Chemical Analysis Report

NE-DIST-2019-05-22-02

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

Event Description: **Melrose Lakes**
Request ID: **RQ-2019-05-20-11**
Customer: **NE-DIST**
Project ID: **SMP**

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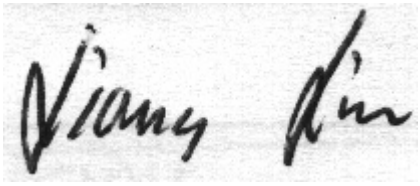
Date Certified: 10-JUN-2019 14:58



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: GOOSE LAKE **Collection Date/Time: 05/21/2019 11:40**

Field ID: 20030980 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2088097	EPA 180.1 Rev. 2.0	Turbidity	2.6	A	NTU	P364433	
	EPA 300.0 Rev. 2.1	Chloride	8.7		mg Cl/L	P364630	
		Sulfate	0.27	I	mg SO4/L	P364633	
	SM 2120 B	Color (true)	490		PCU	P364406	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P364860	
	SM 2540 C-97	TDS	58		mg/L	P364926	
	SM 2540 D-97	TSS	4	I	mg/L	P364886	
	SM 4500 F-C-97	Fluoride	0.047	I	mg F/L	P364871	
2088099	EPA 350.1 Rev. 2.0	Ammonia-N	0.24		mg N/L	P364812	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P364821	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P364520	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P364717	
	SM 5310 B-00	Organic Carbon	33		mg C/L	P364513	
2088101	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P364402	

Sample Location: LAKE ROSA CENTER **Collection Date/Time: 05/21/2019 10:20**

Field ID: G2NE1130 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2088098	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P364433	
	EPA 300.0 Rev. 2.1	Chloride	9.9		mg Cl/L	P364630	
		Sulfate	7.8		mg SO4/L	P364633	
	SM 2120 B	Color (true)	6.6		PCU	P364406	
	SM 2320 B-97	Total Alkalinity	4.1		mg CaCO3/L	P364856	
	SM 2540 C-97	TDS	32		mg/L	P364926	
	SM 2540 D-97	TSS	2	U	mg/L	P364886	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P364861	
2088100	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P364806	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40		mg N/L	P364754	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364520	
	EPA 365.1 Rev. 2.0	Total-P	0.007		mg P/L	P364717	
	SM 5310 B-00	Organic Carbon	3.0		mg C/L	P364513	
2088102	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P364402	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: LAKE SUGGS CTR **Collection Date/Time: 05/21/2019 12:35**

Field ID: 20030922 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2088094	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P364432	
	EPA 300.0 Rev. 2.1	Chloride	8.3		mg Cl/L	P364630	
		Sulfate	0.48	I	mg SO4/L	P364633	
	SM 2120 B	Color (true)	650		PCU	P364406	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P364860	
	SM 2540 C-97	TDS	91		mg/L	P364926	
	SM 2540 D-97	TSS	2	I	mg/L	P364886	
	SM 4500 F-C-97	Fluoride	0.046	I	mg F/L	P364871	
2088095	EPA 350.1 Rev. 2.0	Ammonia-N	1.0		mg N/L	P364812	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.2		mg N/L	P364821	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364520	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P364717	
	SM 5310 B-00	Organic Carbon	47		mg C/L	P364513	
2088096	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P364402	
2088106	EPA 200.7 Rev. 4.4	Barium	14.3		ug/L	P364577	
		Calcium	2.51		mg/L	P364577	
		Iron	1.00E+03		ug/L	P364577	
		Magnesium	1.65		mg/L	P364577	
		Potassium	2.2		mg/L	P364577	
		Sodium	4.5		mg/L	P364577	
		Zinc	5.0	U	ug/L	P364577	
	EPA 200.8 Rev. 5.4	Aluminum	482		ug/L	P364577	
		Antimony	0.050	U	ug/L	P364577	
		Arsenic	0.89		ug/L	P364577	
		Boron**	18.3		ug/L	P364577	
		Cadmium	0.020	U	ug/L	P364577	
		Chromium	0.67	I	ug/L	P364577	
		Copper	0.40	U	ug/L	P364577	
		Lead	0.65		ug/L	P364577	
		Nickel	0.60	I	ug/L	P364577	
		Selenium	0.22	I	ug/L	P364577	
		Silver	0.010	U	ug/L	P364577	
		Thallium	0.10	U	ug/L	P364577	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 06/06/2019.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P364432

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P364433

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P364577

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: P364577

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: P364630

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364633

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364806

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364812

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364754

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364821

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364520

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364717

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364402

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

Reference Method: SM 2120 B
Batch ID: P364406

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P364856

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P364860

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

Reference Method: SM 2540 C-97
Batch ID: P364926

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P364886

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P364861

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P364871

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P364513

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: P364577

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	105		P	85 - 115
Iron	101		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	100		P	85 - 115
Sodium	103		P	85 - 115
Zinc	98.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P364577

