Chemical Analysis Report

CEN-DIST-2021-11-30-02

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

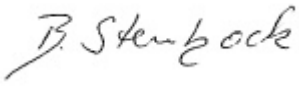
Event Description: **Long Branch**
Request ID: **RQ-2021-11-29-09**
Customer: **CEN-DIST**
Project ID: **BMAP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd. Suite 232
Orlando, FL 32803-3767
Attn: Matt Bearden

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

Report Comment: The BOD sample 2291514 was received at Eurofins TestAmerica Tampa 11/30/2021 at 09:20.

Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 16-DEC-2021 13:13



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, Nutrients and Pesticides.

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: Long Branch @ 0.7 mi DS of CR 13 **Collection Date/Time: 11/29/2021 12:46**

Field ID: G2CE0036 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2291502	EPA 180.1 Rev. 2.0	Turbidity	3.3	A	NTU	P406837	
	EPA 300.0 Rev. 2.1	Chloride	28		mg Cl/L	P407155	
		Sulfate	25		mg SO4/L	P407158	
	SM 2120 B-2011	Color (true)	160		PCU	P406830	
	SM 2320 B-2011	Total Alkalinity	68		mg CaCO3/L	P407029	
	SM 2540 C-2011	TDS	202		mg/L	P407377	
	SM 2540 D-2011	TSS	4	I	mg/L	P407346	
	SM 4500 F-C-2011	Fluoride	0.079	I	mg F/L	P407038	
2291503	EPA 350.1 Rev. 2.0	Ammonia-N	0.024		mg N/L	P407303	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P406994	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.084		mg N/L	P406861	
	EPA 365.1 Rev. 2.0	Total-P	0.077		mg P/L	P406828	
	SM 5310 B-2011	Organic Carbon	21		mg C/L	P407176	
2291504	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.050		mg P/L	P406832	
2291517	EPA 8321B	Sucralose	0.28		ug/L	P406948	
2291518	EPA 200.7 Rev. 4.4	Calcium	38.5		mg/L	P406931	
		Iron	570		ug/L	P406931	
		Magnesium	2.52		mg/L	P406931	
		Potassium	1.4		mg/L	P406931	
		Sodium	15.9		mg/L	P406931	
		Zinc	5.6	I	ug/L	P406931	
	EPA 200.8 Rev. 5.4	Arsenic	0.63		ug/L	P406931	
		Cadmium	0.020	U	ug/L	P406931	
		Chromium	0.57	I	ug/L	P406931	
		Copper	0.47	I	ug/L	P406931	
		Lead	0.43		ug/L	P406931	
		Nickel	0.50	U	ug/L	P406931	
		Silver	0.010	U	ug/L	P406931	

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: FB **Collection Date/Time: 11/29/2021 12:56**

Field ID: FB_11292021 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2291505	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P406837	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P407155	
		Sulfate	0.20	U	mg SO4/L	P407158	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P406830	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P407029	
	SM 2540 C-2011	TDS	15	U	mg/L	P407377	
	SM 2540 D-2011	TSS	2	U	mg/L	P407346	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P407038	
2291506	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P407303	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P406994	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P406861	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P406829	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P407176	
2291507	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P406833	
2291519	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P406931	
		Iron	30	U	ug/L	P406931	
		Magnesium	0.040	U	mg/L	P406931	
		Potassium	0.30	U	mg/L	P406931	
		Sodium	0.50	U	mg/L	P406931	
		Zinc	5.0	U	ug/L	P406931	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P406931	
		Cadmium	0.020	U	ug/L	P406931	
		Chromium	0.40	U	ug/L	P406931	
		Copper	0.67	I	ug/L	P406931	
		Lead	0.20	U	ug/L	P406931	
		Nickel	1.3	I	ug/L	P406931	
		Silver	0.010	U	ug/L	P406931	

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 copper and nickel result was confirmed in the undigested sample on 12/03/2021.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P406837

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406931

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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406931

Component	Result	Code	Units
Arsenic	0.050	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
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407155

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407158

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407303

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406994

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406861

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406828

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406829

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406832

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406833

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

Reference Method: EPA 8321B
Batch ID: P406948

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: SM 2120 B-2011
Batch ID: P406830

