

Chemical Analysis Report

NW-DIST-2019-05-09-01

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

Event Description: **ESC/BW BAY RUN**
Request ID: **RQ-2019-05-06-36**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 29-MAY-2019 18:51



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 by the Florida Department of Health Environmental Laboratory Certification Program 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: BLACKWATER BAY WEST OF ESCRIBANO POINT

Collection Date/Time: 05/08/2019 10:25

Field ID: G4NW0401

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085073	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P363736	
	EPA 300.0	Bromide	15		mg Br/L	P363949	
	SM 2320 B-97	Total Alkalinity	35		mg CaCO3/L	P364172	
	SM 2540 D-97	TSS	4	I	mg/L	P364243	
	SM 4500 F-C-97	Fluoride	0.30		mg F/L	P364176	
2085074	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P364047	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31	I	mg N/L	P364077	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P363974	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P364103	MS
	SM 5310 B-00	Organic Carbon	3.3		mg C/L	P364050	
2085075	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P363705	
2085088	EPA 200.7 Rev. 4.4	Iron	100	I	ug/L	P364004	
		Manganese	14.4		ug/L	P364004	
		Zinc	5.0	U	ug/L	P364004	
	EPA 200.8 Rev. 5.4	Aluminum	91		ug/L	P364004	
		Antimony	0.20	U	ug/L	P364004	
		Arsenic	0.56	I	ug/L	P364004	
		Cadmium	0.080	U	ug/L	P364004	
		Chromium	4.0	U	ug/L	P364004	
		Copper	1.6	U	ug/L	P364004	
		Lead	0.80	U	ug/L	P364004	
		Nickel	2.0	U	ug/L	P364004	
		Selenium	0.80	U	ug/L	P364004	
		Silver	0.040	U	ug/L	P364004	
		Thallium	0.40	U	ug/L	P364004	

Ref. Method and Comment:

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

Sample Location: JUDGES BAYOU MOUTH

Collection Date/Time: 05/08/2019 12:15

Field ID: G4NW0441

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085076	EPA 180.1 Rev. 2.0	Turbidity	8.3		NTU	P363736	
	EPA 300.0	Bromide	4.6		mg Br/L	P363949	
	SM 2320 B-97	Total Alkalinity	27		mg CaCO3/L	P364259	
	SM 2540 D-97	TSS	9	I	mg/L	P364243	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P364263	
2085078	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P364044	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P364076	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.064		mg N/L	P364120	
	EPA 365.1 Rev. 2.0	Total-P	0.041		mg P/L	P364072	
	SM 5310 B-00	Organic Carbon	5.7		mg C/L	P364050	
2085080	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P363702	

Sample Location: JUDGES BAYOU CONFLUENCE

Collection Date/Time: 05/08/2019 12:00

Field ID: G4NW0442

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2085077	EPA 180.1 Rev. 2.0	Turbidity	10		NTU	P363736	
	EPA 300.0	Bromide	1.6		mg Br/L	P363949	
	SM 2320 B-97	Total Alkalinity	23		mg CaCO3/L	P364259	
	SM 2540 D-97	TSS	10	A	mg/L	P364243	
	SM 4500 F-C-97	Fluoride	0.072	I	mg F/L	P364263	
2085079	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P364044	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.56		mg N/L	P364076	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.091		mg N/L	P364120	
	EPA 365.1 Rev. 2.0	Total-P	0.047		mg P/L	P364072	
	SM 5310 B-00	Organic Carbon	5.9		mg C/L	P364050	
2085081	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P363704	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P363736

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P364004

Component	Result	Code	Units
Iron	30	U	ug/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P364004

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0
Batch ID: P363949

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364044

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364047

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364076

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: P364077

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363974

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364120

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364072

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364103

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363702

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363704

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363705

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

Reference Method: SM 2320 B-97
Batch ID: P364172

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: P364259

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

Reference Method: SM 2540 D-97
Batch ID: P364243

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P364176

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P364263

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P364050

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: P364004

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	95.2		P	85 - 115
Manganese	96.6		P	85 - 115
Zinc	95.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P364004

