Chemical Analysis Report

SO-DIST-2016-12-01-02

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

Event Description: **SCI Kit Myrtle Slough 1995**
Request ID: **RQ-2016-11-28-17**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Corey Anderson

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 29-DEC-2016 11:25

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: MYRTLE 1995 @ PINE ISLAND ST. **Collection Date/Time: 11/30/2016 13:40**

Field ID: G3SD113016-1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853769	EPA 180.1 Rev. 2.0	Turbidity	5.6	A	NTU	P316042	
	EPA 300.0 Rev. 2.1	Chloride	40		mg Cl/L	P316909	
		Sulfate	14		mg SO4/L	P316906	
	SM 2120 B	Color (true)	55	A	PCU	P316036	
	SM 2320 B-97	Total Alkalinity	259		mg CaCO3/L	P316122	
	SM 2540 C-97	TDS	399		mg/L	P316704	
	SM 2540 D-97	TSS	5	I	mg/L	P316482	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P316125	
1853773	EPA 350.1 Rev. 2.0	Ammonia-N	0.057		mg N/L	P316472	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.99		mg N/L	P316460	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.70		mg N/L	P316092	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P316319	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P316150	
1853777	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.019		mg P/L	P316046	
1853786	EPA 200.7 Rev. 4.4	Calcium	100		mg/L	P316193	
		Iron	800		ug/L	P316193	
		Magnesium	6.07		mg/L	P316193	
		Potassium	1.8		mg/L	P316193	
		Sodium	27.0		mg/L	P316193	
		Zinc	5.0	U	ug/L	P316193	
	EPA 200.8 Rev. 5.4	Arsenic	0.86		ug/L	P316193	
		Cadmium	0.020	U	ug/L	P316193	
		Chromium	0.33		ug/L	P316193	
		Copper	0.94		ug/L	P316193	
		Lead	0.058	I	ug/L	P316193	
		Nickel	0.74		ug/L	P316193	
		Silver	0.0050	U	ug/L	P316193	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailble for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The copper and nickel results were confirmed in the undigested sample on 12/22/2016.

Sample Location: MYRTLE 1995 @ PINE ISLAND ST. DUP **Collection Date/Time: 11/30/2016 13:45**

Field ID: G3SD113016-D Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853770	EPA 180.1 Rev. 2.0	Turbidity	6.5	A	NTU	P316044	
	EPA 300.0 Rev. 2.1	Chloride	40		mg Cl/L	P316909	
		Sulfate	14		mg SO4/L	P316906	
	SM 2120 B	Color (true)	62		PCU	P316036	
	SM 2320 B-97	Total Alkalinity	260		mg CaCO3/L	P316122	
	SM 2540 C-97	TDS	410		mg/L	P316705	
	SM 2540 D-97	TSS	4	I	mg/L	P316483	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P316125	
1853774	EPA 350.1 Rev. 2.0	Ammonia-N	0.051		mg N/L	P316472	

Field ID: G3SD113016-D Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853774	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P316460	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.71		mg N/L	P316092	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P316319	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P316150	
1853778	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P316046	
1853787	EPA 200.7 Rev. 4.4	Calcium	102		mg/L	P316193	
		Iron	740		ug/L	P316193	
		Magnesium	6.07		mg/L	P316193	
		Potassium	1.8		mg/L	P316193	
		Sodium	27.2		mg/L	P316193	
		Zinc	5.0	U	ug/L	P316193	
	EPA 200.8 Rev. 5.4	Arsenic	0.86		ug/L	P316193	
		Cadmium	0.020	U	ug/L	P316193	
		Chromium	0.30		ug/L	P316193	
		Copper	0.56		ug/L	P316193	
		Lead	0.067	I	ug/L	P316193	
		Nickel	0.45		ug/L	P316193	
		Silver	0.0050	U	ug/L	P316193	

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 calcium are unavailble for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The copoer and nickel results were confirmed in the undigested sample on 12/22/2016.

