

Chemical Analysis Report

SO-DIST-2016-09-09-03

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

Event Description: **EBAP D-Kit**
Request ID: **RQ-2016-09-12-09**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Corey Anderson

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Certified by: Colin Wright, Environmental Administrator

Date Certified: 06-OCT-2016 12:36

A handwritten signature in black ink, appearing to read "Colin Wright", is written on a light-colored rectangular background.

Case Narrative

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

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

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

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

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: MATANZAS PASS/SCAN CARLOS/DEP DOCK Collection Date/Time: 09/08/2016 10:45

Field ID: G2SD-SEPTEMBER

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830072	EPA 180.1 Rev. 2.0	Turbidity	3.7		NTU	P310908	
	SM 2320 B-97	Total Alkalinity	125		mg CaCO3/L	P311452	
	SM 2540 D-97	TSS	8	I	mg/L	P311492	RPD
	SM 4500 F-C-97	Fluoride	1.1		mg F/L	P311627	
1830073	EPA 350.1 Rev. 2.0	Ammonia-N	0.083		mg N/L	P311171	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P311200	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.037		mg N/L	P311697	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P311482	
	SM 5310 B-00	Organic Carbon	5.2		mg C/L	P311164	
1830074	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.025		mg P/L	P310922	
1830079	EPA 200.7 Rev. 4.4	Iron	30	U	ug/L	P311144	
	EPA 200.8 Rev. 5.4	Arsenic	2.22		ug/L	P311144	
		Cadmium	0.060	U	ug/L	P311144	
		Chromium	0.33	I	ug/L	P311144	
		Copper	1.6		ug/L	P311144	
		Lead	0.25	U	ug/L	P311144	
		Nickel	0.30	I	ug/L	P311144	
		Silver	0.015	U	ug/L	P311144	
		Zinc	3.0	U	ug/L	P311144	

Sample Location: MATANZAS PASS/SCAN CARLOS/DEP DOCK Collection Date/Time: 09/08/2016 10:45

Field ID: G2SD-SEPTEMBER

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1830075	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P310908	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P311258	
	SM 2540 D-97	TSS	2	U	mg/L	P311490	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P311261	
1830076	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P311171	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P311099	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P311589	
	EPA 365.1 Rev. 2.0	Total-P	0.003	I	mg P/L	P311828	
	SM 5310 B-00	Organic Carbon	1.1		mg C/L	P311339	
1830077	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P310921	
1830080	EPA 200.7 Rev. 4.4	Iron	30	U	ug/L	P311044	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P311044	
		Cadmium	0.020	U	ug/L	P311044	
		Chromium	0.050	U	ug/L	P311044	
		Copper	0.10	U	ug/L	P311044	
		Lead	0.050	U	ug/L	P311519	
		Nickel	0.076	I	ug/L	P311519	
		Silver	0.0050	U	ug/L	P311044	
		Zinc	1.0	I	ug/L	P311519	

Field ID: G2SD-SEPTEMBER

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
Ref. Method and Comment:							
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.							
EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 09/30/2016.							
SM 5310 B-00: The result was confirmed on 09/19/2016.							
EPA 200.8 Rev. 5.4: The nickel and zinc results were confirmed on 09/19/2016.							

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310908

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311044

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311144

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311044

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311144

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311519

Component	Result	Code	Units
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311519

Component	Result	Code	Units
Zinc	1.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311171

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311099

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311200

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311589

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311697

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311482

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311828

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310921

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310922

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

Reference Method: SM 2320 B-97
Batch ID: P311258

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2320 B-97
Batch ID: P311452

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 D-97
Batch ID: P311490

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P311492

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P311261

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P311627

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P311164

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

Reference Method: SM 5310 B-00
Batch ID: P311339

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: P311044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	104		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.9		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	98.0		P	85 - 115
Copper	98.4		P	85 - 115
Silver	98.1		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.3		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	101		P	85 - 115
Copper	95.8		P	85 - 115
Lead	96.3		P	85 - 115
Nickel	95.6		P	85 - 115
Silver	98.1		P	85 - 115
Zinc	98.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311519

