Chemical Analysis Report

WAS-SECT-2021-02-22-01

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

Event Description: **Alligator Creek**
Request ID: **RQ-2021-02-22-04**
Customer: **WAS-SECT**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 17-MAR-2021 09:53

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: Alligator Creek Upstream of SR 273 **Collection Date/Time: 02/22/2021 10:54**

Field ID: G3WA0005 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2226363	EPA 180.1 Rev. 2.0	Turbidity	15	A	NTU	P394118	
	EPA 300.0 Rev. 2.1	Chloride	3.7		mg Cl/L	P394241	
		Sulfate	0.77		mg SO4/L	P394243	
	SM 2120 B-2011	Color (true)	72	A	PCU	P394125	
	SM 2320 B-2011	Total Alkalinity	4.9		mg CaCO3/L	P394365	
	SM 2540 C-2011	TDS	50		mg/L	P394602	
	SM 2540 D-2011	TSS	6	I	mg/L	P394529	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394524	
2226369	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P394299	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P394203	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.080		mg N/L	P394133	
	EPA 365.1 Rev. 2.0	Total-P	0.043		mg P/L	P394153	
	SM 5310 B-2011	Organic Carbon	9.3		mg C/L	P394646	
2226375	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P394102	
2226393	EPA 200.7 Rev. 4.4	Barium	10.5		ug/L	P394173	
		Calcium	2.49		mg/L	P394173	
		Iron	730		ug/L	P394173	
		Magnesium	0.97		mg/L	P394173	
		Manganese	26.1		ug/L	P394173	
		Potassium	1.6		mg/L	P394173	
		Sodium	1.6	I	mg/L	P394173	
		Strontium	5.7	I	ug/L	P394173	
		Tin	3.0	U	ug/L	P394173	
		Titanium	29.6		ug/L	P394173	
		Vanadium	2.0	U	ug/L	P394173	
		Zinc	5.0	U	ug/L	P394173	
	EPA 200.8 Rev. 5.4	Aluminum	727		ug/L	P394173	
		Antimony	0.050	U	ug/L	P394173	
		Arsenic	0.38		ug/L	P394173	
		Beryllium	0.025	I	ug/L	P394173	
		Boron**	9.6		ug/L	P394173	
		Cadmium	0.020	U	ug/L	P394173	
		Chromium	0.66	I	ug/L	P394173	
		Cobalt	0.130		ug/L	P394173	
		Copper	0.75	I	ug/L	P394173	
		Lead	0.63		ug/L	P394173	
		Molybdenum	0.15	U	ug/L	P394173	
		Nickel	0.50	U	ug/L	P394173	
		Selenium	0.20	U	ug/L	P394173	
		Silver	0.010	U	ug/L	P394173	
		Thallium	0.10	U	ug/L	P394173	
	SM 2340B	Hardness	10.2		mg/L	P394173	

Field ID: G3WA0005 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

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: The lead result was confirmed in the undigested sample on 03/09/2021.

Sample Location: Minnow Creek at Lovewood Rd. **Collection Date/Time: 02/22/2021 09:56**

Field ID: G3WA0008 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2226364	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P394118	
	EPA 300.0 Rev. 2.1	Chloride	4.3		mg Cl/L	P394241	
		Sulfate	0.65		mg SO4/L	P394243	
	SM 2120 B-2011	Color (true)	72	A	PCU	P394122	
	SM 2320 B-2011	Total Alkalinity	6.2		mg CaCO3/L	P394365	
	SM 2540 C-2011	TDS	37		mg/L	P394602	
	SM 2540 D-2011	TSS	3	I	mg/L	P394529	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394524	
2226370	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P394299	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35		mg N/L	P394203	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P394133	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P394153	
	SM 5310 B-2011	Organic Carbon	5.8		mg C/L	P394646	
2226376	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P394102	
2226394	EPA 200.7 Rev. 4.4	Barium	13.0		ug/L	P394173	
		Calcium	3.28		mg/L	P394173	
		Iron	790		ug/L	P394173	
		Magnesium	1.12		mg/L	P394173	
		Manganese	38.3		ug/L	P394173	
		Potassium	1.3		mg/L	P394173	
		Sodium	1.8	I	mg/L	P394173	
		Strontium	7.6	I	ug/L	P394173	
		Tin	3.0	U	ug/L	P394173	
		Titanium	14.3		ug/L	P394173	
		Vanadium	2.0	U	ug/L	P394173	
		Zinc	5.0	U	ug/L	P394173	
	EPA 200.8 Rev. 5.4	Aluminum	433		ug/L	P394173	
		Antimony	0.050	U	ug/L	P394173	
		Arsenic	0.31		ug/L	P394173	
		Beryllium	0.013	I	ug/L	P394173	
		Boron**	8.5		ug/L	P394173	
		Cadmium	0.020	U	ug/L	P394173	
		Chromium	0.45	I	ug/L	P394173	
		Cobalt	0.094		ug/L	P394173	
		Copper	0.51	I	ug/L	P394173	
		Lead	0.45		ug/L	P394173	
		Molybdenum	0.15	U	ug/L	P394173	
		Nickel	0.50	U	ug/L	P394173	
		Selenium	0.20	U	ug/L	P394173	
		Silver	0.010	U	ug/L	P394173	
		Thallium	0.10	U	ug/L	P394173	
	SM 2340B	Hardness	12.8		mg/L	P394173	