Sample Location: FIELD BLANK **Collection Date/Time: 11/30/2016 10:56**

Field ID: G3SDBLANK Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853771	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P316042	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P316909	
		Sulfate	0.20	U	mg SO4/L	P316906	
	SM 2120 B	Color (true)	2.5	U	PCU	P316036	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P316122	
	SM 2540 C-97	TDS	15	U	mg/L	P316705	
	SM 2540 D-97	TSS	2	U	mg/L	P316483	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P316125	
1853775	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P316472	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P316478	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316092	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P316338	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P316150	
1853779	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.21		mg P/L	P316046	
1853788	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P316193	
		Iron	30	U	ug/L	P316193	
		Magnesium	0.040	U	mg/L	P316193	
		Potassium	0.30	U	mg/L	P316193	

Field ID: G3SDBLANK Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853788	EPA 200.7 Rev. 4.4	Sodium	0.50	U	mg/L	P316193	
		Zinc	5.0	U	ug/L	P316193	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P316193	
		Cadmium	0.020	U	ug/L	P316193	
		Chromium	0.050	U	ug/L	P316193	
		Copper	0.10	U	ug/L	P316193	
		Lead	0.050	U	ug/L	P316193	
		Nickel	0.050	U	ug/L	P316193	
		Silver	0.0050	U	ug/L	P316193	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The result was confirmed on 12/01/2016.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailble for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: BOBCAT CREEK IN PRESERVE EAST **Collection Date/Time: 11/30/2016 10:45**

Field ID: G3SD113016-3 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853772	EPA 180.1 Rev. 2.0	Turbidity	9.1		NTU	P316042	
	EPA 300.0 Rev. 2.1	Chloride	39		mg Cl/L	P316909	
		Sulfate	22		mg SO4/L	P316906	
	SM 2120 B	Color (true)	79		PCU	P316036	
	SM 2320 B-97	Total Alkalinity	132		mg CaCO3/L	P316122	
	SM 2540 C-97	TDS	290	A	mg/L	P316704	
	SM 2540 D-97	TSS	11	A	mg/L	P316482	
	SM 4500 F-C-97	Fluoride	0.52		mg F/L	P316125	
1853776	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P316472	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P316458	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.058		mg N/L	P316092	
	EPA 365.1 Rev. 2.0	Total-P	1.5		mg P/L	P316338	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P316150	
1853780	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.93		mg P/L	P316046	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P316042

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P316044

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P316193

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: P316193

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	0.0061	I	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316906

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316909

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316472

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316458

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316460

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: P316478

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316092

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316319

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316338

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P316046

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

Reference Method: SM 2120 B
Batch ID: P316036

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P316122

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

Reference Method: SM 2540 C-97
Batch ID: P316704

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P316705

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P316482

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P316483

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P316125

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P316150

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: P316193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	108		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	101		P	85 - 115
Sodium	100		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.0		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	97.3		P	85 - 115
Copper	95.9		P	85 - 115
Lead	92.6		P	85 - 115
Nickel	98.4		P	85 - 115
Silver	98.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316906

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316909

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316472

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316458

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: P316460

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316478

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316092

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316319

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316338

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P316046

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P316122

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.5		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P316125

