Chemical Analysis Report

NE-DIST-2018-07-11-02

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-2018-07-09-13**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256-7577
Attn: Jeremy Parrish

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

Certified by: Colin Wright, Program Administrator

Date Certified: 01-AUG-2018 11:36

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: LAKE ROWAN CTR **Collection Date/Time: 07/10/2018 12:20**

Field ID: 20030923 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2006457	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P348272	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P348798	
		Sulfate	0.70		mg SO4/L	P348803	
	SM 2120 B	Color (true)	480		PCU	P348263	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P348511	
	SM 2540 C-97	TDS	98		mg/L	P348814	
	SM 2540 D-97	TSS	2	I	mg/L	P348819	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P348515	
2006460	EPA 350.1 Rev. 2.0	Ammonia-N	2.7		mg N/L	P348722	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	5.1		mg N/L	P348469	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P348416	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P348651	
	SM 5310 B-00	Organic Carbon	47		mg C/L	P348386	
2006463	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P348437	
2006474	EPA 200.7 Rev. 4.4	Calcium	1.22		mg/L	P348273	
		Iron	550		ug/L	P348273	
		Magnesium	1.21		mg/L	P348273	
		Potassium	1.2	I	mg/L	P348273	
		Sodium	3.4		mg/L	P348273	
		Zinc	5.0	U	ug/L	P348273	
	EPA 200.8 Rev. 5.4	Arsenic	0.78		ug/L	P348273	
		Cadmium	0.020	U	ug/L	P348273	
		Chromium	0.40	U	ug/L	P348273	
		Copper	0.21	I	ug/L	P348273	
		Lead	0.67		ug/L	P348273	
		Nickel	0.33	I	ug/L	P348273	
		Silver	0.010	U	ug/L	P348273	

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 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 07/17/2018.

Sample Location: LAKE ROWAN ~ 280m E of CENTER **Collection Date/Time: 07/10/2018 12:00**

Field ID: G2NE0006 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2006458	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P348272	
	EPA 300.0 Rev. 2.1	Chloride	6.2		mg Cl/L	P348798	
		Sulfate	0.69		mg SO4/L	P348803	
	SM 2120 B	Color (true)	490		PCU	P348263	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P348511	
	SM 2540 C-97	TDS	87		mg/L	P348814	
	SM 2540 D-97	TSS	2	IA	mg/L	P348819	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P348515	
2006461	EPA 350.1 Rev. 2.0	Ammonia-N	2.7		mg N/L	P348722	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	5.2		mg N/L	P348469	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P348416	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P348651	
	SM 5310 B-00	Organic Carbon	47		mg C/L	P348386	
2006464	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P348437	
2006475	EPA 200.7 Rev. 4.4	Calcium	1.22		mg/L	P348273	
		Iron	560		ug/L	P348273	
		Magnesium	1.22		mg/L	P348273	
		Potassium	1.2	I	mg/L	P348273	
		Sodium	3.5		mg/L	P348273	
		Zinc	5.0	U	ug/L	P348273	
	EPA 200.8 Rev. 5.4	Arsenic	0.83		ug/L	P348273	
		Cadmium	0.020	U	ug/L	P348273	
		Chromium	0.40	U	ug/L	P348273	
		Copper	0.20	U	ug/L	P348273	
		Lead	0.67		ug/L	P348273	
		Nickel	0.29	I	ug/L	P348273	
		Silver	0.010	U	ug/L	P348273	

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 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 07/17/2018.