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: Scurlock Creek at Pilgrim Rd. **Collection Date/Time: 02/22/2021 12:02**

Field ID: G3WA0009 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2226365	EPA 180.1 Rev. 2.0	Turbidity	7.3		NTU	P394118	
	EPA 300.0 Rev. 2.1	Chloride	2.7		mg Cl/L	P394241	
		Sulfate	0.49	I	mg SO4/L	P394243	
	SM 2120 B-2011	Color (true)	120		PCU	P394122	
	SM 2320 B-2011	Total Alkalinity	2.6		mg CaCO3/L	P394365	
	SM 2540 C-2011	TDS	41		mg/L	P394602	
	SM 2540 D-2011	TSS	3	I	mg/L	P394529	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394524	
2226371	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P394299	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P394203	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P394133	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P394153	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P394646	
2226377	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P394102	
2226395	EPA 200.7 Rev. 4.4	Barium	10.8		ug/L	P394173	
		Calcium	2.22		mg/L	P394173	
		Iron	580		ug/L	P394173	
		Magnesium	0.63		mg/L	P394173	
		Manganese	62.3		ug/L	P394173	
		Potassium	0.77	I	mg/L	P394173	
		Sodium	1.5	I	mg/L	P394173	
		Strontium	4.7	I	ug/L	P394173	
		Tin	3.0	U	ug/L	P394173	
		Titanium	18.3		ug/L	P394173	
		Vanadium	2.0	U	ug/L	P394173	
		Zinc	5.8	I	ug/L	P394173	
	EPA 200.8 Rev. 5.4	Aluminum	472		ug/L	P394173	
		Antimony	0.050	U	ug/L	P394173	
		Arsenic	0.32		ug/L	P394173	
		Beryllium	0.024	I	ug/L	P394173	
		Boron**	11.1		ug/L	P394173	
		Cadmium	0.020	U	ug/L	P394173	
		Chromium	0.51	I	ug/L	P394173	
		Cobalt	0.199		ug/L	P394173	
		Copper	0.71	I	ug/L	P394173	
		Lead	0.50		ug/L	P394173	
		Molybdenum	0.15	U	ug/L	P394173	
		Nickel	0.50	U	ug/L	P394173	
		Selenium	0.20	U	ug/L	P394173	
		Silver	0.010	U	ug/L	P394173	
		Thallium	0.10	U	ug/L	P394173	
	SM 2340B	Hardness	8.1		mg/L	P394173	

Field ID: G3WA0009 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

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: The lead result was confirmed in the undigested sample on 03/09/2021.

Sample Location: Unnamed Creek at Woodrest Rd. **Collection Date/Time: 02/22/2021 13:14**

Field ID: G3WA0010 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2226366	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P394118	
	EPA 300.0 Rev. 2.1	Chloride	3.7		mg Cl/L	P394241	
		Sulfate	0.71		mg SO4/L	P394243	
	SM 2120 B-2011	Color (true)	120		PCU	P394122	
	SM 2320 B-2011	Total Alkalinity	3.0		mg CaCO3/L	P394365	
	SM 2540 C-2011	TDS	40		mg/L	P394602	
	SM 2540 D-2011	TSS	2	I	mg/L	P394529	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394524	
2226372	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P394299	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P394203	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.059		mg N/L	P394133	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P394153	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P394646	
2226378	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P394102	
2226396	EPA 200.7 Rev. 4.4	Barium	12.4		ug/L	P394173	
		Calcium	2.22		mg/L	P394173	
		Iron	680		ug/L	P394173	
		Magnesium	0.90		mg/L	P394173	
		Manganese	52.8		ug/L	P394173	
		Potassium	1.4		mg/L	P394173	
		Sodium	1.6	I	mg/L	P394173	
		Strontium	5.9	I	ug/L	P394173	
		Tin	3.0	U	ug/L	P394173	
		Titanium	22.1		ug/L	P394173	
		Vanadium	2.0	U	ug/L	P394173	
		Zinc	5.0	U	ug/L	P394173	
	EPA 200.8 Rev. 5.4	Aluminum	629		ug/L	P394173	
		Antimony	0.050	U	ug/L	P394173	
		Arsenic	0.41		ug/L	P394173	
		Beryllium	0.021	I	ug/L	P394173	
		Boron**	9.9		ug/L	P394173	
		Cadmium	0.020	U	ug/L	P394173	
		Chromium	0.60	I	ug/L	P394173	
		Cobalt	0.175		ug/L	P394173	
		Copper	0.83		ug/L	P394173	
		Lead	0.74		ug/L	P394173	
		Molybdenum	0.15	U	ug/L	P394173	
		Nickel	0.50	U	ug/L	P394173	
		Selenium	0.23	I	ug/L	P394173	
		Silver	0.010	U	ug/L	P394173	
		Thallium	0.10	U	ug/L	P394173	
	SM 2340B	Hardness	9.2		mg/L	P394173	

Field ID: G3WA0010 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

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: The lead result was confirmed in the undigested sample on 03/09/2021.

