Chemical Analysis Report

CEN-DIST-2020-03-12-01

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

Event Description: **Packingham X2 / Blanket X2**
Request ID: **RQ-2020-03-02-63**
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: Natalie Ayala

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 01-APR-2020 13:31

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Blanket Bay Slough @ SR 60 **Collection Date/Time: 03/11/2020 10:31**

Field ID: G4CE0180 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2164881	EPA 180.1 Rev. 2.0	Turbidity	9.2		NTU	P380573	
	EPA 300.0 Rev. 2.1	Chloride	47		mg Cl/L	P380935	
		Sulfate	3.0		mg SO4/L	P380937	
	SM 2120 B-2011	Color (true)	160		PCU	P380580	
	SM 2320 B-2011	Total Alkalinity	58		mg CaCO3/L	P381067	
	SM 2540 C-2011	TDS	196		mg/L	P381119	
	SM 2540 D-2011	TSS	11		mg/L	P381187	
	SM 4500 F-C-2011	Fluoride	0.16		mg F/L	P381263	
2164883	EPA 350.1 Rev. 2.0	Ammonia-N	0.22		mg N/L	P381039	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P380956	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.28		mg N/L	P381199	
	EPA 365.1 Rev. 2.0	Total-P	0.21		mg P/L	P381143	
	SM 5310 B-2011	Organic Carbon	24		mg C/L	P380752	
2164885	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P380569	

Ref. Method and Comment:
SM 2540 D-2011: 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: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Blanket Bay Slough @ 0.9 mi upstream of Kissimmee River

Collection Date/Time: 03/11/2020 11:31

Field ID: G4CE0179

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2164887	EPA 180.1 Rev. 2.0	Turbidity	17		NTU	P380573	
	EPA 300.0 Rev. 2.1	Chloride	32		mg Cl/L	P380935	
		Sulfate	3.4		mg SO4/L	P380937	
	SM 2120 B-2011	Color (true)	130		PCU	P380581	
	SM 2320 B-2011	Total Alkalinity	73		mg CaCO3/L	P381068	
	SM 2540 C-2011	TDS	187		mg/L	P381119	
	SM 2540 D-2011	TSS	15		mg/L	P381187	
	SM 4500 F-C-2011	Fluoride	0.13		mg F/L	P381264	
2164888	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P381040	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P381102	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P381199	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P381144	
	SM 5310 B-2011	Organic Carbon	24		mg C/L	P380752	
2164889	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.061		mg P/L	P380569	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: 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: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Packingham Slough @ 3 km S of SR 60 **Collection Date/Time: 03/11/2020 11:07**

Field ID: G4CE0186 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2164882	EPA 180.1 Rev. 2.0	Turbidity	6.3		NTU	P380573	
	EPA 300.0 Rev. 2.1	Chloride	22		mg Cl/L	P380935	
		Sulfate	7.6		mg SO4/L	P380937	
	SM 2120 B-2011	Color (true)	76		PCU	P380580	
	SM 2320 B-2011	Total Alkalinity	30		mg CaCO3/L	P381068	
	SM 2540 C-2011	TDS	109		mg/L	P381119	
	SM 2540 D-2011	TSS	6	I	mg/L	P381187	
	SM 4500 F-C-2011	Fluoride	0.076	I	mg F/L	P381264	
2164884	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P381040	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P381102	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381199	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P381144	
	SM 5310 B-2011	Organic Carbon	17		mg C/L	P380752	
2164886	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P380569	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: 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: 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: P380573

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380935

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380937

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381039

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381040

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380956

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381102

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381199

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381143

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381144

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380569

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

Reference Method: SM 2120 B-2011
Batch ID: P380580

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P380581

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P381067

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

Reference Method: SM 2320 B-2011
Batch ID: P381068

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

Reference Method: SM 2540 C-2011
Batch ID: P381119

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P381187

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P381263

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P381264

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P380752

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: P380935

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380937

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381039

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381040

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380956

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381102

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381199

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381143

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: P381144

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380569

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.1		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P380580

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

Reference Method: SM 2120 B-2011
Batch ID: P380581

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.2		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P381067

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	98 - 106

Reference Method: SM 2320 B-2011
Batch ID: P381068

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	106		P	98 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P381263

