115
Lead	95.5		P	85 - 115
Manganese	100		P	85 - 115
Molybdenum	102		P	85 - 115
Nickel	103		P	85 - 115
Selenium	99.7		P	85 - 115
Silver	102		P	85 - 115
Thallium	105		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P409117

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P409120

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P408831

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408881

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408849

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408853

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408854

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408677

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408678

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408646

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408502

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2120 B-2011
Batch ID: P408450

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P408451

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

Reference Method: SM 2320 B-2011
Batch ID: P408610

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.9		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P408613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P408837

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P408710

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299623	Calcium	99.2		P	80 - 120
2299623	Iron	105	107	P/P	80 - 120
2299623	Magnesium	103		P	80 - 120
2299623	Potassium	103	105	P/P	80 - 120
2299623	Sodium	103		P	80 - 120
2299623	Strontium	104	103	P/P	80 - 120
2299623	Tin	105	105	P/P	80 - 120
2299623	Titanium	105	106	P/P	80 - 120
2299623	Vanadium	107	107	P/P	80 - 120
2299623	Zinc	83.8	84.3	P/P	80 - 120
2299727	Calcium	112		P	80 - 120
2299727	Iron	110		P	80 - 120
2299727	Magnesium	110		P	80 - 120
2299727	Potassium	110		P	80 - 120
2299727	Sodium	107		P	80 - 120
2299727	Strontium	106		P	80 - 120
2299727	Tin	108		P	80 - 120
2299727	Titanium	108		P	80 - 120
2299727	Vanadium	107		P	80 - 120
2299727	Zinc	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P408710

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299623	Aluminum	100	98.9	P/P	80 - 120
2299623	Antimony	104	103	P/P	80 - 120
2299623	Arsenic	104	102	P/P	80 - 120
2299623	Barium	106	106	P/P	80 - 120
2299623	Beryllium	104	102	P/P	80 - 120
2299623	Boron	98.6	97.2	P/P	80 - 120
2299623	Cadmium	105	102	P/P	80 - 120
2299623	Chromium	107	106	P/P	80 - 120
2299623	Cobalt	100	98.7	P/P	80 - 120
2299623	Copper	99.0	98.3	P/P	80 - 120
2299623	Lead	99.1	96.9	P/P	80 - 120
2299623	Molybdenum	106	105	P/P	80 - 120
2299623	Nickel	101	99.6	P/P	80 - 120
2299623	Selenium	102	101	P/P	80 - 120
2299623	Silver	100	100	P/P	80 - 120
2299623	Thallium	109	108	P/P	80 - 120
2299727	Aluminum	102		P	80 - 120
2299727	Antimony	99.9		P	80 - 120
2299727	Arsenic	102		P	80 - 120
2299727	Barium	106		P	80 - 120
2299727	Beryllium	103		P	80 - 120
2299727	Boron	98.6		P	80 - 120
2299727	Cadmium	102		P	80 - 120
2299727	Chromium	104		P	80 - 120
2299727	Cobalt	98.1		P	80 - 120
2299727	Copper	102		P	80 - 120
2299727	Lead	97.2		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P408710

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299727	Molybdenum	101		P	80 - 120
2299727	Nickel	102		P	80 - 120
2299727	Selenium	99.0		P	80 - 120
2299727	Silver	100		P	80 - 120
2299727	Thallium	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409117

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299313	Chloride	104		P	90 - 110
2299374	Chloride	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409120

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299313	Sulfate	97.9		P	90 - 110
2299374	Sulfate	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299332	Ammonia-N	98.0	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299333	Ammonia-N	99.6	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408849

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299446	Kjeldahl Nitrogen	109	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299453	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408853

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299291	Kjeldahl Nitrogen	103	105	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408854

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299364	Kjeldahl Nitrogen	99.3	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408677

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299293	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408678

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299340	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299333	Total-P	111	113	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408502

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299334	O-Phosphate-P	96.7	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P408613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299472	Fluoride	98.2	98.2	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P408837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299333	Organic Carbon	94.7	95.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P408512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299339	Turbidity	0.685	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P408710