Sample Location: Pine Barn Creek at Woodrest Rd. **Collection Date/Time: 02/22/2021 12:26**

Field ID: G3WA0011 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2226367	EPA 180.1 Rev. 2.0	Turbidity	23		NTU	P394118	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P394241	
		Sulfate	0.73		mg SO4/L	P394243	
	SM 2120 B-2011	Color (true)	49		PCU	P394125	
	SM 2320 B-2011	Total Alkalinity	5.6		mg CaCO3/L	P394365	
	SM 2540 C-2011	TDS	51		mg/L	P394602	
	SM 2540 D-2011	TSS	3	I	mg/L	P394529	
	SM 4500 F-C-2011	Fluoride	0.036	I	mg F/L	P394524	
2226373	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P394299	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P394203	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P394133	
	EPA 365.1 Rev. 2.0	Total-P	0.046		mg P/L	P394153	
	SM 5310 B-2011	Organic Carbon	6.9		mg C/L	P394646	
2226379	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P394102	
2226397	EPA 200.7 Rev. 4.4	Barium	9.1		ug/L	P394173	
		Calcium	2.29		mg/L	P394173	
		Iron	1.28E+03		ug/L	P394173	
		Magnesium	1.02		mg/L	P394173	
		Manganese	54.2		ug/L	P394173	
		Potassium	2.2		mg/L	P394173	
		Sodium	1.3	I	mg/L	P394173	
		Strontium	4.9	I	ug/L	P394173	
		Tin	3.0	U	ug/L	P394173	
		Titanium	34.6		ug/L	P394173	
		Vanadium	2.4	I	ug/L	P394173	
		Zinc	5.0	U	ug/L	P394173	
	EPA 200.8 Rev. 5.4	Aluminum	1.01E+03		ug/L	P394173	
		Antimony	0.097	I	ug/L	P394173	
		Arsenic	0.40		ug/L	P394173	
		Beryllium	0.022	I	ug/L	P394173	
		Boron**	9.9		ug/L	P394173	
		Cadmium	0.020	U	ug/L	P394173	
		Chromium	0.78	I	ug/L	P394173	
		Cobalt	0.171		ug/L	P394173	
		Copper	0.77	I	ug/L	P394173	
		Lead	0.54		ug/L	P394173	
		Molybdenum	0.15	U	ug/L	P394173	
		Nickel	0.50	U	ug/L	P394173	
		Selenium	0.20	U	ug/L	P394173	
		Silver	0.010	U	ug/L	P394173	
		Thallium	0.10	U	ug/L	P394173	
	SM 2340B	Hardness	9.9		mg/L	P394173	

Field ID: G3WA0011 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

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: The lead result was confirmed in the undigested sample on 03/10/2021.

Sample Location: Unnamed Creek at Palmview Rd. **Collection Date/Time: 02/22/2021 13:56**

Field ID: G3WA0013 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2226368	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P394118	
	EPA 300.0 Rev. 2.1	Chloride	3.7		mg Cl/L	P394241	
		Sulfate	0.81		mg SO4/L	P394243	
	SM 2120 B-2011	Color (true)	110		PCU	P394122	
	SM 2320 B-2011	Total Alkalinity	3.9		mg CaCO3/L	P394365	
	SM 2540 C-2011	TDS	45		mg/L	P394602	
	SM 2540 D-2011	TSS	3	I	mg/L	P394529	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394524	
2226374	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P394299	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P394203	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.033		mg N/L	P394133	
	EPA 365.1 Rev. 2.0	Total-P	0.043		mg P/L	P394153	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P394646	
2226380	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P394102	
2226398	EPA 200.7 Rev. 4.4	Barium	12.4		ug/L	P394173	
		Calcium	2.36		mg/L	P394173	
		Iron	700		ug/L	P394173	
		Magnesium	0.97		mg/L	P394173	
		Manganese	49.4		ug/L	P394173	
		Potassium	1.6		mg/L	P394173	
		Sodium	1.5	I	mg/L	P394173	
		Strontium	6.2	I	ug/L	P394173	
		Tin	3.0	U	ug/L	P394173	
		Titanium	28.8		ug/L	P394173	
		Vanadium	2.0	U	ug/L	P394173	
		Zinc	5.0	U	ug/L	P394173	
	EPA 200.8 Rev. 5.4	Aluminum	600		ug/L	P394173	
		Antimony	0.050	U	ug/L	P394173	
		Arsenic	0.39		ug/L	P394173	
		Beryllium	0.020	I	ug/L	P394173	
		Boron**	9.7		ug/L	P394173	
		Cadmium	0.020	U	ug/L	P394173	
		Chromium	0.57	I	ug/L	P394173	
		Cobalt	0.134		ug/L	P394173	
		Copper	0.74	I	ug/L	P394173	
		Lead	0.51		ug/L	P394173	
		Molybdenum	0.15	U	ug/L	P394173	
		Nickel	0.50	U	ug/L	P394173	
		Selenium	0.20	U	ug/L	P394173	
		Silver	0.010	U	ug/L	P394173	
		Thallium	0.10	U	ug/L	P394173	
	SM 2340B	Hardness	9.9		mg/L	P394173	

