Chemical Analysis Report

SE-DIST-2016-08-31-01

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

Event Description: **SMP-Great white north run**
Request ID: **RQ-2016-08-08-55**
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: Matthew Sewell

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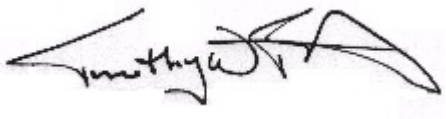
Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 22-SEP-2016 09:58



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: KID CREEK @ OLD DIXIE HWY **Collection Date/Time: 08/30/2016 12:25**

Field ID: G5SE0050 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1828336	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P310646	
	EPA 300.0 Rev. 2.1	Chloride	120		mg Cl/L	P311212	
		Sulfate	15		mg SO4/L	P311216	
	SM 2120 B	Color (true)	80	A	PCU	P310635	
	SM 2320 B-97	Total Alkalinity	48		mg CaCO3/L	P310789	
	SM 2540 C-97	TDS	367	Q	mg/L	P311050	
	SM 2540 D-97	TSS	2	IQ	mg/L	P310861	
	SM 4500 F-C-97	Fluoride	0.045	I	mg F/L	P310791	
1828338	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P310655	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P310707	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.026		mg N/L	P310890	
	EPA 365.1 Rev. 2.0	Total-P	0.053		mg P/L	P310899	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P311046	
1828340	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P310641	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 C-97: Sample analyzed beyond holding time due to a protracted power outage caused by hurricane Hermine.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample analyzed beyond routine holding time due to a protracted power outage caused by hurricane Hermine.

Sample Location: MICCO DITCH @ MICCO RD **Collection Date/Time: 08/30/2016 12:45**

Field ID: G5SE0050 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1828337	EPA 180.1 Rev. 2.0	Turbidity	5.9	A	NTU	P310647	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P311212	
		Sulfate	26		mg SO4/L	P311216	
	SM 2120 B	Color (true)	93	A	PCU	P310636	
	SM 2320 B-97	Total Alkalinity	185		mg CaCO3/L	P310789	
	SM 2540 C-97	TDS	484	AQ	mg/L	P311050	
	SM 2540 D-97	TSS	6	IQ	mg/L	P310861	
	SM 4500 F-C-97	Fluoride	0.23		mg F/L	P310791	
1828339	EPA 350.1 Rev. 2.0	Ammonia-N	0.13		mg N/L	P310655	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P310707	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P310890	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P310899	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P311046	
1828341	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.048		mg P/L	P310642	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 C-97: Sample analyzed beyond holding time due to a protracted power outage caused by hurricane Hermine.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample analyzed beyond routine holding time due to a protracted power outage caused by hurricane Hermine.

Sample Location: INDIAN RIVER LAGOON S OF SR 60 **Collection Date/Time: 08/30/2016 13:50**

Field ID: G5SE0051 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1828342	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P310647	
	SM 2320 B-97	Total Alkalinity	128		mg CaCO3/L	P310954	
	SM 2540 D-97	TSS	6	IQ	mg/L	P310864	
	SM 4500 F-C-97	Fluoride	1.1		mg F/L	P310955	
1828343	EPA 350.1 Rev. 2.0	Ammonia-N	0.048		mg N/L	P310654	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P310704	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.020		mg N/L	P311330	
	EPA 365.1 Rev. 2.0	Total-P	0.093		mg P/L	P311019	
	SM 5310 B-00	Organic Carbon	5.6		mg C/L	P311054	
1828344	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.053		mg P/L	P310645	
1828348	EPA 200.7 Rev. 4.4	Iron	94	I	ug/L	P310911	
	EPA 200.8 Rev. 5.4	Arsenic	2.41		ug/L	P310911	
		Cadmium	0.060	U	ug/L	P310911	
		Chromium	0.26	I	ug/L	P310911	
		Copper	1.9		ug/L	P310911	
		Lead	0.26	I	ug/L	P310911	
		Silver	0.015	U	ug/L	P310911	
		Zinc	3.0	U	ug/L	P310911	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample analyzed beyond routine holding time due to a protracted power outage caused by hurricane Hermine.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310646

