Chemical Analysis Report

NW-DIST-2017-08-16-01

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

Event Description: **Upper Escambia River WBID 10 A,B,C**
Request ID: **RQ-2017-08-14-21**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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160 W Government St
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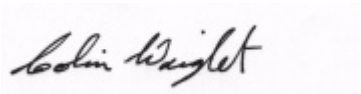
Certified by: Colin Wright, Program Administrator

Date Certified: 13-SEP-2017 10:51



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 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 downstream of Cotton Lake **Collection Date/Time: 08/15/2017 11:10**

Field ID: G4NW0403 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1921833	EPA 180.1 Rev. 2.0	Turbidity	18	A	NTU	P330339	
	EPA 300.0 Rev. 2.1	Chloride	3.9		mg Cl/L	P330470	
		Sulfate	3.9		mg SO4/L	P330468	
	SM 2120 B	Color (true)	45	A	PCU	P330352	
	SM 2320 B-97	Total Alkalinity	23		mg CaCO3/L	P330606	
	SM 2540 C-97	TDS	70		mg/L	P330693	
	SM 2540 D-97	TSS	15		mg/L	P330921	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P330609	
1921835	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P330515	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P330451	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.17		mg N/L	P330563	
	EPA 365.1 Rev. 2.0	Total-P	0.042		mg P/L	P330420	
	SM 5310 B-00	Organic Carbon	7.2		mg C/L	P330659	
1921837	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P330346	
1921844	EPA 200.7 Rev. 4.4	Calcium	8.62		mg/L	P330427	
		Iron	2.12E+03		ug/L	P330427	
		Magnesium	1.09		mg/L	P330427	
		Potassium	1.0	I	mg/L	P330427	
		Sodium	4.0		mg/L	P330427	
		Zinc	5.0	U	ug/L	P330427	
	EPA 200.8 Rev. 5.4	Arsenic	1.10		ug/L	P330427	
		Cadmium	0.020	U	ug/L	P330427	
		Chromium	1.4	I	ug/L	P330427	
		Copper	0.67	I	ug/L	P330427	
		Lead	0.66		ug/L	P330427	
		Nickel	1.00		ug/L	P330587	
		Silver	0.010	U	ug/L	P330427	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for aluminum are unavailable for one of two spiked samples because of high analyte concentration in the QC sample. The lead result was confirmed on 08/24/2017.

Sample Location: Escambia River upstream of Mitchell Creek **Collection Date/Time: 08/15/2017 12:00**

Field ID: G4NW0404 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1921834	EPA 180.1 Rev. 2.0	Turbidity	20		NTU	P330339	
	EPA 300.0 Rev. 2.1	Chloride	4.0	A	mg Cl/L	P330470	
		Sulfate	4.2	A	mg SO4/L	P330468	
	SM 2120 B	Color (true)	42		PCU	P330352	
	SM 2320 B-97	Total Alkalinity	25		mg CaCO3/L	P330606	
	SM 2540 C-97	TDS	70		mg/L	P330693	
	SM 2540 D-97	TSS	20		mg/L	P330921	

Field ID: G4NW0404 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1921834	SM 4500 F-C-97	Fluoride	0.040	I	mg F/L	P330609	
1921836	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P330515	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.28		mg N/L	P330451	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P330563	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P330420	
	SM 5310 B-00	Organic Carbon	6.9		mg C/L	P330659	
1921838	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P330347	
1921845	EPA 200.7 Rev. 4.4	Calcium	9.14		mg/L	P330427	
		Iron	2.11E+03		ug/L	P330427	
		Magnesium	1.10		mg/L	P330427	
		Potassium	1.0	I	mg/L	P330427	
		Sodium	4.2		mg/L	P330427	
		Zinc	5.0	U	ug/L	P330427	
	EPA 200.8 Rev. 5.4	Arsenic	1.10		ug/L	P330427	
		Cadmium	0.020	U	ug/L	P330427	
		Chromium	1.6	I	ug/L	P330427	
		Copper	0.67	I	ug/L	P330427	
		Lead	0.67		ug/L	P330427	
		Nickel	1.03		ug/L	P330587	
		Silver	0.010	U	ug/L	P330427	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for aluminum are unavailable for one of two spiked samples because of high analyte concentration in the QC sample. The lead result was confirmed on 08/24/2017.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P330339

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330427

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: P330427

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330427

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330587

Component	Result	Code	Units
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330468

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330470

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P330515

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330451

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330563

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330420

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330346

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330347

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

Reference Method: SM 2120 B
Batch ID: P330352

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P330606

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

Reference Method: SM 2540 C-97
Batch ID: P330693

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P330921

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P330609

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P330659

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: P330427

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330427

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	102		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	97.9		P	85 - 115
Sodium	96.0		P	85 - 115
Zinc	94.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330427