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Lead	94.9		P	85 - 115
Nickel	102		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311171

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311099

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311200

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311589

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311697

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: P311482

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: P311828

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310921

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310922

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

Reference Method: SM 2320 B-97
Batch ID: P311258

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P311452

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P311261

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P311627

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P311164

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	107		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P311339

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829521	Iron	99.6	100	P/P	80 - 120
1829575	Iron	101		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830681	Iron	101	102	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829521	Arsenic	100	97.6	P/P	80 - 120
1829521	Cadmium	98.6	99.7	P/P	80 - 120
1829521	Chromium	98.9	98.4	P/P	80 - 120
1829521	Copper	96.9	95.0	P/P	80 - 120
1829521	Silver	97.3	97.2	P/P	80 - 120
1829575	Arsenic	101		P	80 - 120
1829575	Cadmium	101		P	80 - 120
1829575	Chromium	99.4		P	80 - 120
1829575	Copper	93.9		P	80 - 120
1829575	Silver	97.5		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P311144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830681	Arsenic	108	106	P/P	70 - 130
1830681	Cadmium	105	101	P/P	70 - 130
1830681	Chromium	96.0	94.7	P/P	70 - 130
1830681	Copper	95.3	93.7	P/P	70 - 130
1830681	Lead	104	104	P/P	70 - 130
1830681	Nickel	97.6	95.9	P/P	70 - 130
1830681	Silver	94.5	93.6	P/P	70 - 130
1830681	Zinc	97.5	95.5	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P311519

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831354	Lead	96.9		P	80 - 120
1831354	Nickel	101		P	80 - 120
1831354	Zinc	100		P	80 - 120
1832154	Lead	95.3	95.1	P/P	80 - 120
1832154	Nickel	98.6	97.5	P/P	80 - 120
1832154	Zinc	98.6	97.7	P/P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P311171

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829748	Ammonia-N	101	95.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P311099

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830034	Kjeldahl Nitrogen	96.6	95.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P311200

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829766	Kjeldahl Nitrogen	101	89.2	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P311589

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830084	NO2NO3-N	102	102	P/P	90 - 110
1830084	NO2NO3-N	104		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P311697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830087	NO2NO3-N	101	103	P/P	90 - 110
1830087	NO2NO3-N	103		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830073	Total-P	91.4	91.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831270	Total-P	99.0	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310921

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830038	O-Phosphate-P	98.1	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310922

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829751	O-Phosphate-P	97.5	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P311261

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1830451	Fluoride	98.2	98.2	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P311627

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1831182	Fluoride	97.0	97.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P311164

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826897	Organic Carbon	95.2	96.4	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P311339

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829982	Organic Carbon	101	103	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310908

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830023	Turbidity	1.88	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829521	Iron	0.657	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830681	Iron	0.524	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829521	Arsenic	2.71	Spike	P	0 - 20
1829521	Cadmium	1.10	Spike	P	0 - 20
1829521	Chromium	0.502	Spike	P	0 - 20
1829521	Copper	1.93	Spike	P	0 - 20
1829521	Silver	0.0973	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830681	Arsenic	1.82	Spike	P	0 - 20
1830681	Cadmium	3.34	Spike	P	0 - 20
1830681	Chromium	1.40	Spike	P	0 - 20
1830681	Copper	1.64	Spike	P	0 - 20
1830681	Lead	0.316	Spike	P	0 - 20
1830681	Nickel	1.76	Spike	P	0 - 20
1830681	Silver	0.963	Spike	P	0 - 20
1830681	Zinc	2.03	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311519

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832154	Lead	0.193	Spike	P	0 - 20
1832154	Nickel	1.10	Spike	P	0 - 20
1832154	Zinc	0.962	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311171

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829748	Ammonia-N	2.68	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311099

