

Chemical Analysis Report

SO-DIST-2017-03-08-02

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

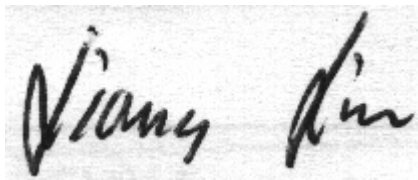
Event Description: **SMP: Florida Keys**
Request ID: **RQ-2017-02-27-14**
Customer: **SO-DIST**
Project ID: **SMP**

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

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 03-APR-2017 17:18

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

Case Narrative

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

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

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

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

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: INDIAN KEY FILL AT SW END

Collection Date/Time: 03/07/2017 12:45

Field ID: G5SD030717-1

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878267	EPA 180.1 Rev. 2.0	Turbidity	28		NTU	P321193	
	SM 2320 B-97	Total Alkalinity	123		mg CaCO3/L	P321700	
	SM 2540 D-97	TSS	50		mg/L	P321823	
	SM 4500 F-C-97	Fluoride	1.4		mg F/L	P321705	
1878270	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P321293	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.16	U	mg N/L	P321236	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P321510	
	EPA 365.1 Rev. 2.0	Total-P	0.012	J	mg P/L	P321246	MS
	SM 5310 B-00	Organic Carbon	2.0		mg C/L	P321340	
1878273	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P321183	
1878282	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P321305	
	EPA 200.8 Rev. 5.4	Arsenic	1.8	I	ug/L	P321305	
		Cadmium	0.20	U	ug/L	P321305	
		Chromium	1.2	U	ug/L	P321305	
		Copper	2.0	U	ug/L	P321305	
		Lead	0.80	U	ug/L	P321305	
		Nickel	1.0	U	ug/L	P321305	
		Silver	0.10	U	ug/L	P321305	
		Zinc	20	U	ug/L	P321305	

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: Refer to the narrative for an explanation of QC Codes.

Sample Location: GRASSY KEY @ CURRY HAMMOCK CREEK

Collection Date/Time: 03/07/2017 13:45

Field ID: G5SD030717-4

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878268	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P321193	
	SM 2320 B-97	Total Alkalinity	134		mg CaCO3/L	P321700	
	SM 2540 D-97	TSS	6	I	mg/L	P321823	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P321705	
1878271	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P321293	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38	I	mg N/L	P321440	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P321510	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P321246	MS
	SM 5310 B-00	Organic Carbon	3.2		mg C/L	P321340	
1878274	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P321183	
1878283	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P321305	
	EPA 200.8 Rev. 5.4	Arsenic	1.8	I	ug/L	P321305	
		Cadmium	0.20	U	ug/L	P321305	
		Chromium	1.2	U	ug/L	P321305	
		Copper	2.0	U	ug/L	P321305	
		Lead	0.80	U	ug/L	P321305	
		Nickel	1.0	U	ug/L	P321305	

Field ID: G5SD030717-4

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878283	EPA 200.8 Rev. 5.4	Silver	0.10	U	ug/L	P321305	
		Zinc	20	U	ug/L	P321305	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: 6012C BY BRIDGE NO NAME KEY

Collection Date/Time: 03/07/2017 14:50

Field ID: G5SD030717-6

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1878269	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P321193	
	SM 2320 B-97	Total Alkalinity	127		mg CaCO3/L	P321700	
	SM 2540 D-97	TSS	4	I	mg/L	P321823	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P321705	
1878272	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P321477	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.34	I	mg N/L	P321436	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P321510	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P321246	MS
	SM 5310 B-00	Organic Carbon	2.6		mg C/L	P321340	
1878275	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P321183	
1878284	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P321305	
	EPA 200.8 Rev. 5.4	Arsenic	1.2	I	ug/L	P321305	
		Cadmium	0.20	U	ug/L	P321305	
		Chromium	1.2	U	ug/L	P321305	
		Copper	2.0	U	ug/L	P321305	
		Lead	0.80	U	ug/L	P321305	
		Nickel	1.0	U	ug/L	P321305	
		Silver	0.10	U	ug/L	P321305	
		Zinc	20	U	ug/L	P321305	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P321193

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P321305

Component	Result	Code	Units
Iron	30	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321305

Component	Result	Code	Units
Arsenic	0.25	U	ug/L
Cadmium	0.050	U	ug/L
Chromium	0.30	U	ug/L
Copper	0.50	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.25	U	ug/L
Silver	0.025	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321293