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P316150

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P316193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853362	Iron	103		P	80 - 120
1853362	Magnesium	102		P	80 - 120
1853362	Potassium	98.9		P	80 - 120
1853362	Sodium	102		P	80 - 120
1853362	Zinc	96.3		P	80 - 120
1854134	Calcium	102		P	80 - 120
1854134	Iron	102	108	P/P	80 - 120
1854134	Magnesium	99.4	109	P/P	80 - 120
1854134	Potassium	93.7	101	P/P	80 - 120
1854134	Sodium	98.7		P	80 - 120
1854134	Zinc	99.5	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853362	Arsenic	102		P	80 - 120
1853362	Cadmium	102		P	80 - 120
1853362	Chromium	98.8		P	80 - 120
1853362	Copper	93.2		P	80 - 120
1853362	Lead	93.7		P	80 - 120
1853362	Nickel	96.3		P	80 - 120
1853362	Silver	101		P	80 - 120
1854134	Arsenic	99.1	102	P/P	80 - 120
1854134	Cadmium	101	104	P/P	80 - 120
1854134	Chromium	97.2	99.0	P/P	80 - 120
1854134	Copper	94.6	98.3	P/P	80 - 120
1854134	Lead	92.4	94.2	P/P	80 - 120
1854134	Nickel	96.0	97.9	P/P	80 - 120
1854134	Silver	97.9	98.4	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853650	Sulfate	103		P	90 - 110
1853651	Sulfate	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853650	Chloride	102		P	90 - 110
1853651	Chloride	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853758	Ammonia-N	98.0	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853655	Kjeldahl Nitrogen	106	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853962	Kjeldahl Nitrogen	98.6	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316478

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853612	Kjeldahl Nitrogen	105	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316092

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853776	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853660	Total-P	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853848	Total-P	103	104	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P316046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853665	O-Phosphate-P	101	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P316125

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853751	Fluoride	98.2	98.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P316150

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853847	Organic Carbon	94.6	92.7	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P316042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853769	Turbidity	0.357	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P316044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853770	Turbidity	1.24	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P316193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1854134	Calcium	3.59	Spike	P	0 - 20
1854134	Iron	5.32	Spike	P	0 - 20
1854134	Magnesium	5.90	Spike	P	0 - 20
1854134	Potassium	4.34	Spike	P	0 - 20
1854134	Sodium	2.84	Spike	P	0 - 20
1854134	Zinc	2.93	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1854134	Arsenic	2.82	Spike	P	0 - 20
1854134	Cadmium	2.39	Spike	P	0 - 20
1854134	Chromium	1.67	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1854134	Copper	3.78	Spike	P	0 - 20
1854134	Lead	1.91	Spike	P	0 - 20
1854134	Nickel	1.87	Spike	P	0 - 20
1854134	Silver	0.505	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853650	Sulfate	0.0206	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853650	Chloride	0.0421	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853758	Ammonia-N	0.351	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853655	Kjeldahl Nitrogen	1.55	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853962	Kjeldahl Nitrogen	0.992	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316478

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853612	Kjeldahl Nitrogen	4.30	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853776	NO2NO3-N	0.381	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853660	Total-P	1.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853848	Total-P	1.52	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P316046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853665	O-Phosphate-P	1.67	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P316036

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853769	Color (true)	1.14	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P316122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853751	Total Alkalinity	0.0771	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P316704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853772	TDS	1.72	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P316705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853874	TDS	0.370	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 2540 D-97
Batch ID: P316482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853772	TSS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P316125

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853751	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P316150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853847	Organic Carbon	1.64	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: A73120
Included Lab Sample IDs: 1853769, 1853770, 1853771, 1853772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A73121
Included Lab Sample IDs: 1853769, 1853770, 1853771, 1853772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A73122
Included Lab Sample IDs: 1853777, 1853778, 1853779, 1853780

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.6	P/P	90 - 110
O-Phosphate-P	99.7	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A73139
Included Lab Sample IDs: 1853773, 1853774, 1853775, 1853776

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A73139
Included Lab Sample IDs: 1853773, 1853774, 1853775, 1853776

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

Reference Method: SM 2320 B-97
Run ID: A73150
Included Lab Sample IDs: 1853769, 1853770, 1853771, 1853772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.2	97.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A73150
Included Lab Sample IDs: 1853769, 1853770, 1853771, 1853772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A73154
Included Lab Sample IDs: 1853773, 1853774, 1853775, 1853776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	96.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A73246
Included Lab Sample IDs: 1853786, 1853787, 1853788

