

Chemical Analysis Report

SE-DIST-2016-06-22-02

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

Event Description: **SMP-Otter taylor and henry creek**
Request ID: **RQ-2016-06-13-30**
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: Colin Wright, Environmental Administrator

Date Certified: 13-JUL-2016 11:51

A handwritten signature in black ink, appearing to read "Colin Wright", is positioned on a light-colored rectangular background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: OTTER CREEK @ HWY 441

Collection Date/Time: 06/21/2016 10:20

Field ID: G1SE0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1810075	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P306703	
	EPA 300.0 Rev. 2.1	Chloride	89		mg Cl/L	P307237	
		Sulfate	27		mg SO4/L	P307239	
	SM 2120 B	Color (true)	250		PCU	P307074	
	SM 2320 B-97	Total Alkalinity	74		mg CaCO3/L	P307280	
	SM 2540 C-97	TDS	322		mg/L	P307300	
	SM 2540 D-97	TSS	6	I	mg/L	P307304	
	SM 4500 F-C-97	Fluoride	0.093	I	mg F/L	P307285	
1810076	EPA 350.1 Rev. 2.0	Ammonia-N	1.6		mg N/L	P306930	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.2		mg N/L	P306714	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P306942	
	EPA 365.1 Rev. 2.0	Total-P	0.76		mg P/L	P306802	
	SM 5310 B-00	Organic Carbon	29		mg C/L	P307062	
1810077	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.67		mg P/L	P306677	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: TAYLOR CREEK @ SR 70

Collection Date/Time: 06/21/2016 11:00

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1810078	EPA 180.1 Rev. 2.0	Turbidity	7.2		NTU	P306703	
	EPA 300.0 Rev. 2.1	Chloride	43		mg Cl/L	P307237	
		Sulfate	24		mg SO4/L	P307239	
	SM 2120 B	Color (true)	180	A	PCU	P306700	
	SM 2320 B-97	Total Alkalinity	126		mg CaCO3/L	P307280	
	SM 2540 C-97	TDS	315		mg/L	P307300	
	SM 2540 D-97	TSS	12		mg/L	P307304	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P307285	
1810080	EPA 350.1 Rev. 2.0	Ammonia-N	0.26		mg N/L	P306931	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P306712	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.31		mg N/L	P306942	
	EPA 365.1 Rev. 2.0	Total-P	0.25		mg P/L	P306802	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P307063	
1810082	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P306677	
1810095	EPA 200.7 Rev. 4.4	Calcium	57.8		mg/L	P306737	
		Iron	930		ug/L	P306737	
		Magnesium	5.30		mg/L	P306737	
		Potassium	3.8		mg/L	P306737	
		Sodium	28.8		mg/L	P306737	
		Zinc	5.0	U	ug/L	P306737	
	EPA 200.8 Rev. 5.4	Arsenic	1.57		ug/L	P306737	
		Cadmium	0.020	U	ug/L	P306737	

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1810095	EPA 200.8 Rev. 5.4	Chromium	0.88		ug/L	P306737	
		Copper	0.76		ug/L	P306737	
		Lead	0.58		ug/L	P306737	
		Nickel	0.76		ug/L	P306737	
		Silver	0.0052	I	ug/L	P306737	

Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: The sodium matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.