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321477

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321236

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321436

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321440

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321510

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321246

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: P321183

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

Reference Method: SM 2320 B-97
 Batch ID: P321700

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

Reference Method: SM 2540 D-97
 Batch ID: P321823

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P321705

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P321340

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: P321305

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

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P321305

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.7		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	103		P	85 - 115
Copper	100		P	85 - 115
Lead	104		P	85 - 115
Nickel	94.3		P	85 - 115
Silver	105		P	85 - 115
Zinc	103		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321293

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321477

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321236

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.5		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321436

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321440

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321510

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321246

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321183

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

Reference Method: SM 2320 B-97
Batch ID: P321700

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: P321705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P321340

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P321305

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878215	Iron	96.0		P	70 - 130
1878526	Iron	98.3	97.9	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321305

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878215	Arsenic	101		P	70 - 130
1878215	Cadmium	94.3		P	70 - 130
1878215	Chromium	107		P	80 - 120
1878215	Copper	95.3		P	80 - 120
1878215	Lead	112		P	80 - 120
1878215	Nickel	92.4		P	80 - 120
1878215	Silver	104		P	80 - 120
1878215	Zinc	98.8		P	80 - 120
1878526	Arsenic	102	96.3	P/P	70 - 130
1878526	Cadmium	95.8	87.9	P/P	70 - 130
1878526	Chromium	96.6	98.4	P/P	80 - 120
1878526	Copper	98.6	103	P/P	80 - 120
1878526	Lead	106	104	P/P	80 - 120
1878526	Nickel	97.4	90.9	P/P	80 - 120
1878526	Silver	95.9	97.5	P/P	80 - 120
1878526	Zinc	93.9	95.5	P/P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321293

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1877892	Ammonia-N	100	98.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321477

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878272	Ammonia-N	103	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321236

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878270	Kjeldahl Nitrogen	109	110	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321436

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878383	Kjeldahl Nitrogen	100	95.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321440

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878271	Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878199	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321246

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878270	Total-P	92.2	85.9	P/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878201	O-Phosphate-P	100	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P321705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878953	Fluoride	94.3	95.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P321340

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1878501	Organic Carbon	90.1	89.4	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P321193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878223	Turbidity	8.40	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P321305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878526	Iron	0.428	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878526	Arsenic	5.21	Spike	P	0 - 20
1878526	Cadmium	8.60	Spike	P	0 - 20
1878526	Chromium	1.81	Spike	P	0 - 20
1878526	Copper	4.36	Spike	P	0 - 20
1878526	Lead	1.37	Spike	P	0 - 20
1878526	Nickel	6.83	Spike	P	0 - 20
1878526	Silver	1.62	Spike	P	0 - 20
1878526	Zinc	1.64	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321293

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1877892	Ammonia-N	1.49	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321477

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878272	Ammonia-N	1.08	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321236

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878270	Kjeldahl Nitrogen	0.587	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321436

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878383	Kjeldahl Nitrogen	4.07	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878271	Kjeldahl Nitrogen	0.760	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878199	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878270	Total-P	6.99	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878201	O-Phosphate-P	1.32	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P321700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878953	Total Alkalinity	2.96	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P321705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878953	Fluoride	0.979	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P321340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1878501	Organic Carbon	0.576	Spike	P	0 - 20

* 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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A74969

Included Lab Sample IDs: 1878273, 1878274, 1878275

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A74972

Included Lab Sample IDs: 1878267, 1878268, 1878269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.0	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A74999

Included Lab Sample IDs: 1878270, 1878271

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

Reference Method: SM 5310 B-00

Run ID: A75012

Included Lab Sample IDs: 1878270, 1878271, 1878272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.5	96.8	P/P	90 - 110
Organic Carbon	95.8	95.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75025

Included Lab Sample IDs: 1878270, 1878271, 1878272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	96.2	P/P	90 - 110
Total-P	97.8	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A75056

Included Lab Sample IDs: 1878270, 1878271, 1878272

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A75063

Included Lab Sample IDs: 1878272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75066

Included Lab Sample IDs: 1878270

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75066

Included Lab Sample IDs: 1878270

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.9	94.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75088

Included Lab Sample IDs: 1878271

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75100

Included Lab Sample IDs: 1878282, 1878283, 1878284

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	94.2	104	P/P	90 - 110
Copper	93.4	102	P/P	90 - 110
Lead	97.4	104	P/P	90 - 110
Silver	99.0	106	P/P	90 - 110
Zinc	95.1	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75105

Included Lab Sample IDs: 1878272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.6	93.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A75109