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	103	P/P	90 - 110
Calcium	101	100	P/P	95 - 105
Iron	101	100	P/P	95 - 105
Iron	102	100	P/P	90 - 110
Magnesium	101	99.6	P/P	95 - 105
Magnesium	102	100	P/P	90 - 110
Potassium	97.0	97.7	P/P	95 - 105
Potassium	99.9	98.8	P/P	90 - 110
Sodium	97.5	98.1	P/P	95 - 105
Sodium	98.6	98.4	P/P	90 - 110
Zinc	101	102	P/P	90 - 110
Zinc	101	102	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73255
Included Lab Sample IDs: 1853773, 1853774, 1853775

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	97.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A73263
Included Lab Sample IDs: 1853773, 1853774, 1853775, 1853776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A73276
Included Lab Sample IDs: 1853786, 1853787, 1853788

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.8	98.4	P/P	90 - 110
Arsenic	99.2	98.8	P/P	90 - 110
Cadmium	98.0	98.2	P/P	90 - 110
Cadmium	98.3	98.0	P/P	90 - 110
Chromium	97.0	97.4	P/P	90 - 110
Chromium	97.4	98.1	P/P	90 - 110
Copper	96.8	96.8	P/P	90 - 110
Copper	98.5	96.8	P/P	90 - 110
Lead	90.5	90.7	P/P	90 - 110
Lead	92.0	90.5	P/P	90 - 110
Nickel	101	99.2	P/P	90 - 110
Nickel	99.2	99.5	P/P	90 - 110
Silver	100	99.5	P/P	90 - 110
Silver	99.5	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73291
Included Lab Sample IDs: 1853776

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A73301
Included Lab Sample IDs: 1853773, 1853774

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A73317
Included Lab Sample IDs: 1853775, 1853776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	98.2	P/P	90 - 110
Kjeldahl Nitrogen	98.2	98.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A73375
Included Lab Sample IDs: 1853769, 1853770, 1853771, 1853772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	106	P/P	90 - 110
Chloride	106	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A73375
Included Lab Sample IDs: 1853769, 1853770, 1853771, 1853772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	102	100	P/P	90 - 110
Sulfate	100	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						0.357	
	Turbidity						1.24	
EPA 200.7 Rev. 4.4	Calcium	105	102					3.59
	Iron	108	103	102	108			5.32
	Magnesium	108	102	99.4	109			5.90
	Potassium	101	98.9	93.7	101			4.34
	Sodium	100	102	98.7				2.84
	Zinc	102	96.3	99.5	103			2.93
EPA 200.8 Rev. 5.4	Arsenic	99.0	102	99.1	102			2.82
	Cadmium	98.9	102	101	104			2.39
	Chromium	97.3	98.8	97.2	99.0			1.67
	Copper	95.9	93.2	94.6	98.3			3.78
	Lead	92.6	93.7	92.4	94.2			1.91
	Nickel	98.4	96.3	96.0	97.9			1.87
	Silver	98.3	101	97.9	98.4			0.505
EPA 300.0 Rev. 2.1	Chloride	105	102	102			0.0421	
	Sulfate	106	103	100			0.0206	
EPA 350.1 Rev. 2.0	Ammonia-N	102	98.0	97.5				0.351
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	106	103				1.55
	Kjeldahl Nitrogen	101	98.6	99.6				0.992
	Kjeldahl Nitrogen	101	105	100				4.30
EPA 353.2 Rev. 2.0	NO2NO3-N	106	102	102				0.381
EPA 365.1 Rev. 2.0	Total-P	98.6	100	102				1.65
	Total-P	103	103	104				1.52
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	101	103				1.67
SM 2120 B	Color (true)						1.14	
SM 2320 B-97	Total Alkalinity	98.5					0.0771	
SM 2540 C-97	TDS						1.72	
	TDS						0.370	
SM 2540 D-97	TSS						0.0	
SM 4500 F-C-97	Fluoride	98.6	98.2	98.2				0.0
SM 5310 B-00	Organic Carbon	98.4	94.6	92.7				1.64