Sample Location: LAKE SUGGS CTR **Collection Date/Time: 07/10/2018 13:15**

Field ID: 20030922 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2006459	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P348272	
	EPA 300.0 Rev. 2.1	Chloride	6.6		mg Cl/L	P348798	
		Sulfate	0.36	I	mg SO4/L	P348803	
	SM 2120 B	Color (true)	780		PCU	P348263	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P348511	
	SM 2540 C-97	TDS	103		mg/L	P348815	
	SM 2540 D-97	TSS	2	IA	mg/L	P348820	
	SM 4500 F-C-97	Fluoride	0.046	I	mg F/L	P348515	
2006462	EPA 350.1 Rev. 2.0	Ammonia-N	0.99		mg N/L	P348722	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.3		mg N/L	P348469	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P348416	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P348651	
	SM 5310 B-00	Organic Carbon	53		mg C/L	P348386	
2006465	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P348437	
2006476	EPA 200.7 Rev. 4.4	Calcium	1.95		mg/L	P348273	
		Iron	970		ug/L	P348273	
		Magnesium	1.44		mg/L	P348273	
		Potassium	2.1		mg/L	P348273	
		Sodium	3.8		mg/L	P348273	
		Zinc	5.0	U	ug/L	P348273	
	EPA 200.8 Rev. 5.4	Arsenic	1.07		ug/L	P348273	
		Cadmium	0.020	U	ug/L	P348273	
		Chromium	0.71	I	ug/L	P348273	
		Copper	0.20	U	ug/L	P348273	
		Lead	0.63		ug/L	P348273	
		Nickel	0.71	I	ug/L	P348273	
		Silver	0.010	U	ug/L	P348273	

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 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 07/17/2018.

Sample Location: LAKE ROSA CENTER **Collection Date/Time: 07/10/2018 14:00**

Field ID: G2NE1130 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2006454	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P348272	
	EPA 300.0 Rev. 2.1	Chloride	8.9		mg Cl/L	P348798	
		Sulfate	7.5		mg SO4/L	P348803	
	SM 2120 B	Color (true)	5.9	I	PCU	P348263	
	SM 2320 B-97	Total Alkalinity	3.1		mg CaCO3/L	P348511	
	SM 2540 C-97	TDS	33		mg/L	P348814	
	SM 2540 D-97	TSS	3	I	mg/L	P348819	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P348515	
2006455	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P348776	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.28		mg N/L	P348469	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P348416	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P348651	
	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P348386	
2006456	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P348436	

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 351.2 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: P348272

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348273

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: P348273

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348798

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348803

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348722

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348776

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348469

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348416

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348651

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348436

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348437

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

Reference Method: SM 2120 B
Batch ID: P348263

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P348511

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

Reference Method: SM 2540 C-97
Batch ID: P348814

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P348815

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P348819

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P348820

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P348515

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P348386

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: P348273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	103		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	102		P	85 - 115
Sodium	99.1		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	99.7		P	85 - 115
Chromium	98.1		P	85 - 115
Copper	100		P	85 - 115
Lead	97.0		P	85 - 115
Nickel	102		P	85 - 115
Silver	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348798

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348803

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348722

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348776

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: P348469

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348416

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348651

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348436

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348437

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

Reference Method: SM 2120 B
Batch ID: P348263

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

Reference Method: SM 2320 B-97
Batch ID: P348511

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P348515

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.5		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P348386

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005587	Calcium	101		P	80 - 120
2005587	Iron	105		P	80 - 120
2005587	Magnesium	103		P	80 - 120
2005587	Potassium	102		P	80 - 120
2005587	Sodium	98.0		P	80 - 120
2005587	Zinc	102		P	80 - 120
2005831	Calcium	108		P	80 - 120
2005831	Iron	108	107	P/P	80 - 120
2005831	Magnesium	108	106	P/P	80 - 120
2005831	Potassium	103	101	P/P	80 - 120
2005831	Sodium	99.0		P	80 - 120
2005831	Zinc	105	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005587	Arsenic	102		P	80 - 120
2005587	Cadmium	103		P	80 - 120
2005587	Chromium	98.2		P	80 - 120
2005587	Copper	98.0		P	80 - 120
2005587	Lead	98.3		P	80 - 120
2005587	Nickel	99.3		P	80 - 120
2005587	Silver	104		P	80 - 120
2005831	Arsenic	101	96.5	P/P	80 - 120
2005831	Cadmium	103	96.4	P/P	80 - 120
2005831	Chromium	99.0	94.3	P/P	80 - 120
2005831	Copper	98.4	93.6	P/P	80 - 120
2005831	Lead	98.6	93.6	P/P	80 - 120
2005831	Nickel	100	95.6	P/P	80 - 120
2005831	Silver	103	98.1	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348798

