

Chemical Analysis Report

SO-DIST-2018-03-27-01

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

Event Description: **Highlands Lakes**
Request ID: **RQ-2018-03-26-11**
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: Maryann Dugan

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 19-APR-2018 15:38



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: Blue Lake @ Center

Collection Date/Time: 03/26/2018 12:45

Field ID: G4SD0157

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977934	EPA 180.1 Rev. 2.0	Turbidity	2.1	A	NTU	P342270	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P342507	
		Sulfate	25		mg SO4/L	P342510	
	SM 2120 B	Color (true)	13	A	PCU	P342264	
	SM 2320 B-97	Total Alkalinity	18		mg CaCO3/L	P342531	RPD
	SM 2540 C-97	TDS	103		mg/L	P342576	
	SM 2540 D-97	TSS	4	I	mg/L	P342631	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P342536	
1977937	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P342682	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.70		mg N/L	P342309	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342337	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P342356	
	SM 5310 B-00	Organic Carbon	7.3		mg C/L	P342873	
1977940	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P342315	

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: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Buck Lake @ Middle

Collection Date/Time: 03/26/2018 10:40

Field ID: G4SD0158

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977935	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P342270	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P342507	
		Sulfate	63		mg SO4/L	P342510	
	SM 2120 B	Color (true)	5.3	I	PCU	P342264	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P342981	
	SM 2540 C-97	TDS	209		mg/L	P342576	
	SM 2540 D-97	TSS	3	I	mg/L	P342631	
	SM 4500 F-C-97	Fluoride	0.076	I	mg F/L	P343645	
1977938	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P342682	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P342309	
	EPA 353.2 Rev. 2.0	NO2NO3-N	14		mg N/L	P342337	
	EPA 365.1 Rev. 2.0	Total-P	0.005		mg P/L	P342356	
	SM 5310 B-00	Organic Carbon	4.2		mg C/L	P342873	
1977941	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P342315	

Ref. Method and Comment:

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 04/04/2018.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Buck Lake @ Middle

Collection Date/Time: 03/26/2018 10:45

Field ID: G4SD0158_DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977943	EPA 180.1 Rev. 2.0	Turbidity	0.65		NTU	P342270	

Field ID: G4SD0158_DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977943	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P342507	
		Sulfate	63		mg SO4/L	P342510	
	SM 2120 B	Color (true)	5.2	I	PCU	P342264	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P342981	
	SM 2540 C-97	TDS	204		mg/L	P342576	
	SM 2540 D-97	TSS	2	I	mg/L	P342631	
	SM 4500 F-C-97	Fluoride	0.077	I	mg F/L	P343645	
1977944	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P342682	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40		mg N/L	P342309	
	EPA 353.2 Rev. 2.0	NO2NO3-N	13		mg N/L	P342337	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P342356	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P342873	
1977945	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P342316	

Ref. Method and Comment:

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 04/04/2018.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Lachard @ Center

Collection Date/Time: 03/26/2018 11:40

Field ID: G4SD0164

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977936	EPA 180.1 Rev. 2.0	Turbidity	6.1		NTU	P342270	
	EPA 300.0 Rev. 2.1	Chloride	6.4		mg Cl/L	P342507	
		Sulfate	16		mg SO4/L	P342510	
	SM 2120 B	Color (true)	10		PCU	P342264	
	SM 2320 B-97	Total Alkalinity	3.9	AJ	mg CaCO3/L	P342531	RPD
	SM 2540 C-97	TDS	51		mg/L	P342576	
	SM 2540 D-97	TSS	5	I	mg/L	P342631	
1977939	SM 4500 F-C-97	Fluoride	0.058	I	mg F/L	P342536	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P342682	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P342309	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342337	
	EPA 365.1 Rev. 2.0	Total-P	0.035		mg P/L	P342482	
1977942	SM 5310 B-00	Organic Carbon	5.4		mg C/L	P342873	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P342316	

Ref. Method and Comment:

SM 2320 B-97: Refer to the narrative for an explanation of QC Codes.