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	105		P	85 - 115
Cadmium	95.9		P	85 - 115
Chromium	100		P	85 - 115
Copper	101		P	85 - 115
Lead	98.7		P	85 - 115
Silver	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330587

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Nickel	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330468

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330470

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P330515

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330451

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330563

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330563

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330420

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330346

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330347

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	104		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P330606

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P330609

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.3		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P330659

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1922083	Calcium	100		P	80 - 120
1922083	Iron	99.9		P	80 - 120
1922083	Magnesium	101		P	80 - 120
1922083	Potassium	98.6		P	80 - 120
1922083	Sodium	98.1		P	80 - 120
1922083	Zinc	97.2		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1922129	Calcium	104	96.0	P/P	80 - 120
1922129	Iron	104	98.6	P/P	80 - 120
1922129	Magnesium	104	98.7	P/P	80 - 120
1922129	Potassium	96.8	89.2	P/P	80 - 120
1922129	Sodium	95.8		P	80 - 120
1922129	Zinc	96.9	96.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1922083	Arsenic	105		P	80 - 120
1922083	Cadmium	98.1		P	80 - 120
1922083	Chromium	103		P	80 - 120
1922083	Copper	101		P	80 - 120
1922083	Lead	99.3		P	80 - 120
1922083	Silver	103		P	80 - 120
1922129	Arsenic	103	103	P/P	80 - 120
1922129	Cadmium	93.4	96.8	P/P	80 - 120
1922129	Chromium	97.6	98.9	P/P	80 - 120
1922129	Copper	97.1	98.1	P/P	80 - 120
1922129	Lead	96.0	98.0	P/P	80 - 120
1922129	Silver	98.8	100	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330587

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1922123	Nickel	99.5		P	80 - 120
1922604	Nickel	99.0	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1921834	Sulfate	95.4		P	90 - 110
1921879	Sulfate	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1921834	Chloride	96.4		P	90 - 110
1921879	Chloride	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330451

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1921883	Kjeldahl Nitrogen	94.4	91.8	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330563

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1921467	NO2NO3-N	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1921709	O-Phosphate-P	91.7	93.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1921887	O-Phosphate-P	96.9	98.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P330609

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1921686	Fluoride	98.0	98.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P330659

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1921787	Organic Carbon	101		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P330339

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921833	Turbidity	1.10	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330427

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1922129	Calcium	4.16	Spike	P	0 - 20
1922129	Iron	4.78	Spike	P	0 - 20
1922129	Magnesium	3.99	Spike	P	0 - 20
1922129	Potassium	4.37	Spike	P	0 - 20
1922129	Sodium	0.720	Spike	P	0 - 20
1922129	Zinc	0.540	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330427

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1922129	Arsenic	0.0999	Spike	P	0 - 20
1922129	Cadmium	3.56	Spike	P	0 - 20
1922129	Chromium	1.28	Spike	P	0 - 20
1922129	Copper	0.932	Spike	P	0 - 20
1922129	Lead	2.04	Spike	P	0 - 20
1922129	Silver	1.43	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1922604	Nickel	1.86	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921834	Sulfate	1.79	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921834	Chloride	0.0423	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P330515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921717	Ammonia-N	0.00179	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330451

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921883	Kjeldahl Nitrogen	1.39	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921467	NO2NO3-N	0.466	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921997	Total-P	3.16	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921709	O-Phosphate-P	1.94	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921887	O-Phosphate-P	0.762	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P330352

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921833	Color (true)	1.57	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P330606

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921686	Total Alkalinity	0.213	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P330693

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921702	TDS	6.11	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P330609

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921686	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P330659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1921787	Organic Carbon	1.09	Spike	P	0 - 20

Quality Assurance Report
Precision

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A78421
Included Lab Sample IDs: 1921833, 1921834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.8	99.9	P/P	90 - 110
Chloride	99.9	99.7	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110
Sulfate	99.1	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A78439
Included Lab Sample IDs: 1921833, 1921834

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A78443
Included Lab Sample IDs: 1921837, 1921838

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	99.1	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A78444
Included Lab Sample IDs: 1921833, 1921834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	103	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A78507
Included Lab Sample IDs: 1921835, 1921836

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A78513
Included Lab Sample IDs: 1921835, 1921836

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A78522
Included Lab Sample IDs: 1921844, 1921845

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	99.8	P/P	90 - 110
Cadmium	97.7	98.9	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Lead	98.0	99.1	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A78523
Included Lab Sample IDs: 1921844, 1921845

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.7	99.0	P/P	90 - 110
Iron	98.9	98.0	P/P	90 - 110
Magnesium	98.8	98.0	P/P	90 - 110
Potassium	97.1	96.3	P/P	90 - 110
Sodium	96.0	96.7	P/P	90 - 110
Zinc	98.6	97.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A78528
Included Lab Sample IDs: 1921835, 1921836