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830034	Kjeldahl Nitrogen	0.535	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311200

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829766	Kjeldahl Nitrogen	10.9	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830084	NO2NO3-N	0.489	Spike	P	0 - 15

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830087	NO2NO3-N	0.776	Spike	P	0 - 15

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830073	Total-P	0.464	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831270	Total-P	1.06	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830038	O-Phosphate-P	1.12	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310922

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829751	O-Phosphate-P	0.931	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P311258

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830451	Total Alkalinity	1.74	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P311452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831182	Total Alkalinity	0.284	Sample	P	0 - 4.8

Reference Method: SM 2540 D-97
Batch ID: P311492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829564	TSS	11.8	Sample	F	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P311261

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1830451	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P311627

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1831182	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P311164

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1826897	Organic Carbon	1.10	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P311339

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829982	Organic Carbon	2.05	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 180.1 Rev. 2.0
Run ID: A71511
Included Lab Sample IDs: 1830072, 1830075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71518
Included Lab Sample IDs: 1830074, 1830077

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	97.9	P/P	90 - 110
O-Phosphate-P	99.2	98.3	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A71630
Included Lab Sample IDs: 1830073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	99.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71633
Included Lab Sample IDs: 1830073, 1830076

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	101	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A71657
Included Lab Sample IDs: 1830075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	105	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A71657
Included Lab Sample IDs: 1830075

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

Reference Method: SM 5310 B-00
Run ID: A71682
Included Lab Sample IDs: 1830076

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	108	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71691

Included Lab Sample IDs: 1830073, 1830076

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	98.6	P/P	90 - 110
Kjeldahl Nitrogen	99.1	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71694

Included Lab Sample IDs: 1830080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	103	99.1	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71703

Included Lab Sample IDs: 1830080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	99.5	P/P	90 - 110
Cadmium	97.6	97.9	P/P	90 - 110
Chromium	97.8	99.5	P/P	90 - 110
Copper	101	100	P/P	90 - 110
Silver	97.1	97.3	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A71720

Included Lab Sample IDs: 1830072

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71721

Included Lab Sample IDs: 1830079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.8	99.5	P/P	90 - 110
Cadmium	99.8	98.3	P/P	90 - 110
Chromium	101	99.7	P/P	90 - 110
Copper	95.6	97.1	P/P	90 - 110
Nickel	95.6	97.3	P/P	90 - 110
Silver	95.5	96.2	P/P	90 - 110
Zinc	98.2	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71734

Included Lab Sample IDs: 1830076

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71744

Included Lab Sample IDs: 1830079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	98.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71754

Included Lab Sample IDs: 1830079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	94.5	93.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71756

Included Lab Sample IDs: 1830073

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

Reference Method: SM 4500 F-C-97

Run ID: A71764

Included Lab Sample IDs: 1830072

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71785

Included Lab Sample IDs: 1830073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71795

Included Lab Sample IDs: 1830080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	91.4	90.6	P/P	90 - 110
Nickel	99.4	96.8	P/P	90 - 110
Zinc	97.2	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71852