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299623	Calcium	0.520	Spike	P	0 - 20
2299623	Iron	1.78	Spike	P	0 - 20
2299623	Magnesium	2.06	Spike	P	0 - 20
2299623	Potassium	1.09	Spike	P	0 - 20
2299623	Sodium	0.289	Spike	P	0 - 20
2299623	Strontium	0.802	Spike	P	0 - 20
2299623	Tin	0.379	Spike	P	0 - 20
2299623	Titanium	1.05	Spike	P	0 - 20
2299623	Vanadium	0.829	Spike	P	0 - 20
2299623	Zinc	0.514	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P408710

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299623	Aluminum	1.44	Spike	P	0 - 20
2299623	Antimony	0.367	Spike	P	0 - 20
2299623	Arsenic	1.78	Spike	P	0 - 20
2299623	Barium	0.402	Spike	P	0 - 20
2299623	Beryllium	1.67	Spike	P	0 - 20
2299623	Boron	1.02	Spike	P	0 - 20
2299623	Cadmium	2.77	Spike	P	0 - 20
2299623	Chromium	0.789	Spike	P	0 - 20
2299623	Cobalt	1.49	Spike	P	0 - 20
2299623	Copper	0.690	Spike	P	0 - 20
2299623	Lead	2.24	Spike	P	0 - 20
2299623	Manganese	0.357	Spike	P	0 - 20
2299623	Molybdenum	1.10	Spike	P	0 - 20
2299623	Nickel	1.31	Spike	P	0 - 20
2299623	Selenium	0.404	Spike	P	0 - 20
2299623	Silver	0.312	Spike	P	0 - 20
2299623	Thallium	1.21	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299313	Chloride	0.631	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409120

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299313	Sulfate	0.571	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408831

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299332	Ammonia-N	1.27	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299333	Ammonia-N	1.73	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299446	Kjeldahl Nitrogen	0.937	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299453	Kjeldahl Nitrogen	1.21	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408853

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299291	Kjeldahl Nitrogen	1.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299364	Kjeldahl Nitrogen	2.29	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408677

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299293	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P408678

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299340	NO2NO3-N	0.293	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P408646

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299333	Total-P	1.98	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P408502

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299334	O-Phosphate-P	0.462	Spike	P	0 - 20

Reference Method: SM 2120 B-2011

Batch ID: P408450

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299286	Color (true)	2.28	Sample	P	0 - 20

Reference Method: SM 2120 B-2011

Batch ID: P408451

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299339	Color (true)	0.0237	Sample	P	0 - 20

Reference Method: SM 2320 B-2011

Batch ID: P408610

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299472	Total Alkalinity	1.38	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011

Batch ID: P408872

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2298450	TDS	2.69	Sample	P	0 - 10

Reference Method: SM 2540 C-2011

Batch ID: P408874

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299336	TDS	4.37	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P408613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299472	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P408837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299333	Organic Carbon	0.669	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B-2011

Run ID: A109826

Included Lab Sample IDs: 2299330, 2299331, 2299336, 2299339, 2299342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115
Color (true)	102	103	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A109853

Included Lab Sample IDs: 2299334, 2299335, 2299338, 2299341, 2299344

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.8	P/P	90 - 110
O-Phosphate-P	99.8	99.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A109856

Included Lab Sample IDs: 2299330, 2299331, 2299336, 2299339, 2299342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	98.5	P/P	95 - 105

Reference Method: SM 2320 B-2011

Run ID: A109907

Included Lab Sample IDs: 2299330, 2299331, 2299336, 2299339, 2299342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.5	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A109907

Included Lab Sample IDs: 2299330, 2299331, 2299336, 2299339, 2299342

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A109923

Included Lab Sample IDs: 2299332, 2299333, 2299337, 2299340, 2299343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110
NO2NO3-N	102	102	P/P	90 - 110
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A109953

Included Lab Sample IDs: 2299351, 2299352, 2299353, 2299354, 2299355

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	99.5	P/P	90 - 110
Aluminum	99.5	99.3	P/P	90 - 110
Antimony	101	100	P/P	90 - 110
Antimony	99.1	101	P/P	90 - 110
Arsenic	102	98.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A109953

