

Chemical Analysis Report

NW-DIST-2021-10-01-02

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

Event Description: **Escambia River Run**
Request ID: **RQ-2021-09-13-26**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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Date Certified: 26-OCT-2021 09:45



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: Escambia River upstream of Mitchell Creek

Collection Date/Time: 09/30/2021 11:15

Field ID: G4NW0404

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2279870	EPA 180.1 Rev. 2.0	Turbidity	15		NTU	P404481	
	EPA 300.0 Rev. 2.1	Chloride	5.4		mg Cl/L	P404662	
		Sulfate	7.0		mg SO4/L	P404665	
		Color (true)	67	J	PCU	P404471	
	SM 2320 B-2011	Total Alkalinity	28		mg CaCO3/L	P404825	
	SM 2540 C-2011	TDS	70		mg/L	P404940	
	SM 2540 D-2011	TSS	14		mg/L	P404898	
	SM 4500 F-C-2011	Fluoride	0.036	I	mg F/L	P404696	
2279872	EPA 350.1 Rev. 2.0	Ammonia-N	0.071		mg N/L	P404902	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.41		mg N/L	P404590	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P404577	
	EPA 365.1 Rev. 2.0	Total-P	0.047		mg P/L	P404672	
	SM 5310 B-2011	Organic Carbon	5.1		mg C/L	P404604	
2279874	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.020		mg P/L	P404468	
2279878	EPA 200.7 Rev. 4.4	Barium	28.0		ug/L	P404542	
		Calcium	9.67		mg/L	P404542	
		Iron	1.42E+03		ug/L	P404542	
		Magnesium	1.29		mg/L	P404542	
		Manganese	68.8		ug/L	P404542	
		Potassium	1.0	I	mg/L	P404542	
		Sodium	7.1		mg/L	P404542	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P404542	
		Aluminum	122		ug/L	P404542	
		Antimony	0.050	U	ug/L	P404542	
		Arsenic	0.71		ug/L	P404542	
		Beryllium	0.064		ug/L	P404542	
		Boron**	12.8		ug/L	P404542	
		Cadmium	0.020	U	ug/L	P404542	
		Chromium	0.44	I	ug/L	P404542	
		Copper	0.40	I	ug/L	P404542	
		Lead	0.32	I	ug/L	P404542	
		Nickel	0.66	I	ug/L	P404542	
		Selenium	0.20	U	ug/L	P404542	
		Silver	0.010	U	ug/L	P404542	
		Thallium	0.10	U	ug/L	P404542	
		Hardness	29.4		mg/L	P404542	

Ref. Method and Comment:

SM 2120 B-2011: The result may be biased high because of matrix interference.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Escambia River downstream of Cotton Lake

Collection Date/Time: 09/30/2021 10:20

Field ID: G4NW0403

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2279871	EPA 180.1 Rev. 2.0	Turbidity	16		NTU	P404481	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P404662	
		Sulfate	6.5		mg SO4/L	P404665	
		Color (true)	73	J	PCU	P404471	
	SM 2320 B-2011	Total Alkalinity	27		mg CaCO3/L	P404825	
	SM 2540 C-2011	TDS	56		mg/L	P404940	
	SM 2540 D-2011	TSS	16		mg/L	P404898	
	SM 4500 F-C-2011	Fluoride	0.036	I	mg F/L	P404696	
2279873	EPA 350.1 Rev. 2.0	Ammonia-N	0.057		mg N/L	P404902	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35		mg N/L	P404590	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P404577	
	EPA 365.1 Rev. 2.0	Total-P	0.046		mg P/L	P404672	
	SM 5310 B-2011	Organic Carbon	5.6		mg C/L	P404845	
2279875	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P404468	
2279879	EPA 200.7 Rev. 4.4	Barium	27.9		ug/L	P404542	
		Calcium	9.64		mg/L	P404542	
		Iron	1.45E+03		ug/L	P404542	
		Magnesium	1.31		mg/L	P404542	
		Manganese	70.7		ug/L	P404542	
		Potassium	1.1	I	mg/L	P404542	
		Sodium	6.8		mg/L	P404542	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P404542	
		Aluminum	142		ug/L	P404542	
		Antimony	0.050	U	ug/L	P404542	
		Arsenic	0.73		ug/L	P404542	
		Beryllium	0.079		ug/L	P404542	
		Boron**	12.2		ug/L	P404542	
		Cadmium	0.020	U	ug/L	P404542	
		Chromium	0.48	I	ug/L	P404542	
		Copper	0.75	I	ug/L	P404542	
		Lead	0.35	I	ug/L	P404542	
		Nickel	0.68	I	ug/L	P404542	
		Selenium	0.20	U	ug/L	P404542	
		Silver	0.010	U	ug/L	P404542	
		Thallium	0.10	U	ug/L	P404542	
		Hardness	29.5		mg/L	P404542	