Field ID: G3WA0013 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

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: The lead result was confirmed in the undigested sample on 03/09/2021.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P394118

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P394173

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/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: P394173

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
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
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: P394241

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394243

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: P394299

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394203

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394133

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394153

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394102

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

Reference Method: SM 2120 B-2011
Batch ID: P394122

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P394125

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P394365

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

Reference Method: SM 2540 C-2011
Batch ID: P394602

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P394529

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P394524

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P394646

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: P394173

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	98.6		P	85 - 115
Calcium	103		P	85 - 115
Iron	99.1		P	85 - 115
Magnesium	94.8		P	85 - 115
Manganese	97.8		P	85 - 115
Potassium	98.8		P	85 - 115
Sodium	103		P	85 - 115
Strontium	92.3		P	85 - 115
Tin	91.5		P	85 - 115
Titanium	91.6		P	85 - 115
Vanadium	91.3		P	85 - 115
Zinc	98.4		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P394173

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	100		P	85 - 115
Beryllium	92.7		P	85 - 115
Boron	97.8		P	85 - 115
Cadmium	95.2		P	85 - 115
Chromium	96.4		P	85 - 115
Cobalt	102		P	85 - 115
Copper	96.8		P	85 - 115
Lead	105		P	85 - 115
Molybdenum	94.8		P	85 - 115
Nickel	98.0		P	85 - 115
Selenium	100		P	85 - 115
Silver	104		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394241

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394243

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394299

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394203

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394133

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394153

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394102

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

Reference Method: SM 2120 B-2011
Batch ID: P394122

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.3		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P394125

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

Reference Method: SM 2320 B-2011
Batch ID: P394365

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	94.5		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P394524

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.6		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P394646

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.3		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P394173

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226395	Barium	108		P	80 - 120
2226395	Calcium	110		P	80 - 120
2226395	Iron	107		P	80 - 120
2226395	Magnesium	103		P	80 - 120
2226395	Manganese	106		P	80 - 120
2226395	Potassium	105		P	80 - 120
2226395	Sodium	109		P	80 - 120
2226395	Strontium	101		P	80 - 120
2226395	Tin	98.9		P	80 - 120
2226395	Titanium	111		P	80 - 120
2226395	Vanadium	101		P	80 - 120
2226395	Zinc	107		P	80 - 120
2226817	Barium	102	103	P/P	80 - 120
2226817	Calcium	104		P	80 - 120
2226817	Iron	103	106	P/P	80 - 120
2226817	Magnesium	96.4		P	80 - 120
2226817	Manganese	102	103	P/P	80 - 120
2226817	Potassium	104	107	P/P	80 - 120
2226817	Sodium	103	107	P/P	80 - 120
2226817	Strontium	97.7	98.7	P/P	80 - 120
2226817	Tin	91.7	94.9	P/P	80 - 120
2226817	Titanium	97.5	98.8	P/P	80 - 120
2226817	Vanadium	96.3	97.8	P/P	80 - 120
2226817	Zinc	113	113	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P394173

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226395	Aluminum	104		P	80 - 120
2226395	Antimony	98.2		P	80 - 120
2226395	Arsenic	98.6		P	80 - 120
2226395	Beryllium	92.4		P	80 - 120
2226395	Boron	101		P	80 - 120
2226395	Cadmium	96.3		P	80 - 120
2226395	Chromium	95.8		P	80 - 120
2226395	Cobalt	96.3		P	80 - 120
2226395	Copper	97.4		P	80 - 120
2226395	Lead	105		P	80 - 120
2226395	Molybdenum	93.7		P	80 - 120
2226395	Nickel	96.7		P	80 - 120
2226395	Selenium	95.1		P	80 - 120
2226395	Silver	104		P	80 - 120
2226395	Thallium	105		P	80 - 120
2226817	Aluminum	97.5	98.3	P/P	80 - 120
2226817	Antimony	98.4	99.2	P/P	80 - 120
2226817	Arsenic	97.1	97.7	P/P	80 - 120
2226817	Beryllium	90.9	98.3	P/P	80 - 120
2226817	Boron	98.1	99.5	P/P	80 - 120
2226817	Cadmium	94.3	96.9	P/P	80 - 120
2226817	Chromium	94.8	95.8	P/P	80 - 120
2226817	Cobalt	95.2	98.7	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P394173

