

Chemical Analysis Report

SO-DIST-2016-02-09-02

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

Event Description: **SMP: Highlands Lakes**

Request ID: **RQ-2016-02-08-19**

Customer: **SO-DIST**

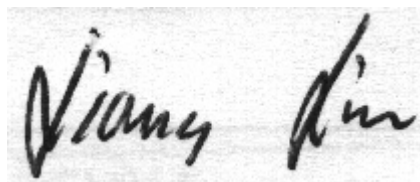
Project ID: **SMP**

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: 25-FEB-2016 16:55

A handwritten signature in black ink, appearing to read "Liang Lin", 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: Lake Adelaide Center South

Collection Date/Time: 02/08/2016 13:15

Field ID: SD020816-4

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1769895	EPA 180.1 Rev. 2.0	Turbidity	2.3	A	NTU	P298354	
	EPA 300.0 Rev. 2.1	Chloride	16	A	mg Cl/L	P298491	
		Sulfate	13	A	mg SO4/L	P298488	
	SM 2120 B	Color (true)	60		PCU	P298347	
	SM 2320 B-97	Total Alkalinity	5.2		mg CaCO3/L	P298778	
	SM 2540 C-97	TDS	67		mg/L	P298989	
	SM 2540 D-97	TSS	3	I	mg/L	P298983	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P298774	
1769901	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P298733	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P298581	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P298527	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P298572	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P298465	
1769907	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298331	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: The result was confirmed on 02/17/2016.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Lake Adelaide Center South dup

Collection Date/Time: 02/08/2016 13:20

Field ID: SD020816-7

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1769896	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P298354	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P298491	
		Sulfate	13		mg SO4/L	P298488	
	SM 2120 B	Color (true)	59	A	PCU	P298348	
	SM 2320 B-97	Total Alkalinity	5.4		mg CaCO3/L	P298778	
	SM 2540 C-97	TDS	70		mg/L	P298989	
	SM 2540 D-97	TSS	4	I	mg/L	P298983	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P298774	
1769902	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P298733	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P298636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P298527	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P298572	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P298465	
1769908	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298331	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: The result was confirmed on 02/17/2016.

Sample Location: Lake Letta @ Center

Collection Date/Time: 02/08/2016 11:50

Field ID: SD020816-5

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1769897	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P298354	

Field ID: SD020816-5

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1769897	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P298491	
		Sulfate	22		mg SO4/L	P298488	
	SM 2120 B	Color (true)	15		PCU	P298348	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	92	A	mg/L	P298989	
	SM 2540 D-97	TSS	2	I	mg/L	P298983	
	SM 4500 F-C-97	Fluoride	0.076	I	mg F/L	P298775	
1769903	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P298733	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P298636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P298527	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P298572	
	SM 5310 B-00	Organic Carbon	5.6		mg C/L	P298465	
1769909	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298331	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: Lake Letta @ Center-duplicate

Collection Date/Time: 02/08/2016 11:55

Field ID: SD020816-8

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1769898	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P298354	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P298491	
		Sulfate	22		mg SO4/L	P298488	
	SM 2120 B	Color (true)	15		PCU	P298348	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	80		mg/L	P298989	
	SM 2540 D-97	TSS	3	I	mg/L	P298983	
1769904	SM 4500 F-C-97	Fluoride	0.076	I	mg F/L	P298775	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P298733	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P298636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P298527	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P298573	
1769910	SM 5310 B-00	Organic Carbon	5.7		mg C/L	P298465	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298331	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: Red Water Lake at Center

Collection Date/Time: 02/08/2016 13:15

Field ID: SD020816-6

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1769899	EPA 180.1 Rev. 2.0	Turbidity	6.3		NTU	P298354	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P298491	
		Sulfate	27		mg SO4/L	P298488	
	SM 2120 B	Color (true)	28		PCU	P298348	
	SM 2320 B-97	Total Alkalinity	21		mg CaCO3/L	P298964	

Field ID: SD020816-6

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1769899	SM 2540 C-97	TDS	105		mg/L	P298989	
	SM 2540 D-97	TSS	6	I	mg/L	P298983	
	SM 4500 F-C-97	Fluoride	0.042	I	mg F/L	P298775	
1769905	EPA 350.1 Rev. 2.0	Ammonia-N	0.045		mg N/L	P298734	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P298636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.72		mg N/L	P298527	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P298573	
	SM 5310 B-00	Organic Carbon	9.3		mg C/L	P298465	
1769911	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298331	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: Field Blank