Included Lab Sample IDs: 1878282, 1878283, 1878284

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	97.9	99.0	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A75152

Included Lab Sample IDs: 1878267, 1878268, 1878269

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

Reference Method: SM 4500 F-C-97

Run ID: A75152

Included Lab Sample IDs: 1878267, 1878268, 1878269

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75414

Included Lab Sample IDs: 1878282, 1878283, 1878284

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	94.7	97.3	P/P	90 - 110
Cadmium	94.1	98.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75417

Included Lab Sample IDs: 1878282, 1878283, 1878284

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	98.9	93.9	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						8.40	
EPA 200.7 Rev. 4.4	Iron	103	96.0	98.3	97.9			0.428
EPA 200.8 Rev. 5.4	Arsenic	98.7	101	102	96.3			5.21
	Cadmium	103	94.3	95.8	87.9			8.60
	Chromium	103	107	96.6	98.4			1.81
	Copper	100	95.3	98.6	103			4.36
	Lead	104	112	106	104			1.37
	Nickel	94.3	92.4	97.4	90.9			6.83
	Silver	105	104	95.9	97.5			1.62
	Zinc	103	98.8	93.9	95.5			1.64
EPA 350.1 Rev. 2.0	Ammonia-N	99.4	100	98.7				1.49
	Ammonia-N	97.2	103	104				1.08
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.5	109	110				0.587
	Kjeldahl Nitrogen	103	100	95.7				4.07
	Kjeldahl Nitrogen	106	101	102				0.760
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	104				0.482
EPA 365.1 Rev. 2.0	Total-P	98.8	92.2	85.9				6.99
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	102				1.32
SM 2320 B-97	Total Alkalinity	104				2.96		
SM 4500 F-C-97	Fluoride	99.7	94.3	95.8				0.979
SM 5310 B-00	Organic Carbon	95.6	90.1	89.4				0.576

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1878267, 1878268, 1878269
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1878282, 1878283, 1878284
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1878282, 1878283, 1878284

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1878270, 1878271, 1878272
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1878270, 1878271, 1878272
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1878270, 1878271, 1878272
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1878270, 1878271, 1878272
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1878273, 1878274, 1878275
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1878267, 1878268, 1878269
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1878267, 1878268, 1878269
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1878267, 1878268, 1878269
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1878270, 1878271, 1878272

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	03/08/2017			03/08/2017 16:09	Sima Feizi	1878267, 1878268, 1878269
EPA 200.7 Rev. 4.4	03/08/2017	03/09/2017	Elliott D. Healy	03/14/2017	Martin Acosta	1878282, 1878283, 1878284
EPA 200.8 Rev. 5.4	03/08/2017	03/09/2017	Elliott D. Healy	03/14/2017	Robert K Palmer	1878282, 1878283, 1878284
	03/08/2017	03/09/2017	Elliott D. Healy	03/28/2017	Robert K Palmer	1878282, 1878283, 1878284
EPA 350.1 Rev. 2.0	03/08/2017			03/09/2017	Sofia Elnemr	1878270, 1878271
	03/08/2017			03/13/2017	Julie Michelle Frank	1878272
EPA 351.2 Rev. 2.0	03/08/2017	03/09/2017	Adrian Shelby	03/10/2017	Joseph Suarez	1878270
	03/08/2017	03/13/2017	Adrian Shelby	03/14/2017	Joseph Suarez	1878271
	03/08/2017	03/13/2017	Adrian Shelby	03/15/2017	Joseph Suarez	1878272
EPA 353.2 Rev. 2.0	03/08/2017			03/13/2017	Beverly Y. Sanders	1878270, 1878271, 1878272
EPA 365.1 Rev. 2.0	03/08/2017	03/09/2017	Adrian Shelby	03/10/2017	Lipi Saha	1878270, 1878271, 1878272
EPA 365.1 Rev. 2.0 dissolved	03/08/2017			03/08/2017 15:06	Lipi Saha	1878273
	03/08/2017			03/08/2017 15:07	Lipi Saha	1878274
	03/08/2017			03/08/2017 15:08	Lipi Saha	1878275
SM 2320 B-97	03/08/2017			03/16/2017	Dale L. Simmons	1878267, 1878268, 1878269
SM 2540 D-97	03/08/2017			03/10/2017	Yijie Li	1878267, 1878268, 1878269
SM 4500 F-C-97	03/08/2017			03/15/2017	Dale L. Simmons	1878267, 1878268, 1878269
SM 5310 B-00	03/08/2017			03/10/2017	Julie Michelle Frank	1878270, 1878271, 1878272