Chemical Analysis Report

CEN-DIST-2018-12-04-01

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

Event Description: **SJR below Harney X2 + HA**
Request ID: **RQ-2018-11-05-26**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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Certified by: Colin Wright, Program Administrator

Date Certified: 27-DEC-2018 10:05

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: SJR NORTH OF LAKE HARNEY @ OLD OSCEOLA FISH CAMP

Collection Date/Time: 12/03/2018 11:48

Field ID: G2CE0166

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2045628	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P355568	
	EPA 300.0 Rev. 2.1	Chloride	300		mg Cl/L	P355799	
		Sulfate	65		mg SO4/L	P355801	
	SM 2120 B	Color (true)	150		PCU	P355540	
	SM 2320 B-97	Total Alkalinity	62		mg CaCO3/L	P355716	
	SM 2540 C-97	TDS	640		mg/L	P355996	
	SM 2540 D-97	TSS	2	I	mg/L	P356008	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P355719	
2045630	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P355767	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P355648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P355660	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P355680	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P355794	
2045632	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.035		mg P/L	P355553	
2045640	EPA 200.7 Rev. 4.4	Calcium	47.0		mg/L	P355673	
		Iron	480		ug/L	P355673	
		Magnesium	20.4		mg/L	P355673	
		Potassium	6.5		mg/L	P355673	
		Sodium	155		mg/L	P355673	
		Zinc	5.0	U	ug/L	P355673	
	EPA 200.8 Rev. 5.4	Arsenic	0.66		ug/L	P355673	
		Cadmium	0.020	U	ug/L	P355673	
		Chromium	0.40	U	ug/L	P355673	
		Copper	0.54	I	ug/L	P355673	
		Lead	0.48		ug/L	P355673	
		Nickel	0.29	I	ug/L	P355673	
		Silver	0.010	U	ug/L	P355673	

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

Sample Location: SJR @ 700M DOWNSTREAM OF LAKE HARNEY **Collection Date/Time: 12/03/2018 11:35**

Field ID: G2CE0188 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2045629	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P355568	
	EPA 300.0 Rev. 2.1	Chloride	320		mg Cl/L	P355799	
		Sulfate	69		mg SO4/L	P355801	
	SM 2120 B	Color (true)	150		PCU	P355540	
	SM 2320 B-97	Total Alkalinity	63		mg CaCO3/L	P355716	
	SM 2540 C-97	TDS	723		mg/L	P355997	
	SM 2540 D-97	TSS	3	I	mg/L	P356009	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P355719	
2045631	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P355767	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P355702	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.22		mg N/L	P355660	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P355680	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P355794	
2045633	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.037		mg P/L	P355553	
2045641	EPA 200.7 Rev. 4.4	Calcium	47.7		mg/L	P355673	
		Iron	470		ug/L	P355673	
		Magnesium	20.6		mg/L	P355673	
		Potassium	6.7		mg/L	P355673	
		Sodium	160		mg/L	P355673	
		Zinc	5.0	U	ug/L	P355673	
	EPA 200.8 Rev. 5.4	Arsenic	0.66		ug/L	P355673	
		Cadmium	0.020	U	ug/L	P355673	
		Chromium	0.40	U	ug/L	P355673	
		Copper	0.53	I	ug/L	P355673	
		Lead	0.49		ug/L	P355673	
		Nickel	0.29	I	ug/L	P355673	
		Silver	0.010	U	ug/L	P355673	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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: P355568

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355673

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: P355673

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: P355799

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355801

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355767

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355648

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355702

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355660

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355680

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355553

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

Reference Method: SM 2120 B
Batch ID: P355540

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P355716

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

Reference Method: SM 2540 C-97
Batch ID: P355996

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P355997

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356008

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P356009

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P355719

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P355794

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: P355673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	80 - 120
Iron	102		P	80 - 120
Magnesium	107		P	80 - 120
Potassium	98.9		P	80 - 120
Sodium	95.1		P	85 - 115
Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	107		P	85 - 115
Chromium	99.5		P	85 - 115
Copper	96.3		P	85 - 115
Lead	105		P	85 - 115
Nickel	97.2		P	85 - 115
Silver	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355799

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355801

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355767

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355648

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355702

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355660

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355680

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.9		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P355540