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.7		P	92 - 103

Reference Method: SM 4500 F-C-2011
Batch ID: P381264

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	93.8		P	92 - 103

Reference Method: SM 5310 B-2011
Batch ID: P380752

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164634	Chloride	97.3		P	90 - 110
2164788	Chloride	98.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164634	Sulfate	96.8		P	90 - 110
2164788	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381039

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164815	Ammonia-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381040

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163928	Ammonia-N	98.7	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2165003	Kjeldahl Nitrogen	97.6	99.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381199

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164815	NO2NO3-N	96.9	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381143

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164857	Total-P	106	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164972	Total-P	106	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P381263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164633	Fluoride	101	101	P/P	89 - 106

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P381264

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164997	Fluoride	98.9	100	P/P	89 - 106

Reference Method: SM 5310 B-2011
Batch ID: P380752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164807	Organic Carbon	98.7	99.7	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P380573

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164839	Turbidity	0.778	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164634	Chloride	0.0148	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164634	Sulfate	0.241	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381039

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164815	Ammonia-N	0.429	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381040

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163928	Ammonia-N	0.980	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2165003	Kjeldahl Nitrogen	1.09	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2165312	Kjeldahl Nitrogen	0.364	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381199

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164815	NO2NO3-N	1.01	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164857	Total-P	2.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164972	Total-P	2.08	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164885	O-Phosphate-P	0.487	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P380580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164789	Color (true)	1.62	Sample	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P380581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164632	Color (true)	5.07	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P381067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164633	Total Alkalinity	0.408	Sample	P	0 - 2.8

Reference Method: SM 2320 B-2011
Batch ID: P381068

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164997	Total Alkalinity	0.211	Sample	P	0 - 2.8

Reference Method: SM 2540 C-2011
Batch ID: P381119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164811	TDS	5.22	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P381263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164633	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-2011
Batch ID: P381264

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164997	Fluoride	0.986	Spike	P	0 - 2.5

Reference Method: SM 5310 B-2011
Batch ID: P380752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164807	Organic Carbon	0.989	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A98165
Included Lab Sample IDs: 2164885, 2164886, 2164889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	95.3	96.8	P/P	90 - 110
O-Phosphate-P	96.8	94.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A98166
Included Lab Sample IDs: 2164881, 2164882, 2164887

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

Reference Method: SM 2120 B-2011
Run ID: A98169
Included Lab Sample IDs: 2164881, 2164882, 2164887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115
Color (true)	101	101	P/P	90 - 115
Color (true)	99.8	102	P/P	90 - 115

Reference Method: SM 5310 B-2011
Run ID: A98233
Included Lab Sample IDs: 2164883, 2164884, 2164888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.9	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A98259
Included Lab Sample IDs: 2164881, 2164882, 2164887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	98.9	P/P	90 - 110
Sulfate	100	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A98337
Included Lab Sample IDs: 2164883, 2164884, 2164888

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

Reference Method: SM 2320 B-2011
Run ID: A98350
Included Lab Sample IDs: 2164881, 2164882, 2164887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	105	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A98369
Included Lab Sample IDs: 2164883

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	96.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A98393
Included Lab Sample IDs: 2164884, 2164888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A98396
Included Lab Sample IDs: 2164883

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.0	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A98402
Included Lab Sample IDs: 2164883, 2164884, 2164888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A98414
Included Lab Sample IDs: 2164884, 2164888

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

Reference Method: SM 4500 F-C-2011
Run ID: A98428
Included Lab Sample IDs: 2164881, 2164882, 2164887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.0	98.1	P/P	90 - 110
Fluoride	98.1	96.0	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		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					0.778	
EPA 300.0 Rev. 2.1	Chloride	100	97.3	98.9		0.0148	
	Sulfate	100	96.8	100		0.241	
EPA 350.1 Rev. 2.0	Ammonia-N	101	98.5	99.0			0.429
	Ammonia-N	99.9	98.7	100			0.980
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.2	97.6	99.6			1.09
	Kjeldahl Nitrogen	101					0.364
EPA 353.2 Rev. 2.0	NO2NO3-N	100	96.9	97.9			1.01
EPA 365.1 Rev. 2.0	Total-P	103	106	109			2.39
	Total-P	103	106	104			2.08
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.1					0.487
SM 2120 B-2011	Color (true)	100				1.62	
	Color (true)	99.2				5.07	
SM 2320 B-2011	Total Alkalinity	105				0.408	
	Total Alkalinity	106				0.211	
SM 2540 C-2011	TDS					5.22	
SM 4500 F-C-2011	Fluoride	94.7	101	101			0.0
	Fluoride	93.8	98.9	100			0.986
SM 5310 B-2011	Organic Carbon	101	98.7	99.7			0.989