Included Lab Sample IDs: 2299351, 2299352, 2299353, 2299354, 2299355

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.5	99.4	P/P	90 - 110
Barium	101	101	P/P	90 - 110
Barium	101	101	P/P	90 - 110
Beryllium	101	99.7	P/P	90 - 110
Beryllium	99.7	98.6	P/P	90 - 110
Boron	96.9	99.4	P/P	90 - 110
Boron	99.4	98.1	P/P	90 - 110
Cadmium	100	100	P/P	90 - 110
Cadmium	98.8	100	P/P	90 - 110
Chromium	100	99.8	P/P	90 - 110
Chromium	99.8	99.3	P/P	90 - 110
Cobalt	94.0	94.7	P/P	90 - 110
Cobalt	97.1	94.0	P/P	90 - 110
Copper	100	96.4	P/P	90 - 110
Copper	96.4	96.9	P/P	90 - 110
Lead	92.4	93.7	P/P	90 - 110
Lead	93.8	92.4	P/P	90 - 110
Manganese	99.2	99.5	P/P	90 - 110
Manganese	99.5	99.2	P/P	90 - 110
Molybdenum	99.1	98.4	P/P	90 - 110
Molybdenum	100	99.1	P/P	90 - 110
Nickel	101	96.9	P/P	90 - 110
Nickel	96.9	97.2	P/P	90 - 110
Selenium	98.4	99.0	P/P	90 - 110
Selenium	99.6	98.4	P/P	90 - 110
Silver	99.3	99.7	P/P	90 - 110
Silver	99.7	98.9	P/P	90 - 110
Thallium	104	105	P/P	90 - 110
Thallium	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A109957

Included Lab Sample IDs: 2299332, 2299337, 2299340, 2299343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.0	P/P	90 - 110
Total-P	99.0	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A109980

Included Lab Sample IDs: 2299333

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	108	107	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A109998

Included Lab Sample IDs: 2299332, 2299333, 2299337, 2299340, 2299343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.8	97.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A109998

Included Lab Sample IDs: 2299332, 2299333, 2299337, 2299340, 2299343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	95.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A110001

Included Lab Sample IDs: 2299351, 2299352, 2299353, 2299354, 2299355

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	102	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Magnesium	100	101	P/P	90 - 110
Potassium	98.2	99.7	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Strontium	103	103	P/P	90 - 110
Tin	103	103	P/P	90 - 110
Titanium	100	102	P/P	90 - 110
Vanadium	103	102	P/P	90 - 110
Zinc	102	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110006

Included Lab Sample IDs: 2299333, 2299337, 2299340, 2299343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110025

Included Lab Sample IDs: 2299333, 2299337, 2299343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.7	98.3	P/P	90 - 110
Kjeldahl Nitrogen	95.4	94.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110029

Included Lab Sample IDs: 2299332, 2299340

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.2	96.7	P/P	90 - 110
Kjeldahl Nitrogen	96.7	95.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A110040

Included Lab Sample IDs: 2299330, 2299331, 2299336, 2299339, 2299342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	103	P/P	90 - 110
Sulfate	99.5	99.4	P/P	90 - 110

Quality Assurance Report

Calibration Verification

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						0.685	
EPA 200.7 Rev. 4.4	Calcium	103	99.2	112				0.520
	Iron	106	105	107	110			1.78
	Magnesium	102	103	110				2.06
	Potassium	103	103	105	110			1.09
	Sodium	102	103	107				0.289
	Strontium	104	104	103	106			0.802
	Tin	108	105	105	108			0.379
	Titanium	107	105	106	108			1.05
	Vanadium	106	107	107	107			0.829
	Zinc	107	83.8	84.3	106			0.514
EPA 200.8 Rev. 5.4	Aluminum	101	100	98.9	102			1.44
	Antimony	99.2	104	103	99.9			0.367
	Arsenic	102	104	102	102			1.78
	Barium	105	106	106	106			0.402
	Beryllium	102	104	102	103			1.67
	Boron	97.6	98.6	97.2	98.6			1.02
	Cadmium	100	105	102	102			2.77
	Chromium	102	107	106	104			0.789
	Cobalt	99.3	100	98.7	98.1			1.49
	Copper	102	99.0	98.3	102			0.690
	Lead	95.5	99.1	96.9	97.2			2.24
	Manganese	100						0.357
	Molybdenum	102	106	105	101			1.10
	Nickel	103	101	99.6	102			1.31
	Selenium	99.7	102	101	99.0			0.404
	Silver	102	100	100	100			0.312
	Thallium	105	109	108	107			1.21
EPA 300.0 Rev. 2.1	Chloride	103	104	105			0.631	
	Sulfate	99.2	97.9	98.8			0.571	
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	98.0	99.6				1.27
	Ammonia-N	98.2	99.6	97.2				1.73
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	109	107				0.937
	Kjeldahl Nitrogen	100	103	104				1.21
	Kjeldahl Nitrogen	98.8	103	105				1.20
	Kjeldahl Nitrogen	99.5	99.3	96.8				2.29
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102				0.0
	NO2NO3-N	102	100	101				0.293
EPA 365.1 Rev. 2.0	Total-P	109	111	113				1.98
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	96.7	97.2				0.462
SM 2120 B-2011	Color (true)	101					2.28	
	Color (true)	99.7					0.0237	
SM 2320 B-2011	Total Alkalinity	98.9					1.38	
SM 2540 C-2011	TDS						2.69	
	TDS						4.37	
SM 4500 F-C-2011	Fluoride	97.9	98.2	98.2				0.0
SM 5310 B-2011	Organic Carbon	95.8	94.7	95.5				0.669

