

Chemical Analysis Report

CEN-DIST-2018-03-13-02

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

Event Description: **Lotus / Lotta / Hope + D&B**
Request ID: **RQ-2018-03-12-56**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

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: 03-APR-2018 14:48



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 Lotta @ Center of Southern Lobe

Collection Date/Time: 03/12/2018 10:47

Field ID: G2CE0093

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974183	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P341488	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P341892	
		Sulfate	10		mg SO4/L	P341896	
	SM 2120 B	Color (true)	59	A	PCU	P341477	
	SM 2320 B-97	Total Alkalinity	69		mg CaCO3/L	P341818	
	SM 2540 C-97	TDS	124		mg/L	P341837	
	SM 2540 D-97	TSS	4	I	mg/L	P341789	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P341826	RPD
1974186	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P342062	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P341615	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341674	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P341517	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P342552	
1974189	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P341704	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample was reanalyzed out of holding time due to analytical difficulties.

Sample Location: Lake Lotta @ Center of Southern Lobe

Collection Date/Time: 03/12/2018 10:50

Field ID: G2CE0093DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974192	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P341488	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P341892	
		Sulfate	10		mg SO4/L	P341896	
	SM 2120 B	Color (true)	59		PCU	P341477	
	SM 2320 B-97	Total Alkalinity	69		mg CaCO3/L	P341819	
	SM 2540 C-97	TDS	129		mg/L	P341838	
	SM 2540 D-97	TSS	3	I	mg/L	P341790	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P341827	
1974193	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P342062	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P341615	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341676	
	EPA 365.1 Rev. 2.0	Total-P	0.035		mg P/L	P341517	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P342552	
1974194	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P341704	

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 dissolved: O-Phosphate-P: The sample was reanalyzed out of holding time due to analytical difficulties.

Sample Location: BLANK_03122018

Collection Date/Time: 03/12/2018 11:05

Field ID: BLANK_03122018

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974195	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P341488	

Field ID: BLANK_03122018

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974195	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P341892	
		Sulfate	0.20	U	mg SO4/L	P341896	
	SM 2120 B	Color (true)	2.5	U	PCU	P341477	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P341819	
	SM 2540 C-97	TDS	15	U	mg/L	P341835	
	SM 2540 D-97	TSS	2	U	mg/L	P341787	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P341827	
1974196	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P342062	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P341616	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341676	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P341517	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P342552	
1974197	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P341705	

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 dissolved: O-Phosphate-P: The sample was reanalyzed out of holding time due to analytical difficulties.

Sample Location: Lake Lotus @ Center

Collection Date/Time: 03/12/2018 11:58

Field ID: G2CE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974184	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P341488	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P341892	
		Sulfate	13		mg SO4/L	P341896	
	SM 2120 B	Color (true)	42		PCU	P341477	
	SM 2320 B-97	Total Alkalinity	69		mg CaCO3/L	P341819	
	SM 2540 C-97	TDS	144	A	mg/L	P341838	
	SM 2540 D-97	TSS	8	IA	mg/L	P341790	
1974187	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P341827	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P342062	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80		mg N/L	P341615	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341674	
	EPA 365.1 Rev. 2.0	Total-P	0.080		mg P/L	P341517	
1974190	SM 5310 B-00	Organic Carbon	10		mg C/L	P342552	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	IQ	mg P/L	P341704	

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 dissolved: O-Phosphate-P: The sample was reanalyzed out of holding time due to analytical difficulties.

Sample Location: Lake Hope @ Center

Collection Date/Time: 03/12/2018 12:53

Field ID: G2CE0106

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974185	EPA 180.1 Rev. 2.0	Turbidity	0.65		NTU	P341488	
	EPA 300.0 Rev. 2.1	Chloride	54		mg Cl/L	P341584	
		Sulfate	26		mg SO4/L	P341586	

Field ID: G2CE0106

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974185	SM 2120 B	Color (true)	27		PCU	P341477	
	SM 2320 B-97	Total Alkalinity	43		mg CaCO3/L	P341819	
	SM 2540 C-97	TDS	183		mg/L	P341838	
	SM 2540 D-97	TSS	2	I	mg/L	P341790	
	SM 4500 F-C-97	Fluoride	0.074	I	mg F/L	P341827	
1974188	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P342062	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P341615	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341676	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P341517	
	SM 5310 B-00	Organic Carbon	6.6		mg C/L	P342552	
1974191	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P341704	

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 dissolved: O-Phosphate-P: The sample was reanalyzed out of holding time due to analytical difficulties.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P341488