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	98.8		P	85 - 115
Arsenic	102		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	99.8		P	85 - 115
Copper	98.5		P	85 - 115
Lead	96.0		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	102		P	85 - 115
Silver	102		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P363949

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364044

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364047

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364076

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364077

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363974

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364120

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364072

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364103

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363704

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.8		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P364172

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 2320 B-97
Batch ID: P364259

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P364176

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P364263

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P364050

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P364004

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085088	Iron	93.2	91.9	P/P	70 - 130
2085088	Manganese	89.9	90.1	P/P	70 - 130
2085088	Zinc	93.5	93.1	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P364004

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085088	Aluminum	112	112	P/P	70 - 130
2085088	Antimony	102	102	P/P	70 - 130
2085088	Arsenic	109	108	P/P	70 - 130
2085088	Cadmium	98.2	97.4	P/P	70 - 130
2085088	Chromium	93.7	93.8	P/P	70 - 130
2085088	Copper	95.0	94.3	P/P	70 - 130
2085088	Lead	102	101	P/P	70 - 130
2085088	Nickel	91.3	91.1	P/P	70 - 130
2085088	Selenium	105	104	P/P	70 - 130
2085088	Silver	96.1	95.9	P/P	70 - 130
2085088	Thallium	103	105	P/P	70 - 130

Reference Method: EPA 300.0
Batch ID: P363949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085500	Bromide	97.5	98.9	P/P	90 - 110
2085617	Bromide	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085035	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364047

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085074	Ammonia-N	102	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364076

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085064	Kjeldahl Nitrogen	105	113	P/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084991	Kjeldahl Nitrogen	98.9	96.6	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363974

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084630	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364120

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085036	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364072

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085064	Total-P	95.4	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364103

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084987	Total-P	86.8	90.1	F/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085189	O-Phosphate-P	94.2	95.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085081	O-Phosphate-P	94.4	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085075	O-Phosphate-P	92.6	94.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P364263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085112	Fluoride	100	98.1	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P364050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085035	Organic Carbon	98.2	97.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P363736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085061	Turbidity	3.10	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P364004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085088	Iron	1.32	Spike	P	0 - 20
2085088	Manganese	0.194	Spike	P	0 - 20
2085088	Zinc	0.507	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P364004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085088	Aluminum	0.0753	Spike	P	0 - 20
2085088	Antimony	0.606	Spike	P	0 - 20
2085088	Arsenic	0.351	Spike	P	0 - 20
2085088	Cadmium	0.836	Spike	P	0 - 20
2085088	Chromium	0.191	Spike	P	0 - 20
2085088	Copper	0.736	Spike	P	0 - 20
2085088	Lead	0.830	Spike	P	0 - 20
2085088	Nickel	0.275	Spike	P	0 - 20
2085088	Selenium	1.27	Spike	P	0 - 20
2085088	Silver	0.138	Spike	P	0 - 20
2085088	Thallium	1.43	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P363949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085500	Bromide	1.14	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085035	Ammonia-N	1.17	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364047

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085074	Ammonia-N	2.26	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364076

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085064	Kjeldahl Nitrogen	5.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084991	Kjeldahl Nitrogen	1.97	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084630	NO2NO3-N	0.298	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364120

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085036	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364072

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085064	Total-P	3.27	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364103

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084987	Total-P	3.49	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085189	O-Phosphate-P	1.79	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085081	O-Phosphate-P	2.10	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P363705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085075	O-Phosphate-P	2.14	Spike	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P364172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084080	Total Alkalinity	0.393	Sample	P	0 - 2.8

Reference Method: SM 2320 B-97
 Batch ID: P364259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085112	Total Alkalinity	0.366	Sample	P	0 - 2.8

Reference Method: SM 2540 D-97
 Batch ID: P364243

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085077	TSS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P364176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084080	Fluoride	1.42	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-97
 Batch ID: P364263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085112	Fluoride	1.45	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
 Batch ID: P364050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085035	Organic Carbon	0.641	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: A91331