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

Reference Method: SM 2320 B-97
Batch ID: P355716

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

Reference Method: SM 4500 F-C-97
Batch ID: P355719

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355794

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045970	Calcium	104		P	80 - 120
2045970	Iron	101		P	80 - 120
2045970	Magnesium	108		P	80 - 120
2045970	Potassium	99.5		P	80 - 120
2045970	Sodium	98.1		P	80 - 120
2045970	Zinc	100		P	80 - 120
2046513	Calcium	101		P	80 - 120
2046513	Iron	102		P	80 - 120
2046513	Magnesium	105	103	P/P	80 - 120
2046513	Sodium	95.8		P	80 - 120
2046513	Zinc	105	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045970	Arsenic	104		P	80 - 120
2045970	Cadmium	108		P	80 - 120
2045970	Chromium	100		P	80 - 120
2045970	Copper	94.8		P	80 - 120
2045970	Lead	109		P	80 - 120
2045970	Nickel	95.1		P	80 - 120
2045970	Silver	104		P	80 - 120
2046513	Arsenic	102	101	P/P	80 - 120
2046513	Cadmium	111	111	P/P	80 - 120
2046513	Chromium	102	102	P/P	80 - 120
2046513	Copper	92.9	91.9	P/P	80 - 120
2046513	Lead	108	108	P/P	80 - 120
2046513	Nickel	91.8	92.3	P/P	80 - 120
2046513	Silver	105	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045840	Chloride	99.6		P	90 - 110
2045843	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355801

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045840	Sulfate	97.9		P	90 - 110
2045843	Sulfate	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045913	Ammonia-N	99.4	98.9	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355648

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045586	Kjeldahl Nitrogen	108	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045646	Kjeldahl Nitrogen	101	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355660

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045586	NO2NO3-N	99.3	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045587	Total-P	97.4	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045842	O-Phosphate-P	93.0	94.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P355719

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045910	Fluoride	99.2	99.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2045586	Organic Carbon	98.5	97.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045620	Turbidity	4.15	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046513	Calcium	0.807	Spike	P	0 - 20
2046513	Iron	1.02	Spike	P	0 - 20
2046513	Magnesium	0.699	Spike	P	0 - 20
2046513	Potassium	1.03	Spike	P	0 - 20
2046513	Sodium	0.107	Spike	P	0 - 20
2046513	Zinc	0.811	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046513	Arsenic	1.01	Spike	P	0 - 20
2046513	Cadmium	0.0610	Spike	P	0 - 20
2046513	Chromium	0.677	Spike	P	0 - 20
2046513	Copper	1.02	Spike	P	0 - 20
2046513	Lead	0.632	Spike	P	0 - 20
2046513	Nickel	0.523	Spike	P	0 - 20
2046513	Silver	1.15	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045840	Chloride	1.29	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045840	Sulfate	1.29	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045913	Ammonia-N	0.468	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355648

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045586	Kjeldahl Nitrogen	1.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045646	Kjeldahl Nitrogen	1.79	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045586	NO2NO3-N	1.05	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045587	Total-P	5.59	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355553

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045842	O-Phosphate-P	1.03	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045584	Color (true)	0.0779	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P355716

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045910	Total Alkalinity	0.529	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P355996

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045585	TDS	3.53	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P355997

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045645	TDS	4.69	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P355719

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045910	Fluoride	0.463	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P355794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2045586	Organic Carbon	0.655	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: A88127
Included Lab Sample IDs: 2045628, 2045629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A88131
Included Lab Sample IDs: 2045632, 2045633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.5	99.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A88139
Included Lab Sample IDs: 2045628, 2045629

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: A88169
Included Lab Sample IDs: 2045630, 2045631

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A88194
Included Lab Sample IDs: 2045628, 2045629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.6	101	P/P	90 - 110
Sulfate	98.8	102	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A88201
Included Lab Sample IDs: 2045628, 2045629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.8	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A88201
Included Lab Sample IDs: 2045628, 2045629

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88202
Included Lab Sample IDs: 2045630

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.7	97.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A88216
Included Lab Sample IDs: 2045630, 2045631

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

Reference Method: SM 5310 B-00
Run ID: A88225
Included Lab Sample IDs: 2045630, 2045631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.4	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88230
Included Lab Sample IDs: 2045630, 2045631

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A88265
Included Lab Sample IDs: 2045640, 2045641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	94.8	95.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A88281
Included Lab Sample IDs: 2045640, 2045641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	97.5	P/P	90 - 110
Iron	102	96.2	P/P	90 - 110
Magnesium	102	97.0	P/P	90 - 110
Potassium	99.6	94.4	P/P	90 - 110
Zinc	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88320
Included Lab Sample IDs: 2045631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88479
Included Lab Sample IDs: 2045640, 2045641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.6	99.0	P/P	90 - 110
Cadmium	102	106	P/P	90 - 110
Chromium	99.2	103	P/P	90 - 110
Copper	96.3	95.6	P/P	90 - 110
Lead	106	109	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88479
Included Lab Sample IDs: 2045640, 2045641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	96.5	95.3	P/P	90 - 110
Silver	99.5	102	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						4.15	
EPA 200.7 Rev. 4.4	Calcium	105	104	101				0.807
	Iron	102	101	102				1.02
	Magnesium	107	108	105	103			0.699
	Potassium	98.9	99.5					1.03
	Sodium	95.1	98.1	95.8				0.107
	Zinc	104	100	105	106			0.811
EPA 200.8 Rev. 5.4	Arsenic	102	104	102	101			1.01
	Cadmium	107	108	111	111			0.0610
	Chromium	99.5	100	102	102			0.677
	Copper	96.3	94.8	92.9	91.9			1.02
	Lead	105	109	108	108			0.632
	Nickel	97.2	95.1	91.8	92.3			0.523
	Silver	102	104	105	104			1.15
EPA 300.0 Rev. 2.1	Chloride	99.1	99.6	97.9			1.29	
	Sulfate	98.6	97.9	99.1			1.29	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.4	98.9				0.468
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.6	108	107				1.01
	Kjeldahl Nitrogen	105	101	104				1.79
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	99.3	101				1.05
EPA 365.1 Rev. 2.0	Total-P	100	97.4	103				5.59
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9	93.0	94.3				1.03
SM 2120 B	Color (true)	102					0.0779	
SM 2320 B-97	Total Alkalinity	100					0.529	
SM 2540 C-97	TDS						3.53	
	TDS						4.69	
SM 4500 F-C-97	Fluoride	99.8	99.2	99.8				0.463
SM 5310 B-00	Organic Carbon	99.8	98.5	97.6				0.655