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006360	Chloride	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348803

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006360	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348722

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006538	Ammonia-N	100	99.3	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006738	Ammonia-N	98.9	99.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348416

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006455	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348651

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006455	Total-P	99.0	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348436

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006438	O-Phosphate-P	97.6	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348437

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006463	O-Phosphate-P	96.7	98.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P348386

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006342	Organic Carbon	98.4	99.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P348272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006410	Turbidity	6.93	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005831	Calcium	1.99	Spike	P	0 - 20
2005831	Iron	0.455	Spike	P	0 - 20
2005831	Magnesium	1.14	Spike	P	0 - 20
2005831	Potassium	1.17	Spike	P	0 - 20
2005831	Sodium	1.94	Spike	P	0 - 20
2005831	Zinc	1.16	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005831	Arsenic	4.57	Spike	P	0 - 20
2005831	Cadmium	6.12	Spike	P	0 - 20
2005831	Chromium	4.85	Spike	P	0 - 20
2005831	Copper	4.64	Spike	P	0 - 20
2005831	Lead	5.15	Spike	P	0 - 20
2005831	Nickel	4.45	Spike	P	0 - 20
2005831	Silver	5.05	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348798

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006360	Chloride	2.67	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006360	Sulfate	2.21	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348722

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006538	Ammonia-N	0.608	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006738	Ammonia-N	0.771	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006786	Kjeldahl Nitrogen	3.64	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006455	NO2NO3-N	0.985	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348651

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006455	Total-P	0.622	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348436

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006438	O-Phosphate-P	0.0863	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006463	O-Phosphate-P	1.34	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P348263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006434	Color (true)	0.285	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P348511

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006963	Total Alkalinity	0.276	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P348814

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006062	TDS	7.26	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P348815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006411	TDS	2.56	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P348515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006963	Fluoride	0.470	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P348386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2006342	Organic Carbon	0.933	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: SM 2120 B
Run ID: A85151
Included Lab Sample IDs: 2006454, 2006457, 2006458, 2006459

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	101	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A85154
Included Lab Sample IDs: 2006454, 2006457, 2006458, 2006459

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.5	P/P	95 - 105

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A85190
Included Lab Sample IDs: 2006474, 2006475, 2006476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	103	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	99.3	97.2	P/P	90 - 110
Zinc	103	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A85202
Included Lab Sample IDs: 2006455, 2006460, 2006461, 2006462

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A85210
Included Lab Sample IDs: 2006456, 2006463, 2006464, 2006465

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.1	P/P	90 - 110
O-Phosphate-P	99.1	99.4	P/P	90 - 110
O-Phosphate-P	99.3	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A85220
Included Lab Sample IDs: 2006455, 2006460, 2006461, 2006462

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A85227
Included Lab Sample IDs: 2006474, 2006475, 2006476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.0	98.5	P/P	90 - 110
Cadmium	99.1	99.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A85227
Included Lab Sample IDs: 2006474, 2006475, 2006476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	99.2	100	P/P	90 - 110
Copper	99.8	100	P/P	90 - 110
Lead	98.3	98.7	P/P	90 - 110
Nickel	99.0	100	P/P	90 - 110
Silver	99.3	101	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A85254
Included Lab Sample IDs: 2006454, 2006457, 2006458, 2006459

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A85254
Included Lab Sample IDs: 2006454, 2006457, 2006458, 2006459

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: A85285
Included Lab Sample IDs: 2006455, 2006460, 2006461, 2006462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	95.2	P/P	90 - 110
Kjeldahl Nitrogen	99.6	94.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A85324
Included Lab Sample IDs: 2006460, 2006461, 2006462

