

Chemical Analysis Report

SE-DIST-2016-04-12-01

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

Event Description: **SMP_April-TREND**

Request ID: **RQ-2016-04-11-27**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

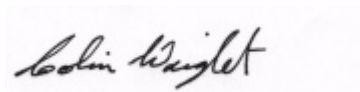
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

For additional information please contact

Timothy W. Fitzpatrick
Liang-Tsair Lin, Ph.D.
Colin Wright, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Environmental Administrator

Date Certified: 29-APR-2016 10:09

A handwritten signature in black ink, appearing to read "Colin Wright", is shown on a light-colored rectangular 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: C-12 Canal Hardwater

Collection Date/Time: 04/11/2016 12:50

Field ID: G4SE0062

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1788538	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P302123	
	EPA 300.0 Rev. 2.1	Chloride	42		mg Cl/L	P302310	
	SM 2120 B	Color (true)	30	A	PCU	P302080	
	SM 2320 B-97	Total Alkalinity	166		mg CaCO3/L	P302423	
	SM 2540 C-97	TDS	249		mg/L	P302838	
	SM 2540 D-97	TSS	2	I	mg/L	P302825	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P302426	
1788539	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P302650	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P302849	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P302261	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P302571	
	SM 5310 B-00	Organic Carbon	8.8		mg C/L	P302646	
1788540	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302107	
1788547	EPA 200.7 Rev. 4.4	Calcium	69.6		mg/L	P302166	
		Iron	34	I	ug/L	P302166	
		Magnesium	4.63		mg/L	P302166	
		Potassium	1.6		mg/L	P302166	
		Sodium	25.2		mg/L	P302166	
		Zinc	5.0	U	ug/L	P302166	
	EPA 200.8 Rev. 5.4	Arsenic	0.92		ug/L	P302166	
		Cadmium	0.020	U	ug/L	P302166	
		Chromium	0.21		ug/L	P302166	
		Copper	2.71		ug/L	P302166	
		Lead	0.050	U	ug/L	P302166	
		Nickel	0.31		ug/L	P302166	
		Silver	0.0050	U	ug/L	P302166	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: L-5 Canal @ G-206

Collection Date/Time: 04/11/2016 14:30

Field ID: G5SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1788532	EPA 180.1 Rev. 2.0	Turbidity	1.5	A	NTU	P302123	
	EPA 300.0 Rev. 2.1	Chloride	55		mg Cl/L	P302310	
		Sulfate	7.1		mg SO4/L	P302316	
		Color (true)	120		PCU	P302080	
	SM 2320 B-97	Total Alkalinity	228		mg CaCO3/L	P302423	
	SM 2540 C-97	TDS	369		mg/L	P302838	
	SM 2540 D-97	TSS	2	U	mg/L	P302825	
	SM 4500 F-C-97	Fluoride	0.27		mg F/L	P302426	
1788534	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P302650	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P302848	

Field ID: G5SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1788534	EPA 353.2 Rev. 2.0	NO2NO3-N	0.090		mg N/L	P302261	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P302571	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P302646	
1788536	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302106	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: L-5 Canal @ G-205

Collection Date/Time: 04/11/2016 14:50

Field ID: G5SE0032

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1788533	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P302123	
	EPA 300.0 Rev. 2.1	Chloride	62		mg Cl/L	P302310	
		Sulfate	7.6		mg SO4/L	P302316	
	SM 2120 B	Color (true)	110		PCU	P302080	
	SM 2320 B-97	Total Alkalinity	220		mg CaCO3/L	P302423	
	SM 2540 C-97	TDS	383	A	mg/L	P302838	
	SM 2540 D-97	TSS	3	I	mg/L	P302825	
	SM 4500 F-C-97	Fluoride	0.27		mg F/L	P302426	
1788535	EPA 350.1 Rev. 2.0	Ammonia-N	0.080		mg N/L	P302650	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P302848	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.094		mg N/L	P302261	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P302571	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P302646	
1788537	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302107	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P302123

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P302166

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P302166

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302310

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302316

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P302650

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302848

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302849

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302261

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P302571

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 dissolved
Batch ID: P302106

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302107

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

Reference Method: SM 2120 B
Batch ID: P302080

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P302423

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

Reference Method: SM 2540 C-97
Batch ID: P302838

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P302825

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P302426

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P302646

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: P302166

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P302166

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	106		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	103		P	85 - 115
Sodium	103		P	85 - 115
Zinc	99.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P302166

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.1		P	85 - 115
Cadmium	94.4		P	85 - 115
Chromium	96.1		P	85 - 115
Copper	91.7		P	85 - 115
Lead	89.7		P	85 - 115
Nickel	94.6		P	85 - 115
Silver	95.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302310

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302316

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P302650

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302848

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302849

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	90.8		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302261

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: P302571

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302106

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302107

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

Reference Method: SM 2320 B-97
Batch ID: P302423

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P302426

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P302646

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P302166

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788397	Calcium	110		P	80 - 120
1788397	Iron	105		P	80 - 120
1788397	Magnesium	107		P	80 - 120
1788397	Potassium	108		P	80 - 120
1788397	Sodium	107		P	80 - 120
1788397	Zinc	100		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P302166

