

Chemical Analysis Report

SE-DIST-2016-11-30-01

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

Event Description: **Henry, Lettuce, L-63**
Request ID: **RQ-2016-11-28-18**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

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: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 23-DEC-2016 11:37



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: Lettuce Creek @ SR 710

Collection Date/Time: 11/29/2016 11:20

Field ID: G1SE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853034	EPA 180.1 Rev. 2.0	Turbidity	7.4		NTU	P316183	
	EPA 300.0 Rev. 2.1	Chloride	61		mg Cl/L	P316553	
		Sulfate	17		mg SO4/L	P316557	
	SM 2120 B	Color (true)	250		PCU	P315982	
	SM 2320 B-97	Total Alkalinity	98		mg CaCO3/L	P316061	
	SM 2540 C-97	TDS	272		mg/L	P316606	
	SM 2540 D-97	TSS	5	I	mg/L	P316582	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P316063	
1853036	EPA 350.1 Rev. 2.0	Ammonia-N	0.31		mg N/L	P316471	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P316367	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.33		mg N/L	P316089	
	EPA 365.1 Rev. 2.0	Total-P	0.29		mg P/L	P316253	
	SM 5310 B-00	Organic Carbon	30		mg C/L	P316050	
1853038	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.18		mg P/L	P315945	

Ref. Method and Comment:

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

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

Sample Location: L-63 @ 59th

Collection Date/Time: 11/29/2016 12:00

Field ID: G1SE0005

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853035	EPA 180.1 Rev. 2.0	Turbidity	3.2	A	NTU	P316184	
	EPA 300.0 Rev. 2.1	Chloride	64		mg Cl/L	P316553	
		Sulfate	43		mg SO4/L	P316557	
	SM 2120 B	Color (true)	160		PCU	P315982	
	SM 2320 B-97	Total Alkalinity	81		mg CaCO3/L	P316061	
	SM 2540 C-97	TDS	268		mg/L	P316606	
	SM 2540 D-97	TSS	4	I	mg/L	P316582	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P316063	
1853037	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P316471	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P316480	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.51		mg N/L	P316089	
	EPA 365.1 Rev. 2.0	Total-P	0.26		mg P/L	P316258	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P316050	
1853039	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.21		mg P/L	P315945	

Ref. Method and Comment:

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

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

Sample Location: Henry Creek @ SR 710

Collection Date/Time: 11/29/2016 11:30

Field ID: G1SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853040	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P316184	

Field ID: G1SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1853040	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P316553	
		Sulfate	29		mg SO4/L	P316557	
	SM 2120 B	Color (true)	250		PCU	P315982	
	SM 2320 B-97	Total Alkalinity	82		mg CaCO3/L	P316061	
	SM 2540 C-97	TDS	339		mg/L	P316606	
	SM 2540 D-97	TSS	6	I	mg/L	P316582	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P316063	
1853041	EPA 350.1 Rev. 2.0	Ammonia-N	0.063		mg N/L	P316240	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P316479	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P316089	
	EPA 365.1 Rev. 2.0	Total-P	0.55		mg P/L	P316258	
	SM 5310 B-00	Organic Carbon	37		mg C/L	P316050	
1853042	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.42		mg P/L	P315945	
1853046	EPA 200.7 Rev. 4.4	Calcium	32.3		mg/L	P316193	
		Iron	1.01E+03		ug/L	P316193	
		Magnesium	11.4		mg/L	P316193	
		Potassium	8.6		mg/L	P316193	
		Sodium	69.5		mg/L	P316193	
		Zinc	5.0	U	ug/L	P316193	
	EPA 200.8 Rev. 5.4	Arsenic	0.84		ug/L	P316193	
		Cadmium	0.020	U	ug/L	P316193	
		Chromium	1.89		ug/L	P316193	
		Copper	0.31	I	ug/L	P316193	
		Lead	0.14	I	ug/L	P316193	
		Nickel	0.38		ug/L	P316193	
		Silver	0.0050	U	ug/L	P316193	

