

Chemical Analysis Report

NW-DIST-2019-08-30-01

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

Event Description: **Holmes Run**
Request ID: **RQ-2019-08-26-58**
Customer: **NW-DIST**
Project ID: **SMP**

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

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 18-SEP-2019 11:03

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 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: Gum Creek Upstream of River Rd

Collection Date/Time: 08/29/2019 10:45

Field ID: G3NW0439

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115946	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P370012	
	EPA 300.0 Rev. 2.1	Chloride	2.7		mg Cl/L	P370345	
		Sulfate	0.21	I	mg SO4/L	P370348	
	SM 2120 B	Color (true)	160		PCU	P370079	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P370208	
	SM 2540 C-97	TDS	45		mg/L	P370384	
	SM 2540 D-97	TSS	3	I	mg/L	P370251	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P370210	
2115950	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P370445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P370147	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P370183	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P370109	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P370277	
2115954	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P370007	
2116005	EPA 200.7 Rev. 4.4	Barium	12.2		ug/L	P370126	
		Calcium	1.09		mg/L	P370126	
		Iron	1.08E+03		ug/L	P370126	
		Magnesium	0.59		mg/L	P370126	
		Potassium	0.34	I	mg/L	P370126	
		Sodium	1.4	I	mg/L	P370126	
		Zinc	5.0	U	ug/L	P370126	
	EPA 200.8 Rev. 5.4	Aluminum	422		ug/L	P370126	
		Antimony	0.050	U	ug/L	P370126	
		Arsenic	0.50		ug/L	P370126	
		Boron**	10.5		ug/L	P370126	
		Cadmium	0.020	U	ug/L	P370126	
		Chromium	0.45	I	ug/L	P370126	
		Copper	0.40	U	ug/L	P370126	
		Lead	0.41		ug/L	P370126	
		Nickel	0.50	U	ug/L	P370126	
		Selenium	0.20	U	ug/L	P370126	
		Silver	0.010	U	ug/L	P370126	
		Thallium	0.10	U	ug/L	P370126	

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: Choctawhatchee River Upstream Hwy 90 Boat Ramp **Collection Date/Time: 08/29/2019 11:15**

Field ID: G3NW0052

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115947	EPA 180.1 Rev. 2.0	Turbidity	18	A	NTU	P370012	
	EPA 300.0 Rev. 2.1	Chloride	5.6		mg Cl/L	P370345	
		Sulfate	4.3		mg SO4/L	P370348	
		Color (true)	13	A	PCU	P370082	
	SM 2320 B-97	Total Alkalinity	35		mg CaCO3/L	P370208	
	SM 2540 C-97	TDS	66		mg/L	P370384	
	SM 2540 D-97	TSS	16		mg/L	P370251	
	SM 4500 F-C-97	Fluoride	0.051	I	mg F/L	P370210	
2115951	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P370445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P370132	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.56		mg N/L	P370184	
	EPA 365.1 Rev. 2.0	Total-P	0.076		mg P/L	P370332	
	SM 5310 B-00	Organic Carbon	3.6		mg C/L	P370277	
2115955	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.030		mg P/L	P370007	
2116006	EPA 200.7 Rev. 4.4	Barium	23.9		ug/L	P370126	
		Calcium	12.3		mg/L	P370126	
		Iron	1.52E+03		ug/L	P370126	
		Magnesium	2.24		mg/L	P370126	
		Potassium	1.5		mg/L	P370126	
		Sodium	4.8		mg/L	P370126	
		Zinc	5.0	U	ug/L	P370126	
	EPA 200.8 Rev. 5.4	Aluminum	508		ug/L	P370126	
		Antimony	0.052	I	ug/L	P370126	
		Arsenic	0.79		ug/L	P370126	
		Boron**	16.4		ug/L	P370126	
		Cadmium	0.020	U	ug/L	P370126	
		Chromium	1.1	I	ug/L	P370126	
		Copper	0.53	I	ug/L	P370126	
		Lead	0.49		ug/L	P370126	
		Nickel	0.54	I	ug/L	P370126	
		Selenium	0.20	U	ug/L	P370126	
		Silver	0.010	U	ug/L	P370126	
		Thallium	0.10	U	ug/L	P370126	

