

Chemical Analysis Report

NW-DIST-2016-09-27-01

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

Event Description: **ENR A WBID 1004 462A 784**

Request ID: **RQ-2016-09-26-20**

Customer: **NW-DIST**

Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 308
Pensacola, FL 32502-5794
Attn: Michael King

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

Certified by: Liang Lin, Environmental Administrator

Date Certified: 24-OCT-2016 10:01

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: Perdidio River

Collection Date/Time: 09/26/2016 10:45

Field ID: G5NW0070

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1834495	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P311921	
	SM 2320 B-97	Total Alkalinity	13		mg CaCO3/L	P312094	
	SM 2540 D-97	TSS	4	I	mg/L	P312364	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P312095	
1834497	EPA 350.1 Rev. 2.0	Ammonia-N	0.02		mg N/L	P312117	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P312390	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P312339	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P312526	
	SM 5310 B-00	Organic Carbon	6.5		mg C/L	P312194	
1834499	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P311915	
1834515	EPA 200.7 Rev. 4.4	Iron	460		ug/L	P312024	
	EPA 200.8 Rev. 5.4	Arsenic	0.59	I	ug/L	P312024	
		Cadmium	0.060	U	ug/L	P312024	
		Chromium	0.29	I	ug/L	P312024	
		Copper	0.37	I	ug/L	P312024	
		Lead	0.16	I	ug/L	P312024	
		Nickel	0.48	I	ug/L	P312024	
		Silver	0.015	U	ug/L	P312024	
		Zinc	3.0	U	ug/L	P312024	

Ref. Method and Comment:

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

Sample Location: Perdidio River @ Mouth

Collection Date/Time: 09/26/2016 11:05

Field ID: G5NW0018

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1834496	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P311921	
	SM 2320 B-97	Total Alkalinity	24		mg CaCO3/L	P312094	
	SM 2540 D-97	TSS	2	I	mg/L	P312364	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P312095	
1834498	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P312117	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40	I	mg N/L	P312389	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P312700	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P312525	
	SM 5310 B-00	Organic Carbon	6.5		mg C/L	P312194	
1834500	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P311918	
1834516	EPA 200.7 Rev. 4.4	Iron	320	I	ug/L	P312024	
	EPA 200.8 Rev. 5.4	Arsenic	0.71		ug/L	P312024	
		Cadmium	0.060	U	ug/L	P312024	
		Chromium	0.28	I	ug/L	P312024	
		Copper	0.30	U	ug/L	P312024	
		Lead	0.15	U	ug/L	P312024	
		Nickel	0.47	I	ug/L	P312024	
		Silver	0.015	U	ug/L	P312024	

Field ID: G5NW0018

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1834516	EPA 200.8 Rev. 5.4	Zinc	3.0	U	ug/L	P312024	

Ref. Method and Comment:

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

Sample Location: Tee Lake Center

Collection Date/Time: 09/26/2016 11:25

Field ID: G5NW0035

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1834501	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P311921	
	SM 2320 B-97	Total Alkalinity	50		mg CaCO3/L	P312271	
	SM 2540 D-97	TSS	4	I	mg/L	P312367	
	SM 4500 F-C-97	Fluoride	0.34		mg F/L	P312583	
1834504	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P312117	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P312389	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P312549	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P312525	
	SM 5310 B-00	Organic Carbon	8.0		mg C/L	P312196	
1834507	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P311918	

Ref. Method and Comment:

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

Sample Location: Big Lagoon State Park-Seagrass Station

Collection Date/Time: 09/26/2016 13:00

Field ID: G5NW0122

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1834502	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P311921	
	SM 2320 B-97	Total Alkalinity	97		mg CaCO3/L	P312271	
	SM 2540 D-97	TSS	3	U	mg/L	P312367	
	SM 4500 F-C-97	Fluoride	0.94		mg F/L	P312275	
1834505	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P312117	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31	I	mg N/L	P312389	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P312549	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P312525	
	SM 5310 B-00	Organic Carbon	3.9		mg C/L	P312196	
1834508	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P311918	

Ref. Method and Comment:

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

Sample Location: Big Lagoon Hwy 292 ICW Bridge Esc Co.