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788547	Calcium	106		P	80 - 120
1788547	Iron	104	105	P/P	80 - 120
1788547	Magnesium	105		P	80 - 120
1788547	Potassium	101	102	P/P	80 - 120
1788547	Sodium	102		P	80 - 120
1788547	Zinc	98.8	98.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P302166

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788397	Arsenic	100		P	80 - 120
1788397	Cadmium	97.9		P	80 - 120
1788397	Chromium	97.3		P	80 - 120
1788397	Copper	91.9		P	80 - 120
1788397	Lead	93.3		P	80 - 120
1788397	Nickel	94.4		P	80 - 120
1788397	Silver	96.2		P	80 - 120
1788547	Arsenic	94.0	95.4	P/P	80 - 120
1788547	Cadmium	93.0	92.8	P/P	80 - 120
1788547	Chromium	91.7	92.7	P/P	80 - 120
1788547	Copper	86.3	86.2	P/P	80 - 120
1788547	Lead	88.8	89.3	P/P	80 - 120
1788547	Nickel	89.0	89.1	P/P	80 - 120
1788547	Silver	93.8	93.6	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302310

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788468	Chloride	102		P	90 - 110
1788557	Chloride	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788468	Sulfate	99.0		P	90 - 110
1788557	Sulfate	102		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302848

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788488	Kjeldahl Nitrogen	103	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302849

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788539	Kjeldahl Nitrogen	108	100	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302261

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788494	NO2NO3-N	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P302571

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788492	Total-P	96.8	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302106

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788501	O-Phosphate-P	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788570	O-Phosphate-P	102	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P302426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788402	Fluoride	95.4	96.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P302646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1788446	Organic Carbon	97.0	94.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P302123

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788532	Turbidity	2.68	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P302166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788547	Calcium	3.69	Spike	P	0 - 20
1788547	Iron	0.836	Spike	P	0 - 20
1788547	Magnesium	0.956	Spike	P	0 - 20
1788547	Potassium	0.743	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P302166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788547	Sodium	2.00	Spike	P	0 - 20
1788547	Zinc	0.120	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P302166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788547	Arsenic	1.39	Spike	P	0 - 20
1788547	Cadmium	0.183	Spike	P	0 - 20
1788547	Chromium	1.09	Spike	P	0 - 20
1788547	Copper	0.0520	Spike	P	0 - 20
1788547	Lead	0.596	Spike	P	0 - 20
1788547	Nickel	0.134	Spike	P	0 - 20
1788547	Silver	0.226	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302310

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788468	Chloride	0.118	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788468	Sulfate	0.0331	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P302650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788534	Ammonia-N	0.169	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302848

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788488	Kjeldahl Nitrogen	5.17	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788539	Kjeldahl Nitrogen	4.75	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302261

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788494	NO2NO3-N	1.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P302571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788492	Total-P	1.79	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302106

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788501	O-Phosphate-P	1.37	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788570	O-Phosphate-P	0.874	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P302080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788538	Color (true)	2.04	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P302423

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788402	Total Alkalinity	0.0236	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P302838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788533	TDS	3.13	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P302426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788402	Fluoride	0.995	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P302646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1788446	Organic Carbon	1.75	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: EPA 300.0 Rev. 2.1
Run ID: A68804
Included Lab Sample IDs: 1788532, 1788533, 1788538

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Chloride	103	102	P/P	90 - 110
Sulfate	101	97.6	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A68822
Included Lab Sample IDs: 1788532, 1788533, 1788538

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A68831
Included Lab Sample IDs: 1788536, 1788537, 1788540

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A68840
Included Lab Sample IDs: 1788532, 1788533, 1788538

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: A68882
Included Lab Sample IDs: 1788534, 1788535, 1788539

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A68912
Included Lab Sample IDs: 1788547

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A68912

Included Lab Sample IDs: 1788547

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	100	100	P/P	90 - 110
Magnesium	101	100	P/P	90 - 110
Potassium	100	99.9	P/P	90 - 110
Sodium	101	100	P/P	90 - 110
Zinc	98.3	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A68926

Included Lab Sample IDs: 1788547

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.3	96.0	P/P	90 - 110
Cadmium	97.5	96.6	P/P	90 - 110
Chromium	98.3	96.1	P/P	90 - 110
Copper	96.3	93.4	P/P	90 - 110
Lead	94.2	93.5	P/P	90 - 110
Nickel	96.3	94.1	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A68927

Included Lab Sample IDs: 1788532, 1788533, 1788538

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A68927

Included Lab Sample IDs: 1788532, 1788533, 1788538

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A68977

Included Lab Sample IDs: 1788547

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

Reference Method: SM 5310 B-00

Run ID: A68999

Included Lab Sample IDs: 1788534, 1788535, 1788539

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.4	95.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A69001

Included Lab Sample IDs: 1788534, 1788535, 1788539

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	99.4	P/P	90 - 110
Ammonia-N	99.4	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69063

