

Chemical Analysis Report

SO-DIST-2016-11-02-01

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

Event Description: **SMP: Pirate Harbor Ditch**
Request ID: **RQ-2016-11-07-75**
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: Liang Lin, Environmental Administrator

Date Certified: 28-NOV-2016 10:36

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 group are included in this report: 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: Pirate Canal Middle

Collection Date/Time: 11/01/2016 12:30

Field ID: G3SD110116-1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1846724	EPA 180.1 Rev. 2.0	Turbidity	1.6	A	NTU	P314432	
	EPA 300.0 Rev. 2.1	Chloride	17	A	mg Cl/L	P315352	
		Sulfate	3.7	A	mg SO4/L	P315357	
	SM 2120 B	Color (true)	45	A	PCU	P314413	
	SM 2320 B-97	Total Alkalinity	76		mg CaCO3/L	P314920	
	SM 2540 C-97	TDS	122		mg/L	P314955	
	SM 2540 D-97	TSS	4	I	mg/L	P315044	
	SM 4500 F-C-97	Fluoride	0.064	I	mg F/L	P314669	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.22		mg N/L	P315023	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P315347	
1846727	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P314521	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P314967	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P314560	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.011		mg P/L	P314418	
	dissolved						

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The sample was reanalyzed on 11/08/2016. The result was 2.1 Q NTU.

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

Sample Location: Pirate Canal Middle Duplicate

Collection Date/Time: 11/01/2016 12:35

Field ID: G3SD110116-D

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1846725	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P314432	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P315352	
		Sulfate	3.7		mg SO4/L	P315357	
	SM 2120 B	Color (true)	43		PCU	P314413	
	SM 2320 B-97	Total Alkalinity	77		mg CaCO3/L	P314920	
	SM 2540 C-97	TDS	114		mg/L	P314955	
	SM 2540 D-97	TSS	5	I	mg/L	P315044	
	SM 4500 F-C-97	Fluoride	0.073	I	mg F/L	P314923	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.22		mg N/L	P315023	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P315346	
1846728	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P314521	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P314967	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P314560	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.011		mg P/L	P314419	
	dissolved						

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The result was confirmed on 11/08/2016.

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

Sample Location: Field Blank

Collection Date/Time: 11/01/2016 13:10

Field ID: G3SD110116-B

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1846726	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P314432	

Field ID: G3SD110116-B

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1846726	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P315353	
		Sulfate	0.20	U	mg SO4/L	P315358	
	SM 2120 B	Color (true)	2.5	U	PCU	P314413	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P314921	
	SM 2540 C-97	TDS	15	U	mg/L	P314951	
	SM 2540 D-97	TSS	2	U	mg/L	P315040	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P314924	
1846729	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P315023	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P315346	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P314521	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P314967	
	SM 5310 B-00	Organic Carbon	0.53	I	mg C/L	P314560	
1846732	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P314419	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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: The result was confirmed on 11/10/2016.

EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 11/18/2016.

SM 5310 B-00: The result was confirmed on 11/04/2016.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P314432

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P315352

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P315353

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P315357

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P315358

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315023

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315346

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315347

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P314521

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P314967

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314418

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314419

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

Reference Method: SM 2120 B
Batch ID: P314413

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P314920

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P314921

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

Reference Method: SM 2540 C-97
Batch ID: P314951

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P314955

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P315040

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P315044

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P314669

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P314923

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P314924

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P314560

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315352

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315353

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315357

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315358

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	107		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315346

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315347

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P314521

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P314967

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314418

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: P314419

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

Reference Method: SM 2320 B-97
Batch ID: P314920

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P314921

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

Reference Method: SM 4500 F-C-97
Batch ID: P314669

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P314923

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P314924

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P314560

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315352

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315352

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846724	Chloride	97.9		P	90 - 110
1846725	Chloride	98.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315353

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846164	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846724	Sulfate	95.3		P	90 - 110
1846725	Sulfate	95.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315358

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846163	Sulfate	96.4		P	90 - 110
1846164	Sulfate	96.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846688	Ammonia-N	106	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1844398	Kjeldahl Nitrogen	101	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1847055	Kjeldahl Nitrogen	93.3	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P314521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846727	NO2NO3-N	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P314967

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846689	Total-P	105	98.1	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846596	O-Phosphate-P	96.9	98.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314419

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846796	O-Phosphate-P	98.7	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P314669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846724	Fluoride	98.0	99.2	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P314923

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1847277	Fluoride	100	101	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P314924

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846901	Fluoride	99.4	100	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P314560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1846688	Organic Carbon	96.3	95.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P314432

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846724	Turbidity	6.10	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315352

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846724	Chloride	0.157	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315353

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846163	Chloride	0.138	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846724	Sulfate	5.40	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315358

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846163	Sulfate	0.106	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846688	Ammonia-N	1.09	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1844398	Kjeldahl Nitrogen	1.85	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1847055	Kjeldahl Nitrogen	4.42	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P314521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846727	NO2NO3-N	0.418	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P314967

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846689	Total-P	3.29	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846596	O-Phosphate-P	0.933	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846796	O-Phosphate-P	1.05	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P314413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846724	Color (true)	9.89	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P314920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1847277	Total Alkalinity	0.459	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P314921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846901	Total Alkalinity	0.287	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P314951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846037	TDS	4.72	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P314955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846687	TDS	2.61	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P314669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846724	Fluoride	1.05	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P314923

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1847277	Fluoride	0.494	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P314924

