

Chemical Analysis Report

NE-DIST-2021-08-27-01

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-2021-08-30-20**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 22-SEP-2021 14:09

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: 08/26/2021 09:25

Field ID: 20030858

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272345	EPA 200.7 Rev. 4.4	Barium	18.4		ug/L	P403121	
		Calcium	24.4		mg/L	P403121	
		Iron	700		ug/L	P403121	
		Magnesium	6.09		mg/L	P403121	
		Manganese	18.4		ug/L	P403121	
		Potassium	2.8		mg/L	P403121	
		Sodium	13.0		mg/L	P403121	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P403121	
		Aluminum	231		ug/L	P403121	
		Antimony	0.080	I	ug/L	P403121	
		Arsenic	1.70		ug/L	P403121	
		Beryllium	0.034	I	ug/L	P403121	
		Boron**	25.3		ug/L	P403121	
		Cadmium	0.020	U	ug/L	P403121	
		Chromium	0.56	I	ug/L	P403121	
		Copper	15.7		ug/L	P403121	
		Lead	0.21	I	ug/L	P403121	
		Nickel	0.50	U	ug/L	P403121	
		Selenium	0.20	U	ug/L	P403121	
		Silver	0.010	U	ug/L	P403121	
		Thallium	0.10	U	ug/L	P403121	
	SM 2340B	Hardness	85.9		mg/L	P403121	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: The copper result was confirmed in the undigested sample on 09/02/2021.

Sample Location: OPEN CREEK AT POWERLINES EAST OF DANFORTH RD

Collection Date/Time: 08/26/2021 10:00

Field ID: 20030950

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272334	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P403097	
	EPA 300.0 Rev. 2.1	Chloride	28		mg Cl/L	P403342	
		Sulfate	41		mg SO4/L	P403343	
	SM 2120 B-2011	Color (true)	78		PCU	P403099	
	SM 2320 B-2011	Total Alkalinity	56		mg CaCO3/L	P403167	
	SM 2540 C-2011	TDS	177		mg/L	P403402	
	SM 2540 D-2011	TSS	4	I	mg/L	P403395	
	SM 4500 F-C-2011	Fluoride	0.075	I	mg F/L	P403169	
2272335	EPA 350.1 Rev. 2.0	Ammonia-N	0.091		mg N/L	P403210	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P403315	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P403189	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P403323	
	SM 5310 B-2011	Organic Carbon	14		mg C/L	P403345	
2272336	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P403090	
2272344	EPA 200.7 Rev. 4.4	Barium	23.4		ug/L	P403121	
		Calcium	32.0		mg/L	P403121	
		Iron	460		ug/L	P403121	
		Magnesium	6.32		mg/L	P403121	
		Manganese	22.9		ug/L	P403121	
		Potassium	3.1		mg/L	P403121	
		Sodium	16.6		mg/L	P403121	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P403121	
		Aluminum	194		ug/L	P403121	
		Antimony	0.11	I	ug/L	P403121	
		Arsenic	1.51		ug/L	P403121	
		Beryllium	0.050		ug/L	P403121	
		Boron**	27.0		ug/L	P403121	
		Cadmium	0.020	U	ug/L	P403121	
		Chromium	0.50	I	ug/L	P403121	
		Copper	6.32		ug/L	P403121	
		Lead	0.20	U	ug/L	P403121	
		Nickel	0.50	U	ug/L	P403121	
		Selenium	0.20	U	ug/L	P403121	
		Silver	0.010	U	ug/L	P403121	
		Thallium	0.10	U	ug/L	P403121	
	SM 2340B	Hardness	106		mg/L	P403121	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P403097

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P403121

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: P403121

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: P403342

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403343

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403210

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: P403315

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403189

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403323

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403090

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

Reference Method: SM 2120 B-2011
Batch ID: P403099

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P403167

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

Reference Method: SM 2540 C-2011
Batch ID: P403402

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P403395

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P403169

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: P403345

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: P403121

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	93.1		P	85 - 115
Calcium	100		P	85 - 115
Iron	96.0		P	85 - 115
Magnesium	97.5		P	85 - 115
Manganese	92.9		P	85 - 115
Potassium	93.9		P	85 - 115
Sodium	95.3		P	85 - 115
Zinc	92.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P403121