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: East Pittman Creek Upstream of Hwy 179

Collection Date/Time: 08/29/2019 11:55

Field ID: G3NW0157

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115948	EPA 180.1 Rev. 2.0	Turbidity	5.4		NTU	P370012	
	EPA 300.0 Rev. 2.1	Chloride	4.5		mg Cl/L	P370345	
		Sulfate	0.62		mg SO4/L	P370348	
		Color (true)	48	A	PCU	P370080	
	SM 2320 B-97	Total Alkalinity	10		mg CaCO3/L	P370208	
	SM 2540 C-97	TDS	42		mg/L	P370384	
	SM 2540 D-97	TSS	4	I	mg/L	P370251	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P370210	
2115952	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P370445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P370147	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.85		mg N/L	P370184	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P370109	
	SM 5310 B-00	Organic Carbon	4.4		mg C/L	P370277	
2115956	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P370009	
2116007	EPA 200.7 Rev. 4.4	Barium	24.2		ug/L	P370126	
		Calcium	4.17		mg/L	P370126	
		Iron	1.19E+03		ug/L	P370126	
		Magnesium	1.63		mg/L	P370126	
		Potassium	0.64	I	mg/L	P370126	
		Sodium	2.4		mg/L	P370126	
		Zinc	5.0	U	ug/L	P370126	
	EPA 200.8 Rev. 5.4	Aluminum	116		ug/L	P370126	
		Antimony	0.050	U	ug/L	P370126	
		Arsenic	0.47		ug/L	P370126	
		Boron**	9.3		ug/L	P370126	
		Cadmium	0.029	I	ug/L	P370126	
		Chromium	0.40	U	ug/L	P370126	
		Copper	0.40	U	ug/L	P370126	
		Lead	0.20	U	ug/L	P370126	
		Nickel	0.50	U	ug/L	P370126	
		Selenium	0.20	U	ug/L	P370126	
		Silver	0.010	U	ug/L	P370126	
		Thallium	0.10	U	ug/L	P370126	

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: Limestone Branch Upstream of Mt. Ida Rd.

Collection Date/Time: 08/29/2019 12:20

Field ID: G3NW0023

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115949	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P370012	
	EPA 300.0 Rev. 2.1	Chloride	4.1		mg Cl/L	P370345	
		Sulfate	1.9		mg SO4/L	P370348	
		Color (true)	13		PCU	P370080	
	SM 2320 B-97	Total Alkalinity	117		mg CaCO3/L	P370208	
	SM 2540 C-97	TDS	129		mg/L	P370384	
	SM 2540 D-97	TSS	2	I	mg/L	P370251	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P370210	
2115953	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P370445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.13	I	mg N/L	P370147	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.33		mg N/L	P370184	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P370109	
	SM 5310 B-00	Organic Carbon	1.4		mg C/L	P370245	
2115957	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P370007	
2116008	EPA 200.7 Rev. 4.4	Barium	14.6		ug/L	P370126	
		Calcium	46.1		mg/L	P370126	
		Iron	310		ug/L	P370126	
		Magnesium	2.48		mg/L	P370126	
		Potassium	0.53	I	mg/L	P370126	
		Sodium	2.1		mg/L	P370126	
		Zinc	5.0	U	ug/L	P370126	
	EPA 200.8 Rev. 5.4	Aluminum	35		ug/L	P370126	
		Antimony	0.050	U	ug/L	P370126	
		Arsenic	0.27		ug/L	P370126	
		Boron**	9.5		ug/L	P370126	
		Cadmium	0.020	U	ug/L	P370126	
		Chromium	0.40	U	ug/L	P370126	
		Copper	0.40	U	ug/L	P370126	
		Lead	0.20	U	ug/L	P370126	
		Nickel	0.50	U	ug/L	P370126	
		Selenium	0.20	U	ug/L	P370126	
		Silver	0.010	U	ug/L	P370126	
		Thallium	0.10	U	ug/L	P370126	

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: P370012

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P370126

Component	Result	Code	Units
Barium	1.0	U	ug/L
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: P370126

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	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 Rev. 2.1
Batch ID: P370345