Sample Location: L63 @ SE 59TH BLVD 16B

Collection Date/Time: 06/21/2016 12:00

Field ID: G1SE0005

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1810079	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P306703	
	EPA 300.0 Rev. 2.1	Chloride	42		mg Cl/L	P307237	
		Sulfate	21		mg SO4/L	P307239	
	SM 2120 B	Color (true)	340		PCU	P306700	
	SM 2320 B-97	Total Alkalinity	58		mg CaCO3/L	P307280	
	SM 2540 C-97	TDS	237	A	mg/L	P307301	
	SM 2540 D-97	TSS	4	I	mg/L	P307305	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P307285	
1810081	EPA 350.1 Rev. 2.0	Ammonia-N	0.20		mg N/L	P306931	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P306712	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P306942	
	EPA 365.1 Rev. 2.0	Total-P	0.70		mg P/L	P306802	
	SM 5310 B-00	Organic Carbon	30		mg C/L	P307063	
1810083	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.59		mg P/L	P306677	
1810096	EPA 200.7 Rev. 4.4	Calcium	27.0		mg/L	P306737	
		Iron	710		ug/L	P306737	
		Magnesium	6.14		mg/L	P306737	
		Potassium	9.7		mg/L	P306737	
		Sodium	24.5		mg/L	P306737	
		Zinc	5.0	U	ug/L	P306737	
	EPA 200.8 Rev. 5.4	Arsenic	0.96		ug/L	P306737	
		Cadmium	0.020	U	ug/L	P306737	
		Chromium	0.64		ug/L	P306737	
		Copper	1.16		ug/L	P306737	
		Lead	0.24		ug/L	P306737	
		Nickel	0.57		ug/L	P306737	
		Silver	0.0050	U	ug/L	P306737	

Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: The sodium matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P306703

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P306737

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: P306737

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: P307237

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307239

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306930

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306931

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306712

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306714

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306942

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306802

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306677

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

Reference Method: SM 2120 B
Batch ID: P306700

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P307074

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P307280

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

Reference Method: SM 2540 C-97
Batch ID: P307300

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P307301

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P307304

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P307305

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P307285

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P307062

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

Reference Method: SM 5310 B-00
Batch ID: P307063

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: P306737

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	105		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	101		P	85 - 115
Sodium	104		P	85 - 115
Zinc	99.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P306737

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.5		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P306737

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	98.6		P	85 - 115
Chromium	98.2		P	85 - 115
Copper	96.0		P	85 - 115
Lead	96.4		P	85 - 115
Nickel	96.6		P	85 - 115
Silver	96.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307237

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307239

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	93.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306930

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306931

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306712

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: P306714

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: P306942

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306802

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	93.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306677

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

Reference Method: SM 2320 B-97
Batch ID: P307280

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

Reference Method: SM 4500 F-C-97
Batch ID: P307285

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P307062

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.0		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P307063

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P306737

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810049	Calcium	105		P	80 - 120
1810049	Iron	105		P	80 - 120
1810049	Magnesium	105		P	80 - 120
1810049	Potassium	104		P	80 - 120
1810049	Zinc	108		P	80 - 120
1810053	Calcium	101		P	80 - 120
1810053	Iron	108	108	P/P	80 - 120
1810053	Magnesium	103		P	80 - 120
1810053	Potassium	106	105	P/P	80 - 120
1810053	Sodium	103		P	80 - 120
1810053	Zinc	101	102	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P306737

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810049	Arsenic	104		P	80 - 120
1810049	Cadmium	102		P	80 - 120
1810049	Chromium	98.1		P	80 - 120
1810049	Copper	95.2		P	80 - 120
1810049	Lead	100		P	80 - 120
1810049	Nickel	96.1		P	80 - 120
1810049	Silver	97.3		P	80 - 120
1810053	Arsenic	101	102	P/P	80 - 120
1810053	Cadmium	99.2	99.9	P/P	80 - 120
1810053	Chromium	99.1	100	P/P	80 - 120
1810053	Copper	92.9	95.6	P/P	80 - 120
1810053	Lead	97.9	98.5	P/P	80 - 120
1810053	Nickel	95.4	95.6	P/P	80 - 120
1810053	Silver	99.4	99.5	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307237

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810202	Chloride	99.8		P	90 - 110
1810671	Chloride	96.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307239

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810202	Sulfate	97.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306930

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810033	Ammonia-N	99.0	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810110	Ammonia-N	98.1	96.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306712

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1809862	Kjeldahl Nitrogen	95.0	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810030	NO2NO3-N	96.0	97.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306802

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810088	Total-P	109	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306677

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810040	O-Phosphate-P	99.1	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P307285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810299	Fluoride	99.0	99.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P307062

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1809968	Organic Carbon	98.0	99.1	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P307063

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810144	Organic Carbon	96.2	97.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P306703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1809977	Turbidity	2.08	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P306737

