

Chemical Analysis Report

CEN-DIST-2016-04-28-01

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

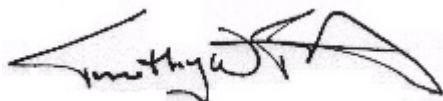
Event Description: **Turkey Creek**
Request ID: **RQ-2016-04-04-65**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

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

Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 25-MAY-2016 15:52

A handwritten signature in black ink, appearing to read "Timothy Fitzpatrick", with a stylized flourish at the end.

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: TURKEY CREEK @ US 1 BRIDGE

Collection Date/Time: 04/27/2016 12:30

Field ID: G5CE0054

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793833	EPA 180.1 Rev. 2.0	Turbidity	2.0	A	NTU	P303206	
	SM 2320 B-97	Total Alkalinity	163		mg CaCO3/L	P303817	
	SM 2540 D-97	TSS	3	U	mg/L	P303794	
	SM 4500 F-C-97	Fluoride	0.55		mg F/L	P303822	
1793836	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P303782	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P304112	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P303630	
	EPA 365.1 Rev. 2.0	Total-P	0.055		mg P/L	P303919	
	SM 5310 B-00	Organic Carbon	9.3		mg C/L	P304745	
1793839	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P303179	
1793845	EPA 200.7 Rev. 4.4	Iron	140		ug/L	P303550	
		Zinc	5.0	U	ug/L	P303550	
	EPA 200.8 Rev. 5.4	Arsenic	1.38		ug/L	P303550	
		Cadmium	0.060	U	ug/L	P303550	
		Chromium	0.19	I	ug/L	P303550	
		Copper	1.1	I	ug/L	P303550	
		Lead	0.15	U	ug/L	P303550	
		Nickel	0.38	I	ug/L	P303550	
		Silver	0.015	U	ug/L	P303550	

Ref. Method and Comment:

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

Sample Location: TURKEY CREEK @ RAILROAD TRESTLE

Collection Date/Time: 04/27/2016 12:42

Field ID: G5CE0055

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793834	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P303206	
	SM 2320 B-97	Total Alkalinity	174	A	mg CaCO3/L	P303817	
	SM 2540 D-97	TSS	3	U	mg/L	P303794	
	SM 4500 F-C-97	Fluoride	0.37		mg F/L	P303822	
1793837	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P303782	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P304112	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P303630	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P304054	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P304745	
1793840	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P303179	
1793846	EPA 200.7 Rev. 4.4	Iron	160		ug/L	P303550	
		Zinc	5.0	U	ug/L	P303550	
	EPA 200.8 Rev. 5.4	Arsenic	1.04		ug/L	P303550	
		Cadmium	0.060	U	ug/L	P303550	
		Chromium	0.21	I	ug/L	P303550	
		Copper	0.30	U	ug/L	P303550	
		Lead	0.15	U	ug/L	P303550	
		Nickel	0.40	I	ug/L	P303550	

Field ID: G5CE0055

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793846	EPA 200.8 Rev. 5.4	Silver	0.015	U	ug/L	P303550	

Ref. Method and Comment:

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

Sample Location: TURKEY CREEK @ S OF ELLIOT ST.

Collection Date/Time: 04/27/2016 12:52

Field ID: G5CE0056

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793835	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P303206	
	SM 2320 B-97	Total Alkalinity	175		mg CaCO3/L	P303816	
	SM 2540 D-97	TSS	2	I	mg/L	P303790	
	SM 4500 F-C-97	Fluoride	0.34		mg F/L	P303821	
1793838	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P303782	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P304309	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P303630	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P304054	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P304638	
1793841	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.027		mg P/L	P303179	
1793847	EPA 200.7 Rev. 4.4	Iron	160		ug/L	P303550	
		Zinc	5.0	U	ug/L	P303550	
	EPA 200.8 Rev. 5.4	Arsenic	1.07		ug/L	P303550	
		Cadmium	0.020	U	ug/L	P303550	
		Chromium	0.19	I	ug/L	P303550	
		Copper	0.44		ug/L	P303550	
		Lead	0.050	U	ug/L	P303550	
		Nickel	0.45		ug/L	P303550	
		Silver	0.0050	U	ug/L	P303550	

Ref. Method and Comment:

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P303206

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P303550

Component	Result	Code	Units
Iron	30	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P303550

Component	Result	Code	Units
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Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P303550

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 350.1 Rev. 2.0
Batch ID: P303782

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304112

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304309

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303630

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303919

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304054

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303179

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P303816

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2320 B-97
Batch ID: P303817

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 D-97
Batch ID: P303790

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P303794

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P303821

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P303822

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P304638

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

Reference Method: SM 5310 B-00
Batch ID: P304745

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: P303550

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P303550

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	105		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P303550

