

Chemical Analysis Report

SO-DIST-2017-05-10-02

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-2017-05-01-16**
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
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 07-JUN-2017 10:07



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 DUP

Collection Date/Time: 05/09/2017 13:05

Field ID: G5SD050917-2

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1897788	EPA 180.1 Rev. 2.0	Turbidity	9.3		NTU	P325037	
	SM 2320 B-97	Total Alkalinity	117		mg CaCO3/L	P325412	
	SM 2540 D-97	TSS	25	A	mg/L	P325674	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P325415	
1897792	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P325057	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.36	I	mg N/L	P325157	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P325268	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P325097	
	SM 5310 B-00	Organic Carbon	2.6		mg C/L	P325361	
1897796	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.01	I	mg P/L	P325042	
1897825	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P325389	
	EPA 200.8 Rev. 5.4	Arsenic	0.95	I	ug/L	P325389	
		Cadmium	0.15	U	ug/L	P325389	
		Chromium	0.90	U	ug/L	P325389	
		Copper	1.5	U	ug/L	P325389	
		Lead	0.60	U	ug/L	P325389	
		Nickel	1.0	U	ug/L	P325389	
		Silver	0.050	U	ug/L	P325389	
		Zinc	15	U	ug/L	P325389	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The sample was reanalyzed on 05/23/2017. The result was 13 Q NTU.

Sample Location: 6012C by Bridge No Name Key

Collection Date/Time: 05/09/2017 15:20

Field ID: G5SD050917-6

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1897789	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P325037	
	SM 2320 B-97	Total Alkalinity	117		mg CaCO3/L	P325412	
	SM 2540 D-97	TSS	5	I	mg/L	P325672	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P325415	
1897793	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P325057	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29	I	mg N/L	P325159	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P325272	
	EPA 365.1 Rev. 2.0	Total-P	0.009	I	mg P/L	P325097	
	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P325361	
1897797	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P325042	
1897826	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P325389	
	EPA 200.8 Rev. 5.4	Arsenic	0.75	U	ug/L	P325389	
		Cadmium	0.15	U	ug/L	P325389	
		Chromium	0.90	U	ug/L	P325389	
		Copper	1.5	U	ug/L	P325389	
		Lead	0.60	U	ug/L	P325389	
		Nickel	1.0	U	ug/L	P325389	
		Silver	0.050	U	ug/L	P325389	

Field ID: G5SD050917-6

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1897826	EPA 200.8 Rev. 5.4	Zinc	15	U	ug/L	P325389	

Sample Location: Indian Key Fill at SW End

Collection Date/Time: 05/09/2017 13:00

Field ID: G5SD050917-1

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1897790	EPA 180.1 Rev. 2.0	Turbidity	14	A	NTU	P325038	
	SM 2320 B-97	Total Alkalinity	119		mg CaCO3/L	P325412	
	SM 2540 D-97	TSS	26		mg/L	P325672	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P325415	
1897794	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P325057	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P325159	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P325273	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P325097	
	SM 5310 B-00	Organic Carbon	2.2		mg C/L	P325361	
1897798	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P325042	
1897827	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P325389	
	EPA 200.8 Rev. 5.4	Arsenic	1.2	U	ug/L	P325389	
		Cadmium	0.25	U	ug/L	P325389	
		Chromium	1.5	U	ug/L	P325389	
		Copper	2.5	U	ug/L	P325389	
		Lead	1.0	U	ug/L	P325389	
		Nickel	1.0	U	ug/L	P325389	
		Silver	0.050	U	ug/L	P325389	
		Zinc	25	U	ug/L	P325389	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The result was confirmed on 05/23/2017.

Sample Location: Grassy Key @ Curry Hammock SP Creek

Collection Date/Time: 05/09/2017 13:50

Field ID: G5SD050917-4

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1897791	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P325038	
	SM 2320 B-97	Total Alkalinity	143		mg CaCO3/L	P325412	
	SM 2540 D-97	TSS	5	I	mg/L	P325672	
	SM 4500 F-C-97	Fluoride	1.4		mg F/L	P325415	
1897795	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P325057	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.41		mg N/L	P325159	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P325274	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P325097	
	SM 5310 B-00	Organic Carbon	4.3		mg C/L	P325361	
1897799	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P325042	
1897828	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P325389	
	EPA 200.8 Rev. 5.4	Arsenic	1.2	U	ug/L	P325389	
		Cadmium	0.25	U	ug/L	P325389	

Field ID: G5SD050917-4

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1897828	EPA 200.8 Rev. 5.4	Chromium	1.5	U	ug/L	P325389	
		Copper	2.5	U	ug/L	P325389	
		Lead	1.0	U	ug/L	P325389	
		Nickel	1.0	U	ug/L	P325389	
		Silver	0.050	U	ug/L	P325389	
		Zinc	25	U	ug/L	P325389	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P325037

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P325038

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P325389

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P325389

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	0.20	U	ug/L
Silver	0.010	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P325057