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P341584

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P341586

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P341892

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P341896

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P342062

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341615

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341616

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341674

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341676

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341517

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341704

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341705

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

Reference Method: SM 2120 B
Batch ID: P341477

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P341818

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P341819

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

Reference Method: SM 2540 C-97
Batch ID: P341835

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P341837

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P341838

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P341787

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P341789

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P341790

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P341826

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P341827

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P342552

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: P341584

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341586

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341892

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341896

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342062

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	90.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341615

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341616

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
-----------	---------	---------	-----------	----------------

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341674

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341676

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341517

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341704

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341705

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

Reference Method: SM 2320 B-97
Batch ID: P341818

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.7		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P341819

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.6		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P341826

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P341827

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	93.6		P	91 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P342552

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973751	Chloride	92.9		P	90 - 110
1974169	Chloride	97.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341586

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973751	Sulfate	97.9		P	90 - 110
1974169	Sulfate	95.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341892

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974026	Chloride	97.2		P	90 - 110
1974106	Chloride	96.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974026	Sulfate	99.6		P	90 - 110
1974106	Sulfate	97.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342062

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974187	Ammonia-N	91.8	92.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341615

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973752	Kjeldahl Nitrogen	101	93.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341616

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974229	Kjeldahl Nitrogen	96.0	91.2	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P341674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974179	NO2NO3-N	98.1	96.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P341676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974188	NO2NO3-N	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P341517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974187	Total-P	102	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P341704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974175	O-Phosphate-P	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P341705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974708	O-Phosphate-P	101	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Batch ID: P341827

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974337	Fluoride	92.3	93.3	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P342552

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974186	Organic Carbon	106	96.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P341488

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974178	Turbidity	0.0	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973751	Chloride	0.166	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973751	Sulfate	0.138	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341892

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974026	Chloride	0.909	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974026	Sulfate	1.05	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342062

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974187	Ammonia-N	0.242	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973752	Kjeldahl Nitrogen	4.77	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341616

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974229	Kjeldahl Nitrogen	3.64	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974179	NO2NO3-N	1.45	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974188	NO2NO3-N	0.971	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974187	Total-P	2.79	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974175	O-Phosphate-P	1.60	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974708	O-Phosphate-P	1.94	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P341477

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974183	Color (true)	1.13	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P341818

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974126	Total Alkalinity	0.166	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P341819

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974337	Total Alkalinity	0.334	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P341835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973594	TDS	5.85	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P341837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974099	TDS	5.26	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P341838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974184	TDS	6.94	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P341826

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974126	Fluoride	14.3	Spike	F	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P341827

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974337	Fluoride	0.988	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P342552

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974186	Organic Carbon	5.62	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: A82577
Included Lab Sample IDs: 1974183, 1974184, 1974185, 1974192, 1974195

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.4	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82581
Included Lab Sample IDs: 1974183, 1974184, 1974185, 1974192, 1974195

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82622

Included Lab Sample IDs: 1974185

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Sulfate	98.9	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82633

Included Lab Sample IDs: 1974186, 1974187, 1974188, 1974193, 1974196

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	100	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82658

Included Lab Sample IDs: 1974187

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	105	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82662

Included Lab Sample IDs: 1974186, 1974188, 1974193, 1974196

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A82664

Included Lab Sample IDs: 1974189, 1974190, 1974191, 1974194, 1974197

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82675

Included Lab Sample IDs: 1974186, 1974187, 1974188, 1974193, 1974196

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.0	96.1	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82726

Included Lab Sample IDs: 1974183, 1974184, 1974185, 1974192, 1974195

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.3	99.2	P/P	90 - 110
Total Alkalinity	99.2	96.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A82726

Included Lab Sample IDs: 1974183, 1974184, 1974185, 1974192, 1974195

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	96.7	97.2	P/P	90 - 110
Fluoride	97.2	105	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82750

Included Lab Sample IDs: 1974183, 1974184, 1974192, 1974195

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.4	96.2	P/P	90 - 110
Chloride	96.2	97.2	P/P	90 - 110
Sulfate	94.5	97.5	P/P	90 - 110
Sulfate	97.5	96.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82797

Included Lab Sample IDs: 1974186, 1974187, 1974188, 1974193, 1974196

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	102	P/P	90 - 110
Ammonia-N	99.6	102	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A82980

