Chemical Analysis Report

NE-DIST-2019-01-15-01

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

Event Description: **Nassau West**
Request ID: **RQ-2019-01-07-45**
Customer: **NE-DIST**
Project ID: **SMP**

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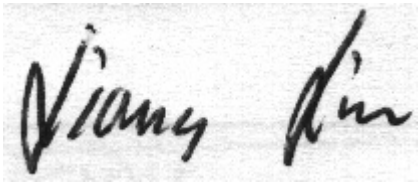
Date Certified: 30-JAN-2019 15:03



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: ST MARYS S PRONG @ CR 23C **Collection Date/Time: 01/14/2019 10:45**

Field ID: 19010023 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2054093	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P357324	
	EPA 300.0 Rev. 2.1	Chloride	9.8		mg Cl/L	P357415	
		Sulfate	0.63		mg SO4/L	P357417	
	SM 2120 B	Color (true)	260		PCU	P357303	
	SM 2320 B-97	Total Alkalinity	3.5		mg CaCO3/L	P357659	
	SM 2540 C-97	TDS	76		mg/L	P357764	
	SM 2540 D-97	TSS	3	I	mg/L	P357861	
	SM 4500 F-C-97	Fluoride	0.036	I	mg F/L	P357663	
2054096	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P357320	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P357345	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.081		mg N/L	P357412	
	EPA 365.1 Rev. 2.0	Total-P	0.035		mg P/L	P357358	
	SM 5310 B-00	Organic Carbon	27		mg C/L	P357395	
2054099	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P357296	
2054126	EPA 200.7 Rev. 4.4	Barium	17.5		ug/L	P357312	
		Calcium	3.83		mg/L	P357312	
		Iron	730		ug/L	P357312	
		Magnesium	1.47		mg/L	P357312	
		Potassium	0.62	I	mg/L	P357312	
		Sodium	5.8		mg/L	P357312	
		Zinc	5.8	I	ug/L	P357312	
	EPA 200.8 Rev. 5.4	Aluminum	499		ug/L	P357312	
		Antimony	0.050	U	ug/L	P357312	
		Arsenic	0.29		ug/L	P357312	
		Boron**	15.8		ug/L	P357312	
		Cadmium	0.020	U	ug/L	P357312	
		Chromium	0.73	I	ug/L	P357312	
		Copper	0.40	U	ug/L	P357312	
		Lead	0.49		ug/L	P357312	
		Nickel	0.61	I	ug/L	P357312	
		Selenium	0.20	U	ug/L	P357312	
		Silver	0.010	U	ug/L	P357312	
		Thallium	0.10	U	ug/L	P357312	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low 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 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, potassium and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: DAUGHTERY BR @ CREWS RD **Collection Date/Time: 01/14/2019 10:00**

Field ID: 19010136 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2054094	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P357324	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P357415	
		Sulfate	0.99		mg SO4/L	P357417	
	SM 2120 B	Color (true)	240		PCU	P357303	
	SM 2320 B-97	Total Alkalinity	10		mg CaCO3/L	P357659	
	SM 2540 C-97	TDS	96		mg/L	P357764	
	SM 2540 D-97	TSS	2	I	mg/L	P357861	
	SM 4500 F-C-97	Fluoride	0.063	I	mg F/L	P357663	
2054097	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P357320	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.76		mg N/L	P357345	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.2		mg N/L	P357412	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P357358	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P357395	
2054100	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P357296	
2054127	EPA 200.7 Rev. 4.4	Barium	36.7		ug/L	P357312	
		Calcium	5.94		mg/L	P357312	
		Iron	910		ug/L	P357312	
		Magnesium	3.12		mg/L	P357312	
		Potassium	0.46	I	mg/L	P357312	
		Sodium	7.2		mg/L	P357312	
		Zinc	6.9	I	ug/L	P357312	
	EPA 200.8 Rev. 5.4	Aluminum	461		ug/L	P357312	
		Antimony	0.050	U	ug/L	P357312	
		Arsenic	0.38		ug/L	P357312	
		Boron**	13.8		ug/L	P357312	
		Cadmium	0.037	I	ug/L	P357312	
		Chromium	0.77	I	ug/L	P357312	
		Copper	0.40	U	ug/L	P357312	
		Lead	0.53		ug/L	P357312	
		Nickel	0.91	I	ug/L	P357312	
		Selenium	0.23	I	ug/L	P357312	
		Silver	0.010	U	ug/L	P357312	
		Thallium	0.10	U	ug/L	P357312	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low 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 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, potassium and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: ST MARYS S PRONG @ US 90 **Collection Date/Time: 01/14/2019 11:30**

