Chemical Analysis Report

SO-DIST-2021-12-10-03

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

Event Description: **2021 SMP: Tri-County Fair**
Request ID: **RQ-2021-12-06-56**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 05-JAN-2022 10:46

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: Drainage Ditch @ CR 850 **Collection Date/Time: 12/08/2021 08:35**

Field ID: G1SD0061 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2294626	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P407527	
		Sulfate	22		mg SO4/L	P407530	
	SM 2320 B-2011	Total Alkalinity	222		mg CaCO3/L	P407541	
	SM 2540 C-2011	TDS	297		mg/L	P407668	
	SM 2540 D-2011	TSS	4	I	mg/L	P407485	
	SM 4500 F-C-2011	Fluoride	0.17		mg F/L	P407544	
2294627	EPA 350.1 Rev. 2.0	Ammonia-N	0.087		mg N/L	P407755	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P407862	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P407401	
	EPA 365.1 Rev. 2.0	Total-P	0.073	J	mg P/L	P407418	MS
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P407796	
2294629	EPA 200.7 Rev. 4.4	Calcium	86.9		mg/L	P407338	
		Iron	890		ug/L	P407338	
		Magnesium	8.43		mg/L	P407338	
		Potassium	3.6		mg/L	P407338	
		Sodium	14.0		mg/L	P407338	
		Strontium	230		ug/L	P407338	
		Tin	3.0	U	ug/L	P407338	
		Titanium	2.0	I	ug/L	P407338	
		Vanadium	3.0	I	ug/L	P407338	
		Zinc	5.0	I	ug/L	P407338	
	EPA 200.8 Rev. 5.4	Aluminum	100		ug/L	P407676	
		Antimony	0.077	I	ug/L	P407338	
		Arsenic	0.63		ug/L	P407338	
		Barium	19.0		ug/L	P407338	
		Beryllium	0.016	I	ug/L	P407338	
		Boron**	45.3		ug/L	P407338	
		Cadmium	0.020	U	ug/L	P407338	
		Chromium	0.62	I	ug/L	P407338	
		Cobalt	0.073	I	ug/L	P407338	
		Copper	0.40	U	ug/L	P407338	
		Lead	0.20	U	ug/L	P407338	
		Manganese	13.3		ug/L	P407338	
		Molybdenum	0.54	I	ug/L	P407338	
		Nickel	0.78	I	ug/L	P407338	
		Selenium	0.20	U	ug/L	P407338	
		Silver	0.010	U	ug/L	P407338	
		Thallium	0.10	U	ug/L	P407338	
	SM 2340B	Hardness	252		mg/L	P407338	

Ref. Method and Comment:
EPA 365.1 Rev. 2.0: Total-P: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P407338

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: P407338

Component	Result	Code	Units
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 200.8 Rev. 5.4
Batch ID: P407676

Component	Result	Code	Units
Aluminum	5.0	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407527

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407530

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: P407755

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P407862

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407401

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P407418

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

Reference Method: SM 2320 B-2011
Batch ID: P407541

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

Reference Method: SM 2540 C-2011
Batch ID: P407668

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P407485

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P407544

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P407796

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: P407338

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	108		P	85 - 115
Iron	106		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	101		P	85 - 115
Sodium	103		P	85 - 115
Strontium	99.7		P	85 - 115
Tin	103		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407338

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Antimony	99.8		P	85 - 115
Arsenic	99.1		P	85 - 115
Barium	105		P	85 - 115
Beryllium	102		P	85 - 115
Boron	100		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	102		P	85 - 115
Cobalt	102		P	85 - 115
Copper	101		P	85 - 115
Lead	97.1		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	102		P	85 - 115
Nickel	102		P	85 - 115
Selenium	99.1		P	85 - 115
Silver	101		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407527

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.1		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407755

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P407862

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407401

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P407418

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

Reference Method: SM 2320 B-2011
Batch ID: P407541

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P407544

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.6		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P407796