Included Lab Sample IDs: 1830076

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.8	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						1.88	
EPA 200.7 Rev. 4.4	Iron	104	99.6	100	101			0.657
	Iron	102	101	102				0.524
EPA 200.8 Rev. 5.4	Arsenic	99.9	100	97.6	101			2.71
	Arsenic	98.3	108	106				1.82
	Cadmium	98.9	98.6	99.7	101			1.10
	Cadmium	101	105	101				3.34
	Chromium	98.0	98.9	98.4	99.4			0.502
	Chromium	101	96.0	94.7				1.40
	Copper	98.4	96.9	95.0	93.9			1.93
	Copper	95.8	95.3	93.7				1.64
	Lead	96.3	104	104				0.316
	Lead	94.9	96.9	95.3	95.1			0.193
	Nickel	95.6	97.6	95.9				1.76
	Nickel	102	101	98.6	97.5			1.10
	Silver	98.1	97.3	97.2	97.5			0.0973
	Silver	98.1	94.5	93.6				0.963
	Zinc	98.7	97.5	95.5				2.03
	Zinc	100	100	98.6	97.7			0.962
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	95.6				2.68
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	96.6	95.7				0.535
	Kjeldahl Nitrogen	97.5	101	89.2				10.9
EPA 353.2 Rev. 2.0	NO2NO3-N	104	102	104	102			0.489 RSD
	NO2NO3-N	104	101	103	103			0.776 RSD
EPA 365.1 Rev. 2.0	Total-P	103	91.4	91.0				0.464
	Total-P	101	99.0	97.9				1.06
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.1	99.5				1.12
	O-Phosphate-P	104	97.5	98.5				0.931
SM 2320 B-97	Total Alkalinity	103					1.74	
	Total Alkalinity	104					0.284	
SM 2540 D-97	TSS						11.8	
SM 4500 F-C-97	Fluoride	100	98.2	98.2				0.0
	Fluoride	98.4	97.0	97.0				0.0
SM 5310 B-00	Organic Carbon	107	95.2	96.4				1.10
	Organic Carbon	102	101	103				2.05

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1830072, 1830075
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1830079, 1830080
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1830079, 1830080
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1830073, 1830076
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1830073, 1830076
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1830073, 1830076
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1830073, 1830076
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1830074, 1830077

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1830072, 1830075
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1830072, 1830075
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1830072, 1830075
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1830073, 1830076

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	09/09/2016			09/09/2016 14:47	Sima Feizi	1830072, 1830075
EPA 200.7 Rev. 4.4	09/09/2016	09/13/2016	Elliott D. Healy	09/15/2016	Joshua Ayres	1830080
	09/09/2016	09/14/2016	Elliott D. Healy	09/20/2016	Joshua Ayres	1830079
EPA 200.8 Rev. 5.4	09/09/2016	09/13/2016	Elliott D. Healy	09/16/2016	Charles J. Peterson	1830080
	09/09/2016	09/14/2016	Elliott D. Healy	09/19/2016	Charles J. Peterson	1830079
	09/09/2016	09/14/2016	Elliott D. Healy	09/20/2016	Charles J. Peterson	1830079
	09/09/2016	09/20/2016	Elliott D. Healy	09/22/2016	Charles J. Peterson	1830080
EPA 350.1 Rev. 2.0	09/09/2016			09/09/2016	Joseph Suarez	1830073, 1830076
EPA 351.2 Rev. 2.0	09/09/2016	09/14/2016	Adrian Shelby	09/16/2016	Virginia P. Brown	1830076
	09/09/2016	09/15/2016	Adrian Shelby	09/16/2016	Virginia P. Brown	1830073
EPA 353.2 Rev. 2.0	09/09/2016			09/20/2016	Beverly Y. Sanders	1830076
	09/09/2016			09/21/2016	Beverly Y. Sanders	1830073
EPA 365.1 Rev. 2.0	09/09/2016	09/20/2016	Lipi Saha	09/21/2016	Lipi Saha	1830073
	09/09/2016	09/26/2016	Vijayalakshmi Reddy	09/27/2016	Lipi Saha	1830076
EPA 365.1 Rev. 2.0 dissolved	09/09/2016			09/09/2016 15:21	Julia Storbeck	1830077
	09/09/2016			09/09/2016 16:01	Julia Storbeck	1830074
SM 2320 B-97	09/09/2016			09/15/2016	Dale L. Simmons	1830075
	09/09/2016			09/19/2016	Dale L. Simmons	1830072
SM 2540 D-97	09/09/2016			09/13/2016	Yijie Li	1830072, 1830075
SM 4500 F-C-97	09/09/2016			09/15/2016	Dale L. Simmons	1830075
	09/09/2016			09/21/2016	Dale L. Simmons	1830072
SM 5310 B-00	09/09/2016			09/15/2016	Sofia Elnemr	1830073, 1830076