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A85336
Included Lab Sample IDs: 2006462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A85337
Included Lab Sample IDs: 2006454, 2006457, 2006458, 2006459

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	106	P/P	90 - 110
Sulfate	100	108	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A85346
Included Lab Sample IDs: 2006455

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A85367
Included Lab Sample IDs: 2006455, 2006460, 2006461

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.8	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						6.93	
EPA 200.7 Rev. 4.4	Calcium	104	101	108				1.99
	Iron	103	105	108	107			0.455
	Magnesium	104	103	108	106			1.14
	Potassium	102	102	103	101			1.17
	Sodium	99.1	98.0	99.0				1.94
	Zinc	103	102	105	106			1.16
EPA 200.8 Rev. 5.4	Arsenic	102	102	101	96.5			4.57
	Cadmium	99.7	103	103	96.4			6.12
	Chromium	98.1	98.2	99.0	94.3			4.85
	Copper	100	98.0	98.4	93.6			4.64
	Lead	97.0	98.3	98.6	93.6			5.15
	Nickel	102	99.3	100	95.6			4.45
	Silver	103	104	103	98.1			5.05
EPA 300.0 Rev. 2.1	Chloride	105	108				2.67	
	Sulfate	103	103				2.21	
EPA 350.1 Rev. 2.0	Ammonia-N	102	100	99.3				0.608
	Ammonia-N	101	98.9	99.7				0.771
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.0						3.64
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	102				0.985
EPA 365.1 Rev. 2.0	Total-P	96.3	99.0	98.4				0.622
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	97.6	97.7				0.0863
	O-Phosphate-P	97.8	96.7	98.0				1.34
SM 2120 B	Color (true)	101					0.285	
SM 2320 B-97	Total Alkalinity	102					0.276	
SM 2540 C-97	TDS						7.26	
	TDS						2.56	
SM 4500 F-C-97	Fluoride	98.5						0.470
SM 5310 B-00	Organic Carbon	98.0	99.5	98.4				0.933

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2006454, 2006457, 2006458, 2006459
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2006474, 2006475, 2006476
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2006474, 2006475, 2006476
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2006454, 2006457, 2006458, 2006459
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2006454, 2006457, 2006458, 2006459
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2006455, 2006460, 2006461, 2006462
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2006455, 2006460, 2006461, 2006462
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2006455, 2006460, 2006461, 2006462
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2006455, 2006460, 2006461, 2006462
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2006456, 2006463, 2006464, 2006465
SM 2120 B / E31780	True Color measured at 450 nm	2006454, 2006457, 2006458, 2006459
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2006454, 2006457, 2006458, 2006459

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2006454, 2006457, 2006458, 2006459
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2006454, 2006457, 2006458, 2006459
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2006454, 2006457, 2006458, 2006459
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2006455, 2006460, 2006461, 2006462