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.7		P	85 - 115
Cadmium	94.5		P	85 - 115
Chromium	93.1		P	85 - 115
Copper	96.1		P	85 - 115
Lead	95.9		P	85 - 115
Nickel	96.9		P	85 - 115
Silver	92.3		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303782

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304112

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304309

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303630

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303919

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304054

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303179

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

Reference Method: SM 2320 B-97
Batch ID: P303816

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 105

Reference Method: SM 2320 B-97
Batch ID: P303817

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P303821

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.5		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P303822

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P304638

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P304745

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P303550

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793847	Iron	100	106	P/P	80 - 120
1793847	Zinc	97.2	99.1	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P303550

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793847	Arsenic	99.4	97.8	P/P	80 - 120
1793847	Cadmium	91.3	90.6	P/P	80 - 120
1793847	Chromium	84.2	83.7	P/P	80 - 120
1793847	Copper	92.8	91.0	P/P	80 - 120
1793847	Lead	103	102	P/P	80 - 120
1793847	Nickel	95.6	94.5	P/P	80 - 120
1793847	Silver	86.7	86.3	P/P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303782

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793683	Ammonia-N	104	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304112

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1792618	Kjeldahl Nitrogen	95.5	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793678	Kjeldahl Nitrogen	93.6	93.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793675	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303919

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793674	Total-P	93.7	93.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304054

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793837	Total-P	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793841	O-Phosphate-P	98.4	99.6	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P303821

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793851	Fluoride	95.9	95.4	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P303822

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793834	Fluoride	97.5	98.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P304638

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793776	Organic Carbon	98.1	97.2	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P304745

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793683	Organic Carbon	91.4	92.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P303206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793833	Turbidity	2.04	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P303550

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793847	Iron	5.17	Spike	P	0 - 20
1793847	Zinc	1.92	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P303550

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793847	Arsenic	1.65	Spike	P	0 - 20
1793847	Cadmium	0.799	Spike	P	0 - 20
1793847	Chromium	0.595	Spike	P	0 - 20
1793847	Copper	1.93	Spike	P	0 - 20
1793847	Lead	1.35	Spike	P	0 - 20
1793847	Nickel	1.06	Spike	P	0 - 20
1793847	Silver	0.469	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793683	Ammonia-N	1.61	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304112

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1792618	Kjeldahl Nitrogen	2.38	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793678	Kjeldahl Nitrogen	0.230	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793675	NO2NO3-N	1.98	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793674	Total-P	0.0255	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304054

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793837	Total-P	1.56	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793841	O-Phosphate-P	0.954	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P303816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793851	Total Alkalinity	0.0379	Sample	P	0 - 4.8

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P303817

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793834	Total Alkalinity	0.401	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P303821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793851	Fluoride	0.490	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P303822

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793834	Fluoride	0.483	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P304638

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793776	Organic Carbon	0.662	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P304745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793683	Organic Carbon	1.04	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: A69156
Included Lab Sample IDs: 1793839, 1793840, 1793841

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A69165
Included Lab Sample IDs: 1793833, 1793834, 1793835

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A69298

Included Lab Sample IDs: 1793836, 1793837, 1793838

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A69330

Included Lab Sample IDs: 1793845, 1793846, 1793847

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	100	99.3	P/P	90 - 110
Iron	99.3	97.0	P/P	90 - 110
Zinc	94.7	97.2	P/P	90 - 110
Zinc	97.2	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A69333

Included Lab Sample IDs: 1793836, 1793837, 1793838

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

Reference Method: SM 2320 B-97

Run ID: A69345

Included Lab Sample IDs: 1793833, 1793834, 1793835

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	98.9	P/P	90 - 110
Total Alkalinity	98.1	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A69345

Included Lab Sample IDs: 1793833, 1793834, 1793835

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A69371

Included Lab Sample IDs: 1793845, 1793846, 1793847

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.6	94.9	P/P	90 - 110
Arsenic	98.7	97.6	P/P	90 - 110
Cadmium	95.0	93.5	P/P	90 - 110
Cadmium	96.6	95.0	P/P	90 - 110
Chromium	94.7	91.3	P/P	90 - 110
Chromium	96.9	94.7	P/P	90 - 110
Copper	100	98.5	P/P	90 - 110
Copper	98.5	96.6	P/P	90 - 110
Lead	93.3	92.0	P/P	90 - 110
Lead	94.7	93.3	P/P	90 - 110
Nickel	100	98.4	P/P	90 - 110
Nickel	98.4	96.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A69371