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846901	Fluoride	0.494	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P314560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1846688	Organic Carbon	0.409	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: SM 2120 B
Run ID: A72580
Included Lab Sample IDs: 1846724, 1846725, 1846726

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.4	98.5	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A72581
Included Lab Sample IDs: 1846730, 1846731, 1846732

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.0	P/P	90 - 110
O-Phosphate-P	99.9	98.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A72583
Included Lab Sample IDs: 1846724, 1846725, 1846726

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A72599
Included Lab Sample IDs: 1846727, 1846728, 1846729

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A72609

Included Lab Sample IDs: 1846727, 1846728, 1846729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.9	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A72644

Included Lab Sample IDs: 1846724

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

Reference Method: SM 2320 B-97

Run ID: A72739

Included Lab Sample IDs: 1846724, 1846725, 1846726

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

Reference Method: SM 4500 F-C-97

Run ID: A72739

Included Lab Sample IDs: 1846725, 1846726

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72764

Included Lab Sample IDs: 1846727, 1846728, 1846729

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72811

Included Lab Sample IDs: 1846727, 1846728, 1846729

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A72830

Included Lab Sample IDs: 1846724, 1846725, 1846726

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	99.0	P/P	90 - 110
Chloride	99.7	101	P/P	90 - 110
Sulfate	96.8	98.5	P/P	90 - 110
Sulfate	99.3	96.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A72894

Included Lab Sample IDs: 1846727, 1846728, 1846729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	104	P/P	90 - 110
Kjeldahl Nitrogen	104	101	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				6.10	
EPA 300.0 Rev. 2.1	Chloride	98.7	97.9 98.0		0.157	
	Chloride	102	100		0.138	
	Sulfate	95.3	95.3 95.0		5.40	
	Sulfate	97.3	96.4 96.5		0.106	
EPA 350.1 Rev. 2.0	Ammonia-N	107	106 104			1.09
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	101 103			1.85
	Kjeldahl Nitrogen	98.8	93.3 98.2			4.42
EPA 353.2 Rev. 2.0	NO2NO3-N	107	106 105			0.418
EPA 365.1 Rev. 2.0	Total-P	98.8	105 98.1			3.29
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.9 98.1			0.933
	O-Phosphate-P	99.4	98.7 100			1.05
SM 2120 B	Color (true)				9.89	
SM 2320 B-97	Total Alkalinity	101			0.459	
	Total Alkalinity	102			0.287	
SM 2540 C-97	TDS				4.72	
	TDS				2.61	
SM 4500 F-C-97	Fluoride	97.1	98.0 99.2			1.05
	Fluoride	97.0	100 101			0.494
	Fluoride	98.5	99.4 100			0.494
SM 5310 B-00	Organic Carbon	97.2	96.3 95.6			0.409

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1846724, 1846725, 1846726
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1846724, 1846725, 1846726
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1846724, 1846725, 1846726
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1846727, 1846728, 1846729
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1846727, 1846728, 1846729
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1846727, 1846728, 1846729
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1846727, 1846728, 1846729

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1846730, 1846731, 1846732
SM 2120 B / E31780	True Color measured at 450 nm	1846724, 1846725, 1846726
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1846724, 1846725, 1846726
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1846724, 1846725, 1846726
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1846724, 1846725, 1846726
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1846724, 1846725, 1846726
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1846727, 1846728, 1846729

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	11/02/2016			11/02/2016 15:45	Julie Michelle Frank	1846724, 1846725, 1846726
EPA 300.0 Rev. 2.1	11/02/2016			11/16/2016	Ping Hua	1846724, 1846725
	11/02/2016			11/17/2016	Ping Hua	1846726
EPA 350.1 Rev. 2.0	11/02/2016			11/10/2016	Julie Michelle Frank	1846727, 1846728, 1846729
EPA 351.2 Rev. 2.0	11/02/2016	11/17/2016	Adrian Shelby	11/18/2016	Joseph Suarez	1846727, 1846728, 1846729
EPA 353.2 Rev. 2.0	11/02/2016			11/03/2016	Beverly Y. Sanders	1846727, 1846728, 1846729
EPA 365.1 Rev. 2.0	11/02/2016	11/10/2016	Adrian Shelby	11/15/2016	Lipi Saha	1846727, 1846728, 1846729
EPA 365.1 Rev. 2.0 dissolved	11/02/2016			11/02/2016 15:18	Julia Storbeck	1846732
	11/02/2016			11/02/2016 15:28	Julia Storbeck	1846730
	11/02/2016			11/02/2016 15:29	Julia Storbeck	1846731
SM 2120 B	11/02/2016			11/02/2016 15:40	Julie Michelle Frank	1846724
	11/02/2016			11/02/2016 15:42	Julie Michelle Frank	1846725, 1846726
SM 2320 B-97	11/02/2016			11/09/2016	Dale L. Simmons	1846724, 1846725
	11/02/2016			11/10/2016	Dale L. Simmons	1846726
SM 2540 C-97	11/02/2016			11/04/2016	Yijie Li	1846724, 1846725, 1846726
SM 2540 D-97	11/02/2016			11/04/2016	Yijie Li	1846724, 1846725, 1846726
SM 4500 F-C-97	11/02/2016			11/05/2016	Dale L. Simmons	1846724
	11/02/2016			11/09/2016	Dale L. Simmons	1846725
	11/02/2016			11/10/2016	Dale L. Simmons	1846726
SM 5310 B-00	11/02/2016			11/03/2016	Julie Michelle Frank	1846727, 1846728, 1846729