

Chemical Analysis Report

NE-DIST-2021-03-12-03

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

Event Description: **Bmap 2 2021 SMP**
Request ID: **RQ-2021-03-08-17**
Customer: **NE-DIST**
Project ID: **SMP**

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

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

Certified by: Liang Lin, Environmental Administrator

Date Certified: 01-APR-2021 15:43

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

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Trib to Open CR @ Windsor Park Dr N

Collection Date/Time: 03/11/2021 11:40

Field ID: 20030858

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2231380	EPA 200.7 Rev. 4.4	Barium	26.8		ug/L	P395033	
		Calcium	30.2		mg/L	P395033	
		Iron	360		ug/L	P395033	
		Magnesium	7.07		mg/L	P395033	
		Manganese	19.7		ug/L	P395033	
		Potassium	3.0		mg/L	P395033	
		Sodium	17.4		mg/L	P395033	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P395033	
		Aluminum	135		ug/L	P395033	
		Antimony	0.072	I	ug/L	P395033	
		Arsenic	0.99		ug/L	P395033	
		Beryllium	0.030	I	ug/L	P395033	
		Boron**	25.0		ug/L	P395033	
		Cadmium	0.020	U	ug/L	P395033	
		Chromium	0.40	U	ug/L	P395033	
		Copper	5.76		ug/L	P395033	
		Lead	0.20	U	ug/L	P395033	
		Nickel	0.50	U	ug/L	P395033	
		Selenium	0.20	U	ug/L	P395033	
		Silver	0.010	U	ug/L	P395033	
		Thallium	0.10	U	ug/L	P395033	
	SM 2340B	Hardness	104		mg/L	P395033	

Sample Location: Open Creek at Powerlines East of Danforth Rd Collection Date/Time: 03/11/2021 12:00

Field ID: 20030950

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2231372	EPA 180.1 Rev. 2.0	Turbidity	6.0	A	NTU	P394922	
	EPA 300.0 Rev. 2.1	Chloride	37		mg Cl/L	P395191	
		Sulfate	57		mg SO4/L	P395194	
		Color (true)	44		PCU	P394918	
	SM 2320 B-2011	Total Alkalinity	72		mg CaCO3/L	P395081	
	SM 2540 C-2011	TDS	230		mg/L	P395368	
	SM 2540 D-2011	TSS	7	I	mg/L	P395374	
	SM 4500 F-C-2011	Fluoride	0.076	I	mg F/L	P395084	
2231373	EPA 350.1 Rev. 2.0	Ammonia-N	0.11		mg N/L	P395252	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P395282	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P395074	
	EPA 365.1 Rev. 2.0	Total-P	0.082		mg P/L	P395102	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P395501	
2231374	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P394915	
2231379	EPA 200.7 Rev. 4.4	Barium	39.8		ug/L	P395033	
		Calcium	47.5		mg/L	P395033	
		Iron	770		ug/L	P395033	
		Magnesium	7.94		mg/L	P395033	
		Manganese	35.1		ug/L	P395033	
		Potassium	3.5		mg/L	P395033	
		Sodium	21.8		mg/L	P395033	
		Zinc	5.2	I	ug/L	P395033	
	EPA 200.8 Rev. 5.4	Aluminum	314		ug/L	P395033	
		Antimony	0.10	I	ug/L	P395033	
		Arsenic	1.0		ug/L	P395033	
		Beryllium	0.078		ug/L	P395033	
		Boron**	28.1		ug/L	P395033	
		Cadmium	0.020	U	ug/L	P395033	
		Chromium	0.46	I	ug/L	P395033	
		Copper	5.24		ug/L	P395033	
		Lead	0.20	I	ug/L	P395033	
		Nickel	0.50	U	ug/L	P395033	
		Selenium	0.20	U	ug/L	P395033	
		Silver	0.010	U	ug/L	P395033	
		Thallium	0.10	U	ug/L	P395033	
		Hardness	151		mg/L	P395033	
	SM 2340B						

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P394922

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395033

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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395033

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
Copper	0.40	U	ug/L
Lead	0.20	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: P395191