Ref. Method and Comment:

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

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P316183

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P316184

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P316193

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

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	0.0061	I	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316553

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316557

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316240

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316471

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

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: P316479

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316480

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316089

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316253

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316258

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315945

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

Reference Method: SM 2120 B
Batch ID: P315982

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P316061

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

Reference Method: SM 2540 C-97
Batch ID: P316606

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P316582

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P316063

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P316050

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: P316193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	108		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	101		P	85 - 115
Sodium	100		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.0		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	97.3		P	85 - 115
Copper	95.9		P	85 - 115
Lead	92.6		P	85 - 115
Nickel	98.4		P	85 - 115
Silver	98.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316553

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: P316557

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.6		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316240

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316471

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316479

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316480

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316089

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316253

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316258

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315945

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P316061

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.1		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P316063

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P316050

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P316193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853362	Iron	103		P	80 - 120
1853362	Magnesium	102		P	80 - 120
1853362	Potassium	98.9		P	80 - 120
1853362	Sodium	102		P	80 - 120
1853362	Zinc	96.3		P	80 - 120
1854134	Calcium	102		P	80 - 120
1854134	Iron	102	108	P/P	80 - 120
1854134	Magnesium	99.4	109	P/P	80 - 120
1854134	Potassium	93.7	101	P/P	80 - 120
1854134	Sodium	98.7		P	80 - 120
1854134	Zinc	99.5	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853362	Arsenic	102		P	80 - 120
1853362	Cadmium	102		P	80 - 120
1853362	Chromium	98.8		P	80 - 120
1853362	Copper	93.2		P	80 - 120
1853362	Lead	93.7		P	80 - 120
1853362	Nickel	96.3		P	80 - 120
1853362	Silver	101		P	80 - 120
1854134	Arsenic	99.1	102	P/P	80 - 120
1854134	Cadmium	101	104	P/P	80 - 120
1854134	Chromium	97.2	99.0	P/P	80 - 120
1854134	Copper	94.6	98.3	P/P	80 - 120
1854134	Lead	92.4	94.2	P/P	80 - 120
1854134	Nickel	96.0	97.9	P/P	80 - 120
1854134	Silver	97.9	98.4	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853005	Chloride	96.3		P	90 - 110
1853609	Chloride	96.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316557

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853005	Sulfate	92.5		P	90 - 110
1853609	Sulfate	92.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853086	Ammonia-N	99.2	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316471

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852987	Ammonia-N	97.8	96.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852747	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316479

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852749	Kjeldahl Nitrogen	91.9	88.9	P/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852816	Kjeldahl Nitrogen	100	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316089

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853006	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853016	Total-P	103	97.6	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316258

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853360	Total-P	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315945

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853076	O-Phosphate-P	98.4	99.5	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P316050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853036	Organic Carbon	101		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P316183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852912	Turbidity	5.16	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P316184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853035	Turbidity	4.72	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P316193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1854134	Calcium	3.59	Spike	P	0 - 20
1854134	Iron	5.32	Spike	P	0 - 20
1854134	Magnesium	5.90	Spike	P	0 - 20
1854134	Potassium	4.34	Spike	P	0 - 20
1854134	Sodium	2.84	Spike	P	0 - 20
1854134	Zinc	2.93	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1854134	Arsenic	2.82	Spike	P	0 - 20
1854134	Cadmium	2.39	Spike	P	0 - 20
1854134	Chromium	1.67	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1854134	Copper	3.78	Spike	P	0 - 20
1854134	Lead	1.91	Spike	P	0 - 20
1854134	Nickel	1.87	Spike	P	0 - 20
1854134	Silver	0.505	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316553

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853005	Chloride	0.0469	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316557

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853005	Sulfate	0.961	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853086	Ammonia-N	1.91	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316471