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1853769, 1853770, 1853771, 1853772
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1853786, 1853787, 1853788
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1853786, 1853787, 1853788
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1853769, 1853770, 1853771, 1853772
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1853769, 1853770, 1853771, 1853772
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1853773, 1853774, 1853775, 1853776
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1853773, 1853774, 1853775, 1853776
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1853773, 1853774, 1853775, 1853776
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1853773, 1853774, 1853775, 1853776
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1853777, 1853778, 1853779, 1853780
SM 2120 B / E31780	True Color measured at 450 nm	1853769, 1853770, 1853771, 1853772
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1853769, 1853770, 1853771, 1853772
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1853769, 1853770, 1853771, 1853772
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1853769, 1853770, 1853771, 1853772
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1853769, 1853770, 1853771, 1853772
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1853773, 1853774, 1853775, 1853776

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	12/01/2016			12/01/2016 16:32	Sima Feizi	1853769, 1853770, 1853771, 1853772
EPA 200.7 Rev. 4.4	12/01/2016	12/05/2016	Elliott D. Healy	12/07/2016	Joshua Ayres	1853786, 1853787, 1853788
EPA 200.8 Rev. 5.4	12/01/2016	12/05/2016	Elliott D. Healy	12/08/2016	Charles J. Peterson	1853786, 1853787, 1853788
EPA 300.0 Rev. 2.1	12/01/2016			12/15/2016	Ping Hua	1853769, 1853770, 1853771, 1853772
EPA 350.1 Rev. 2.0	12/01/2016			12/08/2016	Sofia Elnemr	1853773, 1853774, 1853775, 1853776
EPA 351.2 Rev. 2.0	12/01/2016	12/09/2016	Adrian Shelby	12/12/2016	Joseph Suarez	1853775, 1853776
	12/01/2016	12/09/2016	Martin Acosta	12/12/2016	Joseph Suarez	1853773, 1853774
EPA 353.2 Rev. 2.0	12/01/2016			12/02/2016	Beverly Y. Sanders	1853773, 1853774, 1853775, 1853776
EPA 365.1 Rev. 2.0	12/01/2016	12/07/2016	Vijayalakshmi Reddy	12/08/2016	Lipi Saha	1853773, 1853774, 1853775
	12/01/2016	12/07/2016	Vijayalakshmi Reddy	12/09/2016	Lipi Saha	1853776
EPA 365.1 Rev. 2.0 dissolved	12/01/2016			12/01/2016 15:59	Julia Storbeck	1853779
	12/01/2016			12/01/2016 16:04	Julia Storbeck	1853777
	12/01/2016			12/01/2016 16:05	Julia Storbeck	1853778
	12/01/2016			12/01/2016 16:30	Julia Storbeck	1853780
SM 2120 B	12/01/2016			12/01/2016 15:58	Jared I. Manley	1853769
	12/01/2016			12/01/2016 16:00	Jared I. Manley	1853770
	12/01/2016			12/01/2016 16:01	Jared I. Manley	1853771
	12/01/2016			12/01/2016 16:02	Jared I. Manley	1853772
SM 2320 B-97	12/01/2016			12/02/2016	Dale L. Simmons	1853769, 1853770, 1853771, 1853772
SM 2540 C-97	12/01/2016			12/05/2016	Sima Feizi	1853769, 1853770, 1853771, 1853772
SM 2540 D-97	12/01/2016			12/05/2016	Sima Feizi	1853769, 1853770, 1853771, 1853772
SM 4500 F-C-97	12/01/2016			12/02/2016	Dale L. Simmons	1853769, 1853770, 1853771, 1853772
SM 5310 B-00	12/01/2016			12/02/2016	Julie Michelle Frank	1853773, 1853774, 1853775, 1853776