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	104		P	85 - 115
Boron	102		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	101		P	85 - 115
Copper	102		P	85 - 115
Lead	95.3		P	85 - 115
Nickel	102		P	85 - 115
Selenium	103		P	85 - 115
Silver	101		P	85 - 115
Thallium	104		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364630

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364633

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364806

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364812

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364754

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364821

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364520

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364717

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: P364402

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.6		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P364406

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P364856

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

Reference Method: SM 2320 B-97
Batch ID: P364860

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P364861

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P364871

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P364513

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.1		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P364577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088440	Barium	103		P	80 - 120
2088440	Calcium	104		P	80 - 120
2088440	Iron	107		P	80 - 120
2088440	Magnesium	106		P	80 - 120
2088440	Potassium	103		P	80 - 120
2088440	Sodium	106		P	80 - 120
2088440	Zinc	101		P	80 - 120
2089219	Barium	102	99.7	P/P	80 - 120
2089219	Calcium	105	104	P/P	80 - 120
2089219	Iron	104	101	P/P	80 - 120
2089219	Magnesium	105	103	P/P	80 - 120
2089219	Potassium	108	105	P/P	80 - 120
2089219	Sodium	105	102	P/P	80 - 120
2089219	Zinc	98.8	97.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P364577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088440	Aluminum	101		P	80 - 120
2088440	Antimony	103		P	80 - 120
2088440	Arsenic	106		P	80 - 120
2088440	Boron	104		P	80 - 120
2088440	Cadmium	106		P	80 - 120
2088440	Chromium	101		P	80 - 120
2088440	Copper	102		P	80 - 120
2088440	Lead	97.7		P	80 - 120
2088440	Nickel	101		P	80 - 120
2088440	Selenium	105		P	80 - 120
2088440	Silver	103		P	80 - 120
2088440	Thallium	106		P	80 - 120
2089219	Aluminum	101	101	P/P	80 - 120
2089219	Antimony	102	101	P/P	80 - 120
2089219	Arsenic	102	101	P/P	80 - 120
2089219	Boron	104	105	P/P	80 - 120
2089219	Cadmium	104	102	P/P	80 - 120
2089219	Chromium	101	101	P/P	80 - 120
2089219	Copper	102	100	P/P	80 - 120
2089219	Lead	96.7	94.7	P/P	80 - 120
2089219	Nickel	101	100	P/P	80 - 120
2089219	Selenium	102	101	P/P	80 - 120
2089219	Silver	103	101	P/P	80 - 120
2089219	Thallium	106	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088094	Chloride	101		P	90 - 110
2088290	Chloride	100		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364633

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088094	Sulfate	101		P	90 - 110
2088290	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364806

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088100	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364812

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088271	Ammonia-N	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364821

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088123	Kjeldahl Nitrogen	93.6	97.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364520

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088055	NO2NO3-N	99.5	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088111	Total-P	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088102	O-Phosphate-P	96.6	97.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P364861

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088433	Fluoride	97.6	96.5	P/P	89 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P364871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088010	Fluoride	100	98.8	P/P	89 - 106

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P364513

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088100	Organic Carbon	94.1	96.7	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P364432

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088028	Turbidity	4.03	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P364433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088097	Turbidity	4.58	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P364577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089219	Barium	1.85	Spike	P	0 - 20
2089219	Calcium	0.619	Spike	P	0 - 20
2089219	Iron	2.64	Spike	P	0 - 20
2089219	Magnesium	1.15	Spike	P	0 - 20
2089219	Potassium	2.62	Spike	P	0 - 20
2089219	Sodium	2.16	Spike	P	0 - 20
2089219	Zinc	1.71	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P364577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089219	Aluminum	0.791	Spike	P	0 - 20
2089219	Antimony	0.837	Spike	P	0 - 20
2089219	Arsenic	1.30	Spike	P	0 - 20
2089219	Boron	0.679	Spike	P	0 - 20
2089219	Cadmium	2.14	Spike	P	0 - 20
2089219	Chromium	0.288	Spike	P	0 - 20
2089219	Copper	1.31	Spike	P	0 - 20
2089219	Lead	2.13	Spike	P	0 - 20
2089219	Nickel	0.730	Spike	P	0 - 20
2089219	Selenium	0.667	Spike	P	0 - 20
2089219	Silver	1.71	Spike	P	0 - 20
2089219	Thallium	1.81	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088290	Chloride	0.368	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364633

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088290	Sulfate	0.196	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364806

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088100	Ammonia-N	0.256	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364812

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088271	Ammonia-N	0.863	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088084	Kjeldahl Nitrogen	1.52	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088123	Kjeldahl Nitrogen	2.37	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364520