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370348

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370445

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370132

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370147

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370183

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370184

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370109

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370332

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370007

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370009

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

Reference Method: SM 2120 B
Batch ID: P370079

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2120 B
Batch ID: P370080

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P370082

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P370208

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

Reference Method: SM 2540 C-97
Batch ID: P370384

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P370251

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P370210

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P370245

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

Reference Method: SM 5310 B-00
Batch ID: P370277

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: P370126

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	106		P	85 - 115
Calcium	110		P	85 - 115
Iron	111		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	107		P	85 - 115
Sodium	107		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P370126

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.3		P	85 - 115
Antimony	95.6		P	85 - 115
Arsenic	97.0		P	85 - 115
Boron	103		P	85 - 115
Cadmium	97.6		P	85 - 115
Chromium	93.3		P	85 - 115
Copper	95.6		P	85 - 115
Lead	94.0		P	85 - 115
Nickel	95.7		P	85 - 115
Selenium	95.8		P	85 - 115
Silver	100		P	85 - 115
Thallium	98.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370345

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370348

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370445

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370132

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370147

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370183

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370184

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370332

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370007

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370009

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.5		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P370079

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

Reference Method: SM 2120 B
Batch ID: P370080

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2120 B
Batch ID: P370082

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

Reference Method: SM 2320 B-97
Batch ID: P370208

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

Reference Method: SM 4500 F-C-97
Batch ID: P370210

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P370245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P370277

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P370126

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116008	Barium	107	104	P/P	80 - 120
2116008	Calcium	109		P	80 - 120
2116008	Iron	109	109	P/P	80 - 120
2116008	Magnesium	109	108	P/P	80 - 120
2116008	Potassium	107	107	P/P	80 - 120
2116008	Sodium	109	109	P/P	80 - 120
2116008	Zinc	104	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P370126

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116008	Aluminum	95.6	95.3	P/P	80 - 120
2116008	Antimony	96.8	97.1	P/P	80 - 120
2116008	Arsenic	98.1	98.3	P/P	80 - 120
2116008	Boron	99.3	101	P/P	80 - 120
2116008	Cadmium	99.0	99.9	P/P	80 - 120
2116008	Chromium	94.5	94.8	P/P	80 - 120
2116008	Copper	93.7	94.9	P/P	80 - 120
2116008	Lead	95.6	96.2	P/P	80 - 120
2116008	Nickel	94.3	95.0	P/P	80 - 120
2116008	Selenium	95.1	92.3	P/P	80 - 120
2116008	Silver	99.8	99.3	P/P	80 - 120
2116008	Thallium	101	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370345

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115920	Chloride	97.8		P	90 - 110
2115949	Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370348

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115920	Sulfate	98.4		P	90 - 110
2115949	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115952	Ammonia-N	94.4	95.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370132

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115951	Kjeldahl Nitrogen	93.4	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370147

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115953	Kjeldahl Nitrogen	98.9	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115927	NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370184

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116067	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115953	Total-P	99.1	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370332

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115934	Total-P	101	95.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370007

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115908	O-Phosphate-P	98.2	98.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370009

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115956	O-Phosphate-P	99.1	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P370210

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115914	Fluoride	97.6	97.6	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P370245

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116070	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P370277

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115924	Organic Carbon	102	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P370012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115947	Turbidity	2.21	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P370126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116008	Barium	1.95	Spike	P	0 - 20
2116008	Calcium	1.22	Spike	P	0 - 20
2116008	Iron	0.222	Spike	P	0 - 20
2116008	Magnesium	0.402	Spike	P	0 - 20
2116008	Potassium	0.364	Spike	P	0 - 20
2116008	Sodium	0.209	Spike	P	0 - 20
2116008	Zinc	1.85	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P370126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116008	Aluminum	0.268	Spike	P	0 - 20
2116008	Antimony	0.298	Spike	P	0 - 20
2116008	Arsenic	0.174	Spike	P	0 - 20
2116008	Boron	1.74	Spike	P	0 - 20
2116008	Cadmium	0.910	Spike	P	0 - 20
2116008	Chromium	0.317	Spike	P	0 - 20
2116008	Copper	1.25	Spike	P	0 - 20
2116008	Lead	0.653	Spike	P	0 - 20
2116008	Nickel	0.754	Spike	P	0 - 20
2116008	Selenium	2.99	Spike	P	0 - 20
2116008	Silver	0.544	Spike	P	0 - 20
2116008	Thallium	2.56	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115920	Chloride	1.24	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115920	Sulfate	2.65	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115952	Ammonia-N	0.498	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370132