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	07/11/2018			07/11/2018 17:13	William L. Brown IV	2006454, 2006457, 2006458, 2006459
EPA 200.7 Rev. 4.4	07/11/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 17:28	Betina Topolski	2006474
	07/11/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 17:33	Betina Topolski	2006475
	07/11/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 17:39	Betina Topolski	2006476
EPA 200.8 Rev. 5.4	07/11/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 18:16	Robert K Palmer	2006474
	07/11/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 18:25	Robert K Palmer	2006475
	07/11/2018	07/11/2018 18:40	Elliott D. Healy	07/12/2018 18:35	Robert K Palmer	2006476
EPA 300.0 Rev. 2.1	07/11/2018			07/20/2018 03:36	Lipi Saha	2006454
	07/11/2018			07/20/2018 03:48	Lipi Saha	2006457
	07/11/2018			07/20/2018 04:00	Lipi Saha	2006458
	07/11/2018			07/20/2018 04:12	Lipi Saha	2006459
EPA 350.1 Rev. 2.0	07/11/2018			07/18/2018 12:36	Ping Hua	2006460
	07/11/2018			07/18/2018 12:37	Ping Hua	2006461
	07/11/2018			07/18/2018 12:39	Ping Hua	2006462
	07/11/2018			07/19/2018 12:11	Ping Hua	2006455
EPA 351.2 Rev. 2.0	07/11/2018	07/16/2018 11:30	Adrian Shelby	07/18/2018 01:01	Joseph Suarez	2006455
	07/11/2018	07/16/2018 11:30	Adrian Shelby	07/18/2018 01:06	Joseph Suarez	2006462
	07/11/2018	07/16/2018 11:30	Adrian Shelby	07/18/2018 03:05	Joseph Suarez	2006460
	07/11/2018	07/16/2018 11:30	Adrian Shelby	07/18/2018 03:06	Joseph Suarez	2006461
EPA 353.2 Rev. 2.0	07/11/2018			07/13/2018 12:33	Lauren Bottorf	2006455
	07/11/2018			07/13/2018 12:41	Lauren Bottorf	2006460
	07/11/2018			07/13/2018 12:42	Lauren Bottorf	2006461
	07/11/2018			07/13/2018 12:43	Lauren Bottorf	2006462
EPA 365.1 Rev. 2.0	07/11/2018	07/18/2018 14:10	Sima Feizi	07/19/2018 09:02	Beverly Y. Sanders	2006462
	07/11/2018	07/18/2018 14:10	Sima Feizi	07/20/2018 11:11	Beverly Y. Sanders	2006455
	07/11/2018	07/18/2018 14:10	Sima Feizi	07/20/2018 11:12	Beverly Y. Sanders	2006460
	07/11/2018	07/18/2018 14:10	Sima Feizi	07/20/2018 11:13	Beverly Y. Sanders	2006461
EPA 365.1 Rev. 2.0 dissolved	07/11/2018			07/11/2018 17:39	Julia Storbeck	2006463
	07/11/2018			07/11/2018 17:54	Julia Storbeck	2006465
	07/11/2018			07/11/2018 18:09	Julia Storbeck	2006456
	07/11/2018			07/11/2018 18:10	Julia Storbeck	2006464
SM 2120 B	07/11/2018			07/11/2018 16:08	Tanya Welborn	2006454
	07/11/2018			07/11/2018 16:11	Tanya Welborn	2006457
	07/11/2018			07/11/2018 16:12	Tanya Welborn	2006458
	07/11/2018			07/11/2018 16:13	Tanya Welborn	2006459
SM 2320 B-97	07/11/2018			07/14/2018 02:57	Dale L. Simmons	2006454
	07/11/2018			07/14/2018 03:05	Dale L. Simmons	2006457
	07/11/2018			07/14/2018 03:14	Dale L. Simmons	2006458
	07/11/2018			07/14/2018 03:24	Dale L. Simmons	2006459
SM 2540 C-97	07/11/2018			07/13/2018 15:35	Yijie Li	2006454, 2006457, 2006458, 2006459

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2540 D-97	07/11/2018			07/13/2018 15:35	Yijie Li	2006454, 2006457, 2006458, 2006459
SM 4500 F-C-97	07/11/2018			07/14/2018 02:57	Dale L. Simmons	2006454
	07/11/2018			07/14/2018 03:05	Dale L. Simmons	2006457
	07/11/2018			07/14/2018 03:14	Dale L. Simmons	2006458
	07/11/2018			07/14/2018 03:24	Dale L. Simmons	2006459
SM 5310 B-00	07/11/2018			07/13/2018 00:07	Megan Treadwell	2006455
	07/11/2018			07/13/2018 00:19	Megan Treadwell	2006460
	07/11/2018			07/13/2018 00:31	Megan Treadwell	2006461
	07/11/2018			07/13/2018 00:43	Megan Treadwell	2006462