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395194

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395252

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395282

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395074

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395102

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394915

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

Reference Method: SM 2120 B-2011
Batch ID: P394918

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P395081

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

Reference Method: SM 2540 C-2011
Batch ID: P395368

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P395374

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P395084

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: P395501

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: P395033

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	107		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Manganese	103		P	85 - 115
Potassium	105		P	85 - 115
Sodium	108		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P395033

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.5		P	85 - 115
Antimony	96.7		P	85 - 115
Arsenic	92.9		P	85 - 115
Beryllium	89.2		P	85 - 115
Boron	92.4		P	85 - 115
Cadmium	95.0		P	85 - 115
Chromium	94.1		P	85 - 115
Copper	96.2		P	85 - 115
Lead	100		P	85 - 115
Nickel	94.6		P	85 - 115
Selenium	89.6		P	85 - 115
Silver	101		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395191

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395194

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P395252

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P395282

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395074

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395102

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394915

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

Reference Method: SM 2120 B-2011
Batch ID: P394918

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

Reference Method: SM 2320 B-2011
Batch ID: P395081

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

Reference Method: SM 4500 F-C-2011
Batch ID: P395084

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P395501

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P395033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231307	Barium	101	102	P/P	80 - 120
2231307	Calcium	104	106	P/P	80 - 120
2231307	Iron	105	107	P/P	80 - 120
2231307	Magnesium	105	106	P/P	80 - 120
2231307	Manganese	101	102	P/P	80 - 120
2231307	Potassium	105	106	P/P	80 - 120
2231307	Sodium	105	106	P/P	80 - 120
2231307	Zinc	98.9	99.7	P/P	80 - 120
2231368	Barium	102		P	80 - 120
2231368	Calcium	106		P	80 - 120
2231368	Iron	107		P	80 - 120
2231368	Magnesium	108		P	80 - 120
2231368	Manganese	102		P	80 - 120
2231368	Potassium	104		P	80 - 120
2231368	Sodium	104		P	80 - 120
2231368	Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P395033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231307	Aluminum	92.7	93.3	P/P	80 - 120
2231307	Antimony	95.6	96.4	P/P	80 - 120
2231307	Arsenic	93.6	93.1	P/P	80 - 120
2231307	Beryllium	88.6	88.8	P/P	80 - 120
2231307	Boron	90.1	90.9	P/P	80 - 120
2231307	Cadmium	95.6	97.1	P/P	80 - 120
2231307	Chromium	93.4	94.4	P/P	80 - 120
2231307	Copper	95.3	95.7	P/P	80 - 120
2231307	Lead	99.5	99.1	P/P	80 - 120
2231307	Nickel	93.7	94.1	P/P	80 - 120
2231307	Selenium	94.2	94.1	P/P	80 - 120
2231307	Silver	101	101	P/P	80 - 120
2231307	Thallium	98.9	98.5	P/P	80 - 120
2231368	Aluminum	93.1		P	80 - 120
2231368	Antimony	99.9		P	80 - 120
2231368	Arsenic	93.3		P	80 - 120
2231368	Beryllium	90.6		P	80 - 120
2231368	Boron	94.3		P	80 - 120
2231368	Cadmium	97.0		P	80 - 120
2231368	Chromium	94.9		P	80 - 120
2231368	Copper	95.3		P	80 - 120
2231368	Lead	103		P	80 - 120
2231368	Nickel	93.6		P	80 - 120
2231368	Selenium	92.1		P	80 - 120
2231368	Silver	101		P	80 - 120
2231368	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231130	Chloride	102		P	90 - 110
2231289	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395194

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231130	Sulfate	98.8		P	90 - 110
2231289	Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231296	Ammonia-N	98.2	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231326	Kjeldahl Nitrogen	108	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395074

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231290	NO2NO3-N	99.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395102

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231296	Total-P	105	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231297	O-Phosphate-P	102	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P395084

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231391	Fluoride	100	99.0	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P395501

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231290	Organic Carbon	97.0	97.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P394922

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231372	Turbidity	1.66	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P395033