Collection Date/Time: 09/26/2016 13:40

Field ID: G5NW0121

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1834503	EPA 180.1 Rev. 2.0	Turbidity	1.7	A	NTU	P311922	
	SM 2320 B-97	Total Alkalinity	95		mg CaCO3/L	P312271	
	SM 2540 D-97	TSS	3	U	mg/L	P312367	
	SM 4500 F-C-97	Fluoride	0.92		mg F/L	P312275	
1834506	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P312117	

Field ID: G5NW0121

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1834506	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29	I	mg N/L	P312389	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P312549	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P312525	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P312196	
1834509	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P311918	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P311921

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P311922

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P312024

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P312024

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
Zinc	1.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P312117

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P312389

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312390

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312339

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312549

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312700

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312525

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312526

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311915

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311918

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

Reference Method: SM 2320 B-97
Batch ID: P312094

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P312271

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

Reference Method: SM 2540 D-97
Batch ID: P312364

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P312367

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P312095

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P312275

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P312583

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P312194

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

Reference Method: SM 5310 B-00
Batch ID: P312196

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: P312024

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: P312024

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	98.4		P	85 - 115
Chromium	99.5		P	85 - 115
Copper	94.4		P	85 - 115
Lead	95.2		P	85 - 115
Nickel	94.9		P	85 - 115
Silver	94.9		P	85 - 115
Zinc	96.6		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312117

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312390

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: P312339

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	108		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312549

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312700

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312525

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312526

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311915

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311918

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

Reference Method: SM 2320 B-97
Batch ID: P312094

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

Reference Method: SM 2320 B-97
Batch ID: P312271

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

Reference Method: SM 4500 F-C-97
Batch ID: P312095

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.1		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P312275

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P312583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.7		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P312194

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

Reference Method: SM 5310 B-00
Batch ID: P312196

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: P312024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834515	Iron	108	108	P/P	70 - 130
1834785	Iron	103		P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834515	Arsenic	104	105	P/P	70 - 130
1834515	Cadmium	95.6	98.5	P/P	70 - 130
1834515	Chromium	94.7	95.5	P/P	70 - 130
1834515	Copper	91.3	94.0	P/P	70 - 130
1834515	Lead	99.4	99.1	P/P	70 - 130
1834515	Nickel	92.1	95.3	P/P	70 - 130
1834515	Silver	90.6	92.1	P/P	70 - 130
1834515	Zinc	95.6	97.1	P/P	70 - 130
1834785	Arsenic	101		P	70 - 130
1834785	Cadmium	87.7		P	70 - 130
1834785	Chromium	79.2		P	70 - 130
1834785	Copper	89.5		P	70 - 130
1834785	Lead	104		P	70 - 130
1834785	Nickel	91.6		P	70 - 130
1834785	Silver	84.1		P	70 - 130
1834785	Zinc	81.7		P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312117

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834497	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834498	Kjeldahl Nitrogen	109	99.7	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834497	Kjeldahl Nitrogen	98.3	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312339

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834294	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833629	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312700

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834498	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312525

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834222	Total-P	93.8	94.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834466	Total-P	101	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834469	O-Phosphate-P	98.4	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834507	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P312095

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834799	Fluoride	96.8	98.4	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P312275

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835048	Fluoride	96.7	98.0	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P312583

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836792	Fluoride	99.9	99.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P312194

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834287	Organic Carbon	99.4	97.6	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P312196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833837	Organic Carbon	88.9	91.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P311921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834461	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P311922

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834503	Turbidity	1.74	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P312024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834515	Iron	0.154	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834515	Arsenic	0.381	Spike	P	0 - 20
1834515	Cadmium	3.07	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834515	Chromium	0.868	Spike	P	0 - 20
1834515	Copper	2.86	Spike	P	0 - 20
1834515	Lead	0.340	Spike	P	0 - 20
1834515	Nickel	3.27	Spike	P	0 - 20
1834515	Silver	1.66	Spike	P	0 - 20
1834515	Zinc	1.64	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834497	Ammonia-N	0.325	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834498	Kjeldahl Nitrogen	7.59	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834497	Kjeldahl Nitrogen	1.67	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312339

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834294	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833629	NO2NO3-N	0.488	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834498	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834222	Total-P	1.09	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834466	Total-P	2.33	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834469	O-Phosphate-P	1.17	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834507	O-Phosphate-P	1.08	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P312094