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	103		P	85 - 115
Beryllium	102		P	85 - 115
Boron	96.5		P	85 - 115
Cadmium	98.2		P	85 - 115
Chromium	102		P	85 - 115
Copper	103		P	85 - 115
Lead	104		P	85 - 115
Nickel	104		P	85 - 115
Selenium	102		P	85 - 115
Silver	108		P	85 - 115
Thallium	104		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403342

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403343

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403210

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403315

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403189

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403323

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403090

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: P403099

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

Reference Method: SM 2320 B-2011
Batch ID: P403167

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P403169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P403345

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P403121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272208	Barium	99.1	103	P/P	80 - 120
2272208	Calcium	103		P	80 - 120
2272208	Iron	106	108	P/P	80 - 120
2272208	Magnesium	107	110	P/P	80 - 120
2272208	Manganese	98.9	103	P/P	80 - 120
2272208	Potassium	102	105	P/P	80 - 120
2272208	Sodium	103	109	P/P	80 - 120
2272208	Zinc	99.6	103	P/P	80 - 120
2272344	Barium	88.2		P	80 - 120
2272344	Calcium	97.6		P	80 - 120
2272344	Iron	91.5		P	80 - 120
2272344	Magnesium	99.2		P	80 - 120
2272344	Manganese	88.1		P	80 - 120
2272344	Potassium	81.8		P	80 - 120
2272344	Sodium	98.8		P	80 - 120
2272344	Zinc	90.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P403121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272208	Aluminum	98.6	103	P/P	80 - 120
2272208	Antimony	105	105	P/P	80 - 120
2272208	Arsenic	100	101	P/P	80 - 120
2272208	Beryllium	99.9	98.0	P/P	80 - 120
2272208	Boron	98.0	104	P/P	80 - 120
2272208	Cadmium	100	101	P/P	80 - 120
2272208	Chromium	103	102	P/P	80 - 120
2272208	Copper	101	98.8	P/P	80 - 120
2272208	Lead	106	106	P/P	80 - 120
2272208	Nickel	102	101	P/P	80 - 120
2272208	Selenium	98.6	99.9	P/P	80 - 120
2272208	Silver	107	107	P/P	80 - 120
2272208	Thallium	107	107	P/P	80 - 120
2272344	Aluminum	100		P	80 - 120
2272344	Antimony	106		P	80 - 120
2272344	Arsenic	101		P	80 - 120
2272344	Beryllium	96.0		P	80 - 120
2272344	Boron	98.8		P	80 - 120
2272344	Cadmium	99.4		P	80 - 120
2272344	Chromium	103		P	80 - 120
2272344	Copper	97.7		P	80 - 120
2272344	Lead	105		P	80 - 120
2272344	Nickel	101		P	80 - 120
2272344	Selenium	99.4		P	80 - 120
2272344	Silver	105		P	80 - 120
2272344	Thallium	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403342

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: P403342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272141	Chloride	96.4		P	90 - 110
2272229	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272141	Sulfate	96.7		P	90 - 110
2272229	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403210

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272419	Ammonia-N	95.0	94.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272394	Kjeldahl Nitrogen	110	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403189

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272335	NO2NO3-N	97.0	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403323

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273025	Total-P	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403090

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272388	O-Phosphate-P	93.9	95.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P403169

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272393	Fluoride	98.4	98.4	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P403345

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272233	Organic Carbon	96.2	98.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P403097

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272313	Turbidity	5.92	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P403121

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272208	Barium	3.78	Spike	P	0 - 20
2272208	Calcium	3.07	Spike	P	0 - 20
2272208	Iron	2.31	Spike	P	0 - 20
2272208	Magnesium	2.62	Spike	P	0 - 20
2272208	Manganese	3.68	Spike	P	0 - 20
2272208	Potassium	2.75	Spike	P	0 - 20
2272208	Sodium	3.37	Spike	P	0 - 20
2272208	Zinc	2.94	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P403121

