Chemical Analysis Report

SE-DIST-2016-09-22-01

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

Event Description: **SMP-Okeechobee NNC sufficiency**
Request ID: **RQ-2016-09-05-71**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

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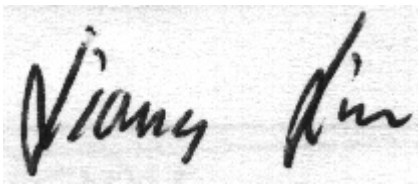
Certified by: Liang Lin, Environmental Administrator

Date Certified: 20-OCT-2016 11:02



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: MOSQUITO CREEK @ CR 710 **Collection Date/Time: 09/21/2016 10:15**

Field ID: MOSQUITO CREEK @ CR 710 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1833907	EPA 180.1 Rev. 2.0	Turbidity	4.0		NTU	P311684	
	EPA 300.0 Rev. 2.1	Chloride	26		mg Cl/L	P312257	
		Sulfate	6.8		mg SO4/L	P312252	
	SM 2120 B	Color (true)	300		PCU	P311911	
	SM 2320 B-97	Total Alkalinity	44		mg CaCO3/L	P311965	
	SM 2540 C-97	TDS	177		mg/L	P312651	
	SM 2540 D-97	TSS	6	I	mg/L	P312180	
	SM 4500 F-C-97	Fluoride	0.066	I	mg F/L	P311969	
1833908	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P311953	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P312211	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.080		mg N/L	P312135	
	EPA 365.1 Rev. 2.0	Total-P	1.1		mg P/L	P312402	
	SM 5310 B-00	Organic Carbon	28		mg C/L	P312089	
1833909	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.96		mg P/L	P311680	
1833911	EPA 200.7 Rev. 4.4	Calcium	16.8		mg/L	P311932	
		Iron	740		ug/L	P311932	
		Magnesium	4.42		mg/L	P311932	
		Potassium	9.3		mg/L	P311932	
		Sodium	14.5		mg/L	P311932	
		Zinc	9.8	I	ug/L	P311932	
	EPA 200.8 Rev. 5.4	Arsenic	1.96		ug/L	P311932	
		Cadmium	0.020	U	ug/L	P311932	
		Chromium	0.59		ug/L	P311932	
		Copper	1.57		ug/L	P311932	
		Lead	0.26		ug/L	P311932	
		Nickel	0.54		ug/L	P311932	
		Silver	0.0050	U	ug/L	P311932	

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P311684

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311932

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311932

Component	Result	Code	Units
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311932

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: P312252

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312257

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311953

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312211

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312135

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312402

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: P311680

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

Reference Method: SM 2120 B
Batch ID: P311911

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P311965

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

Reference Method: SM 2540 C-97
Batch ID: P312651

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P312180

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P311969

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P312089

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: P311932

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	102		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	98.8		P	85 - 115
Sodium	100		P	85 - 115
Zinc	101		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311932

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.6		P	85 - 115
Cadmium	97.5		P	85 - 115
Chromium	95.8		P	85 - 115
Copper	94.9		P	85 - 115
Lead	91.0		P	85 - 115
Nickel	96.7		P	85 - 115
Silver	93.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312252