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310647

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310911

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310911

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310911

Component	Result	Code	Units
Lead	0.050	U	ug/L
Silver	0.0050	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311212

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311216

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310654

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310655

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310704

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310707

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310890

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311330

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310899

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311019

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310641

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310642

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310645

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

Reference Method: SM 2120 B
Batch ID: P310635

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P310636

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P310789

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

Reference Method: SM 2320 B-97
Batch ID: P310954

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P311050

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310861

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310864

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P310791

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P310955

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P311046

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

Reference Method: SM 5310 B-00
Batch ID: P311054

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: P310911

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	98.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310911

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310911

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	100		P	85 - 115
Copper	98.4		P	85 - 115
Lead	101		P	85 - 115
Silver	99.8		P	85 - 115
Zinc	99.6		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311212

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311216

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310654

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310655

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	106		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310704

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310707

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: P310890

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311330

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310899

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311019

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310641

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310642

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310645

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

Reference Method: SM 2320 B-97
Batch ID: P310789

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P310954

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

Reference Method: SM 4500 F-C-97
Batch ID: P310791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.4		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P310955

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P311046

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.6		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P311054

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	104		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829142	Iron	107	106	P/P	70 - 130
1829183	Iron	95.8		P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829142	Arsenic	105	104	P/P	70 - 130
1829142	Cadmium	96.2	95.9	P/P	70 - 130
1829142	Chromium	86.5	84.7	P/P	70 - 130
1829142	Copper	94.2	91.9	P/P	70 - 130
1829142	Lead	104	102	P/P	70 - 130
1829142	Silver	92.7	92.5	P/P	70 - 130
1829142	Zinc	94.0	93.8	P/P	70 - 130
1829183	Arsenic	104		P	70 - 130
1829183	Cadmium	90.7		P	70 - 130
1829183	Chromium	81.8		P	70 - 130
1829183	Copper	92.6		P	70 - 130
1829183	Lead	105		P	70 - 130
1829183	Silver	92.4		P	70 - 130
1829183	Zinc	91.0		P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828414	Chloride	98.6		P	90 - 110
1828415	Chloride	99.2		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311216

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828415	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827966	Ammonia-N	107	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310655

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828338	Ammonia-N	107	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828015	Kjeldahl Nitrogen	103	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828339	Kjeldahl Nitrogen	98.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310890

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828314	NO2NO3-N	97.2	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311330

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827938	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310899

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828314	Total-P	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311019

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828461	Total-P	93.7	94.0	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310641

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828340	O-Phosphate-P	96.4	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828369	O-Phosphate-P	96.9	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310645

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828344	O-Phosphate-P	98.7	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P310791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828362	Fluoride	97.2	98.3	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P310955

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829144	Fluoride	96.7	97.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P311046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827894	Organic Carbon	99.9	99.9	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P311054

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827967	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828218	Turbidity	0.766	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310647

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828337	Turbidity	1.53	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829142	Iron	0.518	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829142	Arsenic	1.05	Spike	P	0 - 20
1829142	Cadmium	0.325	Spike	P	0 - 20
1829142	Chromium	1.99	Spike	P	0 - 20
1829142	Copper	2.34	Spike	P	0 - 20
1829142	Lead	1.17	Spike	P	0 - 20
1829142	Silver	0.220	Spike	P	0 - 20
1829142	Zinc	0.299	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828415	Chloride	0.0740	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828415	Sulfate	6.57	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827966	Ammonia-N	1.48	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310655

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828338	Ammonia-N	0.917	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828015	Kjeldahl Nitrogen	4.55	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828339	Kjeldahl Nitrogen	1.34	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310890

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828314	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311330

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827938	NO2NO3-N	0.991	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310899

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828314	Total-P	0.717	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311019

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828461	Total-P	0.356	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310641