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226817	Copper	90.4	91.9	P/P	80 - 120
2226817	Lead	102	103	P/P	80 - 120
2226817	Molybdenum	93.8	96.0	P/P	80 - 120
2226817	Nickel	93.3	93.7	P/P	80 - 120
2226817	Selenium	96.3	97.4	P/P	80 - 120
2226817	Silver	103	103	P/P	80 - 120
2226817	Thallium	102	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226363	Chloride	102		P	90 - 110
2226434	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394243

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226363	Sulfate	100		P	90 - 110
2226434	Sulfate	107		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394299

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226370	Ammonia-N	98.6	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394203

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226369	Kjeldahl Nitrogen	98.9	93.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394133

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226338	NO2NO3-N	96.5	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394153

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226338	Total-P	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394102

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226339	O-Phosphate-P	95.7	96.5	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P394524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226238	Fluoride	98.0	99.6	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P394646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226372	Organic Carbon	95.6	96.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P394118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226363	Turbidity	1.95	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P394173

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226817	Barium	1.05	Spike	P	0 - 20
2226817	Calcium	1.25	Spike	P	0 - 20
2226817	Iron	2.07	Spike	P	0 - 20
2226817	Magnesium	2.72	Spike	P	0 - 20
2226817	Manganese	1.39	Spike	P	0 - 20
2226817	Potassium	2.42	Spike	P	0 - 20
2226817	Sodium	2.40	Spike	P	0 - 20
2226817	Strontium	0.966	Spike	P	0 - 20
2226817	Tin	3.42	Spike	P	0 - 20
2226817	Titanium	1.27	Spike	P	0 - 20
2226817	Vanadium	1.57	Spike	P	0 - 20
2226817	Zinc	0.122	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P394173

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226817	Aluminum	0.877	Spike	P	0 - 20
2226817	Antimony	0.893	Spike	P	0 - 20
2226817	Arsenic	0.594	Spike	P	0 - 20
2226817	Beryllium	7.54	Spike	P	0 - 20
2226817	Boron	1.34	Spike	P	0 - 20
2226817	Cadmium	2.70	Spike	P	0 - 20
2226817	Chromium	1.05	Spike	P	0 - 20
2226817	Cobalt	3.70	Spike	P	0 - 20
2226817	Copper	1.26	Spike	P	0 - 20
2226817	Lead	0.758	Spike	P	0 - 20
2226817	Molybdenum	2.24	Spike	P	0 - 20
2226817	Nickel	0.379	Spike	P	0 - 20
2226817	Selenium	1.18	Spike	P	0 - 20
2226817	Silver	0.317	Spike	P	0 - 20
2226817	Thallium	1.55	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226434	Chloride	2.07	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394243

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226434	Sulfate	2.38	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226370	Ammonia-N	0.293	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226369	Kjeldahl Nitrogen	4.15	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226338	NO2NO3-N	0.277	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394153

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226338	Total-P	0.358	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226339	O-Phosphate-P	0.663	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P394122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226364	Color (true)	8.22	Sample	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P394125

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226363	Color (true)	1.01	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P394365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226238	Total Alkalinity	0.564	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P394602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226414	TDS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P394524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226238	Fluoride	0.959	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P394646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226372	Organic Carbon	0.568	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A103726
Included Lab Sample IDs: 2226375, 2226376, 2226377, 2226378, 2226379, 2226380

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.9	P/P	90 - 110
O-Phosphate-P	98.1	98.0	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A103729
Included Lab Sample IDs: 2226363, 2226364, 2226365, 2226366, 2226367, 2226368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.7	101	P/P	90 - 115
Color (true)	99.5	103	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A103730
Included Lab Sample IDs: 2226363, 2226364, 2226365, 2226366, 2226367, 2226368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A103736
Included Lab Sample IDs: 2226369, 2226370, 2226371, 2226372, 2226373, 2226374

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A103737
Included Lab Sample IDs: 2226363, 2226364, 2226365, 2226366, 2226367, 2226368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	101	P/P	90 - 110
Sulfate	98.8	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103767
Included Lab Sample IDs: 2226369, 2226370, 2226372, 2226373, 2226374

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.5	P/P	90 - 110
Total-P	99.5	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103776
Included Lab Sample IDs: 2226371

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A103798
Included Lab Sample IDs: 2226369, 2226370, 2226371, 2226372, 2226373, 2226374

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.1	97.7	P/P	90 - 110
Kjeldahl Nitrogen	93.2	97.0	P/P	90 - 110
Kjeldahl Nitrogen	97.2	93.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A103809
Included Lab Sample IDs: 2226369, 2226370, 2226371, 2226372, 2226373, 2226374

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A103829
Included Lab Sample IDs: 2226393, 2226394, 2226395, 2226396, 2226397, 2226398