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P407029

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

Reference Method: SM 2540 C-2011
Batch ID: P407377

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P407346

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P407038

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P407176

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: P406931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	107		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	102		P	85 - 115
Sodium	97.3		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.8		P	85 - 115
Cadmium	97.8		P	85 - 115
Chromium	99.2		P	85 - 115
Copper	99.1		P	85 - 115
Lead	98.5		P	85 - 115
Nickel	99.4		P	85 - 115
Silver	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407155

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407158

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407303

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406994

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406861

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406828

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406829

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406832

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406833

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

Reference Method: EPA 8321B
Batch ID: P406948

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	100		P	40 - 150

Reference Method: SM 2120 B-2011
Batch ID: P406830

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.9		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P407029

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.6		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P407038

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P407176

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291403	Calcium	102	99.8	P/P	80 - 120
2291403	Iron	106	104	P/P	80 - 120
2291403	Magnesium	107	104	P/P	80 - 120
2291403	Potassium	97.9	95.8	P/P	80 - 120
2291403	Sodium	95.2		P	80 - 120
2291403	Zinc	109	105	P/P	80 - 120
2291656	Calcium	97.6		P	80 - 120
2291656	Iron	106		P	80 - 120
2291656	Magnesium	99.5		P	80 - 120
2291656	Potassium	106		P	80 - 120
2291656	Sodium	102		P	80 - 120
2291656	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291403	Arsenic	95.2	97.4	P/P	80 - 120
2291403	Cadmium	95.9	98.2	P/P	80 - 120
2291403	Chromium	98.7	100	P/P	80 - 120
2291403	Copper	93.9	97.5	P/P	80 - 120
2291403	Lead	96.2	98.2	P/P	80 - 120
2291403	Nickel	98.7	101	P/P	80 - 120
2291403	Silver	99.2	101	P/P	80 - 120
2291656	Arsenic	99.4		P	80 - 120
2291656	Cadmium	101		P	80 - 120
2291656	Chromium	102		P	80 - 120
2291656	Copper	98.3		P	80 - 120
2291656	Lead	99.7		P	80 - 120
2291656	Nickel	102		P	80 - 120
2291656	Silver	104		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407155

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291243	Chloride	98.9		P	90 - 110
2291468	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407158

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291243	Sulfate	97.0		P	90 - 110
2291468	Sulfate	97.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291470	Ammonia-N	97.8	98.8	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406994

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291470	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406861

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291470	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291445	Total-P	103	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406829

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291511	Total-P	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291472	O-Phosphate-P	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406833

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291524	O-Phosphate-P	98.7	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P406948

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291412	Sucralose	104	109	P/P	40 - 150

Reference Method: SM 4500 F-C-2011
Batch ID: P407038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2292330	Fluoride	98.3	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P407176

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291471	Organic Carbon	90.0	91.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P406837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291502	Turbidity	0.916	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291403	Calcium	1.64	Spike	P	0 - 20
2291403	Iron	1.91	Spike	P	0 - 20
2291403	Magnesium	1.92	Spike	P	0 - 20
2291403	Potassium	1.92	Spike	P	0 - 20
2291403	Sodium	1.89	Spike	P	0 - 20
2291403	Zinc	3.13	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291403	Arsenic	2.37	Spike	P	0 - 20
2291403	Cadmium	2.33	Spike	P	0 - 20
2291403	Chromium	1.64	Spike	P	0 - 20
2291403	Copper	2.10	Spike	P	0 - 20
2291403	Lead	1.94	Spike	P	0 - 20
2291403	Nickel	2.18	Spike	P	0 - 20
2291403	Silver	1.34	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407155

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291243	Chloride	1.04	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407158

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291243	Sulfate	1.90	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291470	Ammonia-N	0.930	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291470	Kjeldahl Nitrogen	1.18	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406861

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291470	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291445	Total-P	1.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291511	Total-P	0.757	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291472	O-Phosphate-P	0.497	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291524	O-Phosphate-P	1.71	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P406948

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291412	Sucralose	4.48	Spike	P	0 - 30

Reference Method: SM 2120 B-2011
Batch ID: P406830

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291468	Color (true)	2.69	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P407029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2292330	Total Alkalinity	1.87	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P407377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291468	TDS	2.23	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P407038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2292330	Fluoride	1.47	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P407176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291471	Organic Carbon	1.01	Spike	P	0 - 20