Ref. Method and Comment:

SM 2120 B-2011: The result may be biased high because of matrix interference.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P404481

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P404542

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: P404542

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: P404662

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404665

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404902

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: P404590

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404577

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404672

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P404468

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

Reference Method: SM 2120 B-2011
Batch ID: P404471

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P404825

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

Reference Method: SM 2540 C-2011
Batch ID: P404940

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P404898

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P404696

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: P404604

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-2011
Batch ID: P404845

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: P404542

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	104		P	85 - 115
Iron	108		P	85 - 115
Magnesium	107		P	85 - 115
Manganese	103		P	85 - 115
Potassium	98.2		P	85 - 115
Sodium	103		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P404542

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	105		P	85 - 115
Boron	100		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	96.9		P	85 - 115
Copper	98.3		P	85 - 115
Lead	96.6		P	85 - 115
Nickel	98.4		P	85 - 115
Selenium	97.4		P	85 - 115
Silver	97.1		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404662

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404665

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404902

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: P404590

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404577

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404672

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P404468

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.2		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P404471

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.6		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P404825

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.5		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P404696

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P404604

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

Reference Method: SM 5310 B-2011
Batch ID: P404845

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P404542

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279028	Barium	102		P	80 - 120
2279028	Calcium	103		P	80 - 120
2279028	Iron	108		P	80 - 120
2279028	Magnesium	108		P	80 - 120
2279028	Manganese	103		P	80 - 120
2279028	Potassium	98.9		P	80 - 120
2279028	Sodium	102		P	80 - 120
2279028	Zinc	106		P	80 - 120
2279286	Barium	103	99.8	P/P	80 - 120
2279286	Calcium	105	101	P/P	80 - 120
2279286	Iron	108	105	P/P	80 - 120
2279286	Magnesium	107	104	P/P	80 - 120
2279286	Manganese	103	99.7	P/P	80 - 120
2279286	Potassium	103	102	P/P	80 - 120
2279286	Sodium	102	97.5	P/P	80 - 120
2279286	Zinc	105	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P404542

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279028	Aluminum	101		P	80 - 120
2279028	Antimony	107		P	80 - 120
2279028	Arsenic	104		P	80 - 120
2279028	Beryllium	108		P	80 - 120
2279028	Boron	101		P	80 - 120
2279028	Cadmium	104		P	80 - 120
2279028	Chromium	100		P	80 - 120
2279028	Copper	100		P	80 - 120
2279028	Lead	101		P	80 - 120
2279028	Nickel	99.4		P	80 - 120
2279028	Selenium	102		P	80 - 120
2279028	Silver	97.7		P	80 - 120
2279028	Thallium	109		P	80 - 120
2279286	Aluminum	101	101	P/P	80 - 120
2279286	Antimony	104	106	P/P	80 - 120
2279286	Arsenic	99.9	102	P/P	80 - 120
2279286	Beryllium	103	105	P/P	80 - 120
2279286	Boron	104	105	P/P	80 - 120
2279286	Cadmium	101	101	P/P	80 - 120
2279286	Chromium	98.0	100	P/P	80 - 120
2279286	Copper	97.2	99.3	P/P	80 - 120
2279286	Lead	98.5	100	P/P	80 - 120
2279286	Nickel	95.3	96.6	P/P	80 - 120
2279286	Selenium	96.6	99.3	P/P	80 - 120
2279286	Silver	96.9	98.1	P/P	80 - 120
2279286	Thallium	105	107	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P404662

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: P404662

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279580	Chloride	99.0		P	90 - 110
2279748	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279580	Sulfate	100		P	90 - 110
2279748	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279834	Ammonia-N	98.0	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P404590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279872	Kjeldahl Nitrogen	96.3	95.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279872	NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P404468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279874	O-Phosphate-P	94.8	95.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P404696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279840	Fluoride	101	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P404604

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279750	Organic Carbon	95.8	96.1	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P404845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2279942	Organic Carbon	95.8	96.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P404481

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279914	Turbidity	12.4	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P404542

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279286	Barium	3.43	Spike	P	0 - 20
2279286	Calcium	2.37	Spike	P	0 - 20
2279286	Iron	2.84	Spike	P	0 - 20
2279286	Magnesium	2.57	Spike	P	0 - 20
2279286	Manganese	3.32	Spike	P	0 - 20
2279286	Potassium	1.04	Spike	P	0 - 20
2279286	Sodium	3.26	Spike	P	0 - 20
2279286	Zinc	3.05	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P404542

