

Chemical Analysis Report

SO-DIST-2017-03-29-02

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

Event Description: **SMP: Peace River Streams**
Request ID: **RQ-2017-03-27-18**
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: Ben Paswater

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 20-APR-2017 16:10



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: Hog Bay @ CR 763

Collection Date/Time: 03/28/2017 09:40

Field ID: G3SD032817-2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884320	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P322465	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P323032	
		Sulfate	160		mg SO4/L	P323035	
	SM 2120 B	Color (true)	53		PCU	P322435	
	SM 2320 B-97	Total Alkalinity	163		mg CaCO3/L	P322916	
	SM 2540 C-97	TDS	650		mg/L	P322831	
	SM 2540 D-97	TSS	7	I	mg/L	P323020	
	SM 4500 F-C-97	Fluoride	0.29		mg F/L	P322919	
1884322	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P322496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P322558	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.071		mg N/L	P322570	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P322669	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P322512	
1884324	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.083		mg P/L	P322447	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Bobcat Creek in Preserve East

Collection Date/Time: 03/28/2017 08:40

Field ID: G3SD032817-5

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884321	EPA 180.1 Rev. 2.0	Turbidity	5.4	A	NTU	P322466	
	EPA 300.0 Rev. 2.1	Chloride	31		mg Cl/L	P323032	
		Sulfate	5.8		mg SO4/L	P323035	
	SM 2120 B	Color (true)	50		PCU	P322435	
	SM 2320 B-97	Total Alkalinity	99	A	mg CaCO3/L	P322916	
	SM 2540 C-97	TDS	187	A	mg/L	P322831	
	SM 2540 D-97	TSS	5	I	mg/L	P323020	
	SM 4500 F-C-97	Fluoride	0.59		mg F/L	P322919	
1884323	EPA 350.1 Rev. 2.0	Ammonia-N	0.078		mg N/L	P322496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P322564	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.038		mg N/L	P322570	
	EPA 365.1 Rev. 2.0	Total-P	1.2		mg P/L	P322669	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P322512	
1884325	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.92		mg P/L	P322447	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Myrtle Slough @ SR31

Collection Date/Time: 03/28/2017 10:30

Field ID: G3SD032817-1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884326	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P322466	

Field ID: G3SD032817-1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884326	EPA 300.0 Rev. 2.1	Chloride	250		mg Cl/L	P323034	
		Sulfate	110		mg SO4/L	P323037	
	SM 2120 B	Color (true)	57		PCU	P322435	
	SM 2320 B-97	Total Alkalinity	186		mg CaCO3/L	P322916	
	SM 2540 C-97	TDS	787		mg/L	P322831	
	SM 2540 D-97	TSS	4	I	mg/L	P323020	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P322919	
1884328	EPA 350.1 Rev. 2.0	Ammonia-N	0.045		mg N/L	P322496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P322564	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P322571	
	EPA 365.1 Rev. 2.0	Total-P	0.040		mg P/L	P322669	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P322512	
1884330	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.019		mg P/L	P322447	
1884336	EPA 200.7 Rev. 4.4	Calcium	125		mg/L	P322485	
		Iron	200		ug/L	P322485	
		Magnesium	19.8		mg/L	P322485	
		Potassium	12.5		mg/L	P322485	
		Sodium	102		mg/L	P322485	
		Zinc	5.0	U	ug/L	P322485	
	EPA 200.8 Rev. 5.4	Arsenic	0.74		ug/L	P322485	
		Cadmium	0.020	U	ug/L	P322485	
		Chromium	0.41	I	ug/L	P322485	
		Copper	0.85		ug/L	P322485	
		Lead	0.050	U	ug/L	P322485	
		Nickel	2.00		ug/L	P322485	
		Silver	0.010	U	ug/L	P322485	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Shell Cr @ SR 31

Collection Date/Time: 03/28/2017 10:45

Field ID: G3SD032817-3

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884327	EPA 180.1 Rev. 2.0	Turbidity	23		NTU	P322466	
	EPA 300.0 Rev. 2.1	Chloride	390		mg Cl/L	P323034	
		Sulfate	140		mg SO4/L	P323037	
	SM 2120 B	Color (true)	36		PCU	P322437	
	SM 2320 B-97	Total Alkalinity	178		mg CaCO3/L	P322916	
	SM 2540 C-97	TDS	1.13E+03		mg/L	P322831	
	SM 2540 D-97	TSS	31		mg/L	P323020	
1884329	SM 4500 F-C-97	Fluoride	0.32		mg F/L	P322919	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.069		mg N/L	P322496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.96		mg N/L	P322564	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P322571	