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P325157

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325159

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325268

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325272

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325273

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325274

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325097

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P325042

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

Reference Method: SM 2320 B-97
Batch ID: P325412

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

Reference Method: SM 2540 D-97
Batch ID: P325672

Component	Result	Code	Units
TSS	3	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P325674

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P325415

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P325361

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: P325389

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.9		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	96.1		P	85 - 115
Copper	95.0		P	85 - 115
Lead	97.7		P	85 - 115
Nickel	100		P	85 - 115
Silver	101		P	85 - 115
Zinc	95.9		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P325057

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325157

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325159

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325268

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325272

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: P325273

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: P325274

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: P325097

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: P325042

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

Reference Method: SM 2320 B-97
Batch ID: P325412

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

Reference Method: SM 4500 F-C-97
Batch ID: P325415

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P325361

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	91.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898453	Iron	97.4	97.2	P/P	70 - 130
1898796	Iron	96.3		P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898453	Arsenic	124	121	P/P	70 - 130
1898453	Cadmium	108	109	P/P	70 - 130
1898453	Chromium	124	122	P/P	70 - 130
1898453	Copper	110	109	P/P	70 - 130
1898453	Lead	126	127	P/P	70 - 130
1898453	Nickel	97.8	95.5	P/P	70 - 130
1898453	Silver	89.5	88.8	P/P	70 - 130
1898453	Zinc	108	106	P/P	70 - 130
1898796	Arsenic	120		P	70 - 130
1898796	Cadmium	115		P	70 - 130
1898796	Chromium	120		P	70 - 130
1898796	Copper	105		P	70 - 130
1898796	Lead	124		P	70 - 130
1898796	Nickel	94.5		P	70 - 130
1898796	Silver	89.8		P	70 - 130
1898796	Zinc	92.8		P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P325057

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897792	Ammonia-N	110	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325157

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897194	Kjeldahl Nitrogen	102	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325159

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897870	Kjeldahl Nitrogen	94.6	91.1	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897792	NO2NO3-N	103	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325272

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1898433	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897794	NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897795	NO2NO3-N	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897793	Total-P	105	94.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P325042

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897797	O-Phosphate-P	100	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P325415

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897107	Fluoride	98.7	98.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P325361

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1897111	Organic Carbon	88.4	87.0	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P325037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897686	Turbidity	0.643	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P325038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897790	Turbidity	5.17	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898453	Iron	0.149	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898453	Arsenic	2.47	Spike	P	0 - 20
1898453	Cadmium	0.708	Spike	P	0 - 20
1898453	Chromium	1.63	Spike	P	0 - 20
1898453	Copper	0.765	Spike	P	0 - 20
1898453	Lead	0.634	Spike	P	0 - 20
1898453	Nickel	2.32	Spike	P	0 - 20
1898453	Silver	0.872	Spike	P	0 - 20
1898453	Zinc	1.74	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P325057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897792	Ammonia-N	1.48	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897194	Kjeldahl Nitrogen	1.85	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P325159

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897870	Kjeldahl Nitrogen	3.10	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897792	NO2NO3-N	1.41	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1898433	NO2NO3-N	0.480	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897794	NO2NO3-N	1.38	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P325274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897795	NO2NO3-N	0.475	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P325097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897793	Total-P	11.5	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P325042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897797	O-Phosphate-P	1.19	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P325412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897107	Total Alkalinity	0.119	Sample	P	0 - 4.8

Reference Method: SM 2540 D-97
Batch ID: P325672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897871	TSS	4.65	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 D-97
Batch ID: P325674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897788	TSS	8.13	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P325415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897107	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P325361

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897111	Organic Carbon	1.21	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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A76333
Included Lab Sample IDs: 1897796, 1897797, 1897798, 1897799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	99.5	P/P	90 - 110
O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A76334
Included Lab Sample IDs: 1897788, 1897789, 1897790, 1897791

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105
Turbidity	101	101	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A76336
Included Lab Sample IDs: 1897792, 1897793, 1897794, 1897795

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A76414
Included Lab Sample IDs: 1897792, 1897793, 1897794, 1897795

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A76414

Included Lab Sample IDs: 1897792, 1897793, 1897794, 1897795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	101	102	P/P	90 - 110
NO2NO3-N	102	101	P/P	90 - 110
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A76417

Included Lab Sample IDs: 1897792, 1897793, 1897794, 1897795

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

Reference Method: SM 5310 B-00

Run ID: A76450

Included Lab Sample IDs: 1897792, 1897793, 1897794, 1897795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.7	93.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A76474

Included Lab Sample IDs: 1897792

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	106	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A76475

Included Lab Sample IDs: 1897788, 1897789, 1897790, 1897791

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: A76475

Included Lab Sample IDs: 1897788, 1897789, 1897790, 1897791

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.6	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A76495

Included Lab Sample IDs: 1897793, 1897794, 1897795

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A76689

Included Lab Sample IDs: 1897825, 1897826, 1897827, 1897828

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	94.1	98.9	P/P	90 - 110
Arsenic	98.9	93.6	P/P	90 - 110
Cadmium	96.0	99.5	P/P	90 - 110
Cadmium	99.5	96.1	P/P	90 - 110
Chromium	94.3	97.9	P/P	90 - 110
Chromium	97.9	91.4	P/P	90 - 110
Copper	92.6	96.4	P/P	90 - 110
Copper	96.4	90.8	P/P	90 - 110
Lead	96.2	99.8	P/P	90 - 110
Lead	99.8	95.9	P/P	90 - 110
Zinc	92.6	96.5	P/P	90 - 110
Zinc	96.5	91.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A76728