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2291517
Field Sample ID: G2CE0036

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	84.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B-2011
Run ID: A109127
Included Lab Sample IDs: 2291502, 2291505

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115
Color (true)	102	99.8	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A109128
Included Lab Sample IDs: 2291504, 2291507

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.5	99.1	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A109131
Included Lab Sample IDs: 2291502, 2291505

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A109138
Included Lab Sample IDs: 2291503, 2291506

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A109188
Included Lab Sample IDs: 2291503

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A109194
Included Lab Sample IDs: 2291506

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A109202
Included Lab Sample IDs: 2291518, 2291519

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.4	96.5	P/P	90 - 110
Arsenic	96.2	95.4	P/P	90 - 110
Cadmium	95.3	97.2	P/P	90 - 110
Cadmium	96.9	95.3	P/P	90 - 110
Chromium	95.0	95.6	P/P	90 - 110
Chromium	95.7	95.0	P/P	90 - 110
Copper	94.2	94.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A109202
Included Lab Sample IDs: 2291518, 2291519

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	94.3	94.6	P/P	90 - 110
Lead	93.7	94.8	P/P	90 - 110
Lead	94.4	93.7	P/P	90 - 110
Nickel	94.5	94.9	P/P	90 - 110
Nickel	94.9	95.2	P/P	90 - 110
Silver	97.4	98.8	P/P	90 - 110
Silver	98.3	97.4	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A109203
Included Lab Sample IDs: 2291502, 2291505

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	97.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A109203
Included Lab Sample IDs: 2291502, 2291505

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A109208
Included Lab Sample IDs: 2291519

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	100	98.0	P/P	95 - 105

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A109213
Included Lab Sample IDs: 2291503, 2291506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	102	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A109218
Included Lab Sample IDs: 2291517

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	100	106	P/P	60 - 160

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A109229
Included Lab Sample IDs: 2291518, 2291519

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.1	99.5	P/P	90 - 110
Calcium	99.5	99.0	P/P	90 - 110
Iron	102	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A109229
Included Lab Sample IDs: 2291518, 2291519

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	103	102	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	97.2	97.4	P/P	90 - 110
Potassium	97.4	97.2	P/P	90 - 110
Sodium	98.7	99.2	P/P	90 - 110
Zinc	102	103	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A109256
Included Lab Sample IDs: 2291502, 2291505

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

Reference Method: SM 5310 B-2011
Run ID: A109260
Included Lab Sample IDs: 2291503, 2291506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	105	P/P	90 - 110
Organic Carbon	95.8	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A109316
Included Lab Sample IDs: 2291503, 2291506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	102	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						0.916	
EPA 200.7 Rev. 4.4	Calcium	105	102	99.8	97.6			1.64
	Iron	107	106	104	106			1.91
	Magnesium	109	107	104	99.5			1.92
	Potassium	102	97.9	95.8	106			1.92
	Sodium	97.3	102	95.2				1.89
	Zinc	105	109	105	101			3.13
EPA 200.8 Rev. 5.4	Arsenic	96.8	95.2	97.4	99.4			2.37
	Cadmium	97.8	95.9	98.2	101			2.33
	Chromium	99.2	98.7	100	102			1.64
	Copper	99.1	93.9	97.5	98.3			2.10
	Lead	98.5	96.2	98.2	99.7			1.94
	Nickel	99.4	98.7	101	102			2.18
	Silver	102	99.2	101	104			1.34
EPA 300.0 Rev. 2.1	Chloride	100	98.9	101			1.04	
	Sulfate	98.4	97.0	97.9			1.90	
EPA 350.1 Rev. 2.0	Ammonia-N	99.8	97.8	98.8				0.930
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	103	104				1.18
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102				0.489
EPA 365.1 Rev. 2.0	Total-P	103	103	101				1.39
	Total-P	102	104	102				0.757
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.0	101	100				0.497
	O-Phosphate-P	99.9	98.7	100				1.71
EPA 8321B	Sucralose	100	104	109				4.48
SM 2120 B-2011	Color (true)	99.9					2.69	
SM 2320 B-2011	Total Alkalinity	99.6					1.87	
SM 2540 C-2011	TDS						2.23	
SM 4500 F-C-2011	Fluoride	102	98.3	101				1.47
SM 5310 B-2011	Organic Carbon	97.8	90.0	91.8				1.01