Included Lab Sample IDs: 1793845, 1793846, 1793847

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	93.1	92.9	P/P	90 - 110
Silver	95.1	93.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69422

Included Lab Sample IDs: 1793836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69459

Included Lab Sample IDs: 1793837, 1793838

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69479

Included Lab Sample IDs: 1793836, 1793837

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	95.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69525

Included Lab Sample IDs: 1793838

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.5	95.1	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A69584

Included Lab Sample IDs: 1793838

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.5	98.6	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A69609

Included Lab Sample IDs: 1793836, 1793837

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.4	93.0	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					2.04
EPA 200.7 Rev. 4.4	Iron	105	100	106		5.17
	Zinc	101	97.2	99.1		1.92
EPA 200.8 Rev. 5.4	Arsenic	95.7	99.4	97.8		1.65
	Cadmium	94.5	91.3	90.6		0.799
	Chromium	93.1	84.2	83.7		0.595
	Copper	96.1	92.8	91.0		1.93
	Lead	95.9	103	102		1.35
	Nickel	96.9	95.6	94.5		1.06
	Silver	92.3	86.7	86.3		0.469
EPA 350.1 Rev. 2.0	Ammonia-N	100	104	106		1.61
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	95.5	98.2		2.38
	Kjeldahl Nitrogen	102	93.6	93.9		0.230
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	100	102		1.98
EPA 365.1 Rev. 2.0	Total-P	99.7	93.7	93.7		0.0255
	Total-P	99.9	101	103		1.56
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	105	98.4	99.6		0.954
SM 2320 B-97	Total Alkalinity	101				0.0379
	Total Alkalinity	101				0.401
SM 4500 F-C-97	Fluoride	96.5	95.9	95.4		0.490
	Fluoride	96.5	97.5	98.2		0.483
SM 5310 B-00	Organic Carbon	97.6	98.1	97.2		0.662
	Organic Carbon	97.6	91.4	92.4		1.04

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1793833, 1793834, 1793835
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1793845, 1793846, 1793847
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1793845, 1793846, 1793847
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1793836, 1793837, 1793838
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1793836, 1793837, 1793838
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1793836, 1793837, 1793838
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1793836, 1793837, 1793838
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1793839, 1793840, 1793841
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1793833, 1793834, 1793835
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1793833, 1793834, 1793835
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1793833, 1793834, 1793835
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1793836, 1793837, 1793838

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	04/28/2016			04/28/2016 15:12	Sima Feizi	1793833, 1793834, 1793835
EPA 200.7 Rev. 4.4	04/28/2016	05/04/2016	Elliott D. Healy	05/06/2016	Joshua Ayres	1793845, 1793846, 1793847
EPA 200.8 Rev. 5.4	04/28/2016	05/04/2016	Elliott D. Healy	05/09/2016	Charles J. Peterson	1793845, 1793846, 1793847
EPA 350.1 Rev. 2.0	04/28/2016			05/06/2016	Diana M. Turner	1793836, 1793837, 1793838
EPA 351.2 Rev. 2.0	04/28/2016	05/12/2016	Christopher Armour	05/15/2016	Virginia P. Brown	1793836, 1793837
	04/28/2016	05/13/2016	Christopher Armour	05/16/2016	Christopher Armour	1793838
EPA 353.2 Rev. 2.0	04/28/2016			05/05/2016	Peter D. Kaus	1793836, 1793837, 1793838
EPA 365.1 Rev. 2.0	04/28/2016	05/10/2016	Vijayalakshmi Reddy	05/11/2016	Lipi Saha	1793836
	04/28/2016	05/11/2016	Vijayalakshmi Reddy	05/12/2016	Rochelle Y Jackson	1793837, 1793838
EPA 365.1 Rev. 2.0 dissolved	04/28/2016			04/28/2016 14:40	Julia Storbeck	1793841
	04/28/2016			04/28/2016 15:25	Julia Storbeck	1793839
	04/28/2016			04/28/2016 15:26	Julia Storbeck	1793840
SM 2320 B-97	04/28/2016			05/07/2016	Dale L. Simmons	1793833, 1793834, 1793835
SM 2540 D-97	04/28/2016			05/03/2016	Yijie Li	1793833, 1793834, 1793835
SM 4500 F-C-97	04/28/2016			05/07/2016	Dale L. Simmons	1793833, 1793834, 1793835
SM 5310 B-00	04/28/2016			05/19/2016	Diana M. Turner	1793838
	04/28/2016			05/21/2016	Ping Hua	1793836, 1793837