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088055	NO2NO3-N	2.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088111	Total-P	1.18	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088102	O-Phosphate-P	0.722	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P364406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088120	Color (true)	2.04	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P364856

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088433	Total Alkalinity	1.92	Sample	P	0 - 2.8

Reference Method: SM 2320 B-97
Batch ID: P364860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088010	Total Alkalinity	0.367	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P364926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088082	TDS	3.84	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P364886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088082	TSS	6.90	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P364861

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088433	Fluoride	0.998	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-97
Batch ID: P364871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088010	Fluoride	0.986	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P364513

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088100	Organic Carbon	2.35	Spike	P	0 - 20

Quality Assurance Report
Precision

* 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: A91603
Included Lab Sample IDs: 2088096, 2088101, 2088102

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.7	96.4	P/P	90 - 110
O-Phosphate-P	99.1	97.7	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A91604
Included Lab Sample IDs: 2088094, 2088097, 2088098

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A91617
Included Lab Sample IDs: 2088094, 2088097, 2088098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.0	P/P	95 - 105
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A91642
Included Lab Sample IDs: 2088094, 2088097, 2088098

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A91657
Included Lab Sample IDs: 2088095, 2088099, 2088100

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	98.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A91661
Included Lab Sample IDs: 2088095, 2088099, 2088100

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	96.4	P/P	90 - 110
Organic Carbon	96.4	98.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A91730
Included Lab Sample IDs: 2088106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	106	P/P	95 - 105
Calcium	104	103	P/P	95 - 105
Iron	104	102	P/P	95 - 105
Magnesium	103	101	P/P	95 - 105

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A91730
Included Lab Sample IDs: 2088106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Potassium	103	102	P/P	95 - 105
Sodium	103	103	P/P	95 - 105
Zinc	103	106	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A91768
Included Lab Sample IDs: 2088106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	102	P/P	90 - 110
Antimony	99.2	99.5	P/P	90 - 110
Arsenic	104	102	P/P	90 - 110
Boron	100	106	P/P	90 - 110
Cadmium	101	103	P/P	90 - 110
Chromium	101	102	P/P	90 - 110
Copper	103	102	P/P	90 - 110
Lead	96.3	96.0	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Selenium	103	102	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Thallium	98.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A91780
Included Lab Sample IDs: 2088100

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A91783
Included Lab Sample IDs: 2088095, 2088099

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91785
Included Lab Sample IDs: 2088095, 2088099

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91790
Included Lab Sample IDs: 2088100

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A91798
Included Lab Sample IDs: 2088094, 2088097, 2088098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110
Total Alkalinity	105	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A91798
Included Lab Sample IDs: 2088098

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

Reference Method: SM 4500 F-C-97
Run ID: A91799
Included Lab Sample IDs: 2088094, 2088097

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A91810
Included Lab Sample IDs: 2088095, 2088099, 2088100

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	99.4	P/P	90 - 110
Kjeldahl Nitrogen	105	105	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			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						4.03	
	Turbidity						4.58	
EPA 200.7 Rev. 4.4	Barium	101	103	102	99.7			1.85
	Calcium	105	104	105	104			0.619
	Iron	101	107	104	101			2.64
	Magnesium	104	106	105	103			1.15
	Potassium	100	103	108	105			2.62
	Sodium	103	102	106	105			2.16
	Zinc	98.2	101	98.8	97.1			1.71
EPA 200.8 Rev. 5.4	Aluminum	100	101	101	101			0.791
	Antimony	101	103	102	101			0.837
	Arsenic	104	106	102	101			1.30
	Boron	102	104	104	105			0.679
	Cadmium	103	106	104	102			2.14
	Chromium	101	101	101	101			0.288
	Copper	102	102	102	100			1.31
	Lead	95.3	97.7	96.7	94.7			2.13
	Nickel	102	101	101	100			0.730
	Selenium	103	105	102	101			0.667
	Silver	101	103	103	101			1.71
	Thallium	104	106	106	105			1.81
EPA 300.0 Rev. 2.1	Chloride	101	100	101			0.368	
	Sulfate	101	100	101			0.196	
EPA 350.1 Rev. 2.0	Ammonia-N	103	102	102				0.256
	Ammonia-N	100	102	103				0.863
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109						1.52
	Kjeldahl Nitrogen	100	93.6	97.5				2.37
EPA 353.2 Rev. 2.0	NO2NO3-N	97.0	99.5	97.0				2.54
EPA 365.1 Rev. 2.0	Total-P	100	102	104				1.18
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	96.6	97.3				0.722
SM 2120 B	Color (true)	101					2.04	
SM 2320 B-97	Total Alkalinity	103					1.92	
	Total Alkalinity	105					0.367	
SM 2540 C-97	TDS						3.84	
SM 2540 D-97	TSS						6.90	
SM 4500 F-C-97	Fluoride	97.9	97.6	96.5				0.998
	Fluoride	98.9	100	98.8				0.986
SM 5310 B-00	Organic Carbon	97.1	94.1	96.7				2.35