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852987	Ammonia-N	0.759	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852747	Kjeldahl Nitrogen	0.554	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852749	Kjeldahl Nitrogen	3.01	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852816	Kjeldahl Nitrogen	0.696	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316089

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853006	NO2NO3-N	0.907	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853016	Total-P	4.95	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316258

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853360	Total-P	0.0215	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315945

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853076	O-Phosphate-P	0.890	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P315982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853050	Color (true)	2.57	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P316061

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853013	Total Alkalinity	0.0347	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P316606

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853085	TDS	7.16	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P316063

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853013	Fluoride	1.93	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P316050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853036	Organic Carbon	0.386	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: A73092
Included Lab Sample IDs: 1853038, 1853039, 1853042

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	98.5	P/P	90 - 110
O-Phosphate-P	99.3	99.7	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A73102
Included Lab Sample IDs: 1853034, 1853035, 1853040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.9	P/P	85 - 115

Reference Method: SM 5310 B-00
Run ID: A73126
Included Lab Sample IDs: 1853036, 1853037, 1853041

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.4	98.8	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A73130
Included Lab Sample IDs: 1853034, 1853035, 1853040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.5	97.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A73130
Included Lab Sample IDs: 1853034, 1853035, 1853040

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A73139

Included Lab Sample IDs: 1853036, 1853037, 1853041

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A73167

Included Lab Sample IDs: 1853034, 1853035, 1853040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.0	99.0	P/P	95 - 105
Turbidity	99.0	98.0	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73197

Included Lab Sample IDs: 1853041

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A73219

Included Lab Sample IDs: 1853034, 1853035, 1853040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	100	P/P	90 - 110
Sulfate	95.4	96.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73224

Included Lab Sample IDs: 1853036, 1853037, 1853041

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A73246

Included Lab Sample IDs: 1853046

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	100	P/P	90 - 110
Iron	100	102	P/P	90 - 110
Magnesium	99.6	102	P/P	90 - 110
Potassium	97.7	99.9	P/P	90 - 110
Sodium	98.1	98.6	P/P	90 - 110
Zinc	102	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73263

Included Lab Sample IDs: 1853036, 1853037

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	99.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73272

Included Lab Sample IDs: 1853036

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A73276

Included Lab Sample IDs: 1853046

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.8	98.4	P/P	90 - 110
Cadmium	98.0	98.2	P/P	90 - 110
Chromium	97.4	98.1	P/P	90 - 110
Copper	96.8	96.8	P/P	90 - 110
Lead	90.5	90.7	P/P	90 - 110
Nickel	99.2	99.5	P/P	90 - 110
Silver	99.5	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73285

Included Lab Sample IDs: 1853037, 1853041

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	96.0	P/P	90 - 110
Kjeldahl Nitrogen	96.0	95.6	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						5.16	
	Turbidity						4.72	
EPA 200.7 Rev. 4.4	Calcium	105	102					3.59
	Iron	108	103	102	108			5.32
	Magnesium	108	102	99.4	109			5.90
	Potassium	101	98.9	93.7	101			4.34
	Sodium	100	102	98.7				2.84
	Zinc	102	96.3	99.5	103			2.93
EPA 200.8 Rev. 5.4	Arsenic	99.0	102	99.1	102			2.82
	Cadmium	98.9	102	101	104			2.39
	Chromium	97.3	98.8	97.2	99.0			1.67
	Copper	95.9	93.2	94.6	98.3			3.78
	Lead	92.6	93.7	92.4	94.2			1.91
	Nickel	98.4	96.3	96.0	97.9			1.87
	Silver	98.3	101	97.9	98.4			0.505
EPA 300.0 Rev. 2.1	Chloride	99.1	96.3	96.8			0.0469	
	Sulfate	94.6	92.5	92.4			0.961	
EPA 350.1 Rev. 2.0	Ammonia-N	107	99.2	102				1.91