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834799	Total Alkalinity	0.384	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P312271

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835048	Total Alkalinity	0.0309	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P312095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834799	Fluoride	1.47	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P312275

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835048	Fluoride	0.946	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P312583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836792	Fluoride	0.509	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P312194

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834287	Organic Carbon	0.964	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P312196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833837	Organic Carbon	2.45	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: A71862
Included Lab Sample IDs: 1834499, 1834500, 1834507, 1834508, 1834509

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	99.3	P/P	90 - 110
O-Phosphate-P	98.7	97.9	P/P	90 - 110
O-Phosphate-P	99.7	98.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71863
Included Lab Sample IDs: 1834495, 1834496, 1834501, 1834502, 1834503

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

Reference Method: SM 2320 B-97
Run ID: A71907
Included Lab Sample IDs: 1834495, 1834496

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A71907
Included Lab Sample IDs: 1834495, 1834496

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

Reference Method: SM 4500 F-C-97

Run ID: A71907

Included Lab Sample IDs: 1834495, 1834496

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A71914

Included Lab Sample IDs: 1834497, 1834498, 1834504, 1834505, 1834506

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

Reference Method: SM 5310 B-00

Run ID: A71942

Included Lab Sample IDs: 1834497, 1834498, 1834504, 1834505, 1834506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	101	102	P/P	90 - 110
Organic Carbon	103	95.0	P/P	90 - 110
Organic Carbon	95.0	97.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A71961

Included Lab Sample IDs: 1834501, 1834502, 1834503

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

Reference Method: SM 4500 F-C-97

Run ID: A71961

Included Lab Sample IDs: 1834502, 1834503

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71966

Included Lab Sample IDs: 1834515, 1834516

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71983

Included Lab Sample IDs: 1834497

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71985

Included Lab Sample IDs: 1834515, 1834516

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.2	99.9	P/P	90 - 110
Arsenic	99.9	101	P/P	90 - 110
Cadmium	96.9	96.0	P/P	90 - 110
Cadmium	97.5	96.9	P/P	90 - 110
Chromium	98.2	99.6	P/P	90 - 110
Chromium	99.6	94.1	P/P	90 - 110
Copper	93.8	95.0	P/P	90 - 110
Copper	95.0	98.2	P/P	90 - 110
Lead	94.5	94.9	P/P	90 - 110
Lead	94.9	95.1	P/P	90 - 110
Nickel	94.0	94.8	P/P	90 - 110
Nickel	94.8	99.1	P/P	90 - 110
Silver	96.2	97.1	P/P	90 - 110
Silver	97.1	96.0	P/P	90 - 110
Zinc	96.3	97.2	P/P	90 - 110
Zinc	97.2	98.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72035

Included Lab Sample IDs: 1834504, 1834505, 1834506

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

Reference Method: SM 4500 F-C-97

Run ID: A72046

Included Lab Sample IDs: 1834501

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A72075

Included Lab Sample IDs: 1834497, 1834498, 1834504, 1834505, 1834506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	96.2	P/P	90 - 110
Kjeldahl Nitrogen	96.2	98.7	P/P	90 - 110
Kjeldahl Nitrogen	98.7	94.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72083