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279286	Aluminum	0.0194	Spike	P	0 - 20
2279286	Antimony	1.62	Spike	P	0 - 20
2279286	Arsenic	1.55	Spike	P	0 - 20
2279286	Beryllium	2.16	Spike	P	0 - 20
2279286	Boron	1.15	Spike	P	0 - 20
2279286	Cadmium	0.483	Spike	P	0 - 20
2279286	Chromium	2.31	Spike	P	0 - 20
2279286	Copper	2.15	Spike	P	0 - 20
2279286	Lead	1.65	Spike	P	0 - 20
2279286	Nickel	1.34	Spike	P	0 - 20
2279286	Selenium	2.81	Spike	P	0 - 20
2279286	Silver	1.24	Spike	P	0 - 20
2279286	Thallium	2.61	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P404662

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279580	Chloride	0.836	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P404665

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279580	Sulfate	3.77	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279834	Ammonia-N	1.15	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P404590

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279872	Kjeldahl Nitrogen	0.894	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279872	NO2NO3-N	0.411	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279915	Total-P	0.838	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P404468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279874	O-Phosphate-P	0.260	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P404471

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279833	Color (true)	0.948	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P404825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279840	Total Alkalinity	0.132	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P404940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279914	TDS	3.66	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 D-2011
Batch ID: P404898

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279914	TSS	3.08	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P404696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279840	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P404604

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279750	Organic Carbon	0.183	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P404845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2279942	Organic Carbon	0.355	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: A108107

Included Lab Sample IDs: 2279874, 2279875

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	99.7	P/P	90 - 110
O-Phosphate-P	99.7	98.6	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A108108

Included Lab Sample IDs: 2279870, 2279871

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A108111

Included Lab Sample IDs: 2279870, 2279871

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: A108146

Included Lab Sample IDs: 2279872, 2279873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	103	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A108154

Included Lab Sample IDs: 2279872

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.3	95.4	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A108179

Included Lab Sample IDs: 2279870, 2279871

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

Reference Method: SM 4500 F-C-2011

Run ID: A108185

Included Lab Sample IDs: 2279870, 2279871

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A108188

Included Lab Sample IDs: 2279878, 2279879

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A108188

Included Lab Sample IDs: 2279878, 2279879

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	101	P/P	90 - 110
Antimony	107	104	P/P	90 - 110
Arsenic	103	100	P/P	90 - 110
Beryllium	103	101	P/P	90 - 110
Boron	106	106	P/P	90 - 110
Cadmium	105	102	P/P	90 - 110
Chromium	99.5	96.0	P/P	90 - 110
Copper	97.3	94.5	P/P	90 - 110
Lead	98.1	95.6	P/P	90 - 110
Nickel	96.4	93.7	P/P	90 - 110
Selenium	102	100	P/P	90 - 110
Silver	99.3	97.5	P/P	90 - 110
Thallium	105	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A108189

Included Lab Sample IDs: 2279878, 2279879

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.2	97.5	P/P	90 - 110
Calcium	101	101	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Manganese	100	100	P/P	90 - 110
Potassium	97.3	97.4	P/P	90 - 110
Sodium	100	100	P/P	90 - 110
Zinc	102	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A108200

Included Lab Sample IDs: 2279872, 2279873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108230

Included Lab Sample IDs: 2279872, 2279873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	97.0	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A108253

Included Lab Sample IDs: 2279870, 2279871

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.8	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A108262

Included Lab Sample IDs: 2279873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	96.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A108277

Included Lab Sample IDs: 2279872, 2279873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.6	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					12.4	
EPA 200.7 Rev. 4.4	Barium	102	102	103	99.8		3.43
	Calcium	104	103	105	101		2.37
	Iron	108	108	108	105		2.84
	Magnesium	107	108	107	104		2.57
	Manganese	103	103	103	99.7		3.32
	Potassium	98.2	98.9	103	102		1.04
	Sodium	103	102	102	97.5		3.26
	Zinc	104	106	105	102		3.05
EPA 200.8 Rev. 5.4	Aluminum	100	101	101	101		0.0194
	Antimony	102	107	104	106		1.62
	Arsenic	102	104	99.9	102		1.55
	Beryllium	105	108	103	105		2.16
	Boron	100	101	104	105		1.15
	Cadmium	100	104	101	101		0.483
	Chromium	96.9	100	98.0	100		2.31
	Copper	98.3	100	97.2	99.3		2.15
	Lead	96.6	101	98.5	100		1.65
	Nickel	98.4	99.4	95.3	96.6		1.34
	Selenium	97.4	102	96.6	99.3		2.81
	Silver	97.1	97.7	96.9	98.1		1.24
	Thallium	101	109	105	107		2.61
EPA 300.0 Rev. 2.1	Chloride	98.9	99.0	101		0.836	
	Sulfate	101	100	103		3.77	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	98.0	99.2			1.15
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.8	96.3	95.1			0.894
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	97.0				0.411
EPA 365.1 Rev. 2.0	Total-P	105					0.838
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	94.8	95.1			0.260
SM 2120 B-2011	Color (true)	96.6				0.948	
SM 2320 B-2011	Total Alkalinity	99.5				0.132	
SM 2540 C-2011	TDS					3.66	
SM 2540 D-2011	TSS					3.08	
SM 4500 F-C-2011	Fluoride	100	101	101			0.0
SM 5310 B-2011	Organic Carbon	95.6	95.8	96.1			0.183
	Organic Carbon	96.2	95.8	96.3			0.355