Field ID: G3SD032817-3

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884329	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P322669	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P322512	
1884331	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.031		mg P/L	P322447	
1884337	EPA 200.7 Rev. 4.4	Calcium	141		mg/L	P322485	
		Iron	1.82E+03		ug/L	P322485	
		Magnesium	30.0		mg/L	P322485	
		Potassium	8.7		mg/L	P322485	
		Sodium	172		mg/L	P322485	
		Zinc	6.6	I	ug/L	P322485	
	EPA 200.8 Rev. 5.4	Arsenic	1.04		ug/L	P322485	
		Cadmium	0.020	U	ug/L	P322485	
		Chromium	2.6		ug/L	P322485	
		Copper	2.77		ug/L	P322485	
		Lead	0.79		ug/L	P322485	
		Nickel	1.47		ug/L	P322485	
		Silver	0.010	U	ug/L	P322485	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P322465

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P322466

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P322485

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: P322485

Component	Result	Code	Units
Arsenic	0.050	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322485

Component	Result	Code	Units
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323032

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323034

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323035

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323037

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322496

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322558

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322564

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322570

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322571

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322669

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322447

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

Reference Method: SM 2120 B
Batch ID: P322435

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P322437

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P322916

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

Reference Method: SM 2540 C-97
Batch ID: P322831

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P323020

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P322919

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P322512

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: P322485

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	94.8		P	85 - 115
Iron	107		P	85 - 115
Magnesium	94.9		P	85 - 115
Potassium	102		P	85 - 115
Sodium	103		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322485

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	98.3		P	85 - 115
Chromium	97.9		P	85 - 115
Copper	99.1		P	85 - 115
Lead	102		P	85 - 115
Nickel	102		P	85 - 115
Silver	104		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323032

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323034

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323035

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.4		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323037

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322496

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	109		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322564

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322570

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322571

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: P322669

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322447

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

Reference Method: SM 2320 B-97
Batch ID: P322916

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P322919

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P322512

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883509	Calcium	101		P	80 - 120
1883509	Iron	110		P	80 - 120
1883509	Magnesium	105		P	80 - 120
1883509	Potassium	103		P	80 - 120
1883509	Sodium	102		P	80 - 120
1883509	Zinc	102		P	80 - 120
1883935	Calcium	104		P	80 - 120
1883935	Iron	108	107	P/P	80 - 120
1883935	Magnesium	104		P	80 - 120
1883935	Potassium	101	99.5	P/P	80 - 120
1883935	Sodium	102	102	P/P	80 - 120
1883935	Zinc	98.1	100	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883509	Arsenic	102		P	80 - 120
1883509	Cadmium	102		P	80 - 120
1883509	Chromium	99.2		P	80 - 120
1883509	Copper	97.4		P	80 - 120
1883509	Lead	104		P	80 - 120
1883509	Nickel	97.2		P	80 - 120
1883509	Silver	104		P	80 - 120
1883935	Arsenic	95.4	97.6	P/P	80 - 120
1883935	Cadmium	94.0	92.9	P/P	80 - 120
1883935	Chromium	93.5	95.3	P/P	80 - 120
1883935	Copper	90.9	92.2	P/P	80 - 120
1883935	Lead	97.5	98.4	P/P	80 - 120
1883935	Nickel	91.4	93.9	P/P	80 - 120
1883935	Silver	101	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323032

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884258	Chloride	101		P	90 - 110
1884348	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884764	Chloride	106		P	90 - 110
1884769	Chloride	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323035

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884258	Sulfate	98.5		P	90 - 110
1884348	Sulfate	99.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323037

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884764	Sulfate	104		P	90 - 110
1884769	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322496

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884260	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884262	Kjeldahl Nitrogen	98.3	112	P/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884349	Kjeldahl Nitrogen	101	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322570

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884261	NO2NO3-N	96.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322571

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322571

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884328	NO2NO3-N	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884328	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884264	O-Phosphate-P	96.4	95.9	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P322512

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884260	Organic Carbon	93.4	92.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P322465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884259	Turbidity	3.36	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P322466