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P407338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294026	Calcium	106		P	80 - 120
2294026	Iron	107		P	80 - 120
2294026	Magnesium	110		P	80 - 120
2294026	Potassium	109		P	80 - 120
2294026	Sodium	104		P	80 - 120
2294026	Strontium	101		P	80 - 120
2294026	Tin	106		P	80 - 120
2294026	Titanium	101		P	80 - 120
2294026	Vanadium	104		P	80 - 120
2294026	Zinc	108		P	80 - 120
2294038	Calcium	104	108	P/P	80 - 120
2294038	Iron	105	108	P/P	80 - 120
2294038	Magnesium	106	110	P/P	80 - 120
2294038	Potassium	105	107	P/P	80 - 120
2294038	Sodium	102		P	80 - 120
2294038	Strontium	99.0	101	P/P	80 - 120
2294038	Tin	103	105	P/P	80 - 120
2294038	Titanium	102	103	P/P	80 - 120
2294038	Vanadium	102	103	P/P	80 - 120
2294038	Zinc	104	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294026	Antimony	101		P	85 - 115
2294026	Arsenic	101		P	85 - 115
2294026	Barium	106		P	85 - 115
2294026	Beryllium	103		P	85 - 115
2294026	Boron	101		P	85 - 115
2294026	Cadmium	103		P	85 - 115
2294026	Chromium	103		P	85 - 115
2294026	Cobalt	100		P	85 - 115
2294026	Copper	102		P	85 - 115
2294026	Lead	98.3		P	85 - 115
2294026	Manganese	103		P	85 - 115
2294026	Molybdenum	102		P	85 - 115
2294026	Nickel	100		P	85 - 115
2294026	Selenium	97.0		P	85 - 115
2294026	Silver	100		P	85 - 115
2294026	Thallium	106		P	85 - 115
2294038	Antimony	98.8	99.8	P/P	85 - 115
2294038	Arsenic	100	102	P/P	85 - 115
2294038	Barium	105	106	P/P	85 - 115
2294038	Beryllium	100	99.6	P/P	85 - 115
2294038	Boron	99.1	99.5	P/P	85 - 115
2294038	Cadmium	98.5	102	P/P	85 - 115
2294038	Chromium	103	104	P/P	85 - 115
2294038	Cobalt	104	104	P/P	85 - 115
2294038	Copper	103	104	P/P	85 - 115
2294038	Lead	97.0	97.5	P/P	85 - 115
2294038	Manganese	102	101	P/P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294038	Molybdenum	101	102	P/P	85 - 115
2294038	Nickel	105	104	P/P	85 - 115
2294038	Selenium	99.9	101	P/P	85 - 115
2294038	Silver	99.0	101	P/P	85 - 115
2294038	Thallium	103	104	P/P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2295684	Aluminum	99.4	98.4	P/P	80 - 120
2295746	Aluminum	102		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407527

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294763	Chloride	99.7		P	90 - 110
2294827	Chloride	98.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294763	Sulfate	97.4		P	90 - 110
2294827	Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407755

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294380	Ammonia-N	96.2	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P407862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294547	Kjeldahl Nitrogen	103	95.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294703	NO2NO3-N	97.4	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P407418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294627	Total-P	109	112	P/F	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P407544

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294787	Fluoride	101	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P407796