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2291502, 2291505
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2291518, 2291519
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2291518, 2291519
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2291502, 2291505
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2291502, 2291505
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2291503, 2291506
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2291503, 2291506
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2291503, 2291506
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2291503, 2291506
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2291504, 2291507
EPA 8321B	Water soluble organic compounds by HPLC/MS/MS	2291517
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2291502, 2291505
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2291502, 2291505
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2291502, 2291505
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2291502, 2291505
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2291502, 2291505
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2291503, 2291506

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	11/30/2021			11/30/2021 14:43	Khloe J Berg	2291502, 2291505
EPA 200.7 Rev. 4.4	11/30/2021	12/02/2021 10:40	Vijayalakshmi Reddy	12/03/2021 13:05	Josef B Mick	2291519
	11/30/2021	12/02/2021 10:40	Vijayalakshmi Reddy	12/06/2021 17:25	Josef B Mick	2291519
	11/30/2021	12/02/2021 10:40	Vijayalakshmi Reddy	12/06/2021 19:35	Josef B Mick	2291518
EPA 200.8 Rev. 5.4	11/30/2021	12/02/2021 10:40	Vijayalakshmi Reddy	12/03/2021 20:11	Emily M Philpot	2291519
	11/30/2021	12/02/2021 10:40	Vijayalakshmi Reddy	12/03/2021 22:27	Emily M Philpot	2291518
EPA 300.0 Rev. 2.1	11/30/2021			12/07/2021 09:26	James L Waggerby	2291502
	11/30/2021			12/07/2021 09:38	James L Waggerby	2291505
EPA 350.1 Rev. 2.0	11/30/2021			12/10/2021 11:22	Ping Hua	2291503
	11/30/2021			12/10/2021 11:27	Ping Hua	2291506
EPA 351.2 Rev. 2.0	11/30/2021	12/03/2021 12:03	Benjamin T. Nordmann	12/06/2021 10:31	Alexandra J Mattheus	2291503
	11/30/2021	12/03/2021 12:03	Benjamin T. Nordmann	12/06/2021 10:33	Alexandra J Mattheus	2291506
EPA 353.2 Rev. 2.0	11/30/2021			12/01/2021 09:39	Beverly Y. Sanders	2291506
	11/30/2021			12/01/2021 10:12	Beverly Y. Sanders	2291503
EPA 365.1 Rev. 2.0	11/30/2021	12/01/2021 13:15	Simonne.V. Calhoun	12/02/2021 17:54	Sarah A Nixon	2291503
	11/30/2021	12/01/2021 13:15	Simonne.V. Calhoun	12/03/2021 12:56	Shengyu Ding	2291506
EPA 365.1 Rev. 2.0 dissolved	11/30/2021			11/30/2021 14:52	James L Waggerby	2291504
	11/30/2021			11/30/2021 14:58	James L Waggerby	2291507
EPA 8321B	11/30/2021	12/02/2021 15:00	Juyoung Kim	12/03/2021 13:37	Manjita Shrestha	2291517
SM 2120 B-2011	11/30/2021			11/30/2021 15:22	Blanca Fach	2291505
	11/30/2021			11/30/2021 15:33	Blanca Fach	2291502
SM 2320 B-2011	11/30/2021			12/04/2021 01:40	Dale L. Simmons	2291502
	11/30/2021			12/04/2021 01:48	Dale L. Simmons	2291505
SM 2540 C-2011	11/30/2021			12/03/2021 15:08	Yijie Li	2291502, 2291505
SM 2540 D-2011	11/30/2021			12/03/2021 15:35	Yijie Li	2291502, 2291505
SM 4500 F-C-2011	11/30/2021			12/04/2021 01:40	Dale L. Simmons	2291502
	11/30/2021			12/04/2021 01:48	Dale L. Simmons	2291505
SM 5310 B-2011	11/30/2021			12/07/2021 18:04	Khloe J Berg	2291503
	11/30/2021			12/07/2021 20:42	Khloe J Berg	2291506