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2299330, 2299331, 2299336, 2299339, 2299342

Reference Method Descriptions

Method	Description	Associated Samples
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2299351, 2299352, 2299353, 2299354, 2299355
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2299351, 2299352, 2299353, 2299354, 2299355
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2299330, 2299331, 2299336, 2299339, 2299342
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2299330, 2299331, 2299336, 2299339, 2299342
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2299332, 2299333, 2299337, 2299340, 2299343
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2299332, 2299333, 2299337, 2299340, 2299343
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2299332, 2299333, 2299337, 2299340, 2299343
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2299332, 2299333, 2299337, 2299340, 2299343
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2299334, 2299335, 2299338, 2299341, 2299344
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2299330, 2299331, 2299336, 2299339, 2299342
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2299330, 2299331, 2299336, 2299339, 2299342
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2299351, 2299352, 2299353, 2299354, 2299355
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2299330, 2299331, 2299336, 2299339, 2299342
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2299330, 2299331, 2299336, 2299339, 2299342
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2299330, 2299331, 2299336, 2299339, 2299342
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2299332, 2299333, 2299337, 2299340, 2299343

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	01/12/2022			01/13/2022 15:45	Khloe J Berg	2299330, 2299331, 2299336, 2299339, 2299342
EPA 200.7 Rev. 4.4	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/21/2022 16:32	Josef B Mick	2299355
	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/21/2022 17:06	Josef B Mick	2299351
	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/21/2022 17:13	Josef B Mick	2299352
	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/21/2022 17:21	Josef B Mick	2299353
	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/21/2022 17:29	Josef B Mick	2299354
EPA 200.8 Rev. 5.4	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/20/2022 17:14	McKinley C Carter	2299355
	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/20/2022 19:47	McKinley C Carter	2299351
	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/20/2022 19:57	McKinley C Carter	2299352
	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/20/2022 20:06	McKinley C Carter	2299353
	01/12/2022	01/20/2022 09:53	Emily M Philpot	01/20/2022 20:16	McKinley C Carter	2299354
EPA 300.0 Rev. 2.1	01/12/2022			01/28/2022 03:50	Roberta Tatti	2299330
	01/12/2022			01/28/2022 04:03	Roberta Tatti	2299331
	01/12/2022			01/28/2022 04:15	Roberta Tatti	2299336
	01/12/2022			01/28/2022 04:27	Roberta Tatti	2299339
	01/12/2022			01/28/2022 04:39	Roberta Tatti	2299342
EPA 350.1 Rev. 2.0	01/12/2022			01/21/2022 12:30	Ping Hua	2299332
	01/12/2022			01/24/2022 13:31	Ping Hua	2299333
	01/12/2022			01/24/2022 13:35	Ping Hua	2299337
	01/12/2022			01/24/2022 13:36	Ping Hua	2299340
	01/12/2022			01/24/2022 13:45	Ping Hua	2299343
EPA 351.2 Rev. 2.0	01/12/2022	01/24/2022 11:37	Samantha L Bates	01/25/2022 13:11	Alexandra J Mattheus	2299340
	01/12/2022	01/24/2022 11:37	Samantha L Bates	01/25/2022 13:26	Alexandra J Mattheus	2299332
	01/12/2022	01/24/2022 11:42	Samantha L Bates	01/25/2022 10:53	Alexandra J Mattheus	2299333
	01/12/2022	01/24/2022 11:42	Samantha L Bates	01/25/2022 10:55	Alexandra J Mattheus	2299337
	01/12/2022	01/24/2022 11:42	Samantha L Bates	01/25/2022 11:19	Alexandra J Mattheus	2299343
EPA 353.2 Rev. 2.0	01/12/2022			01/19/2022 10:24	Beverly Y. Sanders	2299333
	01/12/2022			01/19/2022 10:26	Beverly Y. Sanders	2299337
	01/12/2022			01/19/2022 10:33	Beverly Y. Sanders	2299340
	01/12/2022			01/19/2022 10:39	Beverly Y. Sanders	2299343
	01/12/2022			01/19/2022 12:06	Beverly Y. Sanders	2299332
EPA 365.1 Rev. 2.0	01/12/2022	01/19/2022 16:00	Simonne.V. Calhoun	01/20/2022 12:07	Shengyu Ding	2299333
	01/12/2022	01/19/2022 16:00	Simonne.V. Calhoun	01/20/2022 15:25	Shengyu Ding	2299343
	01/12/2022	01/19/2022 16:00	Simonne.V. Calhoun	01/20/2022 15:35	Shengyu Ding	2299332
	01/12/2022	01/19/2022 16:00	Simonne.V. Calhoun	01/20/2022 15:36	Shengyu Ding	2299337
	01/12/2022	01/19/2022 16:00	Simonne.V. Calhoun	01/20/2022 15:37	Shengyu Ding	2299340
EPA 365.1 Rev. 2.0 dissolved	01/12/2022			01/13/2022 14:39	Ping Hua	2299334
	01/12/2022			01/13/2022 14:42	Ping Hua	2299335
	01/12/2022			01/13/2022 14:43	Ping Hua	2299338