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 350.1 Rev. 2.0	Ammonia-N	102	97.8	96.9		0.759
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	102	101		0.554
	Kjeldahl Nitrogen	99.9	91.9	88.9		3.01
	Kjeldahl Nitrogen	101	100	101		0.696
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	102			0.907
EPA 365.1 Rev. 2.0	Total-P	102	103	97.6		4.95
	Total-P	100	105	105		0.0215
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	98.4	99.5		0.890
SM 2120 B	Color (true)				2.57	
SM 2320 B-97	Total Alkalinity	98.1			0.0347	
SM 2540 C-97	TDS				7.16	
SM 4500 F-C-97	Fluoride	99.3				1.93
SM 5310 B-00	Organic Carbon	98.5	101			0.386

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1853034, 1853035, 1853040
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1853046
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1853046
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1853034, 1853035, 1853040
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1853034, 1853035, 1853040
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1853036, 1853037, 1853041
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1853036, 1853037, 1853041
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1853036, 1853037, 1853041
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1853036, 1853037, 1853041
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1853038, 1853039, 1853042
SM 2120 B / E31780	True Color measured at 450 nm	1853034, 1853035, 1853040
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1853034, 1853035, 1853040
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1853034, 1853035, 1853040
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1853034, 1853035, 1853040
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1853034, 1853035, 1853040
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1853036, 1853037, 1853041

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	11/30/2016			11/30/2016 16:14	Julie Michelle Frank	1853034, 1853035, 1853040
EPA 200.7 Rev. 4.4	11/30/2016	12/05/2016	Elliott D. Healy	12/07/2016	Joshua Ayres	1853046
EPA 200.8 Rev. 5.4	11/30/2016	12/05/2016	Elliott D. Healy	12/08/2016	Charles J. Peterson	1853046
EPA 300.0 Rev. 2.1	11/30/2016			12/09/2016	Ping Hua	1853034, 1853035, 1853040
EPA 350.1 Rev. 2.0	11/30/2016			12/05/2016	Sofia Elnemr	1853041
	11/30/2016			12/08/2016	Sofia Elnemr	1853036, 1853037
EPA 351.2 Rev. 2.0	11/30/2016	12/08/2016	Adrian Shelby	12/09/2016	Joseph Suarez	1853036
	11/30/2016	12/09/2016	Adrian Shelby	12/09/2016	Joseph Suarez	1853037, 1853041
EPA 353.2 Rev. 2.0	11/30/2016			12/02/2016	Beverly Y. Sanders	1853036, 1853037, 1853041
EPA 365.1 Rev. 2.0	11/30/2016	12/06/2016	Vijayalakshmi Reddy	12/07/2016	Lipi Saha	1853036, 1853037, 1853041
EPA 365.1 Rev. 2.0 dissolved	11/30/2016			11/30/2016 16:01	Julia Storbeck	1853038
	11/30/2016			11/30/2016 16:02	Julia Storbeck	1853039
	11/30/2016			11/30/2016 16:26	Julia Storbeck	1853042
SM 2120 B	11/30/2016			11/30/2016 16:46	Jared I. Manley	1853034
	11/30/2016			11/30/2016 16:47	Jared I. Manley	1853035
	11/30/2016			11/30/2016 16:48	Jared I. Manley	1853040
SM 2320 B-97	11/30/2016			12/02/2016	Dale L. Simmons	1853034, 1853035, 1853040
SM 2540 C-97	11/30/2016			12/01/2016	Yijie Li	1853034, 1853035, 1853040
SM 2540 D-97	11/30/2016			12/01/2016	Yijie Li	1853034, 1853035, 1853040
SM 4500 F-C-97	11/30/2016			12/02/2016	Dale L. Simmons	1853034, 1853035, 1853040
SM 5310 B-00	11/30/2016			12/01/2016	Julie Michelle Frank	1853036, 1853037, 1853041