

Chemical Analysis Report

WQAP-2017-12-01-02

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

Event Description: **SMP: Alligators 2071, 2081**

Request ID: **RQ-2017-12-04-32**

Customer: **WQAP**

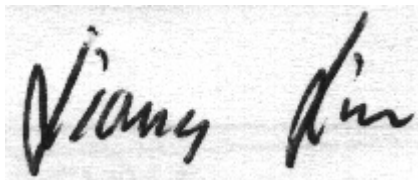
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2295 Victoria Ave.
Suite 364
Fort Myers, FL 33901
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: Liang Lin, Environmental Administrator

Date Certified: 20-DEC-2017 09:38

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and 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: 2081 @ Burnt Store Road

Collection Date/Time: 11/30/2017 10:40

Field ID: G2SD113017-2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1950087	EPA 180.1 Rev. 2.0	Turbidity	4.7		NTU	P336259	
	EPA 300.0 Rev. 2.1	Chloride	41		mg Cl/L	P336482	
		Sulfate	17		mg SO4/L	P336485	
	SM 2120 B	Color (true)	62	A	PCU	P336226	
	SM 2320 B-97	Total Alkalinity	189		mg CaCO3/L	P336618	
	SM 2540 C-97	TDS	308		mg/L	P336674	
	SM 2540 D-97	TSS	4	I	mg/L	P336783	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P336621	RPD
1950088	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P336796	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.56		mg N/L	P336643	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.040		mg N/L	P336387	
	EPA 365.1 Rev. 2.0	Total-P	0.042		mg P/L	P336571	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P336546	
1950089	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.015		mg P/L	P336218	

Ref. Method and Comment:

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

Sample Location: Alligator Cr South Branch @ SR768

Collection Date/Time: 11/30/2017 11:00

Field ID: G2SD113017-1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1950090	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P336259	
	EPA 300.0 Rev. 2.1	Chloride	59		mg Cl/L	P336482	
		Sulfate	11		mg SO4/L	P336485	
	SM 2120 B	Color (true)	53	A	PCU	P336225	
	SM 2320 B-97	Total Alkalinity	77	A	mg CaCO3/L	P336618	
	SM 2540 C-97	TDS	208		mg/L	P336674	
	SM 2540 D-97	TSS	5	I	mg/L	P336783	
	SM 4500 F-C-97	Fluoride	0.091	IJ	mg F/L	P336621	RPD
1950091	EPA 350.1 Rev. 2.0	Ammonia-N	0.18		mg N/L	P336796	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P336643	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P336387	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P336571	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P336546	
1950092	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P336218	
1950096	EPA 200.7 Rev. 4.4	Calcium	31.2		mg/L	P336291	
		Iron	790		ug/L	P336291	
		Magnesium	5.63		mg/L	P336291	
		Potassium	1.2		mg/L	P336291	
		Sodium	27.5		mg/L	P336291	
		Zinc	5.0	U	ug/L	P336291	
	EPA 200.8 Rev. 5.4	Arsenic	1.12		ug/L	P336291	
		Cadmium	0.020	U	ug/L	P336291	
		Chromium	0.40	U	ug/L	P336291	

Field ID: G2SD113017-1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1950096	EPA 200.8 Rev. 5.4	Copper	0.27	I	ug/L	P336291	
		Lead	0.17	I	ug/L	P336291	
		Nickel	0.22	I	ug/L	P336291	
		Silver	0.010	U	ug/L	P336291	

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: Refer to the narrative for an explanation of QC Codes.
 EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples 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: P336259

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P336291

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P336291

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P336482

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P336485

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336796

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336643

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P336387

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P336571

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P336218

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

Reference Method: SM 2120 B
Batch ID: P336225

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P336226

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P336618

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

Reference Method: SM 2540 C-97
Batch ID: P336674

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P336783

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P336621

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P336546

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P336291

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	98.9		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	106		P	85 - 115
Sodium	102		P	85 - 115
Zinc	98.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P336291

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	98.4		P	85 - 115
Chromium	97.0		P	85 - 115
Copper	99.1		P	85 - 115
Lead	97.6		P	85 - 115
Nickel	101		P	85 - 115
Silver	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P336482

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P336485

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.8		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336796

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336643

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P336387

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P336571

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: P336218

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.7		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P336618

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P336621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P336546