Field ID: 19010021 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2054095	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P357324	
	EPA 300.0 Rev. 2.1	Chloride	9.3		mg Cl/L	P357415	
		Sulfate	0.67		mg SO4/L	P357417	
	SM 2120 B	Color (true)	270		PCU	P357303	
	SM 2320 B-97	Total Alkalinity	2.1	I	mg CaCO3/L	P357659	
	SM 2540 C-97	TDS	76		mg/L	P357764	
	SM 2540 D-97	TSS	3	I	mg/L	P357861	
	SM 4500 F-C-97	Fluoride	0.036	I	mg F/L	P357663	
2054098	EPA 350.1 Rev. 2.0	Ammonia-N	0.031		mg N/L	P357320	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P357346	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.055		mg N/L	P357412	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P357358	
	SM 5310 B-00	Organic Carbon	29		mg C/L	P357395	
2054101	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P357296	
2054128	EPA 200.7 Rev. 4.4	Barium	16.9		ug/L	P357312	
		Calcium	3.69		mg/L	P357312	
		Iron	740		ug/L	P357312	
		Magnesium	1.43		mg/L	P357312	
		Potassium	0.65	I	mg/L	P357312	
		Sodium	5.9		mg/L	P357312	
		Zinc	5.7	I	ug/L	P357312	
	EPA 200.8 Rev. 5.4	Aluminum	546		ug/L	P357312	
		Antimony	0.050	U	ug/L	P357312	
		Arsenic	0.28		ug/L	P357312	
		Boron**	16.8		ug/L	P357312	
		Cadmium	0.020	U	ug/L	P357312	
		Chromium	0.78	I	ug/L	P357312	
		Copper	0.46	I	ug/L	P357312	
		Lead	0.52		ug/L	P357312	
		Nickel	0.67	I	ug/L	P357312	
		Selenium	0.20	U	ug/L	P357312	
		Silver	0.010	U	ug/L	P357312	
		Thallium	0.10	U	ug/L	P357312	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, potassium and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P357324

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357312

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: P357312

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: P357415

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357417

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357320

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: P357345

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357346

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357412

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357358

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357296

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

Reference Method: SM 2120 B
Batch ID: P357303

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P357659

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

Reference Method: SM 2540 C-97
Batch ID: P357764

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P357861

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P357663

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P357395

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: P357312

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	105		P	85 - 115
Iron	107		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	105		P	85 - 115
Sodium	109		P	85 - 115
Zinc	98.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357312

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	97.6		P	85 - 115
Arsenic	104		P	85 - 115
Boron	103		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	103		P	85 - 115
Copper	103		P	85 - 115
Lead	99.6		P	85 - 115
Nickel	103		P	85 - 115
Selenium	102		P	85 - 115
Silver	99.1		P	85 - 115
Thallium	98.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357415

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357417

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357320

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357345

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357346

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357412

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357358

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357296

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

Reference Method: SM 2120 B
Batch ID: P357303

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

Reference Method: SM 2320 B-97
Batch ID: P357659

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

Reference Method: SM 4500 F-C-97
Batch ID: P357663

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P357395

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.1		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2053668	Barium	98.7		P	80 - 120
2053668	Iron	103		P	80 - 120
2053668	Magnesium	102		P	80 - 120
2053668	Zinc	101		P	80 - 120
2054037	Barium	104	103	P/P	80 - 120
2054037	Calcium	108	107	P/P	80 - 120
2054037	Iron	110	108	P/P	80 - 120
2054037	Magnesium	113	111	P/P	80 - 120
2054037	Potassium	111	110	P/P	80 - 120
2054037	Sodium	107		P	80 - 120
2054037	Zinc	103	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2053668	Aluminum	99.6		P	80 - 120
2053668	Antimony	102		P	80 - 120
2053668	Arsenic	108		P	80 - 120
2053668	Cadmium	103		P	80 - 120
2053668	Chromium	97.6		P	80 - 120
2053668	Copper	97.2		P	80 - 120
2053668	Lead	103		P	80 - 120
2053668	Nickel	97.5		P	80 - 120
2053668	Selenium	101		P	80 - 120
2053668	Silver	95.1		P	80 - 120
2053668	Thallium	104		P	80 - 120
2054037	Aluminum	98.0	99.6	P/P	80 - 120
2054037	Antimony	97.7	96.7	P/P	80 - 120
2054037	Arsenic	104	104	P/P	80 - 120
2054037	Boron	103	101	P/P	80 - 120
2054037	Cadmium	104	103	P/P	80 - 120
2054037	Chromium	105	104	P/P	80 - 120
2054037	Copper	106	105	P/P	80 - 120
2054037	Lead	100	99.7	P/P	80 - 120
2054037	Nickel	103	103	P/P	80 - 120
2054037	Selenium	102	101	P/P	80 - 120
2054037	Silver	99.5	98.5	P/P	80 - 120
2054037	Thallium	102	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357415