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884321	Turbidity	1.11	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883935	Calcium	1.14	Spike	P	0 - 20
1883935	Iron	1.25	Spike	P	0 - 20
1883935	Magnesium	0.386	Spike	P	0 - 20
1883935	Potassium	1.20	Spike	P	0 - 20
1883935	Sodium	0.167	Spike	P	0 - 20
1883935	Zinc	2.41	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883935	Arsenic	2.29	Spike	P	0 - 20
1883935	Cadmium	1.10	Spike	P	0 - 20
1883935	Chromium	1.94	Spike	P	0 - 20
1883935	Copper	1.41	Spike	P	0 - 20
1883935	Lead	0.972	Spike	P	0 - 20
1883935	Nickel	2.64	Spike	P	0 - 20
1883935	Silver	1.41	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884258	Chloride	0.0733	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323034

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884764	Chloride	0.740	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884258	Sulfate	0.775	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322496

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884260	Ammonia-N	0.538	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884262	Kjeldahl Nitrogen	8.26	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884349	Kjeldahl Nitrogen	3.60	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322570

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884261	NO2NO3-N	0.393	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884328	NO2NO3-N	1.49	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884328	Total-P	0.653	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884264	O-Phosphate-P	0.483	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P322435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884258	Color (true)	0.193	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P322437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884187	Color (true)	2.29	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P322916

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884321	Total Alkalinity	0.157	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P322831

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884321	TDS	7.49	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P322919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884321	Fluoride	0.520	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P322512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884260	Organic Carbon	0.404	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: A75443
Included Lab Sample IDs: 1884320, 1884321, 1884326, 1884327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	85 - 115
Color (true)	102	100	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A75452
Included Lab Sample IDs: 1884324, 1884325, 1884330, 1884331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.7	P/P	90 - 110
O-Phosphate-P	99.2	98.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A75456
Included Lab Sample IDs: 1884320, 1884321, 1884326, 1884327

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75470
Included Lab Sample IDs: 1884322, 1884323, 1884328, 1884329

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A75475

Included Lab Sample IDs: 1884322, 1884323, 1884328, 1884329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	95.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A75490

Included Lab Sample IDs: 1884322, 1884323, 1884328, 1884329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	96.5	P/P	90 - 110
NO2NO3-N	98.0	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75524

Included Lab Sample IDs: 1884323, 1884328, 1884329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A75525

Included Lab Sample IDs: 1884336, 1884337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	98.4	98.4	P/P	90 - 110
Zinc	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75527

Included Lab Sample IDs: 1884322

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75535

Included Lab Sample IDs: 1884336, 1884337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	99.2	P/P	90 - 110
Cadmium	97.8	96.0	P/P	90 - 110
Chromium	98.4	97.0	P/P	90 - 110
Copper	99.2	99.8	P/P	90 - 110
Lead	101	99.3	P/P	90 - 110
Nickel	99.8	101	P/P	90 - 110
Silver	102	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75541

Included Lab Sample IDs: 1884322, 1884329

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75554

Included Lab Sample IDs: 1884328

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

Reference Method: SM 2320 B-97

Run ID: A75625

Included Lab Sample IDs: 1884320, 1884321, 1884326, 1884327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	105	P/P	90 - 110
Total Alkalinity	105	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A75625

Included Lab Sample IDs: 1884320, 1884321, 1884326, 1884327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	95.0	96.6	P/P	90 - 110
Fluoride	96.6	95.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75646

Included Lab Sample IDs: 1884323

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75672

Included Lab Sample IDs: 1884321, 1884326, 1884327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Chloride	103	105	P/P	90 - 110
Sulfate	100	104	P/P	90 - 110
Sulfate	99.8	105	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75723

Included Lab Sample IDs: 1884320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.3	98.9	P/P	90 - 110
Sulfate	94.6	97.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

* 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						3.36	
	Turbidity						1.11	
EPA 200.7 Rev. 4.4	Calcium	94.8	101	104				1.14
	Iron	107	110	108	107			1.25
	Magnesium	94.9	105	104				0.386
	Potassium	102	103	101	99.5			1.20
	Sodium	103	102	102	102			0.167
	Zinc	101	102	98.1	100			2.41
EPA 200.8 Rev. 5.4	Arsenic	102	102	95.4	97.6			2.29
	Cadmium	98.3	94.0	92.9	102			1.10
	Chromium	97.9	99.2	93.5	95.3			1.94
	Copper	99.1	97.4	90.9	92.2			1.41
	Lead	102	104	97.5	98.4			0.972
	Nickel	102	97.2	91.4	93.9			2.64
	Silver	104	104	101	102			1.41
EPA 300.0 Rev. 2.1	Chloride	101	101	101			0.0733	
	Chloride	105	106	105			0.740	
	Sulfate	99.4	98.5	99.0			0.775	
	Sulfate	103	104	104				
EPA 350.1 Rev. 2.0	Ammonia-N	104	102	102				0.538
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109	98.3	112				8.26
	Kjeldahl Nitrogen	105	101	106				3.60
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	96.2					0.393
	NO2NO3-N	101	102	100				1.49
EPA 365.1 Rev. 2.0	Total-P	105	106	105				0.653
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	106	96.4	95.9				0.483
SM 2120 B	Color (true)						0.193	
	Color (true)						2.29	
SM 2320 B-97	Total Alkalinity	104					0.157	
SM 2540 C-97	TDS						7.49	
SM 4500 F-C-97	Fluoride	94.5						0.520
SM 5310 B-00	Organic Carbon	98.6	93.4	92.9				0.404