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2045628, 2045629
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2045640, 2045641
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2045640, 2045641
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2045628, 2045629
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2045628, 2045629
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2045630, 2045631
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2045630, 2045631
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2045630, 2045631
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2045630, 2045631
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2045632, 2045633
SM 2120 B / E31780	True Color measured at 450 nm	2045628, 2045629
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2045628, 2045629
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2045628, 2045629

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2045628, 2045629
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2045628, 2045629
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2045630, 2045631

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	12/04/2018			12/04/2018 17:10	Megan Treadwell	2045628, 2045629
EPA 200.7 Rev. 4.4	12/04/2018	12/05/2018 18:00	Elliott D. Healy	12/06/2018 18:36	Martin Acosta	2045640
	12/04/2018	12/05/2018 18:00	Elliott D. Healy	12/06/2018 18:43	Martin Acosta	2045641
	12/04/2018	12/05/2018 18:00	Elliott D. Healy	12/10/2018 14:58	Martin Acosta	2045640
	12/04/2018	12/05/2018 18:00	Elliott D. Healy	12/10/2018 15:03	Martin Acosta	2045641
EPA 200.8 Rev. 5.4	12/04/2018	12/05/2018 18:00	Elliott D. Healy	12/21/2018 01:11	Allison Taylor	2045640
	12/04/2018	12/05/2018 18:00	Elliott D. Healy	12/21/2018 01:20	Allison Taylor	2045641
EPA 300.0 Rev. 2.1	12/04/2018			12/06/2018 21:40	Lipi Saha	2045628
	12/04/2018			12/06/2018 21:52	Lipi Saha	2045629
EPA 350.1 Rev. 2.0	12/04/2018			12/06/2018 11:14	Ping Hua	2045630
	12/04/2018			12/06/2018 11:15	Ping Hua	2045631
EPA 351.2 Rev. 2.0	12/04/2018	12/05/2018 11:30	Adrian Shelby	12/06/2018 11:52	Joseph Suarez	2045630
	12/04/2018	12/06/2018 11:30	Adrian Shelby	12/07/2018 13:59	Virginia P. Brown	2045631
EPA 353.2 Rev. 2.0	12/04/2018			12/05/2018 11:49	Lauren Bottorf	2045630
	12/04/2018			12/05/2018 11:50	Lauren Bottorf	2045631
EPA 365.1 Rev. 2.0	12/04/2018	12/06/2018 12:30	Sima Feizi	12/07/2018 10:11	Beverly Y. Sanders	2045630
	12/04/2018	12/06/2018 12:30	Sima Feizi	12/07/2018 10:12	Beverly Y. Sanders	2045631
EPA 365.1 Rev. 2.0 dissolved	12/04/2018			12/04/2018 15:05	Jhamieka S. Greenwood	2045632
	12/04/2018			12/04/2018 15:06	Jhamieka S. Greenwood	2045633
SM 2120 B	12/04/2018			12/04/2018 14:46	Chelsea Hernandez	2045628
	12/04/2018			12/04/2018 14:47	Chelsea Hernandez	2045629
SM 2320 B-97	12/04/2018			12/06/2018 07:24	Dale L. Simmons	2045628
	12/04/2018			12/06/2018 07:34	Dale L. Simmons	2045629
SM 2540 C-97	12/04/2018			12/06/2018 14:21	Yijie Li	2045628, 2045629
SM 2540 D-97	12/04/2018			12/06/2018 14:08	Yijie Li	2045628, 2045629
SM 4500 F-C-97	12/04/2018			12/06/2018 07:24	Dale L. Simmons	2045628
	12/04/2018			12/06/2018 07:34	Dale L. Simmons	2045629
SM 5310 B-00	12/04/2018			12/06/2018 03:49	Megan Treadwell	2045630
	12/04/2018			12/06/2018 04:01	Megan Treadwell	2045631