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P336291

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P336291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1949568	Calcium	97.8		P	80 - 120
1949568	Iron	98.5		P	80 - 120
1949568	Magnesium	98.3		P	80 - 120
1949568	Sodium	101		P	80 - 120
1949568	Zinc	96.5		P	80 - 120
1949904	Calcium	96.5	95.5	P/P	80 - 120
1949904	Iron	94.8	95.9	P/P	80 - 120
1949904	Magnesium	100	102	P/P	80 - 120
1949904	Potassium	104	101	P/P	80 - 120
1949904	Sodium	97.3		P	80 - 120
1949904	Zinc	98.2	97.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P336291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1949568	Arsenic	104		P	80 - 120
1949568	Cadmium	100		P	80 - 120
1949568	Chromium	94.4		P	80 - 120
1949568	Copper	96.4		P	80 - 120
1949568	Lead	98.5		P	80 - 120
1949568	Nickel	97.7		P	80 - 120
1949568	Silver	101		P	80 - 120
1949904	Arsenic	98.7	99.1	P/P	80 - 120
1949904	Cadmium	97.2	99.1	P/P	80 - 120
1949904	Chromium	93.9	94.3	P/P	80 - 120
1949904	Copper	96.6	97.2	P/P	80 - 120
1949904	Lead	97.2	97.6	P/P	80 - 120
1949904	Nickel	97.8	97.9	P/P	80 - 120
1949904	Silver	98.6	99.6	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P336482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1950021	Chloride	97.8		P	90 - 110
1950053	Chloride	96.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P336485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1950021	Sulfate	98.8		P	90 - 110
1950053	Sulfate	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336796

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1950088	Ammonia-N	101	98.2	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336643

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1950005	Kjeldahl Nitrogen	109	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P336387

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1950022	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P336571

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1950088	Total-P	100	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P336218

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1950092	O-Phosphate-P	98.2	98.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P336621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1950090	Fluoride	105	100	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P336546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1949962	Organic Carbon	102	103	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P336259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950021	Turbidity	6.45	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P336291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1949904	Calcium	0.567	Spike	P	0 - 20
1949904	Iron	1.20	Spike	P	0 - 20
1949904	Magnesium	1.37	Spike	P	0 - 20
1949904	Potassium	2.14	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P336291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1949904	Sodium	0.284	Spike	P	0 - 20
1949904	Zinc	0.646	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P336291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1949904	Arsenic	0.413	Spike	P	0 - 20
1949904	Cadmium	1.93	Spike	P	0 - 20
1949904	Chromium	0.476	Spike	P	0 - 20
1949904	Copper	0.534	Spike	P	0 - 20
1949904	Lead	0.437	Spike	P	0 - 20
1949904	Nickel	0.114	Spike	P	0 - 20
1949904	Silver	1.09	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P336482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950021	Chloride	0.782	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P336485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950021	Sulfate	0.734	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950088	Ammonia-N	1.74	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950005	Kjeldahl Nitrogen	1.26	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P336387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950022	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P336571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950088	Total-P	2.24	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P336218

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950092	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P336225

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950090	Color (true)	0.959	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P336226

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950087	Color (true)	5.94	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P336618

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950090	Total Alkalinity	1.29	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P336674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950021	TDS	5.76	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P336621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1950090	Fluoride	3.37	Spike	F	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P336546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1949962	Organic Carbon	1.03	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: EPA 365.1 Rev. 2.0 dissolved

Run ID: A80641

Included Lab Sample IDs: 1950089, 1950092

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	102	P/P	90 - 110
O-Phosphate-P	97.8	99.3	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A80644

Included Lab Sample IDs: 1950087, 1950090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	102	P/P	85 - 115
Color (true)	104	103	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A80658

Included Lab Sample IDs: 1950087, 1950090

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A80702

Included Lab Sample IDs: 1950088, 1950091

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A80712

Included Lab Sample IDs: 1950096

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	100	P/P	90 - 110
Cadmium	97.0	96.7	P/P	90 - 110
Chromium	94.6	94.3	P/P	90 - 110
Copper	102	101	P/P	90 - 110
Lead	97.2	97.7	P/P	90 - 110
Nickel	102	101	P/P	90 - 110
Silver	97.7	97.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A80735

Included Lab Sample IDs: 1950087, 1950090

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A80735

Included Lab Sample IDs: 1950087, 1950090

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A80748

Included Lab Sample IDs: 1950096

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	94.8	95.6	P/P	90 - 110
Iron	90.8	92.1	P/P	90 - 110
Magnesium	93.6	95.1	P/P	90 - 110
Potassium	99.3	100	P/P	90 - 110
Sodium	95.9	96.3	P/P	90 - 110
Zinc	97.8	99.2	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A80752

Included Lab Sample IDs: 1950088, 1950091

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	101	98.4	P/P	90 - 110
Organic Carbon	98.4	103	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A80770

Included Lab Sample IDs: 1950087, 1950090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	103	P/P	90 - 110
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A80770

