

Chemical Analysis Report

NE-DIST-2016-09-07-02

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

Event Description: **Reference Lakes**
Request ID: **RQ-2016-09-05-18**
Customer: **NE-DIST**
Project ID: **LAKESREF**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Jacksonville, FL 32256-7577
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 03-OCT-2016 15:39



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: Lave Crosby SW

Collection Date/Time: 09/06/2016 12:00

Field ID: 21030062 FLA

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1829250	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P310766	
	EPA 300.0	Bromide**	0.068		mg Br/L	P311559	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P311120	
		Sulfate	7.7		mg SO4/L	P311125	
	SM 2120 B	Color (true)	46	A	PCU	P310749	
	SM 2320 B-97	Total Alkalinity	3.5		mg CaCO3/L	P311189	
	SM 2540 C-97	TDS	81		mg/L	P311299	
	SM 2540 D-97	TSS	4	I	mg/L	P311294	
	SM 4500 F-C-97	Fluoride	0.052	I	mg F/L	P311194	
1829251	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P311075	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P310961	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P311276	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P311219	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P311104	
1829252	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P310742	
1829255	EPA 200.7 Rev. 4.4	Calcium	6.17		mg/L	P311044	
		Iron	250		ug/L	P311044	
		Magnesium	1.88		mg/L	P311044	
		Potassium	0.68	I	mg/L	P311044	
		Sodium	8.5		mg/L	P311044	
		Zinc	5.0	U	ug/L	P311044	
	EPA 200.8 Rev. 5.4	Arsenic	1.22		ug/L	P311044	
		Cadmium	0.020	U	ug/L	P311044	
		Chromium	0.31		ug/L	P311044	
		Copper	0.45		ug/L	P311044	
		Lead	0.43		ug/L	P311044	
		Nickel	0.38		ug/L	P311044	
		Silver	0.0050	U	ug/L	P311044	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P310766

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P311044

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311044

Component	Result	Code	Units
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: P311044

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0
Batch ID: P311559

Component	Result	Code	Units
Bromide	0.016	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311120

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311125

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311075

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310961

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311276

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311219

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310742

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

Reference Method: SM 2120 B
Batch ID: P310749

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P311189

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

Reference Method: SM 2540 C-97
Batch ID: P311299

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P311294

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P311194

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P311104

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: P311044

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

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P311044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	104		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	97.1		P	85 - 115
Sodium	97.7		P	85 - 115
Zinc	98.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P311044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.9		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	98.0		P	85 - 115
Copper	98.4		P	85 - 115
Lead	97.6		P	85 - 115
Nickel	99.2		P	85 - 115
Silver	98.1		P	85 - 115

Reference Method: EPA 300.0

Batch ID: P311559

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P311120

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P311125

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P311075

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: P310961

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P311276

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P311219

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	94.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P310742

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

Reference Method: SM 2320 B-97
 Batch ID: P311189

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

Reference Method: SM 4500 F-C-97
 Batch ID: P311194

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P311104

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P311044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829521	Calcium	90.7	96.2	P/P	80 - 120
1829521	Iron	99.6	100	P/P	80 - 120
1829521	Magnesium	99.6	102	P/P	80 - 120
1829521	Potassium	98.3	101	P/P	80 - 120
1829521	Sodium	98.0		P	80 - 120
1829521	Zinc	99.7	99.6	P/P	80 - 120
1829575	Calcium	100		P	80 - 120
1829575	Iron	101		P	80 - 120
1829575	Magnesium	102		P	80 - 120
1829575	Potassium	98.6		P	80 - 120
1829575	Sodium	97.2		P	80 - 120
1829575	Zinc	97.6		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829521	Arsenic	100	97.6	P/P	80 - 120
1829521	Cadmium	98.6	99.7	P/P	80 - 120
1829521	Chromium	98.9	98.4	P/P	80 - 120
1829521	Copper	96.9	95.0	P/P	80 - 120
1829521	Lead	98.1	97.6	P/P	80 - 120
1829521	Nickel	97.3	96.1	P/P	80 - 120
1829521	Silver	97.3	97.2	P/P	80 - 120
1829575	Arsenic	101		P	80 - 120
1829575	Cadmium	101		P	80 - 120
1829575	Chromium	99.4		P	80 - 120
1829575	Copper	93.9		P	80 - 120
1829575	Lead	98.7		P	80 - 120
1829575	Nickel	94.3		P	80 - 120
1829575	Silver	97.5		P	80 - 120