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810053	Calcium	0.124	Spike	P	0 - 20
1810053	Iron	0.405	Spike	P	0 - 20
1810053	Magnesium	0.965	Spike	P	0 - 20
1810053	Potassium	0.440	Spike	P	0 - 20
1810053	Sodium	0.0589	Spike	P	0 - 20
1810053	Zinc	0.886	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P306737

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810053	Arsenic	1.06	Spike	P	0 - 20
1810053	Cadmium	0.698	Spike	P	0 - 20
1810053	Chromium	1.07	Spike	P	0 - 20
1810053	Copper	2.81	Spike	P	0 - 20
1810053	Lead	0.630	Spike	P	0 - 20
1810053	Nickel	0.223	Spike	P	0 - 20
1810053	Silver	0.122	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307237

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810202	Chloride	0.542	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307239

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810202	Sulfate	2.98	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306930

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810033	Ammonia-N	1.60	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810110	Ammonia-N	1.31	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306712

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1809862	Kjeldahl Nitrogen	4.86	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810019	Kjeldahl Nitrogen	2.72	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P306942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810030	NO2NO3-N	0.803	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306802

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810088	Total-P	12.4	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306677

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810040	O-Phosphate-P	1.50	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P306700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810078	Color (true)	0.756	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307074

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810024	Color (true)	1.54	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P307280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810299	Total Alkalinity	0.168	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P307300

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810018	TDS	4.74	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P307301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810079	TDS	3.38	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P307285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810299	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P307062

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1809968	Organic Carbon	0.674	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P307063

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810144	Organic Carbon	0.816	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: A70171
Included Lab Sample IDs: 1810077, 1810082, 1810083

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	96.9	P/P	90 - 110
O-Phosphate-P	99.0	99.6	P/P	90 - 110
O-Phosphate-P	99.6	98.2	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A70178
Included Lab Sample IDs: 1810078, 1810079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.4	98.9	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A70179
Included Lab Sample IDs: 1810075, 1810078, 1810079

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

Reference Method: SM 2120 B
Run ID: A70182
Included Lab Sample IDs: 1810075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A70182
Included Lab Sample IDs: 1810075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.7	94.3	P/P	90 - 115

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A70228
Included Lab Sample IDs: 1810095, 1810096

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	102	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	103	102	P/P	90 - 110
Zinc	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A70231
Included Lab Sample IDs: 1810076, 1810080, 1810081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	100	P/P	90 - 110
Kjeldahl Nitrogen	97.4	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A70236
Included Lab Sample IDs: 1810076, 1810080, 1810081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A70249
Included Lab Sample IDs: 1810076, 1810080, 1810081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A70250
Included Lab Sample IDs: 1810076, 1810080, 1810081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	98.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A70295
Included Lab Sample IDs: 1810095, 1810096

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.5	97.9	P/P	90 - 110
Cadmium	97.3	97.6	P/P	90 - 110
Chromium	98.7	98.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A70295
Included Lab Sample IDs: 1810095, 1810096

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	97.1	96.3	P/P	90 - 110
Lead	94.8	94.3	P/P	90 - 110
Nickel	96.6	96.0	P/P	90 - 110
Silver	95.9	96.2	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A70299
Included Lab Sample IDs: 1810076, 1810080, 1810081

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A70313
Included Lab Sample IDs: 1810075, 1810078, 1810079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.9	P/P	90 - 110
Sulfate	100	95.2	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A70372
Included Lab Sample IDs: 1810075, 1810078, 1810079

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: A70372
Included Lab Sample IDs: 1810075, 1810078, 1810079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.1	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				2.08	
EPA 200.7 Rev. 4.4	Calcium	103	105	101		0.124
	Iron	105	105	108		0.405
	Magnesium	104	105	103		0.965
	Potassium	101	104	105		0.440
	Sodium	104	103			0.0589