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272208	Aluminum	3.49	Spike	P	0 - 20
2272208	Antimony	0.549	Spike	P	0 - 20
2272208	Arsenic	0.783	Spike	P	0 - 20
2272208	Beryllium	1.76	Spike	P	0 - 20
2272208	Boron	3.61	Spike	P	0 - 20
2272208	Cadmium	0.464	Spike	P	0 - 20
2272208	Chromium	0.638	Spike	P	0 - 20
2272208	Copper	1.95	Spike	P	0 - 20
2272208	Lead	0.270	Spike	P	0 - 20
2272208	Nickel	1.16	Spike	P	0 - 20
2272208	Selenium	1.32	Spike	P	0 - 20
2272208	Silver	0.431	Spike	P	0 - 20
2272208	Thallium	0.664	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403342

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272141	Chloride	0.610	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403343

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272141	Sulfate	1.14	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272419	Ammonia-N	0.181	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272394	Kjeldahl Nitrogen	2.04	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272335	NO2NO3-N	0.621	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273025	Total-P	0.333	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403090

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272388	O-Phosphate-P	1.90	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P403099

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272313	Color (true)	0.296	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P403167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272393	Total Alkalinity	0.0994	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P403402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272232	TDS	5.88	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P403169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272393	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P403345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272233	Organic Carbon	1.58	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: A107515

Included Lab Sample IDs: 2272336

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A107517

Included Lab Sample IDs: 2272334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A107518

Included Lab Sample IDs: 2272334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	100	P/P	90 - 115

Reference Method: SM 2320 B-2011

Run ID: A107559

Included Lab Sample IDs: 2272334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A107559

Included Lab Sample IDs: 2272334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107563

Included Lab Sample IDs: 2272335

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107569

Included Lab Sample IDs: 2272335

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107604

Included Lab Sample IDs: 2272344, 2272345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	95.0	93.1	P/P	90 - 110
Calcium	96.1	96.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107604

Included Lab Sample IDs: 2272344, 2272345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	95.6	95.7	P/P	90 - 110
Magnesium	95.9	96.1	P/P	90 - 110
Manganese	100	97.2	P/P	90 - 110
Potassium	95.7	97.0	P/P	90 - 110
Sodium	96.1	97.0	P/P	90 - 110
Zinc	98.2	95.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107605

Included Lab Sample IDs: 2272344, 2272345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.1	101	P/P	90 - 110
Antimony	103	105	P/P	90 - 110
Arsenic	98.6	99.8	P/P	90 - 110
Beryllium	96.8	94.5	P/P	90 - 110
Boron	97.7	99.4	P/P	90 - 110
Cadmium	98.2	98.8	P/P	90 - 110
Chromium	98.8	102	P/P	90 - 110
Copper	95.6	98.2	P/P	90 - 110
Lead	98.7	100	P/P	90 - 110
Nickel	96.5	99.2	P/P	90 - 110
Selenium	97.3	99.4	P/P	90 - 110
Silver	101	102	P/P	90 - 110
Thallium	102	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107634