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: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P342270

Component	Result	Code	Units
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Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P342270

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342507

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342682

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342309

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342337

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342356

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342482

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342315

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342316

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

Reference Method: SM 2120 B
Batch ID: P342264

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P342531

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

Reference Method: SM 2320 B-97
Batch ID: P342981

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

Reference Method: SM 2540 C-97
Batch ID: P342576

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P342631

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P343645

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P342873

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: P342507

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342682

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342309

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342337

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: P342356

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342482

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342315

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342316

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P342531

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P342981

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.8		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.6		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P343645

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342873

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977857	Chloride	94.2		P	90 - 110
1977934	Chloride	96.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977857	Sulfate	96.6		P	90 - 110
1977934	Sulfate	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977937	Ammonia-N	96.5	96.3	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977927	Kjeldahl Nitrogen	98.9	96.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977937	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977887	O-Phosphate-P	96.7	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977942	O-Phosphate-P	98.0	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977936	Fluoride	97.3	97.8	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P343645

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978282	Fluoride	97.0	97.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977219	Organic Carbon	100	99.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P342270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977934	Turbidity	1.45	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977857	Chloride	0.757	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977857	Sulfate	0.948	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977937	Ammonia-N	0.228	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977927	Kjeldahl Nitrogen	1.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977937	NO2NO3-N	0.471	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342356

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977927	Total-P	2.98	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977932	Total-P	0.699	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977887	O-Phosphate-P	1.01	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977942	O-Phosphate-P	0.509	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P342264

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977934	Color (true)	1.30	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P342531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977936	Total Alkalinity	4.10	Sample	F	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P342981

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978282	Total Alkalinity	0.435	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P342576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977924	TDS	6.02	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977936	Fluoride	0.479	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P343645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978282	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P342873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977219	Organic Carbon	0.592	Spike	P	0 - 20

Quality Assurance Report Precision

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A82875

Included Lab Sample IDs: 1977934, 1977935, 1977936, 1977943

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.4	98.3	P/P	85 - 115
Color (true)	99.6	99.3	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A82876

Included Lab Sample IDs: 1977934, 1977935, 1977936, 1977943

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82892

Included Lab Sample IDs: 1977934, 1977935, 1977936, 1977943

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.6	101	P/P	90 - 110
Chloride	99.6	98.6	P/P	90 - 110
Sulfate	98.0	98.9	P/P	90 - 110
Sulfate	98.9	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A82895

Included Lab Sample IDs: 1977940, 1977941, 1977942, 1977945

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	102	100	P/P	90 - 110
O-Phosphate-P	99.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82906

Included Lab Sample IDs: 1977937, 1977938, 1977939, 1977944

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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: A82946

Included Lab Sample IDs: 1977937, 1977938, 1977944

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82956

Included Lab Sample IDs: 1977937, 1977938, 1977939, 1977944

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

Reference Method: SM 2320 B-97

Run ID: A82967

Included Lab Sample IDs: 1977934, 1977936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	97.4	P/P	90 - 110
Total Alkalinity	97.4	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A82967

Included Lab Sample IDs: 1977934, 1977936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.1	P/P	90 - 110
Fluoride	98.1	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83000

Included Lab Sample IDs: 1977939

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.0	97.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A83017

Included Lab Sample IDs: 1977937, 1977938, 1977939, 1977944

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	100	P/P	90 - 110
Ammonia-N	99.1	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A83069

Included Lab Sample IDs: 1977937, 1977938, 1977939, 1977944

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.5	96.0	P/P	90 - 110
Organic Carbon	96.0	95.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A83098

Included Lab Sample IDs: 1977935, 1977943

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.2	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A83315

Included Lab Sample IDs: 1977935, 1977943

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

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				1.45	
EPA 300.0 Rev. 2.1	Chloride	97.4	94.2 96.5		0.757	
	Sulfate	97.7	96.6 97.1		0.948	
EPA 350.1 Rev. 2.0	Ammonia-N	96.6	96.5 96.3			0.228
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	98.9 96.6			1.62
EPA 353.2 Rev. 2.0	NO2NO3-N	104	106 106			0.471
EPA 365.1 Rev. 2.0	Total-P	103				2.98
	Total-P	102				0.699
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	96.7 98.0			1.01
	O-Phosphate-P	104	98.0 98.5			0.509
SM 2120 B	Color (true)				1.30	
SM 2320 B-97	Total Alkalinity	100			4.10	
	Total Alkalinity	99.8			0.435	
SM 2540 C-97	TDS				6.02	
SM 4500 F-C-97	Fluoride	95.6	97.3 97.8			0.479
	Fluoride	96.7	97.0 97.0			0.0
SM 5310 B-00	Organic Carbon	96.9	100 99.4			0.592

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1977934, 1977935, 1977936, 1977943
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1977934, 1977935, 1977936, 1977943
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1977934, 1977935, 1977936, 1977943
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1977937, 1977938, 1977939, 1977944
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1977937, 1977938, 1977939, 1977944
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1977937, 1977938, 1977939, 1977944
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1977937, 1977938, 1977939, 1977944
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1977940, 1977941, 1977942, 1977945
SM 2120 B / E31780	True Color measured at 450 nm	1977934, 1977935, 1977936, 1977943
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1977934, 1977935, 1977936, 1977943
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1977934, 1977935, 1977936, 1977943