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312257

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311953

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312211

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312135

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: P312402

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311680

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P311965

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

Reference Method: SM 4500 F-C-97
Batch ID: P311969

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P312089

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833789	Calcium	103		P	80 - 120
1833789	Iron	109		P	80 - 120
1833789	Magnesium	103		P	80 - 120
1833789	Potassium	103		P	80 - 120
1833789	Sodium	104		P	80 - 120
1833789	Zinc	104		P	80 - 120
1833899	Calcium	104		P	80 - 120
1833899	Iron	108	106	P/P	80 - 120
1833899	Magnesium	108	107	P/P	80 - 120
1833899	Potassium	110	107	P/P	80 - 120
1833899	Sodium	102		P	80 - 120
1833899	Zinc	102	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833789	Arsenic	102		P	80 - 120
1833789	Cadmium	99.0		P	80 - 120
1833789	Chromium	96.5		P	80 - 120
1833789	Copper	95.8		P	80 - 120
1833789	Lead	97.8		P	80 - 120
1833789	Nickel	97.6		P	80 - 120
1833789	Silver	94.7		P	80 - 120
1833899	Arsenic	101	99.3	P/P	80 - 120
1833899	Cadmium	100	99.1	P/P	80 - 120
1833899	Chromium	101	99.0	P/P	80 - 120
1833899	Copper	98.7	97.7	P/P	80 - 120
1833899	Lead	100	99.5	P/P	80 - 120
1833899	Nickel	99.6	98.8	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833899	Silver	95.1	94.8	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833747	Sulfate	94.5		P	90 - 110
1833883	Sulfate	96.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833747	Chloride	98.7		P	90 - 110
1833883	Chloride	99.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311953

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833885	Ammonia-N	105	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833927	Kjeldahl Nitrogen	95.5	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833894	NO2NO3-N	98.8	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833893	Total-P	97.4	94.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833930	O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P311969

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834207	Fluoride	98.4	98.4	P/P	91 - 105

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P312089

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833329	Organic Carbon	98.1	99.3	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P311684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833891	Turbidity	8.92	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833899	Calcium	1.18	Spike	P	0 - 20
1833899	Iron	1.72	Spike	P	0 - 20
1833899	Magnesium	0.634	Spike	P	0 - 20
1833899	Potassium	2.77	Spike	P	0 - 20
1833899	Sodium	1.51	Spike	P	0 - 20
1833899	Zinc	0.535	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833899	Arsenic	2.09	Spike	P	0 - 20
1833899	Cadmium	1.30	Spike	P	0 - 20
1833899	Chromium	1.98	Spike	P	0 - 20
1833899	Copper	0.928	Spike	P	0 - 20
1833899	Lead	0.929	Spike	P	0 - 20
1833899	Nickel	0.802	Spike	P	0 - 20
1833899	Silver	0.289	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833747	Sulfate	1.25	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833747	Chloride	0.00913	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833885	Ammonia-N	1.92	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833927	Kjeldahl Nitrogen	0.530	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833894	NO2NO3-N	0.418	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833893	Total-P	2.96	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833930	O-Phosphate-P	0.498	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P311911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833742	Color (true)	1.24	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P311965

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834207	Total Alkalinity	0.0664	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P312651

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833924	TDS	2.64	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P311969

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834207	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P312089

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833329	Organic Carbon	0.697	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 365.1 Rev. 2.0 dissolved
Run ID: A71780
Included Lab Sample IDs: 1833909

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71781
Included Lab Sample IDs: 1833907

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

Reference Method: SM 2120 B
Run ID: A71860
Included Lab Sample IDs: 1833907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.2	97.7	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71866
Included Lab Sample IDs: 1833908

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

Reference Method: SM 2320 B-97
Run ID: A71875
Included Lab Sample IDs: 1833907

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A71875
Included Lab Sample IDs: 1833907

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71882
Included Lab Sample IDs: 1833907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	98.0	P/P	90 - 110
Sulfate	99.4	97.4	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A71905
Included Lab Sample IDs: 1833908

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71911
Included Lab Sample IDs: 1833911

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.0	96.0	P/P	90 - 110
Cadmium	96.5	96.2	P/P	90 - 110
Chromium	96.0	96.1	P/P	90 - 110
Copper	95.0	93.6	P/P	90 - 110
Lead	91.4	93.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71919
Included Lab Sample IDs: 1833908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71930
Included Lab Sample IDs: 1833911

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	101	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	99.7	101	P/P	90 - 110
Sodium	99.4	101	P/P	90 - 110
Zinc	99.6	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71944
Included Lab Sample IDs: 1833911