Included Lab Sample IDs: 1788534, 1788535, 1788539

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69109

Included Lab Sample IDs: 1788534, 1788535, 1788539

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	103	P/P	90 - 110
Kjeldahl Nitrogen	99.5	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			Precision SMP	MS
			LCS	MS	MS		
EPA 180.1 Rev. 2.0	Turbidity					2.68	
EPA 200.7 Rev. 4.4	Calcium	106	110	106			3.69
	Iron	106	105	104	105		0.836
	Magnesium	103	107	105			0.956
	Potassium	103	108	101	102		0.743
	Sodium	103	107	102			2.00
	Zinc	99.7	100	98.8	98.7		0.120
EPA 200.8 Rev. 5.4	Arsenic	95.1	100	94.0	95.4		1.39
	Cadmium	94.4	97.9	93.0	92.8		0.183
	Chromium	96.1	97.3	91.7	92.7		1.09
	Copper	91.7	91.9	86.3	86.2		0.0520
	Lead	89.7	93.3	88.8	89.3		0.596
	Nickel	94.6	94.4	89.0	89.1		0.134
	Silver	95.4	96.2	93.8	93.6		0.226
EPA 300.0 Rev. 2.1	Chloride	104	102	105		0.118	
	Sulfate	100	99.0	102		0.0331	
EPA 350.1 Rev. 2.0	Ammonia-N	97.9					0.169
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.2	103	97.0			5.17
	Kjeldahl Nitrogen	90.8	108	100			4.75
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.0	100			1.39
EPA 365.1 Rev. 2.0	Total-P	96.0	96.8	98.6			1.79
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	105	101	103			1.37
	O-Phosphate-P	101	102	103			0.874

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
SM 2120 B	Color (true)				2.04	
SM 2320 B-97	Total Alkalinity	102			0.0236	
SM 2540 C-97	TDS				3.13	
SM 4500 F-C-97	Fluoride	98.0	95.4 96.5			0.995
SM 5310 B-00	Organic Carbon	92.5	97.0 94.0			1.75

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1788532, 1788533, 1788538
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1788547
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1788547
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1788532, 1788533, 1788538
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1788532, 1788533
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1788534, 1788535, 1788539
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1788534, 1788535, 1788539
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1788534, 1788535, 1788539
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1788534, 1788535, 1788539
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1788536, 1788537, 1788540
SM 2120 B / E31780	True Color measured at 450 nm	1788532, 1788533, 1788538
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1788532, 1788533, 1788538
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1788532, 1788533, 1788538
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1788532, 1788533, 1788538
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1788532, 1788533, 1788538
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1788534, 1788535, 1788539

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	04/12/2016			04/12/2016 15:22	Sima Feizi	1788532, 1788533, 1788538
EPA 200.7 Rev. 4.4	04/12/2016	04/13/2016	Elliott D. Healy	04/15/2016	Joshua Ayres	1788547
EPA 200.8 Rev. 5.4	04/12/2016	04/13/2016	Elliott D. Healy	04/16/2016	Charles J. Peterson	1788547
	04/12/2016	04/13/2016	Elliott D. Healy	04/19/2016	Charles J. Peterson	1788547
EPA 300.0 Rev. 2.1	04/12/2016			04/14/2016	Ping Hua	1788532, 1788533
EPA 350.1 Rev. 2.0	04/12/2016			04/20/2016	Diana M. Turner	1788534, 1788535, 1788539
EPA 351.2 Rev. 2.0	04/12/2016	04/25/2016	Sofia Elnemr	04/26/2016	Christopher Armour	1788534, 1788535, 1788539
EPA 353.2 Rev. 2.0	04/12/2016			04/14/2016	Peter D. Kaus	1788534, 1788535, 1788539
EPA 365.1 Rev. 2.0	04/12/2016	04/20/2016	Christopher Armour	04/21/2016	Lipi Saha	1788534, 1788535, 1788539
EPA 365.1 Rev. 2.0 dissolved	04/12/2016			04/12/2016 15:32	Julia Storbeck	1788536
	04/12/2016			04/12/2016 15:33	Julia Storbeck	1788537
	04/12/2016			04/12/2016 15:34	Julia Storbeck	1788540
SM 2120 B	04/12/2016			04/12/2016 14:01	Rochelle Y Jackson	1788532, 1788533
	04/12/2016			04/12/2016 14:03	Rochelle Y Jackson	1788538
SM 2320 B-97	04/12/2016			04/16/2016	Dale L. Simmons	1788532, 1788533, 1788538
SM 2540 C-97	04/12/2016			04/15/2016	Yijie Li	1788532, 1788533, 1788538
SM 2540 D-97	04/12/2016			04/15/2016	Yijie Li	1788532, 1788533, 1788538
SM 4500 F-C-97	04/12/2016			04/16/2016	Dale L. Simmons	1788532, 1788533, 1788538
SM 5310 B-00	04/12/2016			04/19/2016	Sofia Elnemr	1788534, 1788535, 1788539