Reference Method: EPA 300.0
Batch ID: P311559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829250	Bromide	110		P	90 - 110
1829516	Bromide	106	107	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311120

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1825827	Chloride	100		P	90 - 110
1829516	Chloride	97.9	99.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311125

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1825827	Sulfate	99.7		P	90 - 110
1829516	Sulfate	96.4	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310961

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829261	Kjeldahl Nitrogen	106	95.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311276

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829234	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311219

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311219

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829234	Total-P	100	96.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310742

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829238	O-Phosphate-P	98.9	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P311194

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829410	Fluoride	96.4	97.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P311104

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1829235	Organic Carbon	108		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310766

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829199	Turbidity	1.54	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829521	Calcium	3.31	Spike	P	0 - 20
1829521	Iron	0.657	Spike	P	0 - 20
1829521	Magnesium	2.34	Spike	P	0 - 20
1829521	Potassium	3.00	Spike	P	0 - 20
1829521	Sodium	0.495	Spike	P	0 - 20
1829521	Zinc	0.103	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829521	Arsenic	2.71	Spike	P	0 - 20
1829521	Cadmium	1.10	Spike	P	0 - 20
1829521	Chromium	0.502	Spike	P	0 - 20
1829521	Copper	1.93	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829521	Lead	0.479	Spike	P	0 - 20
1829521	Nickel	1.26	Spike	P	0 - 20
1829521	Silver	0.0973	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P311559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829516	Bromide	0.862	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311120

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829516	Chloride	1.37	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311125

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829516	Sulfate	1.84	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829201	Ammonia-N	0.732	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310961

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829261	Kjeldahl Nitrogen	6.96	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311276

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829234	NO2NO3-N	0.477	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311219

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P311219

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829234	Total-P	3.46	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829238	O-Phosphate-P	0.906	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P310749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829250	Color (true)	1.61	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P311189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829410	Total Alkalinity	1.96	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P311299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829199	TDS	1.40	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P311194

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829410	Fluoride	0.470	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P311104

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1829235	Organic Carbon	0.113	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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A71465

Included Lab Sample IDs: 1829252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.7	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A71467

Included Lab Sample IDs: 1829250

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	93.6	94.2	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A71470

Included Lab Sample IDs: 1829250

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A71576

Included Lab Sample IDs: 1829250

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71588

Included Lab Sample IDs: 1829251

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.7	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A71596

Included Lab Sample IDs: 1829251

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

Reference Method: SM 5310 B-00

Run ID: A71605

Included Lab Sample IDs: 1829251

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

Reference Method: SM 2320 B-97

Run ID: A71639

Included Lab Sample IDs: 1829250

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

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A71639

Included Lab Sample IDs: 1829250

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71651

Included Lab Sample IDs: 1829251

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71694

Included Lab Sample IDs: 1829255

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.6	101	P/P	90 - 110
Iron	99.1	98.9	P/P	90 - 110
Magnesium	100	100	P/P	90 - 110
Potassium	97.4	101	P/P	90 - 110
Sodium	95.7	98.9	P/P	90 - 110
Zinc	99.9	99.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71703

Included Lab Sample IDs: 1829255

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	99.5	P/P	90 - 110
Cadmium	97.6	97.9	P/P	90 - 110
Chromium	97.8	99.5	P/P	90 - 110
Copper	101	100	P/P	90 - 110
Lead	95.8	95.3	P/P	90 - 110
Silver	97.1	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71709

Included Lab Sample IDs: 1829251

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71721

Included Lab Sample IDs: 1829255

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	101	97.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0
Run ID: A71749
Included Lab Sample IDs: 1829250