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A78550
Included Lab Sample IDs: 1921835, 1921836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.5	97.6	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A78552
Included Lab Sample IDs: 1921833, 1921834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A78552
Included Lab Sample IDs: 1921833, 1921834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.5	99.5	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A78572
Included Lab Sample IDs: 1921835, 1921836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A78572
Included Lab Sample IDs: 1921835, 1921836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.8	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A78590
Included Lab Sample IDs: 1921844, 1921845

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A78612
Included Lab Sample IDs: 1921844, 1921845

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	99.8	100	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						1.10	
EPA 200.7 Rev. 4.4	Calcium	104	100	104	96.0			4.16
	Iron	102	99.9	104	98.6			4.78
	Magnesium	103	101	104	98.7			3.99
	Potassium	97.9	98.6	96.8	89.2			4.37
	Sodium	96.0	98.1	95.8				0.720
	Zinc	94.6	97.2	96.9	96.4			0.540
EPA 200.8 Rev. 5.4	Arsenic	105	103	103	105			0.0999
	Cadmium	95.9	93.4	96.8	98.1			3.56
	Chromium	100	97.6	98.9	103			1.28
	Copper	101	97.1	98.1	101			0.932
	Lead	98.7	96.0	98.0	99.3			2.04
	Nickel	103	99.5	99.0	101			1.86
	Silver	102	98.8	100	103			1.43
EPA 300.0 Rev. 2.1	Chloride	97.5	96.4	98.2			0.0423	
	Sulfate	96.6	95.4	97.5			1.79	
EPA 350.1 Rev. 2.0	Ammonia-N	99.4						0.0017
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	94.4	91.8				1.39
EPA 353.2 Rev. 2.0	NO2NO3-N	104	105	104				0.466
EPA 365.1 Rev. 2.0	Total-P	97.7						3.16
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	91.7	93.5				1.94
	O-Phosphate-P	104	96.9	98.3				0.762
SM 2120 B	Color (true)						1.57	
SM 2320 B-97	Total Alkalinity	102					0.213	
SM 2540 C-97	TDS						6.11	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 4500 F-C-97	Fluoride	95.3	98.0	98.0			0.0
SM 5310 B-00	Organic Carbon	96.0	101				1.09

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1921833, 1921834
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1921844, 1921845
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1921844, 1921845
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1921833, 1921834
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1921833, 1921834
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1921835, 1921836
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1921835, 1921836
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1921835, 1921836
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1921835, 1921836
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1921837, 1921838
SM 2120 B / E31780	True Color measured at 450 nm	1921833, 1921834
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1921833, 1921834
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1921833, 1921834
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1921833, 1921834
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1921833, 1921834
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1921835, 1921836

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	08/16/2017			08/16/2017 15:34	DeAsia Armster	1921833, 1921834
EPA 200.7 Rev. 4.4	08/16/2017	08/17/2017	Elliott D. Healy	08/18/2017	Betina Topolski	1921844, 1921845
EPA 200.8 Rev. 5.4	08/16/2017	08/17/2017	Elliott D. Healy	08/20/2017	Robert K Palmer	1921844, 1921845
	08/16/2017	08/17/2017	Elliott D. Healy	08/23/2017	Nadine Brooks	1921844, 1921845
	08/16/2017	08/21/2017	Elliott D. Healy	08/24/2017	Nadine Brooks	1921844, 1921845
EPA 300.0 Rev. 2.1	08/16/2017			08/17/2017	Julia Storbeck	1921833, 1921834
EPA 350.1 Rev. 2.0	08/16/2017			08/17/2017	Sofia Elnemr	1921835, 1921836
EPA 351.2 Rev. 2.0	08/16/2017	08/18/2017	Adrian Shelby	08/21/2017	Joseph Suarez	1921835, 1921836
EPA 353.2 Rev. 2.0	08/16/2017			08/21/2017	Beverly Y. Sanders	1921835, 1921836
EPA 365.1 Rev. 2.0	08/16/2017	08/17/2017	Sima Feizi	08/18/2017	Lipi Saha	1921835, 1921836
EPA 365.1 Rev. 2.0 dissolved	08/16/2017			08/16/2017 15:20	Megan Treadwell	1921837
	08/16/2017			08/16/2017 15:21	Megan Treadwell	1921838
SM 2120 B	08/16/2017			08/16/2017 16:57	Tanya Welborn	1921833
	08/16/2017			08/16/2017 16:58	Tanya Welborn	1921834
SM 2320 B-97	08/16/2017			08/18/2017	Dale L. Simmons	1921833, 1921834
SM 2540 C-97	08/16/2017			08/18/2017	Yijie Li	1921833, 1921834
SM 2540 D-97	08/16/2017			08/18/2017	Yijie Li	1921833, 1921834
SM 4500 F-C-97	08/16/2017			08/18/2017	Dale L. Simmons	1921833, 1921834
SM 5310 B-00	08/16/2017			08/22/2017	Ping Hua	1921835, 1921836