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1977934, 1977935, 1977936, 1977943
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1977934, 1977935, 1977936, 1977943
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1977937, 1977938, 1977939, 1977944

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	03/27/2018			03/27/2018 15:15	DeAsia Armster	1977934, 1977935, 1977936, 1977943
EPA 300.0 Rev. 2.1	03/27/2018			03/29/2018 18:38	Lipi Saha	1977934
	03/27/2018			03/29/2018 21:13	Lipi Saha	1977935
	03/27/2018			03/29/2018 21:25	Lipi Saha	1977936
	03/27/2018			03/29/2018 21:37	Lipi Saha	1977943
EPA 350.1 Rev. 2.0	03/27/2018			04/03/2018 14:16	Ping Hua	1977937
	03/27/2018			04/03/2018 14:21	Ping Hua	1977938
	03/27/2018			04/03/2018 14:22	Ping Hua	1977939
	03/27/2018			04/03/2018 14:30	Ping Hua	1977944
EPA 351.2 Rev. 2.0	03/27/2018	03/28/2018 10:40	Adrian Shelby	03/30/2018 10:02	Joseph Suarez	1977937
	03/27/2018	03/28/2018 10:40	Adrian Shelby	03/30/2018 10:03	Joseph Suarez	1977938
	03/27/2018	03/28/2018 10:40	Adrian Shelby	03/30/2018 10:05	Joseph Suarez	1977939
	03/27/2018	03/28/2018 10:40	Adrian Shelby	03/30/2018 10:06	Joseph Suarez	1977944
EPA 353.2 Rev. 2.0	03/27/2018			03/28/2018 12:01	Lauren Bottorf	1977937
	03/27/2018			03/28/2018 12:59	Lauren Bottorf	1977939
	03/27/2018			03/28/2018 13:04	Lauren Bottorf	1977938
	03/27/2018			03/28/2018 13:05	Lauren Bottorf	1977944
EPA 365.1 Rev. 2.0	03/27/2018	03/28/2018 13:55	Sima Feizi	03/29/2018 10:31	Beverly Y. Sanders	1977937
	03/27/2018	03/28/2018 13:55	Sima Feizi	03/29/2018 10:32	Beverly Y. Sanders	1977938
	03/27/2018	03/28/2018 13:55	Sima Feizi	03/29/2018 10:33	Beverly Y. Sanders	1977944
	03/27/2018	03/30/2018 13:51	Sima Feizi	04/02/2018 12:58	Beverly Y. Sanders	1977939
EPA 365.1 Rev. 2.0 dissolved	03/27/2018			03/27/2018 15:05	Megan Treadwell	1977942
	03/27/2018			03/27/2018 15:30	Megan Treadwell	1977940
	03/27/2018			03/27/2018 15:31	Megan Treadwell	1977941
	03/27/2018			03/27/2018 15:32	Megan Treadwell	1977945
SM 2120 B	03/27/2018			03/27/2018 15:32	Tanya Welborn	1977934
	03/27/2018			03/27/2018 15:34	Tanya Welborn	1977936
	03/27/2018			03/27/2018 15:59	Tanya Welborn	1977935
	03/27/2018			03/27/2018 16:00	Tanya Welborn	1977943
SM 2320 B-97	03/27/2018			03/31/2018 00:08	Lauren Bottorf	1977936
	03/27/2018			03/31/2018 02:47	Lauren Bottorf	1977934
	03/27/2018			04/05/2018 16:17	Dale L. Simmons	1977935
	03/27/2018			04/05/2018 16:27	Dale L. Simmons	1977943
SM 2540 C-97	03/27/2018			03/28/2018 15:49	Yijie Li	1977934, 1977935, 1977936, 1977943
SM 2540 D-97	03/27/2018			03/28/2018 15:49	Yijie Li	1977934, 1977935, 1977936, 1977943
SM 4500 F-C-97	03/27/2018			03/31/2018 00:00	Lauren Bottorf	1977936
	03/27/2018			03/31/2018 02:47	Lauren Bottorf	1977934
	03/27/2018			04/17/2018 15:05	Dale L. Simmons	1977935
	03/27/2018			04/17/2018 15:09	Dale L. Simmons	1977943
SM 5310 B-00	03/27/2018			04/04/2018 22:59	Julia Storbeck	1977937

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	03/27/2018			04/04/2018 23:45	Julia Storbeck	1977938
	03/27/2018			04/05/2018 00:05	Julia Storbeck	1977939
	03/27/2018			04/05/2018 00:19	Julia Storbeck	1977944