Included Lab Sample IDs: 1974186, 1974187, 1974188, 1974193, 1974196

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	101	106	P/P	90 - 110
Organic Carbon	106	105	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				0.0	
EPA 300.0 Rev. 2.1	Chloride	101	92.9 97.6		0.166	
	Chloride	99.0	97.2 96.2		0.909	
	Sulfate	101	97.9 95.9		0.138	
	Sulfate	101	99.6 97.7		1.05	
EPA 350.1 Rev. 2.0	Ammonia-N	90.7	91.8 92.1			0.242
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4	101 93.7			4.77
	Kjeldahl Nitrogen	97.8	96.0 91.2			3.64
EPA 353.2 Rev. 2.0	NO2NO3-N	101	98.1 96.6			1.45
	NO2NO3-N	102	104 102			0.971
EPA 365.1 Rev. 2.0	Total-P	96.7	102 106			2.79
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	100 102			1.60

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	101	104			1.94
SM 2120 B	Color (true)					1.13	
SM 2320 B-97	Total Alkalinity	98.7				0.166	
	Total Alkalinity	98.6				0.334	
SM 2540 C-97	TDS					5.85	
	TDS					5.26	
	TDS					6.94	
SM 4500 F-C-97	Fluoride	98.2					14.3
	Fluoride	93.6	92.3	93.3			0.988
SM 5310 B-00	Organic Carbon	100	106	96.3			5.62

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1974183, 1974184, 1974185, 1974192, 1974195
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1974183, 1974184, 1974185, 1974192, 1974195
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1974183, 1974184, 1974185, 1974192, 1974195
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1974186, 1974187, 1974188, 1974193, 1974196
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1974186, 1974187, 1974188, 1974193, 1974196
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1974186, 1974187, 1974188, 1974193, 1974196
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1974186, 1974187, 1974188, 1974193, 1974196
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1974189, 1974190, 1974191, 1974194, 1974197
SM 2120 B / E31780	True Color measured at 450 nm	1974183, 1974184, 1974185, 1974192, 1974195
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1974183, 1974184, 1974185, 1974192, 1974195
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1974183, 1974184, 1974185, 1974192, 1974195
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1974183, 1974184, 1974185, 1974192, 1974195
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1974183, 1974184, 1974185, 1974192, 1974195
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1974186, 1974187, 1974188, 1974193, 1974196

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	03/13/2018			03/13/2018 16:35	DeAsia Armster	1974183, 1974184, 1974185, 1974192, 1974195
EPA 300.0 Rev. 2.1	03/13/2018			03/15/2018	Julia Storbeck	1974185
	03/13/2018			03/20/2018	Julia Storbeck	1974183, 1974184, 1974192, 1974195
EPA 350.1 Rev. 2.0	03/13/2018			03/22/2018	Ping Hua	1974186, 1974187, 1974188, 1974193, 1974196
EPA 351.2 Rev. 2.0	03/13/2018	03/15/2018	Adrian Shelby	03/16/2018	Joseph Suarez	1974186, 1974187, 1974188, 1974193, 1974196
EPA 353.2 Rev. 2.0	03/13/2018			03/15/2018	Beverly Y. Sanders	1974186, 1974187, 1974188, 1974193, 1974196
EPA 365.1 Rev. 2.0	03/13/2018	03/14/2018	Adrian Shelby	03/16/2018	Lipi Saha	1974186, 1974187, 1974188, 1974193, 1974196
EPA 365.1 Rev. 2.0 dissolved	03/13/2018			03/16/2018 12:14	Megan Treadwell	1974189
	03/13/2018			03/16/2018 12:15	Megan Treadwell	1974190
	03/13/2018			03/16/2018 12:16	Megan Treadwell	1974191, 1974194
	03/13/2018			03/16/2018 12:17	Megan Treadwell	1974197
SM 2120 B	03/13/2018			03/13/2018 15:10	Tanya Welborn	1974183
	03/13/2018			03/13/2018 15:11	Tanya Welborn	1974184, 1974185
	03/13/2018			03/13/2018 15:12	Tanya Welborn	1974192
	03/13/2018			03/13/2018 15:13	Tanya Welborn	1974195
SM 2320 B-97	03/13/2018			03/19/2018	Lauren Bottorf	1974183
	03/13/2018			03/20/2018	Lauren Bottorf	1974184, 1974185, 1974192, 1974195
SM 2540 C-97	03/13/2018			03/14/2018	Yijie Li	1974183, 1974184, 1974185, 1974192, 1974195
SM 2540 D-97	03/13/2018			03/14/2018	Yijie Li	1974183, 1974184, 1974185, 1974192, 1974195
SM 4500 F-C-97	03/13/2018			03/19/2018	Lauren Bottorf	1974183
	03/13/2018			03/20/2018	Lauren Bottorf	1974184, 1974185, 1974192, 1974195
SM 5310 B-00	03/13/2018			03/30/2018	Megan Treadwell	1974186, 1974187, 1974188, 1974193, 1974196