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.7 Rev. 4.4	Zinc	99.3	108	102	101		0.886
EPA 200.8 Rev. 5.4	Arsenic	99.5	104	101	102		1.06
	Cadmium	98.6	102	99.2	99.9		0.698
	Chromium	98.2	98.1	99.1	100		1.07
	Copper	96.0	95.2	92.9	95.6		2.81
	Lead	96.4	100	97.9	98.5		0.630
	Nickel	96.6	96.1	95.4	95.6		0.223
	Silver	96.9	97.3	99.4	99.5		0.122
EPA 300.0 Rev. 2.1	Chloride	99.3	99.8	96.0		0.542	
	Sulfate	93.4	97.7			2.98	
EPA 350.1 Rev. 2.0	Ammonia-N	97.2	99.0	97.2			1.60
	Ammonia-N	101	98.1	96.6			1.31
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	95.0	102			4.86
	Kjeldahl Nitrogen	103					2.72
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	96.0	97.5			0.803
EPA 365.1 Rev. 2.0	Total-P	93.4	109	95.8			12.4
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	99.1	101			1.50
SM 2120 B	Color (true)					0.756	
	Color (true)					1.54	
SM 2320 B-97	Total Alkalinity	103				0.168	
SM 2540 C-97	TDS					4.74	
	TDS					3.38	
SM 4500 F-C-97	Fluoride	98.9	99.0	99.0			0.0
SM 5310 B-00	Organic Carbon	99.0	98.0	99.1			0.674
	Organic Carbon	101	96.2	97.3			0.816

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1810075, 1810078, 1810079
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1810095, 1810096
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1810095, 1810096
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1810075, 1810078, 1810079
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1810075, 1810078, 1810079
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1810076, 1810080, 1810081
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1810076, 1810080, 1810081
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1810076, 1810080, 1810081
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1810076, 1810080, 1810081
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1810077, 1810082, 1810083
SM 2120 B / E31780	True Color measured at 450 nm	1810075, 1810078, 1810079
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1810075, 1810078, 1810079
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1810075, 1810078, 1810079
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1810075, 1810078, 1810079
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1810075, 1810078, 1810079
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1810076, 1810080, 1810081

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	06/22/2016			06/22/2016 15:56	Sima Feizi	1810075, 1810078, 1810079
EPA 200.7 Rev. 4.4	06/22/2016	06/23/2016	Elliott D. Healy	06/24/2016	Joshua Ayres	1810095, 1810096
EPA 200.8 Rev. 5.4	06/22/2016	06/23/2016	Elliott D. Healy	06/29/2016	Charles J. Peterson	1810095, 1810096
EPA 300.0 Rev. 2.1	06/22/2016			07/01/2016	Ping Hua	1810075, 1810078, 1810079
EPA 350.1 Rev. 2.0	06/22/2016			06/27/2016	Diana M. Turner	1810076, 1810080, 1810081
EPA 351.2 Rev. 2.0	06/22/2016	06/23/2016	Sofia Elnemr	06/24/2016	Christopher Armour	1810076, 1810080, 1810081
EPA 353.2 Rev. 2.0	06/22/2016			06/27/2016	Beverly Y. Sanders	1810076, 1810080, 1810081
EPA 365.1 Rev. 2.0	06/22/2016	06/24/2016	Vijayalakshmi Reddy	06/27/2016	Lipi Saha	1810076, 1810080, 1810081
EPA 365.1 Rev. 2.0 dissolved	06/22/2016			06/22/2016 14:43	Julia Storbeck	1810082
	06/22/2016			06/22/2016 15:02	Julia Storbeck	1810077
	06/22/2016			06/22/2016 15:09	Julia Storbeck	1810083
SM 2120 B	06/22/2016			06/22/2016 18:10	Chrisoulla Rakowski	1810075
	06/22/2016			06/23/2016 09:57	Blanca Fach	1810078
	06/22/2016			06/23/2016 09:58	Blanca Fach	1810079
SM 2320 B-97	06/22/2016			07/02/2016	Dale L. Simmons	1810075, 1810078, 1810079
SM 2540 C-97	06/22/2016			06/24/2016	Yijie Li	1810075, 1810078, 1810079
SM 2540 D-97	06/22/2016			06/24/2016	Yijie Li	1810075, 1810078, 1810079
SM 4500 F-C-97	06/22/2016			07/02/2016	Dale L. Simmons	1810075, 1810078, 1810079
SM 5310 B-00	06/22/2016			06/28/2016	Diana M. Turner	1810076
	06/22/2016			06/29/2016	Diana M. Turner	1810080, 1810081