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	106	101	P/P	90 - 110
Barium	97.4	106	P/P	90 - 110
Calcium	103	101	P/P	90 - 110
Calcium	97.8	103	P/P	90 - 110
Iron	101	98.9	P/P	90 - 110
Iron	95.5	101	P/P	90 - 110
Magnesium	94.1	99.3	P/P	90 - 110
Magnesium	99.3	97.3	P/P	90 - 110
Manganese	104	101	P/P	90 - 110
Manganese	97.0	104	P/P	90 - 110
Potassium	100	98.9	P/P	90 - 110
Potassium	95.7	100	P/P	90 - 110
Sodium	102	99.9	P/P	90 - 110
Sodium	97.3	102	P/P	90 - 110
Strontium	92.7	99.8	P/P	90 - 110
Strontium	99.8	97.7	P/P	90 - 110
Tin	102	99.0	P/P	90 - 110
Tin	95.2	102	P/P	90 - 110
Titanium	102	99.3	P/P	90 - 110
Titanium	95.4	102	P/P	90 - 110
Vanadium	101	98.8	P/P	90 - 110
Vanadium	95.2	101	P/P	90 - 110
Zinc	92.9	99.2	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A103841
Included Lab Sample IDs: 2226363, 2226364, 2226365, 2226366, 2226367, 2226368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.8	92.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A103850
Included Lab Sample IDs: 2226395, 2226396, 2226397, 2226398

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	95.6	106	P/P	95 - 105

Reference Method: SM 4500 F-C-2011
Run ID: A103903
Included Lab Sample IDs: 2226363, 2226364, 2226365, 2226366, 2226367, 2226368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	98.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A103955
Included Lab Sample IDs: 2226393, 2226394, 2226395, 2226396, 2226397, 2226398

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.4	99.1	P/P	90 - 110
Aluminum	100	99.4	P/P	90 - 110
Antimony	97.4	97.1	P/P	90 - 110
Antimony	97.5	97.4	P/P	90 - 110
Arsenic	101	98.8	P/P	90 - 110
Arsenic	98.8	99.0	P/P	90 - 110
Beryllium	97.7	96.6	P/P	90 - 110
Beryllium	99.4	97.7	P/P	90 - 110
Boron	102	102	P/P	90 - 110
Boron	97.4	102	P/P	90 - 110
Cadmium	98.7	98.5	P/P	90 - 110
Cadmium	99.4	98.7	P/P	90 - 110
Chromium	97.4	97.8	P/P	90 - 110
Chromium	98.2	97.4	P/P	90 - 110
Copper	97.2	97.1	P/P	90 - 110
Copper	99.8	97.2	P/P	90 - 110
Lead	107	108	P/P	90 - 110
Lead	108	107	P/P	90 - 110
Molybdenum	97.8	96.9	P/P	90 - 110
Molybdenum	98.3	97.8	P/P	90 - 110
Nickel	100	98.6	P/P	90 - 110
Nickel	98.6	98.0	P/P	90 - 110
Selenium	100	99.8	P/P	90 - 110
Selenium	99.8	99.0	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Silver	102	101	P/P	90 - 110
Thallium	106	106	P/P	90 - 110
Thallium	106	106	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A103961
Included Lab Sample IDs: 2226369, 2226370, 2226371, 2226372, 2226373, 2226374

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	95.7	P/P	90 - 110
Organic Carbon	95.7	95.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A103972
Included Lab Sample IDs: 2226393, 2226394, 2226395, 2226396, 2226397, 2226398

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cobalt	105	97.3	P/P	90 - 110
Cobalt	97.3	100	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						1.95	
EPA 200.7 Rev. 4.4	Barium	98.6	108	102	103			1.05
	Calcium	103	110	104				1.25
	Iron	99.1	107	103	106			2.07
	Magnesium	94.8	103	96.4				2.72
	Manganese	97.8	106	102	103			1.39
	Potassium	98.8	105	104	107			2.42
	Sodium	103	109	103	107			2.40
	Strontium	92.3	101	97.7	98.7			0.966
	Tin	91.5	98.9	91.7	94.9			3.42
	Titanium	91.6	111	97.5	98.8			1.27
	Vanadium	91.3	101	96.3	97.8			1.57
	Zinc	98.4	107	113	113			0.122
EPA 200.8 Rev. 5.4	Aluminum	100	97.5	98.3	104			0.877
	Antimony	101	98.4	99.2	98.2			0.893
	Arsenic	100	97.1	97.7	98.6			0.594
	Beryllium	92.7	90.9	98.3	92.4			7.54
	Boron	97.8	98.1	99.5	101			1.34
	Cadmium	95.2	94.3	96.9	96.3			2.70
	Chromium	96.4	94.8	95.8	95.8			1.05
	Cobalt	102	95.2	98.7	96.3			3.70
	Copper	96.8	90.4	91.9	97.4			1.26
	Lead	105	102	103	105			0.758
	Molybdenum	94.8	93.8	96.0	93.7			2.24
	Nickel	98.0	93.3	93.7	96.7			0.379
	Selenium	100	96.3	97.4	95.1			1.18
	Silver	104	103	103	104			0.317
	Thallium	102	102	104	105			1.55
EPA 300.0 Rev. 2.1	Chloride	102	103	102			2.07	
	Sulfate	101	107	100			2.38	
EPA 350.1 Rev. 2.0	Ammonia-N	101	98.6	99.0				0.293
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	98.9	93.0				4.15
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	96.5	96.0				0.277
EPA 365.1 Rev. 2.0	Total-P	104	102	101				0.358
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	95.7	96.5				0.663
SM 2120 B-2011	Color (true)	98.3					8.22	
	Color (true)	101					1.01	
SM 2320 B-2011	Total Alkalinity	94.5					0.564	
SM 2540 C-2011	TDS						0.0	
SM 4500 F-C-2011	Fluoride	95.6	98.0	99.6				0.959
SM 5310 B-2011	Organic Carbon	95.3	95.6	96.4				0.568