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	90.6	97.0	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						1.54	
EPA 200.7 Rev. 4.4	Calcium	103	90.7	96.2	100			3.31
	Iron	104	99.6	100	101			0.657
	Magnesium	106	99.6	102	102			2.34
	Potassium	97.1	98.3	101	98.6			3.00
	Sodium	97.7	98.0	97.2				0.495
	Zinc	98.5	99.7	99.6	97.6			0.103
EPA 200.8 Rev. 5.4	Arsenic	99.9	100	97.6	101			2.71
	Cadmium	98.9	98.6	99.7	101			1.10
	Chromium	98.0	98.9	98.4	99.4			0.502
	Copper	98.4	96.9	95.0	93.9			1.93
	Lead	97.6	98.1	97.6	98.7			0.479
	Nickel	99.2	97.3	96.1	94.3			1.26
	Silver	98.1	97.3	97.2	97.5			0.0973
EPA 300.0	Bromide	107	106	107	110			0.862
EPA 300.0 Rev. 2.1	Chloride	99.9	97.9	99.6	100			1.37
	Sulfate	99.1	96.4	98.5	99.7			1.84
EPA 350.1 Rev. 2.0	Ammonia-N	101						0.732
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	106	95.0				6.96
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	102				0.477
EPA 365.1 Rev. 2.0	Total-P	94.7	100	96.9				3.46
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	98.9	99.8				0.906
SM 2120 B	Color (true)						1.61	
SM 2320 B-97	Total Alkalinity	104					1.96	
SM 2540 C-97	TDS						1.40	
SM 4500 F-C-97	Fluoride	99.8	96.4	97.0				0.470
SM 5310 B-00	Organic Carbon	106	108					0.113

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1829250
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1829255
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1829255
EPA 300.0 / E31780	Bromide in aqueous matrices	1829250

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1829250
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1829250
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1829251
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1829251
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1829251
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1829251
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1829252
SM 2120 B / E31780	True Color measured at 450 nm	1829250
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1829250
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1829250
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1829250
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1829250
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1829251

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	09/07/2016			09/07/2016 15:52	Sima Feizi	1829250
EPA 200.7 Rev. 4.4	09/07/2016	09/13/2016	Elliott D. Healy	09/15/2016	Joshua Ayres	1829255
EPA 200.8 Rev. 5.4	09/07/2016	09/13/2016	Elliott D. Healy	09/16/2016	Charles J. Peterson	1829255
	09/07/2016	09/13/2016	Elliott D. Healy	09/19/2016	Charles J. Peterson	1829255
EPA 300.0	09/07/2016			09/20/2016	Ping Hua	1829250
EPA 300.0 Rev. 2.1	09/07/2016			09/13/2016	Ping Hua	1829250
EPA 350.1 Rev. 2.0	09/07/2016			09/08/2016	Joseph Suarez	1829251
EPA 351.2 Rev. 2.0	09/07/2016	09/12/2016	Adrian Shelby	09/13/2016	Christopher Armour	1829251
EPA 353.2 Rev. 2.0	09/07/2016			09/15/2016	Peter D. Kaus	1829251
EPA 365.1 Rev. 2.0	09/07/2016	09/15/2016	Vijayalakshmi Reddy	09/16/2016	Lipi Saha	1829251
EPA 365.1 Rev. 2.0 dissolved	09/07/2016			09/07/2016 15:46	Julia Storbeck	1829252
SM 2120 B	09/07/2016			09/07/2016 15:19	Blanca Fach	1829250
SM 2320 B-97	09/07/2016			09/14/2016	Dale L. Simmons	1829250
SM 2540 C-97	09/07/2016			09/09/2016	Yijie Li	1829250
SM 2540 D-97	09/07/2016			09/09/2016	Yijie Li	1829250
SM 4500 F-C-97	09/07/2016			09/14/2016	Dale L. Simmons	1829250
SM 5310 B-00	09/07/2016			09/14/2016	Sofia Elhemr	1829251