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	01/12/2022			01/13/2022 14:44	Ping Hua	2299341
	01/12/2022			01/13/2022 14:52	Ping Hua	2299344
SM 2120 B-2011	01/12/2022			01/12/2022 15:41	Blanca Fach	2299330
	01/12/2022			01/12/2022 15:42	Blanca Fach	2299331
	01/12/2022			01/12/2022 15:43	Blanca Fach	2299336
	01/12/2022			01/12/2022 15:47	Blanca Fach	2299339
	01/12/2022			01/12/2022 15:48	Blanca Fach	2299342
SM 2320 B-2011	01/12/2022			01/15/2022 00:55	Dale L. Simmons	2299330
	01/12/2022			01/15/2022 01:06	Dale L. Simmons	2299331
	01/12/2022			01/15/2022 01:17	Dale L. Simmons	2299336
	01/12/2022			01/15/2022 01:29	Dale L. Simmons	2299339
	01/12/2022			01/15/2022 01:36	Dale L. Simmons	2299342
SM 2340B	01/12/2022			01/21/2022 16:32	Josef B Mick	2299355
	01/12/2022			01/21/2022 17:06	Josef B Mick	2299351
	01/12/2022			01/21/2022 17:13	Josef B Mick	2299352
	01/12/2022			01/21/2022 17:21	Josef B Mick	2299353
	01/12/2022			01/21/2022 17:29	Josef B Mick	2299354
SM 2540 C-2011	01/12/2022			01/13/2022 14:02	Yijie Li	2299330, 2299331, 2299336, 2299339, 2299342
SM 2540 D-2011	01/12/2022			01/13/2022 14:02	Yijie Li	2299330, 2299331, 2299336, 2299339, 2299342
SM 4500 F-C-2011	01/12/2022			01/15/2022 00:55	Dale L. Simmons	2299330
	01/12/2022			01/15/2022 01:06	Dale L. Simmons	2299331
	01/12/2022			01/15/2022 01:17	Dale L. Simmons	2299336
	01/12/2022			01/15/2022 01:29	Dale L. Simmons	2299339
	01/12/2022			01/15/2022 01:36	Dale L. Simmons	2299342
SM 5310 B-2011	01/12/2022			01/20/2022 22:17	Nathaniel J Jones	2299333
	01/12/2022			01/20/2022 23:11	Nathaniel J Jones	2299337
	01/12/2022			01/21/2022 02:06	Nathaniel J Jones	2299332
	01/12/2022			01/21/2022 02:19	Nathaniel J Jones	2299340
	01/12/2022			01/21/2022 02:32	Nathaniel J Jones	2299343