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828340	O-Phosphate-P	1.13	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828369	O-Phosphate-P	1.40	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828344	O-Phosphate-P	0.920	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P310635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828336	Color (true)	0.177	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P310636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828337	Color (true)	1.61	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P310789

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828362	Total Alkalinity	0.685	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P310954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828722	Total Alkalinity	0.392	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P311050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828337	TDS	4.76	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P310791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828362	Fluoride	0.984	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P310955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829144	Fluoride	0.470	Spike	P	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P311046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827894	Organic Carbon	0.0	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P311054

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827967	Organic Carbon	0.245	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: A71432
Included Lab Sample IDs: 1828336, 1828337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	95.8	95.7	P/P	85 - 115
Color (true)	97.8	95.8	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71433
Included Lab Sample IDs: 1828340, 1828341, 1828344

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	102	P/P	90 - 110
O-Phosphate-P	100	101	P/P	90 - 110
O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71435
Included Lab Sample IDs: 1828336, 1828337, 1828342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71438
Included Lab Sample IDs: 1828338, 1828339, 1828343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	102	P/P	90 - 110
Ammonia-N	104	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A71480
Included Lab Sample IDs: 1828336, 1828337

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

Reference Method: SM 4500 F-C-97
Run ID: A71480
Included Lab Sample IDs: 1828336, 1828337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71504
Included Lab Sample IDs: 1828338, 1828339

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71520
Included Lab Sample IDs: 1828343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71521
Included Lab Sample IDs: 1828338, 1828339

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	98.9	P/P	90 - 110
Kjeldahl Nitrogen	98.4	105	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A71541
Included Lab Sample IDs: 1828342

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

Reference Method: SM 4500 F-C-97
Run ID: A71541
Included Lab Sample IDs: 1828342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71542
Included Lab Sample IDs: 1828348

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71542
Included Lab Sample IDs: 1828348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	98.8	99.9	P/P	90 - 110
Chromium	95.6	95.5	P/P	90 - 110
Copper	100	99.1	P/P	90 - 110
Silver	98.9	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71546
Included Lab Sample IDs: 1828338, 1828339

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71562
Included Lab Sample IDs: 1828348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	96.4	97.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71576
Included Lab Sample IDs: 1828336, 1828337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	99.7	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71577
Included Lab Sample IDs: 1828343

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

Reference Method: SM 5310 B-00
Run ID: A71583
Included Lab Sample IDs: 1828338, 1828339

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

Reference Method: SM 5310 B-00
Run ID: A71584
Included Lab Sample IDs: 1828343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	99.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71611
Included Lab Sample IDs: 1828343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.2	97.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71665
Included Lab Sample IDs: 1828348

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71744
Included Lab Sample IDs: 1828348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	98.6	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						0.766	
	Turbidity						1.53	
EPA 200.7 Rev. 4.4	Iron	98.6	95.8	107	106			0.518
EPA 200.8 Rev. 5.4	Arsenic	102	105	104	104			1.05
	Cadmium	101	96.2	95.9	90.7			0.325
	Chromium	100	86.5	84.7	81.8			1.99
	Copper	98.4	94.2	91.9	92.6			2.34
	Lead	101	104	102	105			1.17
	Silver	99.8	92.7	92.5	92.4			0.220
	Zinc	99.6	94.0	93.8	91.0			0.299
EPA 300.0 Rev. 2.1	Chloride	102	99.2	98.6			0.0740	
	Sulfate	101	101				6.57	
EPA 350.1 Rev. 2.0	Ammonia-N	105	107	106				1.48
	Ammonia-N	106	107	106				0.917
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	103	97.8				4.55
	Kjeldahl Nitrogen	103	98.8	101				1.34
EPA 353.2 Rev. 2.0	NO2NO3-N	104	97.2	97.6				0.487
	NO2NO3-N	102	101	100				0.991
EPA 365.1 Rev. 2.0	Total-P	98.7	105	104				0.717
	Total-P	98.7	93.7	94.0				0.356
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	96.4	97.7				1.13
	O-Phosphate-P	102	96.9	98.4				1.40
	O-Phosphate-P	99.9	98.7	100				0.920
SM 2120 B	Color (true)						0.177	
	Color (true)						1.61	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 2320 B-97	Total Alkalinity	102				0.685	
	Total Alkalinity	103				0.392	
SM 2540 C-97	TDS					4.76	
SM 4500 F-C-97	Fluoride	95.4	97.2	98.3			0.984
	Fluoride	97.7	96.7	97.4			0.470
SM 5310 B-00	Organic Carbon	98.6	99.9	99.9			0.0
	Organic Carbon	104	102	102			0.245