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2226393, 2226394, 2226395, 2226396, 2226397, 2226398
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2226393, 2226394, 2226395, 2226396, 2226397, 2226398
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2226363, 2226364, 2226365, 2226366, 2226367, 2226368

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2226369, 2226370, 2226371, 2226372, 2226373, 2226374
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2226369, 2226370, 2226371, 2226372, 2226373, 2226374
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2226369, 2226370, 2226371, 2226372, 2226373, 2226374
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2226369, 2226370, 2226371, 2226372, 2226373, 2226374
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2226375, 2226376, 2226377, 2226378, 2226379, 2226380
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2226393, 2226394, 2226395, 2226396, 2226397, 2226398
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2226369, 2226370, 2226371, 2226372, 2226373, 2226374

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	02/22/2021			02/23/2021 15:14	Yen Ta	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
EPA 200.7 Rev. 4.4	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/01/2021 17:52	Betina Topolski	2226393
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/01/2021 17:58	Betina Topolski	2226394
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/01/2021 18:31	Betina Topolski	2226395
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/01/2021 18:50	Betina Topolski	2226396
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/01/2021 18:56	Betina Topolski	2226397
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/01/2021 19:02	Betina Topolski	2226398
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/02/2021 11:59	Betina Topolski	2226395
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/02/2021 12:07	Betina Topolski	2226396
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/02/2021 12:11	Betina Topolski	2226397
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/02/2021 12:15	Betina Topolski	2226398
EPA 200.8 Rev. 5.4	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/08/2021 15:32	Alexander Thompson	2226393
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/08/2021 16:24	Alexander Thompson	2226394
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/08/2021 16:32	Alexander Thompson	2226396
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/08/2021 16:39	Alexander Thompson	2226397
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/08/2021 16:46	Alexander Thompson	2226398
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/08/2021 17:23	Alexander Thompson	2226395
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/09/2021 12:59	Alexander Thompson	2226393
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/09/2021 13:04	Alexander Thompson	2226394
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/09/2021 13:36	Alexander Thompson	2226396
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/09/2021 13:41	Alexander Thompson	2226397
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/09/2021 13:46	Alexander Thompson	2226398
	02/22/2021	02/24/2021 16:30	Elliott D. Healy	03/09/2021 13:50	Alexander Thompson	2226395
EPA 300.0 Rev. 2.1	02/22/2021			02/24/2021 21:07	Lipi Saha	2226363
	02/22/2021			02/24/2021 21:31	Lipi Saha	2226364
	02/22/2021			02/24/2021 21:43	Lipi Saha	2226365
	02/22/2021			02/24/2021 21:55	Lipi Saha	2226366
	02/22/2021			02/24/2021 22:07	Lipi Saha	2226367
	02/22/2021			02/24/2021 22:19	Lipi Saha	2226368
EPA 350.1 Rev. 2.0	02/22/2021			02/27/2021 13:13	Ping Hua	2226370
	02/22/2021			02/27/2021 13:17	Ping Hua	2226369
	02/22/2021			02/27/2021 13:18	Ping Hua	2226371
	02/22/2021			02/27/2021 13:19	Ping Hua	2226372
	02/22/2021			02/27/2021 13:21	Ping Hua	2226373
	02/22/2021			02/27/2021 13:22	Ping Hua	2226374
EPA 351.2 Rev. 2.0	02/22/2021	02/25/2021 12:02	Yen Ta	02/26/2021 11:47	Virginia P. Brown	2226369
	02/22/2021	02/25/2021 12:02	Yen Ta	02/26/2021 14:05	Virginia P. Brown	2226370
	02/22/2021	02/25/2021 12:02	Yen Ta	02/26/2021 14:07	Virginia P. Brown	2226371
	02/22/2021	02/25/2021 12:02	Yen Ta	02/26/2021 14:12	Virginia P. Brown	2226372