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115951	Kjeldahl Nitrogen	6.44	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370147

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115953	Kjeldahl Nitrogen	2.52	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115927	NO2NO3-N	0.229	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116067	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115953	Total-P	2.04	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370332

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115934	Total-P	5.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370007

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115908	O-Phosphate-P	0.102	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370009

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115956	O-Phosphate-P	0.303	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P370079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116069	Color (true)	0.387	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P370080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115948	Color (true)	2.23	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P370082

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115947	Color (true)	0.280	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P370208

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115914	Total Alkalinity	0.487	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P370384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115933	TDS	1.86	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P370210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115914	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P370245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116070	Organic Carbon	0.460	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P370277

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115924	Organic Carbon	0.647	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: A93926

Included Lab Sample IDs: 2115954, 2115955, 2115956, 2115957

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.7	P/P	90 - 110
O-Phosphate-P	98.7	99.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A93927

Included Lab Sample IDs: 2115946, 2115947, 2115948, 2115949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	102	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A93960

Included Lab Sample IDs: 2115946, 2115947, 2115948, 2115949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115
Color (true)	103	102	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93999

Included Lab Sample IDs: 2115950, 2115951, 2115952, 2115953

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94006

Included Lab Sample IDs: 2115950, 2115952, 2115953

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94010

Included Lab Sample IDs: 2115951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.6	98.6	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A94011

Included Lab Sample IDs: 2115946, 2115947, 2115948, 2115949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A94011

Included Lab Sample IDs: 2115946, 2115947, 2115948, 2115949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A94012

Included Lab Sample IDs: 2115946, 2115947, 2115948, 2115949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.8	P/P	90 - 110
Chloride	98.9	100	P/P	90 - 110
Sulfate	100	102	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A94014

Included Lab Sample IDs: 2115950, 2115951, 2115952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	108	109	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94015

Included Lab Sample IDs: 2115950, 2115952, 2115953

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.5	95.3	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A94021

Included Lab Sample IDs: 2115953

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A94050

Included Lab Sample IDs: 2116005, 2116006, 2116007, 2116008

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	103	P/P	90 - 110
Calcium	103	103	P/P	90 - 110
Iron	104	103	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	99.7	100	P/P	90 - 110
Zinc	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94099

Included Lab Sample IDs: 2115951

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94099

Included Lab Sample IDs: 2115951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94110

Included Lab Sample IDs: 2115950, 2115951, 2115952, 2115953

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94206

Included Lab Sample IDs: 2116005, 2116006, 2116007, 2116008

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.2	98.6	P/P	90 - 110
Aluminum	98.2	97.2	P/P	90 - 110
Antimony	95.9	95.6	P/P	90 - 110
Antimony	96.3	95.9	P/P	90 - 110
Arsenic	101	99.6	P/P	90 - 110
Arsenic	99.7	101	P/P	90 - 110
Boron	100	104	P/P	90 - 110
Boron	103	100	P/P	90 - 110
Cadmium	101	100	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Copper	98.8	99.7	P/P	90 - 110
Copper	99.7	101	P/P	90 - 110
Lead	97.0	98.9	P/P	90 - 110
Lead	97.5	97.0	P/P	90 - 110
Nickel	99.3	99.9	P/P	90 - 110
Nickel	99.4	99.3	P/P	90 - 110
Selenium	98.9	98.6	P/P	90 - 110
Selenium	99.8	98.9	P/P	90 - 110
Silver	98.4	98.2	P/P	90 - 110
Silver	99.0	98.4	P/P	90 - 110
Thallium	94.3	95.8	P/P	90 - 110
Thallium	95.8	96.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94208