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294602	Organic Carbon	95.8	96.3	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P407338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294038	Calcium	2.98	Spike	P	0 - 20
2294038	Iron	2.85	Spike	P	0 - 20
2294038	Magnesium	2.96	Spike	P	0 - 20
2294038	Potassium	2.33	Spike	P	0 - 20
2294038	Sodium	1.43	Spike	P	0 - 20
2294038	Strontium	1.77	Spike	P	0 - 20
2294038	Tin	2.56	Spike	P	0 - 20
2294038	Titanium	1.41	Spike	P	0 - 20
2294038	Vanadium	1.35	Spike	P	0 - 20
2294038	Zinc	1.52	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294038	Antimony	0.991	Spike	P	0 - 20
2294038	Arsenic	1.68	Spike	P	0 - 20
2294038	Barium	0.282	Spike	P	0 - 20
2294038	Beryllium	0.701	Spike	P	0 - 20
2294038	Boron	0.232	Spike	P	0 - 20
2294038	Cadmium	3.55	Spike	P	0 - 20
2294038	Chromium	0.565	Spike	P	0 - 20
2294038	Cobalt	0.0678	Spike	P	0 - 20
2294038	Copper	1.34	Spike	P	0 - 20
2294038	Lead	0.532	Spike	P	0 - 20
2294038	Manganese	0.451	Spike	P	0 - 20
2294038	Molybdenum	1.01	Spike	P	0 - 20
2294038	Nickel	1.35	Spike	P	0 - 20
2294038	Selenium	0.973	Spike	P	0 - 20
2294038	Silver	1.60	Spike	P	0 - 20
2294038	Thallium	1.33	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2295684	Aluminum	0.969	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294763	Chloride	1.87	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294763	Sulfate	1.77	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407755

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294380	Ammonia-N	1.17	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P407862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294547	Kjeldahl Nitrogen	3.97	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294703	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P407418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294627	Total-P	2.20	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P407541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294787	Total Alkalinity	0.792	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P407668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294582	TDS	3.52	Sample	P	0 - 10

Reference Method: SM 2540 D-2011
Batch ID: P407485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294857	TSS	7.14	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P407544

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294787	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P407796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294602	Organic Carbon	0.383	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A109366
Included Lab Sample IDs: 2294627

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A109378
Included Lab Sample IDs: 2294629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	101	P/P	90 - 110
Iron	102	100	P/P	90 - 110
Magnesium	102	100	P/P	90 - 110
Potassium	97.0	95.1	P/P	90 - 110
Sodium	101	99.5	P/P	90 - 110
Strontium	100	97.6	P/P	90 - 110
Tin	102	98.7	P/P	90 - 110
Titanium	98.4	95.4	P/P	90 - 110
Vanadium	98.6	95.9	P/P	90 - 110
Zinc	103	99.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A109385
Included Lab Sample IDs: 2294629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	95.8	95.4	P/P	90 - 110
Arsenic	96.6	95.2	P/P	90 - 110
Barium	98.6	98.5	P/P	90 - 110
Beryllium	96.6	96.5	P/P	90 - 110
Boron	103	102	P/P	90 - 110
Cadmium	98.8	98.9	P/P	90 - 110
Chromium	99.5	98.5	P/P	90 - 110
Cobalt	94.9	95.1	P/P	90 - 110
Copper	96.0	94.6	P/P	90 - 110
Lead	93.0	92.5	P/P	90 - 110
Manganese	99.7	99.9	P/P	90 - 110
Molybdenum	98.1	98.2	P/P	90 - 110
Nickel	96.4	95.5	P/P	90 - 110
Selenium	99.7	96.9	P/P	90 - 110
Silver	96.9	97.1	P/P	90 - 110
Thallium	97.2	96.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A109387
Included Lab Sample IDs: 2294626

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	99.9	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A109427
Included Lab Sample IDs: 2294626

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.2	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A109427
Included Lab Sample IDs: 2294626

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A109462
Included Lab Sample IDs: 2294627

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	105	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A109511
Included Lab Sample IDs: 2294627

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	105	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A109530
Included Lab Sample IDs: 2294627

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A109591
Included Lab Sample IDs: 2294627