Included Lab Sample IDs: 2272334

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

Reference Method: SM 5310 B-2011

Run ID: A107635

Included Lab Sample IDs: 2272335

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107638

Included Lab Sample IDs: 2272335

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107640

Included Lab Sample IDs: 2272335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.0	101	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					5.92	
EPA 200.7 Rev. 4.4	Barium	93.1	103	99.1	88.2		3.78
	Calcium	100	103	97.6			3.07
	Iron	96.0	106	108	91.5		2.31
	Magnesium	97.5	107	110	99.2		2.62
	Manganese	92.9	98.9	103	88.1		3.68
	Potassium	93.9	102	105	81.8		2.75
	Sodium	95.3	103	109	98.8		3.37
	Zinc	92.2	99.6	103	90.3		2.94
EPA 200.8 Rev. 5.4	Aluminum	101	98.6	103	100		3.49
	Antimony	105	105	105	106		0.549
	Arsenic	103	100	101	101		0.783
	Beryllium	102	99.9	98.0	96.0		1.76
	Boron	96.5	98.0	104	98.8		3.61
	Cadmium	98.2	100	101	99.4		0.464
	Chromium	102	103	102	103		0.638
	Copper	103	101	98.8	97.7		1.95
	Lead	104	106	106	105		0.270
	Nickel	104	102	101	101		1.16
	Selenium	102	98.6	99.9	99.4		1.32
	Silver	108	107	107	105		0.431
	Thallium	104	107	107	107		0.664
EPA 300.0 Rev. 2.1	Chloride	100	96.4	97.9		0.610	
	Sulfate	99.9	96.7	100		1.14	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	95.0	94.8			0.181
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	110	106			2.04
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.0	97.0	98.0			0.621
EPA 365.1 Rev. 2.0	Total-P	106	107	107			0.333
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	93.9	95.7			1.90
SM 2120 B-2011	Color (true)	100				0.296	
SM 2320 B-2011	Total Alkalinity	103				0.0994	
SM 2540 C-2011	TDS					5.88	
SM 4500 F-C-2011	Fluoride	99.0	98.4	98.4			0.0
SM 5310 B-2011	Organic Carbon	99.2	96.2	98.8			1.58

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2272334
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2272344, 2272345
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2272344, 2272345
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2272334
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2272334
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2272335
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2272335
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2272335
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2272335
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2272336
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2272334
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2272334

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2272344, 2272345
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2272334
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2272334
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2272334
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2272335

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	08/27/2021			08/27/2021 15:00	Sarah A Nixon	2272334
EPA 200.7 Rev. 4.4	08/27/2021	08/30/2021 13:10	Elliott D. Healy	09/02/2021 03:36	Josef B Mick	2272344
	08/27/2021	08/30/2021 13:10	Elliott D. Healy	09/02/2021 04:00	Josef B Mick	2272345
EPA 200.8 Rev. 5.4	08/27/2021	08/30/2021 13:10	Elliott D. Healy	09/01/2021 16:21	Alexander Thompson	2272345
	08/27/2021	08/30/2021 13:10	Elliott D. Healy	09/01/2021 16:48	Alexander Thompson	2272344
EPA 300.0 Rev. 2.1	08/27/2021			09/02/2021 20:05	Roberta Tatti	2272334
EPA 350.1 Rev. 2.0	08/27/2021			08/31/2021 12:21	Ping Hua	2272335
EPA 351.2 Rev. 2.0	08/27/2021	09/02/2021 13:17	Benjamin T. Nordmann	09/03/2021 12:19	Alexandra J Mattheus	2272335
EPA 353.2 Rev. 2.0	08/27/2021			08/31/2021 09:27	Beverly Y. Sanders	2272335
EPA 365.1 Rev. 2.0	08/27/2021	09/02/2021 14:00	Simonne.V. Calhoun	09/03/2021 10:22	Shengyu Ding	2272335
EPA 365.1 Rev. 2.0 dissolved	08/27/2021			08/27/2021 14:49	James L Waggeberby	2272336
SM 2120 B-2011	08/27/2021			08/27/2021 15:46	Sarah A Nixon	2272334
SM 2320 B-2011	08/27/2021			08/30/2021 17:58	Dale L. Simmons	2272334
SM 2340B	08/27/2021			09/02/2021 03:36	Josef B Mick	2272344
	08/27/2021			09/02/2021 04:00	Josef B Mick	2272345
SM 2540 C-2011	08/27/2021			08/30/2021 15:46	Yijie Li	2272334
SM 2540 D-2011	08/27/2021			08/30/2021 14:36	Yijie Li	2272334
SM 4500 F-C-2011	08/27/2021			08/30/2021 17:58	Dale L. Simmons	2272334
SM 5310 B-2011	08/27/2021			09/02/2021 05:55	Touraj Touran	2272335