Included Lab Sample IDs: 2116005, 2116006, 2116007, 2116008

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	99.0	99.6	P/P	90 - 110
Chromium	99.6	99.4	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.21	
EPA 200.7 Rev. 4.4	Barium	106	107	104			1.95
	Calcium	110	109				1.22
	Iron	111	109	109			0.222
	Magnesium	112	109	108			0.402
	Potassium	107	107	107			0.364
	Sodium	107	109	109			0.209
	Zinc	104	104	102			1.85
EPA 200.8 Rev. 5.4	Aluminum	95.3	95.6	95.3			0.268
	Antimony	95.6	96.8	97.1			0.298
	Arsenic	97.0	98.1	98.3			0.174
	Boron	103	99.3	101			1.74
	Cadmium	97.6	99.0	99.9			0.910
	Chromium	93.3	94.5	94.8			0.317
	Copper	95.6	93.7	94.9			1.25
	Lead	94.0	95.6	96.2			0.653
	Nickel	95.7	94.3	95.0			0.754
	Selenium	95.8	95.1	92.3			2.99
	Silver	100	99.8	99.3			0.544
	Thallium	98.3	101	103			2.56
EPA 300.0 Rev. 2.1	Chloride	99.1	97.8	99.4		1.24	
	Sulfate	98.9	98.4	98.4		2.65	
EPA 350.1 Rev. 2.0	Ammonia-N	98.5	94.4	95.1			0.498
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.0	93.4	101			6.44
	Kjeldahl Nitrogen	108	98.9	102			2.52
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.5				0.229
	NO2NO3-N	102	104	104			0.0
EPA 365.1 Rev. 2.0	Total-P	96.3	99.1	97.0			2.04
	Total-P	95.4	101	95.2			5.19
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	98.2	98.3			0.102
	O-Phosphate-P	98.5	99.1	98.8			0.303
SM 2120 B	Color (true)	102				0.387	
	Color (true)	100				2.23	
	Color (true)	102				0.280	
SM 2320 B-97	Total Alkalinity	103				0.487	
SM 2540 C-97	TDS					1.86	
SM 4500 F-C-97	Fluoride	96.1	97.6	97.6			0.0
SM 5310 B-00	Organic Carbon	102	102	102			0.460
	Organic Carbon	102	102	101			0.647

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2115946, 2115947, 2115948, 2115949
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2116005, 2116006, 2116007, 2116008
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2116005, 2116006, 2116007, 2116008
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2115946, 2115947, 2115948, 2115949
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2115946, 2115947, 2115948, 2115949

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2115950, 2115951, 2115952, 2115953
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2115950, 2115951, 2115952, 2115953
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2115950, 2115951, 2115952, 2115953
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2115950, 2115951, 2115952, 2115953
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2115954, 2115955, 2115956, 2115957
SM 2120 B / E31780	True Color measured at 450 nm	2115946, 2115947, 2115948, 2115949
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2115946, 2115947, 2115948, 2115949
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2115946, 2115947, 2115948, 2115949
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2115946, 2115947, 2115948, 2115949
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2115946, 2115947, 2115948, 2115949
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2115950, 2115951, 2115952, 2115953