Included Lab Sample IDs: 2085075, 2085080, 2085081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.5	98.0	P/P	90 - 110
O-Phosphate-P	98.0	97.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A91343

Included Lab Sample IDs: 2085073, 2085076, 2085077

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: EPA 300.0

Run ID: A91402

Included Lab Sample IDs: 2085073, 2085076, 2085077

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	107	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91438

Included Lab Sample IDs: 2085074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91468

Included Lab Sample IDs: 2085074, 2085078, 2085079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	104	104	P/P	90 - 110
Ammonia-N	105	106	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A91470

Included Lab Sample IDs: 2085074, 2085078, 2085079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.4	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91494

Included Lab Sample IDs: 2085078, 2085079

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

Reference Method: SM 2320 B-97

Run ID: A91513

Included Lab Sample IDs: 2085073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
-----------	---------	---------	------------	----------------

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A91513
Included Lab Sample IDs: 2085073

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: A91513
Included Lab Sample IDs: 2085073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A91516
Included Lab Sample IDs: 2085074, 2085078, 2085079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	96.8	P/P	90 - 110
Kjeldahl Nitrogen	107	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A91517
Included Lab Sample IDs: 2085088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	97.4	97.5	P/P	90 - 110
Manganese	97.6	97.0	P/P	90 - 110
Zinc	98.2	97.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91541
Included Lab Sample IDs: 2085078, 2085079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.2	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A91544
Included Lab Sample IDs: 2085076, 2085077

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A91544
Included Lab Sample IDs: 2085076, 2085077

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91557

Included Lab Sample IDs: 2085074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91613

Included Lab Sample IDs: 2085088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	104	105	P/P	90 - 110
Antimony	98.6	97.3	P/P	90 - 110
Arsenic	104	102	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Copper	102	102	P/P	90 - 110
Lead	98.0	98.6	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Selenium	103	103	P/P	90 - 110
Silver	103	103	P/P	90 - 110
Thallium	97.4	97.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91681

Included Lab Sample IDs: 2085088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	98.4	98.8	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	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					3.10	
EPA 200.7 Rev. 4.4	Iron	95.2	93.2	91.9			1.32
	Manganese	96.6	89.9	90.1			0.194
	Zinc	95.5	93.5	93.1			0.507
EPA 200.8 Rev. 5.4	Aluminum	101	112	112			0.0753
	Antimony	98.8	102	102			0.606
	Arsenic	102	109	108			0.351
	Cadmium	100	98.2	97.4			0.836
	Chromium	99.8	93.7	93.8			0.191
	Copper	98.5	95.0	94.3			0.736
	Lead	96.0	102	101			0.830
	Nickel	98.7	91.3	91.1			0.275
	Selenium	102	105	104			1.27
	Silver	102	96.1	95.9			0.138
	Thallium	102	103	105			1.43
EPA 300.0	Bromide	102	97.5	98.9	101		1.14
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	102			1.17
	Ammonia-N	101	102	105			2.26
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	105	113			5.20
	Kjeldahl Nitrogen	103	98.9	96.6			1.97
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	102			0.298
	NO2NO3-N	99.5	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	97.5	99.5	95.4			3.27
	Total-P	98.3	86.8	90.1			3.49
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	94.2	95.9			1.79
	O-Phosphate-P	97.6	94.4	96.4			2.10
	O-Phosphate-P	97.8	92.6	94.6			2.14
SM 2320 B-97	Total Alkalinity	103				0.393	
	Total Alkalinity	102				0.366	
SM 2540 D-97	TSS					0.0	
SM 4500 F-C-97	Fluoride	96.7					1.42
	Fluoride	98.5	100	98.1			1.45
SM 5310 B-00	Organic Carbon	98.1	98.2	97.3			0.641