Included Lab Sample IDs: 1897825, 1897826, 1897827, 1897828

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	99.2	99.9	P/P	90 - 110
Nickel	99.9	96.9	P/P	90 - 110
Silver	103	103	P/P	90 - 110
Silver	103	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A76844

Included Lab Sample IDs: 1897825, 1897826, 1897827, 1897828

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	100	P/P	95 - 105

* 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						0.643	
	Turbidity						5.17	
EPA 200.7 Rev. 4.4	Iron	102	97.4	97.2	96.3			0.149
EPA 200.8 Rev. 5.4	Arsenic	95.9	124	121	120			2.47
	Cadmium	101	108	109	115			0.708
	Chromium	96.1	124	122	120			1.63
	Copper	95.0	110	109	105			0.765
	Lead	97.7	126	127	124			0.634
	Nickel	100	97.8	95.5	94.5			2.32
	Silver	101	89.5	88.8	89.8			0.872
	Zinc	95.9	108	106	92.8			1.74

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
			LCS			
EPA 350.1 Rev. 2.0	Ammonia-N	106	110	108		1.48
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	102	104		1.85
	Kjeldahl Nitrogen	102	94.6	91.1		3.10
EPA 353.2 Rev. 2.0	NO2NO3-N	102	103	105		1.41
	NO2NO3-N	104	104	104		0.480
	NO2NO3-N	104	103	104		1.38
	NO2NO3-N	104	105	106		0.475
EPA 365.1 Rev. 2.0	Total-P	101	105	94.0		11.5
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	100	102		1.19
SM 2320 B-97	Total Alkalinity	103			0.119	
SM 2540 D-97	TSS				4.65	
	TSS				8.13	
SM 4500 F-C-97	Fluoride	102	98.7	98.7		0.0
SM 5310 B-00	Organic Carbon	91.0	88.4	87.0		1.21

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1897788, 1897789, 1897790, 1897791
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1897825, 1897826, 1897827, 1897828
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1897825, 1897826, 1897827, 1897828
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1897792, 1897793, 1897794, 1897795
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1897792, 1897793, 1897794, 1897795
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1897792, 1897793, 1897794, 1897795
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1897792, 1897793, 1897794, 1897795
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1897796, 1897797, 1897798, 1897799
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1897788, 1897789, 1897790, 1897791
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1897788, 1897789, 1897790, 1897791
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1897788, 1897789, 1897790, 1897791
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1897792, 1897793, 1897794, 1897795

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	05/10/2017			05/10/2017 15:36	Sima Feizi	1897788, 1897789, 1897790, 1897791
EPA 200.7 Rev. 4.4	05/10/2017	05/16/2017	Elliott D. Healy	06/02/2017	Betina Topolski	1897825, 1897826, 1897827, 1897828
EPA 200.8 Rev. 5.4	05/10/2017	05/16/2017	Elliott D. Healy	05/25/2017	Robert K Palmer	1897825, 1897826, 1897827, 1897828
	05/10/2017	05/16/2017	Elliott D. Healy	05/29/2017	Robert K Palmer	1897825, 1897826, 1897827, 1897828
EPA 350.1 Rev. 2.0	05/10/2017			05/10/2017	Julie Michelle Frank	1897792, 1897793, 1897794, 1897795
EPA 351.2 Rev. 2.0	05/10/2017	05/12/2017	Adrian Shelby	05/17/2017	Joseph Suarez	1897792, 1897793, 1897794, 1897795
EPA 353.2 Rev. 2.0	05/10/2017			05/15/2017	Beverly Y. Sanders	1897792, 1897793, 1897794, 1897795
EPA 365.1 Rev. 2.0	05/10/2017	05/11/2017	Adrian Shelby	05/15/2017	Lipi Saha	1897792, 1897793, 1897794, 1897795
EPA 365.1 Rev. 2.0 dissolved	05/10/2017			05/10/2017 15:02	Anthony C. Onicha	1897797
	05/10/2017			05/10/2017 15:15	Anthony C. Onicha	1897796
	05/10/2017			05/10/2017 15:16	Anthony C. Onicha	1897798
	05/10/2017			05/10/2017 15:17	Anthony C. Onicha	1897799
SM 2320 B-97	05/10/2017			05/17/2017	Dale L. Simmons	1897788, 1897789, 1897790, 1897791
SM 2540 D-97	05/10/2017			05/12/2017	Yijie Li	1897788, 1897789, 1897790, 1897791
SM 4500 F-C-97	05/10/2017			05/17/2017	Dale L. Simmons	1897788, 1897789, 1897790, 1897791
SM 5310 B-00	05/10/2017			05/16/2017	Christopher Armour	1897792, 1897793, 1897794, 1897795