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	08/30/2019			08/30/2019 16:15	Samantha Davila	2115946, 2115947, 2115948, 2115949
EPA 200.7 Rev. 4.4	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/06/2019 15:04	Alexander Thompson	2116005
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/06/2019 15:10	Alexander Thompson	2116006
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/06/2019 15:17	Alexander Thompson	2116007
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/06/2019 15:24	Alexander Thompson	2116008
EPA 200.8 Rev. 5.4	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/12/2019 20:50	Robert K Palmer	2116005
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/12/2019 21:00	Robert K Palmer	2116008
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/12/2019 21:59	Robert K Palmer	2116006
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/12/2019 22:08	Robert K Palmer	2116007
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/14/2019 03:06	Robert K Palmer	2116005
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/14/2019 03:12	Robert K Palmer	2116008
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/14/2019 03:46	Robert K Palmer	2116006
	08/30/2019	09/04/2019 13:30	Elliott D. Healy	09/14/2019 03:51	Robert K Palmer	2116007
EPA 300.0 Rev. 2.1	08/30/2019			09/06/2019 13:44	Jhamieka S. Greenwood	2115949
	08/30/2019			09/06/2019 15:45	Jhamieka S. Greenwood	2115946
	08/30/2019			09/06/2019 15:57	Jhamieka S. Greenwood	2115947
	08/30/2019			09/06/2019 16:09	Jhamieka S. Greenwood	2115948
EPA 350.1 Rev. 2.0	08/30/2019			09/10/2019 11:22	Ping Hua	2115952
	08/30/2019			09/10/2019 11:34	Ping Hua	2115950
	08/30/2019			09/10/2019 11:36	Ping Hua	2115951
	08/30/2019			09/10/2019 11:37	Ping Hua	2115953
EPA 351.2 Rev. 2.0	08/30/2019	09/04/2019 13:40	Sima Feizi	09/05/2019 11:22	Joseph Suarez	2115951
	08/30/2019	09/04/2019 13:40	Sima Feizi	09/05/2019 15:02	Joseph Suarez	2115950
	08/30/2019	09/04/2019 13:40	Sima Feizi	09/05/2019 15:03	Joseph Suarez	2115952
	08/30/2019	09/04/2019 13:40	Sima Feizi	09/05/2019 15:05	Joseph Suarez	2115953
EPA 353.2 Rev. 2.0	08/30/2019			09/05/2019 10:40	Beverly Y. Sanders	2115950
	08/30/2019			09/05/2019 10:47	Beverly Y. Sanders	2115951
	08/30/2019			09/05/2019 11:24	Beverly Y. Sanders	2115952
	08/30/2019			09/05/2019 11:25	Beverly Y. Sanders	2115953
EPA 365.1 Rev. 2.0	08/30/2019	09/04/2019 07:24	Joseph Suarez	09/05/2019 13:27	Lipi Saha	2115953
	08/30/2019	09/04/2019 07:24	Joseph Suarez	09/05/2019 13:29	Lipi Saha	2115950
	08/30/2019	09/04/2019 07:24	Joseph Suarez	09/05/2019 13:30	Lipi Saha	2115952
	08/30/2019	09/09/2019 13:10	Lipi Saha	09/10/2019 10:51	Rosalyn Ballman	2115951
EPA 365.1 Rev. 2.0 dissolved	08/30/2019			08/30/2019 14:32	Jhamieka S. Greenwood	2115956
	08/30/2019			08/30/2019 14:38	Jhamieka S. Greenwood	2115957
	08/30/2019			08/30/2019 14:44	Jhamieka S. Greenwood	2115954
	08/30/2019			08/30/2019 14:45	Jhamieka S. Greenwood	2115955
SM 2120 B	08/30/2019			08/30/2019 17:41	Madeline Funaro	2115948, 2115949
	08/30/2019			08/30/2019 17:58	Madeline Funaro	2115947
	08/30/2019			08/30/2019 18:04	Madeline Funaro	2115946

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2320 B-97	08/30/2019			09/04/2019 22:24	Dale L. Simmons	2115946
	08/30/2019			09/04/2019 22:36	Dale L. Simmons	2115947
	08/30/2019			09/04/2019 22:48	Dale L. Simmons	2115948
	08/30/2019			09/04/2019 23:01	Dale L. Simmons	2115949
SM 2540 C-97	08/30/2019			08/30/2019 15:41	Yijie Li	2115946, 2115947, 2115948, 2115949
SM 2540 D-97	08/30/2019			08/30/2019 15:41	Yijie Li	2115946, 2115947, 2115948, 2115949
SM 4500 F-C-97	08/30/2019			09/04/2019 22:24	Dale L. Simmons	2115946
	08/30/2019			09/04/2019 22:36	Dale L. Simmons	2115947
	08/30/2019			09/04/2019 22:48	Dale L. Simmons	2115948
	08/30/2019			09/04/2019 23:01	Dale L. Simmons	2115949
SM 5310 B-00	08/30/2019			09/05/2019 09:19	Madeline Funaro	2115950
	08/30/2019			09/05/2019 09:33	Madeline Funaro	2115951
	08/30/2019			09/05/2019 09:46	Madeline Funaro	2115952
	08/30/2019			09/05/2019 20:01	Madeline Funaro	2115953