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2085073, 2085076, 2085077
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2085088
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2085088
EPA 300.0 / E31780	Bromide in aqueous matrices	2085073, 2085076, 2085077
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2085074, 2085078, 2085079
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2085074, 2085078, 2085079
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2085074, 2085078, 2085079
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2085074, 2085078, 2085079
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2085075, 2085080, 2085081
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2085073, 2085076, 2085077

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2085073, 2085076, 2085077
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2085073, 2085076, 2085077
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2085074, 2085078, 2085079

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	05/09/2019			05/09/2019 16:45	Sima Feizi	2085073, 2085076, 2085077
EPA 200.7 Rev. 4.4	05/09/2019	05/15/2019 17:15	Elliott D. Healy	05/17/2019 16:08	Betina Topolski	2085088
EPA 200.8 Rev. 5.4	05/09/2019	05/15/2019 17:15	Elliott D. Healy	05/22/2019 19:45	Robert K Palmer	2085088
	05/09/2019	05/15/2019 17:15	Elliott D. Healy	05/25/2019 06:09	Robert K Palmer	2085088
EPA 300.0	05/09/2019			05/14/2019 17:28	Lipi Saha	2085073
	05/09/2019			05/14/2019 17:45	Lipi Saha	2085076
	05/09/2019			05/14/2019 18:03	Lipi Saha	2085077
EPA 350.1 Rev. 2.0	05/09/2019			05/15/2019 12:13	Ping Hua	2085078
	05/09/2019			05/15/2019 12:15	Ping Hua	2085079
	05/09/2019			05/15/2019 13:21	Ping Hua	2085074
EPA 351.2 Rev. 2.0	05/09/2019	05/16/2019 12:45	Adrian Shelby	05/17/2019 16:16	Joseph Suarez	2085078
	05/09/2019	05/16/2019 12:45	Adrian Shelby	05/17/2019 16:18	Joseph Suarez	2085079
	05/09/2019	05/16/2019 12:45	Adrian Shelby	05/17/2019 16:46	Joseph Suarez	2085074
EPA 353.2 Rev. 2.0	05/09/2019			05/15/2019 08:36	Beverly Y. Sanders	2085074
	05/09/2019			05/17/2019 09:47	Beverly Y. Sanders	2085078
	05/09/2019			05/17/2019 09:48	Beverly Y. Sanders	2085079
EPA 365.1 Rev. 2.0	05/09/2019	05/16/2019 14:45	Adrian Shelby	05/20/2019 12:29	Rosalyn Ballman	2085078
	05/09/2019	05/16/2019 14:45	Adrian Shelby	05/20/2019 12:30	Rosalyn Ballman	2085079
	05/09/2019	05/17/2019 09:23	Adrian Shelby	05/20/2019 18:27	Rosalyn Ballman	2085074
EPA 365.1 Rev. 2.0 dissolved	05/09/2019			05/09/2019 15:07	Jhamieka S. Greenwood	2085081
	05/09/2019			05/09/2019 15:11	Jhamieka S. Greenwood	2085075
	05/09/2019			05/09/2019 15:22	Jhamieka S. Greenwood	2085080
SM 2320 B-97	05/09/2019			05/17/2019 08:28	Dale L. Simmons	2085073
	05/09/2019			05/18/2019 08:50	Dale L. Simmons	2085077
	05/09/2019			05/18/2019 09:02	Dale L. Simmons	2085076
SM 2540 D-97	05/09/2019			05/10/2019 16:05	Yijie Li	2085073, 2085076, 2085077
SM 4500 F-C-97	05/09/2019			05/17/2019 06:21	Dale L. Simmons	2085073
	05/09/2019			05/18/2019 08:50	Dale L. Simmons	2085077
	05/09/2019			05/18/2019 09:02	Dale L. Simmons	2085076
SM 5310 B-00	05/09/2019			05/16/2019 00:48	Julia Storbeck	2085074
	05/09/2019			05/16/2019 01:01	Julia Storbeck	2085078
	05/09/2019			05/16/2019 01:13	Julia Storbeck	2085079