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2279870, 2279871
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2279878, 2279879
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2279878, 2279879
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2279870, 2279871
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2279870, 2279871
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2279872, 2279873
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2279872, 2279873
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2279872, 2279873
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2279872, 2279873
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2279874, 2279875

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2279870, 2279871
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2279870, 2279871
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2279878, 2279879
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2279870, 2279871
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2279870, 2279871
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2279870, 2279871
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2279872, 2279873

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	10/01/2021			10/01/2021 15:49	Khloe J Berg	2279870, 2279871
EPA 200.7 Rev. 4.4	10/01/2021	10/05/2021 11:00	Emily M Philpot	10/06/2021 18:34	Josef B Mick	2279878
	10/01/2021	10/05/2021 11:00	Emily M Philpot	10/06/2021 18:41	Josef B Mick	2279879
EPA 200.8 Rev. 5.4	10/01/2021	10/05/2021 11:00	Emily M Philpot	10/07/2021 01:33	Alexander Thompson	2279878
	10/01/2021	10/05/2021 11:00	Emily M Philpot	10/07/2021 01:43	Alexander Thompson	2279879
EPA 300.0 Rev. 2.1	10/01/2021			10/05/2021 17:10	Roberta Tatti	2279870
	10/01/2021			10/05/2021 17:22	Roberta Tatti	2279871
EPA 350.1 Rev. 2.0	10/01/2021			10/11/2021 12:37	Ping Hua	2279872
	10/01/2021			10/11/2021 12:38	Ping Hua	2279873
EPA 351.2 Rev. 2.0	10/01/2021	10/05/2021 12:35	Benjamin T. Nordmann	10/07/2021 09:37	Alexandra J Mattheus	2279872
	10/01/2021	10/05/2021 12:35	Benjamin T. Nordmann	10/07/2021 09:42	Alexandra J Mattheus	2279873
EPA 353.2 Rev. 2.0	10/01/2021			10/05/2021 10:49	Beverly Y. Sanders	2279872
	10/01/2021			10/05/2021 10:58	Beverly Y. Sanders	2279873
EPA 365.1 Rev. 2.0	10/01/2021	10/06/2021 12:50	Simonne.V. Calhoun	10/07/2021 14:15	Lipi Saha	2279872
	10/01/2021	10/06/2021 12:50	Simonne.V. Calhoun	10/07/2021 14:16	Lipi Saha	2279873
EPA 365.1 Rev. 2.0 dissolved	10/01/2021			10/01/2021 14:13	James L Waggeberby	2279874
	10/01/2021			10/01/2021 14:25	James L Waggeberby	2279875
SM 2120 B-2011	10/01/2021			10/01/2021 15:14	Benjamin T. Nordmann	2279870
	10/01/2021			10/01/2021 15:15	Benjamin T. Nordmann	2279871
SM 2320 B-2011	10/01/2021			10/09/2021 02:12	Dale L. Simmons	2279870
	10/01/2021			10/09/2021 02:21	Dale L. Simmons	2279871
SM 2340B	10/01/2021			10/06/2021 18:34	Josef B Mick	2279878
	10/01/2021			10/06/2021 18:41	Josef B Mick	2279879
SM 2540 C-2011	10/01/2021			10/04/2021 14:45	Yijie Li	2279870, 2279871
SM 2540 D-2011	10/01/2021			10/04/2021 14:45	Yijie Li	2279870, 2279871
SM 4500 F-C-2011	10/01/2021			10/06/2021 20:44	Dale L. Simmons	2279870
	10/01/2021			10/06/2021 20:52	Dale L. Simmons	2279871
SM 5310 B-2011	10/01/2021			10/05/2021 07:39	Khloe J Berg	2279872
	10/01/2021			10/08/2021 21:01	Khloe J Berg	2279873