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	90.5	93.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A109595
Included Lab Sample IDs: 2294629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.6	95.9	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 200.7 Rev. 4.4	Calcium	108	106	104	108			2.98
	Iron	106	107	105	108			2.85
	Magnesium	108	110	106	110			2.96
	Potassium	101	109	105	107			2.33
	Sodium	103	104	102				1.43
	Strontium	99.7	101	99.0	101			1.77
	Tin	103	106	103	105			2.56
	Titanium	101	101	102	103			1.41
	Vanadium	101	104	102	103			1.35
	Zinc	103	108	104	105			1.52
EPA 200.8 Rev. 5.4	Aluminum	102	99.4	98.4	102			0.969
	Antimony	99.8	98.8	99.8	101			0.991
	Arsenic	99.1	100	102	101			1.68
	Barium	105	105	106	106			0.282
	Beryllium	102	100	99.6	103			0.701
	Boron	100	99.1	99.5	101			0.232
	Cadmium	100	98.5	102	103			3.55
	Chromium	102	103	104	103			0.565
	Cobalt	102	104	100	104			0.0678
	Copper	101	103	104	102			1.34
	Lead	97.1	97.0	97.5	98.3			0.532
	Manganese	101	102	101	103			0.451
	Molybdenum	102	101	102	102			1.01
	Nickel	102	105	104	100			1.35
	Selenium	99.1	99.9	101	97.0			0.973
	Silver	101	99.0	101	100			1.60
	Thallium	103	103	104	106			1.33
EPA 300.0 Rev. 2.1	Chloride	99.3	99.7	98.1			1.87	
	Sulfate	98.1	97.4	96.2			1.77	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	96.2	97.4				1.17
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	103	95.1				3.97
EPA 353.2 Rev. 2.0	NO2NO3-N	100	97.4	98.0				0.487
EPA 365.1 Rev. 2.0	Total-P	106	109	112				2.20
SM 2320 B-2011	Total Alkalinity	100					0.792	
SM 2540 C-2011	TDS						3.52	
SM 2540 D-2011	TSS						7.14	
SM 4500 F-C-2011	Fluoride	99.6	101	101				0.0
SM 5310 B-2011	Organic Carbon	96.4	95.8	96.3				0.383

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	2294629
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2294629
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2294626
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2294626
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2294627
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2294627
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2294627
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2294627
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2294626

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2294629
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2294626
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2294626
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2294626
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2294627

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	12/10/2021	12/13/2021 12:00	Emily M Philpot	12/14/2021 16:34	Josef B Mick	2294629
EPA 200.8 Rev. 5.4	12/10/2021	12/13/2021 12:00	Emily M Philpot	12/14/2021 16:52	Alexander Thompson	2294629
	12/10/2021	12/20/2021 11:25	Vijayalakshmi Reddy	12/28/2021 14:59	Alexander Thompson	2294629
EPA 300.0 Rev. 2.1	12/10/2021			12/15/2021 20:00	Roberta Tatti	2294626
EPA 350.1 Rev. 2.0	12/10/2021			12/21/2021 13:22	Ping Hua	2294627
EPA 351.2 Rev. 2.0	12/10/2021	12/27/2021 11:02	Samantha L Bates	12/28/2021 14:05	Virginia P. Brown	2294627
EPA 353.2 Rev. 2.0	12/10/2021			12/14/2021 10:48	Beverly Y. Sanders	2294627
EPA 365.1 Rev. 2.0	12/10/2021	12/15/2021 17:30	Simonne.V. Calhoun	12/17/2021 13:28	Shengyu Ding	2294627
SM 2320 B-2011	12/10/2021			12/15/2021 18:47	Dale L. Simmons	2294626
SM 2340B	12/10/2021			12/14/2021 16:34	Josef B Mick	2294629
SM 2540 C-2011	12/10/2021			12/14/2021 13:02	Yijie Li	2294626
SM 2540 D-2011	12/10/2021			12/14/2021 13:02	Yijie Li	2294626
SM 4500 F-C-2011	12/10/2021			12/15/2021 18:47	Dale L. Simmons	2294626
SM 5310 B-2011	12/10/2021			12/21/2021 03:48	Khloe J Berg	2294627