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2164881, 2164882, 2164887
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2164881, 2164882, 2164887
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2164881, 2164882, 2164887
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2164883, 2164884, 2164888
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2164883, 2164884, 2164888
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2164883, 2164884, 2164888
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2164883, 2164884, 2164888
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2164885, 2164886, 2164889
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2164881, 2164882, 2164887
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2164881, 2164882, 2164887
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2164881, 2164882, 2164887
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2164881, 2164882, 2164887
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2164881, 2164882, 2164887
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2164883, 2164884, 2164888

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	03/12/2020			03/12/2020 16:01	Yen Ta	2164881, 2164882, 2164887
EPA 300.0 Rev. 2.1	03/12/2020			03/18/2020 20:32	Lipi Saha	2164881
	03/12/2020			03/18/2020 20:44	Lipi Saha	2164882
	03/12/2020			03/18/2020 20:57	Lipi Saha	2164887
EPA 350.1 Rev. 2.0	03/12/2020			03/20/2020 13:36	Ping Hua	2164884
	03/12/2020			03/20/2020 13:37	Ping Hua	2164888
	03/12/2020			03/20/2020 14:42	Ping Hua	2164883
EPA 351.2 Rev. 2.0	03/12/2020	03/19/2020 11:35	Sima Feizi	03/23/2020 08:39	Jhamieka S. Greenwood	2164883
	03/12/2020	03/23/2020 11:25	Sima Feizi	03/24/2020 08:18	Jhamieka S. Greenwood	2164884
	03/12/2020	03/23/2020 11:25	Sima Feizi	03/24/2020 08:20	Jhamieka S. Greenwood	2164888
EPA 353.2 Rev. 2.0	03/12/2020			03/24/2020 11:57	Beverly Y. Sanders	2164883
	03/12/2020			03/24/2020 11:58	Beverly Y. Sanders	2164884
	03/12/2020			03/24/2020 11:59	Beverly Y. Sanders	2164888
EPA 365.1 Rev. 2.0	03/12/2020	03/23/2020 15:45	Lipi Saha	03/24/2020 10:37	Benjamin T. Nordmann	2164883
	03/12/2020	03/23/2020 15:45	Lipi Saha	03/24/2020 14:21	Benjamin T. Nordmann	2164884
	03/12/2020	03/23/2020 15:45	Lipi Saha	03/24/2020 14:29	Benjamin T. Nordmann	2164888
EPA 365.1 Rev. 2.0 dissolved	03/12/2020			03/12/2020 16:26	Carlos Miranda	2164885
	03/12/2020			03/12/2020 16:29	Carlos Miranda	2164886
	03/12/2020			03/12/2020 16:34	Carlos Miranda	2164889
SM 2120 B-2011	03/12/2020			03/12/2020 17:36	Madeline Gruver	2164882
	03/12/2020			03/12/2020 17:44	Madeline Gruver	2164887
	03/12/2020			03/12/2020 18:01	Madeline Gruver	2164881
SM 2320 B-2011	03/12/2020			03/21/2020 06:22	Dale L. Simmons	2164881
	03/12/2020			03/21/2020 07:16	Dale L. Simmons	2164882
	03/12/2020			03/21/2020 07:27	Dale L. Simmons	2164887
SM 2540 C-2011	03/12/2020			03/16/2020 15:52	Yijie Li	2164881, 2164882, 2164887
SM 2540 D-2011	03/12/2020			03/16/2020 15:52	Yijie Li	2164881, 2164882, 2164887
SM 4500 F-C-2011	03/12/2020			03/24/2020 21:50	Dale L. Simmons	2164881
	03/12/2020			03/24/2020 23:24	Dale L. Simmons	2164882
	03/12/2020			03/24/2020 23:29	Dale L. Simmons	2164887
SM 5310 B-2011	03/12/2020			03/16/2020 20:06	Lauren Lees	2164883
	03/12/2020			03/16/2020 20:21	Lauren Lees	2164884
	03/12/2020			03/16/2020 20:33	Lauren Lees	2164888