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231307	Barium	0.419	Spike	P	0 - 20
2231307	Calcium	1.78	Spike	P	0 - 20
2231307	Iron	1.63	Spike	P	0 - 20
2231307	Magnesium	1.20	Spike	P	0 - 20
2231307	Manganese	0.828	Spike	P	0 - 20
2231307	Potassium	0.903	Spike	P	0 - 20
2231307	Sodium	0.178	Spike	P	0 - 20
2231307	Zinc	0.780	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P395033

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231307	Aluminum	0.559	Spike	P	0 - 20
2231307	Antimony	0.838	Spike	P	0 - 20
2231307	Arsenic	0.543	Spike	P	0 - 20
2231307	Beryllium	0.186	Spike	P	0 - 20
2231307	Boron	0.777	Spike	P	0 - 20
2231307	Cadmium	1.52	Spike	P	0 - 20
2231307	Chromium	1.03	Spike	P	0 - 20
2231307	Copper	0.438	Spike	P	0 - 20
2231307	Lead	0.389	Spike	P	0 - 20
2231307	Nickel	0.433	Spike	P	0 - 20
2231307	Selenium	0.116	Spike	P	0 - 20
2231307	Silver	0.734	Spike	P	0 - 20
2231307	Thallium	0.392	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395191

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231130	Chloride	1.69	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395194

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231130	Sulfate	1.34	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231296	Ammonia-N	1.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231326	Kjeldahl Nitrogen	3.10	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395074

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231290	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231296	Total-P	4.07	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231297	O-Phosphate-P	0.590	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P394918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231289	Color (true)	0.579	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P395081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231391	Total Alkalinity	0.245	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P395368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231115	TDS	2.45	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 D-2011
Batch ID: P395374

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231115	TSS	8.96	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P395084

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231391	Fluoride	0.946	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P395501

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231290	Organic Carbon	0.389	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: A104041

Included Lab Sample IDs: 2231374

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.8	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A104042

Included Lab Sample IDs: 2231372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	101	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A104045

Included Lab Sample IDs: 2231372

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A104102

Included Lab Sample IDs: 2231373

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

Reference Method: SM 2320 B-2011

Run ID: A104103

Included Lab Sample IDs: 2231372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.5	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A104103

Included Lab Sample IDs: 2231372

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A104133

Included Lab Sample IDs: 2231373

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104152

Included Lab Sample IDs: 2231379, 2231380

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.7	100	P/P	90 - 110
Antimony	97.9	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104152

Included Lab Sample IDs: 2231379, 2231380

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.8	97.1	P/P	90 - 110
Beryllium	99.0	97.8	P/P	90 - 110
Boron	96.0	101	P/P	90 - 110
Cadmium	98.7	101	P/P	90 - 110
Chromium	98.7	98.9	P/P	90 - 110
Copper	99.7	98.5	P/P	90 - 110
Lead	106	107	P/P	90 - 110
Nickel	100	98.0	P/P	90 - 110
Selenium	100	99.3	P/P	90 - 110
Silver	100	101	P/P	90 - 110
Thallium	103	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A104153

Included Lab Sample IDs: 2231372

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A104179

Included Lab Sample IDs: 2231373

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A104250

Included Lab Sample IDs: 2231373

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	106	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A104251

Included Lab Sample IDs: 2231379, 2231380

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.3	99.5	P/P	90 - 110
Calcium	102	104	P/P	90 - 110
Iron	102	104	P/P	90 - 110
Magnesium	100	102	P/P	90 - 110
Manganese	101	102	P/P	90 - 110
Potassium	103	104	P/P	90 - 110
Sodium	100	102	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A104280