Included Lab Sample IDs: 1834498

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72124

Included Lab Sample IDs: 1834497, 1834498, 1834504, 1834505, 1834506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	102	P/P	90 - 110
Total-P	102	100	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						0.0	
	Turbidity						1.74	
EPA 200.7 Rev. 4.4	Iron	106	108	108	103			0.154
EPA 200.8 Rev. 5.4	Arsenic	100	104	105	101			0.381
	Cadmium	98.4	95.6	98.5	87.7			3.07
	Chromium	99.5	94.7	95.5	79.2			0.868
	Copper	94.4	91.3	94.0	89.5			2.86
	Lead	95.2	99.4	99.1	104			0.340
	Nickel	94.9	92.1	95.3	91.6			3.27
	Silver	94.9	90.6	92.1	84.1			1.66
	Zinc	96.6	95.6	97.1	81.7			1.64
EPA 350.1 Rev. 2.0	Ammonia-N	106	105	105				0.325
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	109	99.7				7.59
	Kjeldahl Nitrogen	102	98.3	101				1.67
EPA 353.2 Rev. 2.0	NO2NO3-N	108	106	106				0.0
	NO2NO3-N	103	103	102				0.488
	NO2NO3-N	102	102	102				0.0
EPA 365.1 Rev. 2.0	Total-P	101	93.8	94.9				1.09
	Total-P	96.5	101	104				2.33
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	98.4	100				1.17
	O-Phosphate-P	105	101	102				1.08
SM 2320 B-97	Total Alkalinity	103					0.384	
	Total Alkalinity	104					0.0309	
SM 4500 F-C-97	Fluoride	98.1	96.8	98.4				1.47
	Fluoride	97.5	96.7	98.0				0.946
	Fluoride	98.7	99.9	99.2				0.509
SM 5310 B-00	Organic Carbon	98.4	99.4	97.6				0.964
	Organic Carbon	98.6	88.9	91.6				2.45

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1834495, 1834496, 1834501, 1834502, 1834503
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1834515, 1834516
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1834515, 1834516

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1834497, 1834498, 1834504, 1834505, 1834506
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1834497, 1834498, 1834504, 1834505, 1834506
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1834497, 1834498, 1834504, 1834505, 1834506
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1834497, 1834498, 1834504, 1834505, 1834506
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1834499, 1834500, 1834507, 1834508, 1834509
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1834495, 1834496, 1834501, 1834502, 1834503
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1834495, 1834496, 1834501, 1834502, 1834503
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1834495, 1834496, 1834501, 1834502, 1834503
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1834497, 1834498, 1834504, 1834505, 1834506

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	09/27/2016			09/27/2016 15:28	Sima Feizi	1834495, 1834496, 1834501, 1834502, 1834503
EPA 200.7 Rev. 4.4	09/27/2016	09/28/2016	Elliott D. Healy	09/30/2016	Joshua Ayres	1834515, 1834516
EPA 200.8 Rev. 5.4	09/27/2016	09/28/2016	Elliott D. Healy	10/04/2016	Charles J. Peterson	1834515, 1834516
EPA 350.1 Rev. 2.0	09/27/2016			09/28/2016	Sofia Elnemr	1834497, 1834498, 1834504, 1834505, 1834506
EPA 351.2 Rev. 2.0	09/27/2016	10/04/2016	Adrian Shelby	10/06/2016	Christopher Armour	1834497, 1834498, 1834504, 1834505, 1834506
EPA 353.2 Rev. 2.0	09/27/2016			10/03/2016	Beverly Y. Sanders	1834497
	09/27/2016			10/05/2016	Beverly Y. Sanders	1834504, 1834505, 1834506
	09/27/2016			10/07/2016	Beverly Y. Sanders	1834498
EPA 365.1 Rev. 2.0	09/27/2016	10/05/2016	Vijayalakshmi Reddy	10/10/2016	Lipi Saha	1834497, 1834498, 1834504, 1834505, 1834506
EPA 365.1 Rev. 2.0 dissolved	09/27/2016			09/27/2016 14:48	Julia Storbeck	1834507
	09/27/2016			09/27/2016 15:11	Julia Storbeck	1834499
	09/27/2016			09/27/2016 15:16	Julia Storbeck	1834500
	09/27/2016			09/27/2016 15:21	Julia Storbeck	1834508
	09/27/2016			09/27/2016 15:22	Julia Storbeck	1834509
SM 2320 B-97	09/27/2016			09/29/2016	Dale L. Simmons	1834495, 1834496
	09/27/2016			09/30/2016	Dale L. Simmons	1834501, 1834502, 1834503
SM 2540 D-97	09/27/2016			09/30/2016	Yijie Li	1834495, 1834496, 1834501, 1834502, 1834503
SM 4500 F-C-97	09/27/2016			09/29/2016	Dale L. Simmons	1834495, 1834496
	09/27/2016			09/30/2016	Dale L. Simmons	1834502, 1834503
	09/27/2016			10/05/2016	Dale L. Simmons	1834501
SM 5310 B-00	09/27/2016			09/29/2016	Julie Michelle Frank	1834497, 1834498, 1834504, 1834505, 1834506