Collection Date/Time: 02/08/2016 11:00

Field ID: SD020816-9

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1769900	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P298354	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P298491	
		Sulfate	0.20	U	mg SO4/L	P298488	
	SM 2120 B	Color (true)	2.5	U	PCU	P298348	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	15	U	mg/L	P298988	
	SM 2540 D-97	TSS	2	U	mg/L	P298982	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P298775	
1769906	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P298734	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P298636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P298527	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P298573	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P298465	
1769912	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298331	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298354

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298488

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298491

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298733

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298734

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298581

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298636

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298527

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: P298572

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298573

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298331

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
Batch ID: P298347

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P298348

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P298778

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

Reference Method: SM 2320 B-97
Batch ID: P298964

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

Reference Method: SM 2540 C-97
Batch ID: P298988

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P298989

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P298982

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P298983

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P298774

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P298775

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P298465

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: P298488

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298491

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298733

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298734

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298581

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298636

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: P298527

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298527

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298572

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298573

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298331

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

Reference Method: SM 2320 B-97
Batch ID: P298778

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 105

Reference Method: SM 2320 B-97
Batch ID: P298964

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

Reference Method: SM 4500 F-C-97
Batch ID: P298774

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.1		P	94 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P298775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P298465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	105		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298488

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769895	Sulfate	96.9		P	90 - 110
1769897	Sulfate	98.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298491

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769895	Chloride	102		P	90 - 110
1769897	Chloride	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298733

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769859	Ammonia-N	95.5	94.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298734

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769987	Ammonia-N	95.4	94.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769902	Kjeldahl Nitrogen	110	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298527

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769901	NO2NO3-N	99.2	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769856	Total-P	96.4	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298573

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769904	Total-P	98.6	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769870	O-Phosphate-P	100	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P298774

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770192	Fluoride	97.8	97.8	P/P	94 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P298775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770128	Fluoride	99.1	98.4	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P298465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769805	Organic Carbon	99.6	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298354

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769895	Turbidity	0.877	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298488

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769895	Sulfate	0.187	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298491

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769895	Chloride	0.00637	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769859	Ammonia-N	0.966	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298734

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769987	Ammonia-N	0.434	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769806	Kjeldahl Nitrogen	0.760	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769902	Kjeldahl Nitrogen	3.10	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769901	NO2NO3-N	1.41	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769856	Total-P	4.28	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298573

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769904	Total-P	4.28	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769870	O-Phosphate-P	0.752	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P298347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769847	Color (true)	0.402	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P298348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769896	Color (true)	0.613	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P298778

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770192	Total Alkalinity	0.132	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P298964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770128	Total Alkalinity	0.135	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P298988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769800	TDS	6.90	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P298989

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769897	TDS	1.08	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P298774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770192	Fluoride	0.0	Spike	P	0 - 3.7

Reference Method: SM 4500 F-C-97
Batch ID: P298775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770128	Fluoride	0.473	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P298465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769805	Organic Carbon	0.224	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 300.0 Rev. 2.1

Run ID: A67519

Included Lab Sample IDs: 1769895, 1769896, 1769897, 1769898, 1769899, 1769900

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.1	98.7	P/P	90 - 110
Sulfate	96.8	92.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A67530

Included Lab Sample IDs: 1769907, 1769908, 1769909, 1769910, 1769911, 1769912

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

Reference Method: SM 2120 B

Run ID: A67534

Included Lab Sample IDs: 1769895, 1769896, 1769897, 1769898, 1769899, 1769900

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.9	P/P	85 - 115
Color (true)	99.9	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A67535

Included Lab Sample IDs: 1769895, 1769896, 1769897, 1769898, 1769899, 1769900

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

Reference Method: SM 5310 B-00

Run ID: A67574

Included Lab Sample IDs: 1769901, 1769902, 1769903, 1769904, 1769905, 1769906

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A67589

Included Lab Sample IDs: 1769901, 1769902, 1769903, 1769904, 1769905, 1769906

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A67626

Included Lab Sample IDs: 1769901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.3	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A67628

Included Lab Sample IDs: 1769901, 1769902, 1769903, 1769904, 1769905, 1769906

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A67628

Included Lab Sample IDs: 1769901, 1769902, 1769903, 1769904, 1769905, 1769906

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

Reference Method: SM 4500 F-C-97

Run ID: A67633

Included Lab Sample IDs: 1769895, 1769896, 1769897, 1769898, 1769899, 1769900

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A67644

Included Lab Sample IDs: 1769902, 1769903, 1769904, 1769905, 1769906

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.9	99.5	P/P	90 - 110
Kjeldahl Nitrogen	98.6	99.1	P/P	90 - 110
Kjeldahl Nitrogen	99.5	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A67650

Included Lab Sample IDs: 1769901, 1769902, 1769903, 1769904, 1769905, 1769906

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	98.6	P/P	90 - 110
Ammonia-N	98.6	98.4	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A67657