Included Lab Sample IDs: 2231373

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	96.2	P/P	90 - 110

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

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

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					1.66	
EPA 200.7 Rev. 4.4	Barium	102	101	102	102		0.419
	Calcium	107	104	106	106		1.78
	Iron	105	105	107	107		1.63
	Magnesium	105	105	106	108		1.20
	Manganese	103	101	102	102		0.828
	Potassium	105	105	106	104		0.903
	Sodium	108	105	106	104		0.178
	Zinc	100	98.9	99.7	100		0.780
EPA 200.8 Rev. 5.4	Aluminum	94.5	92.7	93.3	93.1		0.559
	Antimony	96.7	95.6	96.4	99.9		0.838
	Arsenic	92.9	93.6	93.1	93.3		0.543
	Beryllium	89.2	88.6	88.8	90.6		0.186
	Boron	92.4	90.1	90.9	94.3		0.777
	Cadmium	95.0	95.6	97.1	97.0		1.52
	Chromium	94.1	93.4	94.4	94.9		1.03
	Copper	96.2	95.3	95.7	95.3		0.438
	Lead	100	99.5	99.1	103		0.389
	Nickel	94.6	93.7	94.1	93.6		0.433
	Selenium	89.6	94.2	94.1	92.1		0.116
	Silver	101	101	101	101		0.734
	Thallium	102	98.9	98.5	103		0.392
EPA 300.0 Rev. 2.1	Chloride	102	102	101		1.69	
	Sulfate	101	98.8	96.2		1.34	
EPA 350.1 Rev. 2.0	Ammonia-N	95.8	98.2	99.2			1.01
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	108	105			3.10
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	99.0	98.5			0.506
EPA 365.1 Rev. 2.0	Total-P	103	105	109			4.07
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	102	101			0.590
SM 2120 B-2011	Color (true)	102				0.579	
SM 2320 B-2011	Total Alkalinity	101				0.245	
SM 2540 C-2011	TDS					2.45	
SM 2540 D-2011	TSS					8.96	
SM 4500 F-C-2011	Fluoride	99.2	100	99.0			0.946
SM 5310 B-2011	Organic Carbon	95.5	97.0	97.6			0.389

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2231372
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2231379, 2231380
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2231379, 2231380
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2231372
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2231372
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2231373
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2231373
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2231373
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2231373
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2231374
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2231372

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2231372
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2231379, 2231380
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2231372
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2231372
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2231372
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2231373

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	03/12/2021			03/12/2021 14:31	Yen Ta	2231372
EPA 200.7 Rev. 4.4	03/12/2021	03/16/2021 15:50	Elliott D. Healy	03/22/2021 17:19	Josef B Mick	2231379
	03/12/2021	03/16/2021 15:50	Elliott D. Healy	03/22/2021 17:27	Josef B Mick	2231380
EPA 200.8 Rev. 5.4	03/12/2021	03/16/2021 15:50	Elliott D. Healy	03/18/2021 16:44	McKinley C Carter	2231379
	03/12/2021	03/16/2021 15:50	Elliott D. Healy	03/18/2021 16:51	McKinley C Carter	2231380
EPA 300.0 Rev. 2.1	03/12/2021			03/16/2021 06:42	Lipi Saha	2231372
EPA 350.1 Rev. 2.0	03/12/2021			03/20/2021 11:41	Ping Hua	2231373
EPA 351.2 Rev. 2.0	03/12/2021	03/22/2021 13:25	Benjamin T. Nordmann	03/23/2021 22:02	Julia Storbeck	2231373
EPA 353.2 Rev. 2.0	03/12/2021			03/17/2021 09:20	Beverly Y. Sanders	2231373
EPA 365.1 Rev. 2.0	03/12/2021	03/17/2021 13:18	Yen Ta	03/18/2021 11:59	Shengyu Ding	2231373
EPA 365.1 Rev. 2.0 dissolved	03/12/2021			03/12/2021 15:18	Patrick M. Roche	2231374
SM 2120 B-2011	03/12/2021			03/12/2021 16:20	Benjamin T. Nordmann	2231372
SM 2320 B-2011	03/12/2021			03/17/2021 05:45	Dale L. Simmons	2231372
SM 2340B	03/12/2021			03/22/2021 17:19	Josef B Mick	2231379
	03/12/2021			03/22/2021 17:27	Josef B Mick	2231380
SM 2540 C-2011	03/12/2021			03/15/2021 15:01	Yijie Li	2231372
SM 2540 D-2011	03/12/2021			03/15/2021 15:01	Yijie Li	2231372
SM 4500 F-C-2011	03/12/2021			03/17/2021 05:45	Dale L. Simmons	2231372
SM 5310 B-2011	03/12/2021			03/24/2021 21:41	Madeline Gruver	2231373