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	100	98.9	P/P	90 - 110
Silver	94.3	95.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71971
Included Lab Sample IDs: 1833908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A72030
Included Lab Sample IDs: 1833908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.6	99.9	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						8.92	
EPA 200.7 Rev. 4.4	Calcium	103	103	104				1.18
	Iron	102	109	108	106			1.72
	Magnesium	104	103	108	107			0.634
	Potassium	98.8	103	110	107			2.77
	Sodium	100	104	102				1.51
	Zinc	101	104	102	101			0.535
EPA 200.8 Rev. 5.4	Arsenic	97.6	102	101	99.3			2.09
	Cadmium	97.5	99.0	100	99.1			1.30
	Chromium	95.8	96.5	101	99.0			1.98
	Copper	94.9	95.8	98.7	97.7			0.928
	Lead	91.0	97.8	100	99.5			0.929
	Nickel	96.7	97.6	99.6	98.8			0.802
	Silver	93.7	94.7	95.1	94.8			0.289
EPA 300.0 Rev. 2.1	Chloride	98.3	98.7	99.0			0.0091	
	Sulfate	96.5	94.5	96.4			1.25	
EPA 350.1 Rev. 2.0	Ammonia-N	103	105	102				1.92
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	95.5	96.4				0.530
EPA 353.2 Rev. 2.0	NO2NO3-N	102	98.8	98.4				0.418
EPA 365.1 Rev. 2.0	Total-P	96.2	97.4	94.4				2.96
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	106	100	101				0.498
SM 2120 B	Color (true)						1.24	
SM 2320 B-97	Total Alkalinity	103					0.0664	
SM 2540 C-97	TDS						2.64	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 4500 F-C-97	Fluoride	97.9	98.4	98.4			0.0
SM 5310 B-00	Organic Carbon	100	98.1	99.3			0.697

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1833907
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1833911
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1833911
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1833907
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1833907
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1833908
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1833908
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1833908
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1833908
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1833909
SM 2120 B / E31780	True Color measured at 450 nm	1833907
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1833907
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1833907
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1833907
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1833907
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1833908

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	09/22/2016			09/22/2016 16:37	Sima Feizi	1833907
EPA 200.7 Rev. 4.4	09/22/2016	09/27/2016	Elliott D. Healy	09/29/2016	Joshua Ayres	1833911
EPA 200.8 Rev. 5.4	09/22/2016	09/27/2016	Elliott D. Healy	09/28/2016	Charles J. Peterson	1833911
	09/22/2016	09/27/2016	Elliott D. Healy	09/29/2016	Charles J. Peterson	1833911
EPA 300.0 Rev. 2.1	09/22/2016			10/01/2016	Ping Hua	1833907
EPA 350.1 Rev. 2.0	09/22/2016			09/26/2016	Joseph Suarez	1833908
EPA 351.2 Rev. 2.0	09/22/2016	09/30/2016	Adrian Shelby	10/03/2016	Virginia P. Brown	1833908
EPA 353.2 Rev. 2.0	09/22/2016			09/29/2016	Beverly Y. Sanders	1833908
EPA 365.1 Rev. 2.0	09/22/2016	10/04/2016	Vijayalakshmi Reddy	10/05/2016	Lipi Saha	1833908
EPA 365.1 Rev. 2.0 dissolved	09/22/2016			09/22/2016 15:30	Julia Storbeck	1833909
SM 2120 B	09/22/2016			09/22/2016 19:22	Julie Michelle Frank	1833907
SM 2320 B-97	09/22/2016			09/26/2016	Dale L. Simmons	1833907
SM 2540 C-97	09/22/2016			09/26/2016	Sima Feizi	1833907
SM 2540 D-97	09/22/2016			09/26/2016	Sima Feizi	1833907
SM 4500 F-C-97	09/22/2016			09/26/2016	Dale L. Simmons	1833907
SM 5310 B-00	09/22/2016			09/28/2016	Julie Michelle Frank	1833908