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 351.2 Rev. 2.0	02/22/2021	02/25/2021 12:02	Yen Ta	02/26/2021 14:13	Virginia P. Brown	2226373
	02/22/2021	02/25/2021 12:02	Yen Ta	02/26/2021 14:15	Virginia P. Brown	2226374
EPA 353.2 Rev. 2.0	02/22/2021			02/24/2021 08:35	Beverly Y. Sanders	2226369
	02/22/2021			02/24/2021 08:37	Beverly Y. Sanders	2226370
	02/22/2021			02/24/2021 08:38	Beverly Y. Sanders	2226371
	02/22/2021			02/24/2021 08:39	Beverly Y. Sanders	2226372
	02/22/2021			02/24/2021 08:40	Beverly Y. Sanders	2226373
	02/22/2021			02/24/2021 08:41	Beverly Y. Sanders	2226374
EPA 365.1 Rev. 2.0	02/22/2021	02/24/2021 11:30	Shengyu Wang	02/25/2021 12:17	Shengyu Wang	2226369
	02/22/2021	02/24/2021 11:30	Shengyu Wang	02/25/2021 12:18	Shengyu Wang	2226370
	02/22/2021	02/24/2021 11:30	Shengyu Wang	02/25/2021 12:19	Shengyu Wang	2226372
	02/22/2021	02/24/2021 11:30	Shengyu Wang	02/25/2021 12:20	Shengyu Wang	2226373
	02/22/2021	02/24/2021 11:30	Shengyu Wang	02/25/2021 12:27	Shengyu Wang	2226374
	02/22/2021	02/24/2021 11:30	Shengyu Wang	02/25/2021 15:13	Shengyu Wang	2226371
EPA 365.1 Rev. 2.0 dissolved	02/22/2021			02/23/2021 13:37	Lipi Saha	2226375
	02/22/2021			02/23/2021 13:38	Lipi Saha	2226376
	02/22/2021			02/23/2021 13:43	Lipi Saha	2226377
	02/22/2021			02/23/2021 13:44	Lipi Saha	2226378
	02/22/2021			02/23/2021 13:45	Lipi Saha	2226379
	02/22/2021			02/23/2021 13:46	Lipi Saha	2226380
SM 2120 B-2011	02/22/2021			02/23/2021 16:13	Benjamin T. Nordmann	2226364, 2226365
	02/22/2021			02/23/2021 16:14	Benjamin T. Nordmann	2226366
	02/22/2021			02/23/2021 16:15	Benjamin T. Nordmann	2226368
	02/22/2021			02/23/2021 16:37	Benjamin T. Nordmann	2226363, 2226367
SM 2320 B-2011	02/22/2021			02/27/2021 11:23	Dale L. Simmons	2226363
	02/22/2021			02/27/2021 11:31	Dale L. Simmons	2226364
	02/22/2021			02/27/2021 11:37	Dale L. Simmons	2226365
	02/22/2021			02/27/2021 11:44	Dale L. Simmons	2226366
	02/22/2021			02/27/2021 11:51	Dale L. Simmons	2226367
	02/22/2021			02/27/2021 11:58	Dale L. Simmons	2226368
SM 2340B	02/22/2021			03/01/2021 17:52	Betina Topolski	2226393
	02/22/2021			03/01/2021 17:58	Betina Topolski	2226394
	02/22/2021			03/01/2021 18:31	Betina Topolski	2226395
	02/22/2021			03/01/2021 18:50	Betina Topolski	2226396
	02/22/2021			03/01/2021 18:56	Betina Topolski	2226397
	02/22/2021			03/01/2021 19:02	Betina Topolski	2226398
SM 2540 C-2011	02/22/2021			02/26/2021 14:36	Yijie Li	2226363, 2226364, 2226365, 2226366, 2226367, 2226368
SM 2540 D-2011	02/22/2021			02/26/2021 14:36	Yijie Li	2226363, 2226364, 2226365, 2226366, 2226367, 2226368

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-2011	02/22/2021			03/05/2021 00:18	Dale L. Simmons	2226363
	02/22/2021			03/05/2021 00:23	Dale L. Simmons	2226364
	02/22/2021			03/05/2021 00:28	Dale L. Simmons	2226365
	02/22/2021			03/05/2021 00:33	Dale L. Simmons	2226366
	02/22/2021			03/05/2021 00:38	Dale L. Simmons	2226367
	02/22/2021			03/05/2021 00:43	Dale L. Simmons	2226368
SM 5310 B-2011	02/22/2021			03/08/2021 22:57	Madeline Gruver	2226372
	02/22/2021			03/09/2021 00:44	Madeline Gruver	2226369
	02/22/2021			03/09/2021 00:55	Madeline Gruver	2226370
	02/22/2021			03/09/2021 01:05	Madeline Gruver	2226371
	02/22/2021			03/09/2021 01:16	Madeline Gruver	2226373
	02/22/2021			03/09/2021 01:26	Madeline Gruver	2226374