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2088094, 2088097, 2088098
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2088106
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2088106
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2088094, 2088097, 2088098
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2088094, 2088097, 2088098
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2088095, 2088099, 2088100

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2088095, 2088099, 2088100
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2088095, 2088099, 2088100
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2088095, 2088099, 2088100
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2088096, 2088101, 2088102
SM 2120 B / E31780	True Color measured at 450 nm	2088094, 2088097, 2088098
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2088094, 2088097, 2088098
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2088094, 2088097, 2088098
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2088094, 2088097, 2088098
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2088094, 2088097, 2088098
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2088095, 2088099, 2088100

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	05/22/2019			05/22/2019 14:38	Sima Feizi	2088094, 2088097, 2088098
EPA 200.7 Rev. 4.4	05/22/2019	05/28/2019 13:50	Elliott D. Healy	05/29/2019 15:58	Betina Topolski	2088106
EPA 200.8 Rev. 5.4	05/22/2019	05/28/2019 13:50	Elliott D. Healy	05/30/2019 21:48	Robert K Palmer	2088106
EPA 300.0 Rev. 2.1	05/22/2019			05/25/2019 07:29	Lipi Saha	2088094
	05/22/2019			05/25/2019 08:17	Lipi Saha	2088097
	05/22/2019			05/25/2019 08:29	Lipi Saha	2088098
EPA 350.1 Rev. 2.0	05/22/2019			05/24/2019 13:40	Ping Hua	2088100
	05/22/2019			05/30/2019 11:15	Ping Hua	2088095
	05/22/2019			05/30/2019 11:17	Ping Hua	2088099
EPA 351.2 Rev. 2.0	05/22/2019	05/30/2019 18:00	Adrian Shelby	06/03/2019 11:09	Joseph Suarez	2088100
	05/22/2019	05/31/2019 13:15	Adrian Shelby	06/03/2019 11:48	Joseph Suarez	2088095
	05/22/2019	05/31/2019 13:15	Adrian Shelby	06/03/2019 11:50	Joseph Suarez	2088099
EPA 353.2 Rev. 2.0	05/22/2019			05/24/2019 11:21	Beverly Y. Sanders	2088095
	05/22/2019			05/24/2019 11:22	Beverly Y. Sanders	2088099
	05/22/2019			05/24/2019 11:24	Beverly Y. Sanders	2088100
EPA 365.1 Rev. 2.0	05/22/2019	05/30/2019 10:32	Joseph Suarez	05/31/2019 12:05	Rosalyn Ballman	2088095
	05/22/2019	05/30/2019 10:32	Joseph Suarez	05/31/2019 12:06	Rosalyn Ballman	2088099
	05/22/2019	05/30/2019 10:32	Joseph Suarez	05/31/2019 15:52	Rosalyn Ballman	2088100
EPA 365.1 Rev. 2.0 dissolved	05/22/2019			05/22/2019 15:45	Jhamieka S. Greenwood	2088102
	05/22/2019			05/22/2019 16:01	Jhamieka S. Greenwood	2088096
	05/22/2019			05/22/2019 16:02	Jhamieka S. Greenwood	2088101
SM 2120 B	05/22/2019			05/22/2019 15:55	Madeline Funaro	2088098
	05/22/2019			05/22/2019 16:08	Madeline Funaro	2088094
	05/22/2019			05/22/2019 16:09	Madeline Funaro	2088097
SM 2320 B-97	05/22/2019			06/01/2019 11:45	Dale L. Simmons	2088098
	05/22/2019			06/02/2019 04:23	Dale L. Simmons	2088094
	05/22/2019			06/02/2019 04:28	Dale L. Simmons	2088097
SM 2540 C-97	05/22/2019			05/23/2019 16:02	Yijie Li	2088094, 2088097, 2088098
SM 2540 D-97	05/22/2019			05/23/2019 16:02	Yijie Li	2088094, 2088097, 2088098
SM 4500 F-C-97	05/22/2019			05/31/2019 12:15	Dale L. Simmons	2088094
	05/22/2019			05/31/2019 12:25	Dale L. Simmons	2088097
	05/22/2019			06/01/2019 11:45	Dale L. Simmons	2088098
SM 5310 B-00	05/22/2019			05/23/2019 11:02	Julia Storbeck	2088100
	05/22/2019			05/24/2019 01:07	Julia Storbeck	2088095
	05/22/2019			05/24/2019 01:23	Julia Storbeck	2088099