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1884320, 1884321, 1884326, 1884327
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1884336, 1884337
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1884336, 1884337
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1884320, 1884321, 1884326, 1884327
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1884320, 1884321, 1884326, 1884327

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1884322, 1884323, 1884328, 1884329
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1884322, 1884323, 1884328, 1884329
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1884322, 1884323, 1884328, 1884329
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1884322, 1884323, 1884328, 1884329
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1884324, 1884325, 1884330, 1884331
SM 2120 B / E31780	True Color measured at 450 nm	1884320, 1884321, 1884326, 1884327
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1884320, 1884321, 1884326, 1884327
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1884320, 1884321, 1884326, 1884327
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1884320, 1884321, 1884326, 1884327
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1884320, 1884321, 1884326, 1884327
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1884322, 1884323, 1884328, 1884329

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	03/29/2017			03/29/2017 17:01	Blanca Fach	1884320, 1884321, 1884326, 1884327
EPA 200.7 Rev. 4.4	03/29/2017	03/30/2017	Elliott D. Healy	03/31/2017	Martin Acosta	1884336, 1884337
EPA 200.8 Rev. 5.4	03/29/2017	03/30/2017	Elliott D. Healy	04/03/2017	Betina Topolski	1884336, 1884337
EPA 300.0 Rev. 2.1	03/29/2017			04/07/2017	Ping Hua	1884321
	03/29/2017			04/08/2017	Ping Hua	1884326, 1884327
	03/29/2017			04/10/2017	Ping Hua	1884320
EPA 350.1 Rev. 2.0	03/29/2017			03/30/2017	Julie Michelle Frank	1884322, 1884323, 1884328, 1884329
EPA 351.2 Rev. 2.0	03/29/2017	03/31/2017	Adrian Shelby	04/03/2017	Joseph Suarez	1884322, 1884323, 1884328, 1884329
EPA 353.2 Rev. 2.0	03/29/2017			03/31/2017	Beverly Y. Sanders	1884322, 1884323, 1884328, 1884329
EPA 365.1 Rev. 2.0	03/29/2017	04/03/2017	Vijayalakshmi Reddy	04/04/2017	Christopher Armour	1884322, 1884329
	03/29/2017	04/03/2017	Vijayalakshmi Reddy	04/04/2017	Lipi Saha	1884328
	03/29/2017	04/03/2017	Vijayalakshmi Reddy	04/07/2017	Lipi Saha	1884323
EPA 365.1 Rev. 2.0 dissolved	03/29/2017			03/29/2017 16:19	Anthony C. Onicha	1884324
	03/29/2017			03/29/2017 16:20	Anthony C. Onicha	1884330
	03/29/2017			03/29/2017 16:21	Anthony C. Onicha	1884331
	03/29/2017			03/29/2017 16:39	Anthony C. Onicha	1884325
SM 2120 B	03/29/2017			03/29/2017 18:33	Julie Michelle Frank	1884327
	03/29/2017			03/29/2017 18:42	Julie Michelle Frank	1884320
	03/29/2017			03/29/2017 18:43	Julie Michelle Frank	1884321, 1884326
SM 2320 B-97	03/29/2017			04/06/2017	Dale L. Simmons	1884320, 1884321, 1884326, 1884327
SM 2540 C-97	03/29/2017			03/31/2017	Yijie Li	1884320, 1884321, 1884326, 1884327
SM 2540 D-97	03/29/2017			03/31/2017	Yijie Li	1884320, 1884321, 1884326, 1884327
SM 4500 F-C-97	03/29/2017			04/06/2017	Dale L. Simmons	1884320, 1884321, 1884326, 1884327
SM 5310 B-00	03/29/2017			03/30/2017	Julie Michelle Frank	1884322, 1884323, 1884328, 1884329