Included Lab Sample IDs: 1769895, 1769896

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	98.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A67716

Included Lab Sample IDs: 1769897, 1769898, 1769899, 1769900

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	104	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity			0.877	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 300.0 Rev. 2.1	Chloride	102	102	102	0.0063	
	Sulfate	99.3	96.9	98.4	0.187	
EPA 350.1 Rev. 2.0	Ammonia-N	95.0	95.5	94.4		0.966
	Ammonia-N	95.3	95.4	94.9		0.434
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101				0.760
	Kjeldahl Nitrogen	102	110	105		3.10
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	99.2	101		1.41
EPA 365.1 Rev. 2.0	Total-P	98.8	96.4	101		4.28
	Total-P	99.2	98.6	103		4.28
EPA 365.1 Rev. 2.0 dissolved SM 2120 B	O-Phosphate-P	102	100	101		0.752
	Color (true)				0.402	
	Color (true)				0.613	
SM 2320 B-97	Total Alkalinity	101			0.132	
	Total Alkalinity	100			0.135	
SM 2540 C-97	TDS				6.90	
	TDS				1.08	
SM 4500 F-C-97	Fluoride	98.1	97.8	97.8		0.0
	Fluoride	97.1	99.1	98.4		0.473
SM 5310 B-00	Organic Carbon	105	99.6	100		0.224

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1769901, 1769902, 1769903, 1769904, 1769905, 1769906
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1769901, 1769902, 1769903, 1769904, 1769905, 1769906
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1769901, 1769902, 1769903, 1769904, 1769905, 1769906
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1769901, 1769902, 1769903, 1769904, 1769905, 1769906
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1769907, 1769908, 1769909, 1769910, 1769911, 1769912
SM 2120 B / E31780	True Color measured at 450 nm	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1769901, 1769902, 1769903, 1769904, 1769905, 1769906

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	02/09/2016			02/09/2016 14:17	Sima Feizi	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
EPA 300.0 Rev. 2.1	02/09/2016			02/12/2016	Ping Hua	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
EPA 350.1 Rev. 2.0	02/09/2016			02/17/2016	Diana M. Turner	1769901, 1769902, 1769903, 1769904, 1769905, 1769906
EPA 351.2 Rev. 2.0	02/09/2016	02/15/2016	Christopher Armour	02/16/2016	Bryan A. Werth	1769901
	02/09/2016	02/16/2016	Sofia Elnemr	02/17/2016	Bryan A. Werth	1769902, 1769903, 1769904, 1769905, 1769906
EPA 353.2 Rev. 2.0	02/09/2016			02/12/2016	Diana M. Turner	1769901, 1769902, 1769903, 1769904, 1769905, 1769906
EPA 365.1 Rev. 2.0	02/09/2016	02/15/2016	Christopher Armour	02/16/2016	Lipi Saha	1769901, 1769902, 1769903, 1769904, 1769905, 1769906
EPA 365.1 Rev. 2.0 dissolved	02/09/2016			02/09/2016 14:56	Bryan A. Werth	1769912
	02/09/2016			02/09/2016 14:57	Bryan A. Werth	1769907
	02/09/2016			02/09/2016 14:58	Bryan A. Werth	1769908
	02/09/2016			02/09/2016 14:59	Bryan A. Werth	1769909
	02/09/2016			02/09/2016 15:00	Bryan A. Werth	1769910
	02/09/2016			02/09/2016 15:01	Bryan A. Werth	1769911
SM 2120 B	02/09/2016			02/09/2016 15:00	Blanca Fach	1769895
	02/09/2016			02/09/2016 15:04	Blanca Fach	1769897, 1769898
	02/09/2016			02/09/2016 15:05	Blanca Fach	1769899
	02/09/2016			02/09/2016 15:06	Blanca Fach	1769900
	02/09/2016			02/09/2016 15:07	Blanca Fach	1769896
SM 2320 B-97	02/09/2016			02/12/2016	Dale L. Simmons	1769895, 1769896
	02/09/2016			02/20/2016	Dale L. Simmons	1769897, 1769898, 1769899, 1769900
SM 2540 C-97	02/09/2016			02/12/2016	Yijie Li	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
SM 2540 D-97	02/09/2016			02/12/2016	Yijie Li	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
SM 4500 F-C-97	02/09/2016			02/12/2016	Dale L. Simmons	1769895, 1769896, 1769897, 1769898, 1769899, 1769900
SM 5310 B-00	02/09/2016			02/11/2016	Sofia Elnemr	1769901, 1769902, 1769903, 1769904, 1769905, 1769906