Included Lab Sample IDs: 1950087, 1950090

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A80790

Included Lab Sample IDs: 1950091

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A80825

Included Lab Sample IDs: 1950088, 1950091

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A80825
 Included Lab Sample IDs: 1950088, 1950091

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

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A80834
 Included Lab Sample IDs: 1950088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A80917
 Included Lab Sample IDs: 1950088, 1950091

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	99.4	P/P	90 - 110

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

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				6.45	
EPA 200.7 Rev. 4.4	Calcium	101	97.8 96.5 95.5			0.567
	Iron	98.9	98.5 94.8 95.9			1.20
	Magnesium	105	98.3 100 102			1.37
	Potassium	106	104 101			2.14
	Sodium	102	101 97.3			0.284
	Zinc	98.9	96.5 98.2 97.6			0.646
EPA 200.8 Rev. 5.4	Arsenic	102	104 98.7 99.1			0.413
	Cadmium	98.4	100 97.2 99.1			1.93
	Chromium	97.0	94.4 93.9 94.3			0.476
	Copper	99.1	96.4 96.6 97.2			0.534
	Lead	97.6	98.5 97.2 97.6			0.437
	Nickel	101	97.7 97.8 97.9			0.114
	Silver	100	101 98.6 99.6			1.09
EPA 300.0 Rev. 2.1	Chloride	98.5	97.8 96.9		0.782	
	Sulfate	99.8	98.8 98.7		0.734	
EPA 350.1 Rev. 2.0	Ammonia-N	100	101 98.2			1.74
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	109 108			1.26
EPA 353.2 Rev. 2.0	NO2NO3-N	103	101 101			0.0
EPA 365.1 Rev. 2.0	Total-P	102	100 97.8			2.24
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	98.2 98.2			0.0
SM 2120 B	Color (true)				0.959	
	Color (true)				5.94	
SM 2320 B-97	Total Alkalinity	103			1.29	
SM 2540 C-97	TDS				5.76	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision LCS	SMP	MS
SM 4500 F-C-97	Fluoride	99.7	105	100			3.37
SM 5310 B-00	Organic Carbon	98.8	102	103			1.03

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1950087, 1950090
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1950096
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1950096
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1950087, 1950090
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1950087, 1950090
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1950088, 1950091
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1950088, 1950091
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1950088, 1950091
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1950088, 1950091
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1950089, 1950092
SM 2120 B / E31780	True Color measured at 450 nm	1950087, 1950090
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1950087, 1950090
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1950087, 1950090
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1950087, 1950090
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1950087, 1950090
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1950088, 1950091

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	12/01/2017			12/01/2017 15:40	Tanya Welborn	1950087, 1950090
EPA 200.7 Rev. 4.4	12/01/2017	12/04/2017	Elliott D. Healy	12/06/2017	Martin Acosta	1950096
EPA 200.8 Rev. 5.4	12/01/2017	12/04/2017	Elliott D. Healy	12/05/2017	Nadine Brooks	1950096
EPA 300.0 Rev. 2.1	12/01/2017			12/06/2017	Julia Storbeck	1950087, 1950090
EPA 350.1 Rev. 2.0	12/01/2017			12/08/2017	Sofia Elnemr	1950088, 1950091
EPA 351.2 Rev. 2.0	12/01/2017	12/08/2017	Adrian Shelby	12/11/2017	Joseph Suarez	1950088, 1950091
EPA 353.2 Rev. 2.0	12/01/2017			12/05/2017	Lauren Bottorf	1950088, 1950091
EPA 365.1 Rev. 2.0	12/01/2017	12/07/2017	Sima Feizi	12/08/2017	Lipi Saha	1950091
	12/01/2017	12/07/2017	Sima Feizi	12/11/2017	Lipi Saha	1950088
EPA 365.1 Rev. 2.0 dissolved	12/01/2017			12/01/2017 14:32	Megan Treadwell	1950092
	12/01/2017			12/01/2017 15:12	Megan Treadwell	1950089
SM 2120 B	12/01/2017			12/01/2017 16:22	Tanya Welborn	1950090
	12/01/2017			12/01/2017 16:36	Tanya Welborn	1950087
SM 2320 B-97	12/01/2017			12/07/2017	Dale L. Simmons	1950087, 1950090
SM 2540 C-97	12/01/2017			12/06/2017	Yijie Li	1950087, 1950090
SM 2540 D-97	12/01/2017			12/06/2017	Yijie Li	1950087, 1950090
SM 4500 F-C-97	12/01/2017			12/07/2017	Dale L. Simmons	1950087, 1950090
SM 5310 B-00	12/01/2017			12/06/2017	Ping Hua	1950088, 1950091