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1828336, 1828337, 1828342
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1828348
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1828348
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1828336, 1828337
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1828336, 1828337
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1828338, 1828339, 1828343
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1828338, 1828339, 1828343
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1828338, 1828339, 1828343
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1828338, 1828339, 1828343
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1828340, 1828341, 1828344
SM 2120 B / E31780	True Color measured at 450 nm	1828336, 1828337
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1828336, 1828337, 1828342
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1828336, 1828337
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1828336, 1828337, 1828342
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1828336, 1828337, 1828342
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1828338, 1828339, 1828343

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	08/31/2016			08/31/2016 16:44	Sima Feizi	1828336, 1828337, 1828342
EPA 200.7 Rev. 4.4	08/31/2016	09/09/2016	Elliott D. Healy	09/20/2016	Joshua Ayres	1828348
EPA 200.8 Rev. 5.4	08/31/2016	09/09/2016	Elliott D. Healy	09/11/2016	Charles J. Peterson	1828348
	08/31/2016	09/09/2016	Elliott D. Healy	09/13/2016	Charles J. Peterson	1828348
	08/31/2016	09/09/2016	Elliott D. Healy	09/15/2016	Charles J. Peterson	1828348
EPA 300.0 Rev. 2.1	08/31/2016			09/15/2016	Ping Hua	1828336, 1828337
EPA 350.1 Rev. 2.0	08/31/2016			08/31/2016	Joseph Suarez	1828338, 1828339, 1828343
EPA 351.2 Rev. 2.0	08/31/2016	09/07/2016	Adrian Shelby	09/08/2016	Virginia P. Brown	1828338, 1828339
	08/31/2016	09/07/2016	Adrian Shelby	09/09/2016	Virginia P. Brown	1828343
EPA 353.2 Rev. 2.0	08/31/2016			09/09/2016	Beverly Y. Sanders	1828338, 1828339
	08/31/2016			09/13/2016	Beverly Y. Sanders	1828343
EPA 365.1 Rev. 2.0	08/31/2016	09/09/2016	Vijayalakshmi Reddy	09/12/2016	Lipi Saha	1828338, 1828339
	08/31/2016	09/13/2016	Vijayalakshmi Reddy	09/14/2016	Lipi Saha	1828343
EPA 365.1 Rev. 2.0 dissolved	08/31/2016			08/31/2016 15:02	Julia Storbeck	1828340
	08/31/2016			08/31/2016 15:28	Julia Storbeck	1828344
	08/31/2016			08/31/2016 15:52	Julia Storbeck	1828341
SM 2120 B	08/31/2016			08/31/2016 15:10	Blanca Fach	1828336
	08/31/2016			08/31/2016 15:21	Blanca Fach	1828337
SM 2320 B-97	08/31/2016			09/07/2016	Dale L. Simmons	1828336, 1828337
	08/31/2016			09/08/2016	Dale L. Simmons	1828342
SM 2540 C-97	08/31/2016			09/07/2016	Yijie Li	1828336, 1828337
SM 2540 D-97	08/31/2016			09/07/2016	Yijie Li	1828336, 1828337, 1828342
SM 4500 F-C-97	08/31/2016			09/07/2016	Dale L. Simmons	1828336, 1828337
	08/31/2016			09/08/2016	Dale L. Simmons	1828342
SM 5310 B-00	08/31/2016			09/13/2016	Sofia Elnemr	1828338, 1828339, 1828343