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054028	Chloride	93.0		P	90 - 110
2054093	Chloride	95.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054028	Sulfate	95.9		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054093	Sulfate	95.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357320

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054049	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054107	Kjeldahl Nitrogen	109	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357412

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054096	NO2NO3-N	96.9	95.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357358

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054065	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054161	O-Phosphate-P	97.0	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P357663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054040	Fluoride	96.7	96.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P357395

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2054030	Organic Carbon	98.4		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P357324

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054105	Turbidity	1.72	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054037	Barium	1.51	Spike	P	0 - 20
2054037	Calcium	1.06	Spike	P	0 - 20
2054037	Iron	1.21	Spike	P	0 - 20
2054037	Magnesium	1.27	Spike	P	0 - 20
2054037	Potassium	1.03	Spike	P	0 - 20
2054037	Sodium	1.54	Spike	P	0 - 20
2054037	Zinc	1.56	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054037	Aluminum	0.979	Spike	P	0 - 20
2054037	Antimony	1.01	Spike	P	0 - 20
2054037	Arsenic	0.0539	Spike	P	0 - 20
2054037	Boron	1.63	Spike	P	0 - 20
2054037	Cadmium	0.375	Spike	P	0 - 20
2054037	Chromium	1.04	Spike	P	0 - 20
2054037	Copper	0.416	Spike	P	0 - 20
2054037	Lead	0.356	Spike	P	0 - 20
2054037	Nickel	0.371	Spike	P	0 - 20
2054037	Selenium	0.672	Spike	P	0 - 20
2054037	Silver	0.966	Spike	P	0 - 20
2054037	Thallium	0.714	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054028	Chloride	1.42	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054028	Sulfate	0.862	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357320

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054049	Ammonia-N	0.397	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054044	Kjeldahl Nitrogen	2.44	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054107	Kjeldahl Nitrogen	1.64	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054096	NO2NO3-N	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357358

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054065	Total-P	2.05	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054161	O-Phosphate-P	1.53	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P357303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054104	Color (true)	5.53	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P357659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054040	Total Alkalinity	0.286	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P357764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054048	TDS	3.88	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P357663

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054040	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P357395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2054030	Organic Carbon	0.238	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A88788
Included Lab Sample IDs: 2054093, 2054094, 2054095

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	99.5	P/P	90 - 110
Chloride	98.4	101	P/P	90 - 110
Sulfate	100	98.6	P/P	90 - 110
Sulfate	99.1	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A88821
Included Lab Sample IDs: 2054099, 2054100, 2054101

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	98.8	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A88822
Included Lab Sample IDs: 2054093, 2054094, 2054095

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	104	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A88830
Included Lab Sample IDs: 2054096, 2054097, 2054098

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A88832
Included Lab Sample IDs: 2054093, 2054094, 2054095

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

Reference Method: SM 5310 B-00
Run ID: A88861
Included Lab Sample IDs: 2054096, 2054097, 2054098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.2	99.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A88870
Included Lab Sample IDs: 2054096, 2054097, 2054098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	101	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88886
Included Lab Sample IDs: 2054096, 2054097, 2054098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	103	P/P	90 - 110
Kjeldahl Nitrogen	105	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A88888
Included Lab Sample IDs: 2054126, 2054127, 2054128

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	101	P/P	90 - 110
Calcium	104	101	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	108	106	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88896
Included Lab Sample IDs: 2054126, 2054127, 2054128

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	101	P/P	90 - 110
Antimony	99.7	99.7	P/P	90 - 110
Arsenic	102	102	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	103	105	P/P	90 - 110
Copper	103	104	P/P	90 - 110
Lead	101	102	P/P	90 - 110
Nickel	103	103	P/P	90 - 110
Selenium	103	101	P/P	90 - 110
Thallium	94.5	95.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88898
Included Lab Sample IDs: 2054096, 2054097, 2054098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	99.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A88947
Included Lab Sample IDs: 2054093, 2054094, 2054095

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A88947
Included Lab Sample IDs: 2054093, 2054094, 2054095

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A88947
Included Lab Sample IDs: 2054093, 2054094, 2054095

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88956
Included Lab Sample IDs: 2054126, 2054127, 2054128

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	99.1	104	P/P	90 - 110
Silver	97.7	98.3	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						1.72	
EPA 200.7 Rev. 4.4	Barium	101	98.7	104	103			1.51
	Calcium	105	108	107				1.06
	Iron	107	103	110	108			1.21
	Magnesium	109	102	113	111			1.27
	Potassium	105	111	110				1.03
	Sodium	109	107					1.54
	Zinc	98.5	101	103	102			1.56
EPA 200.8 Rev. 5.4	Aluminum	101	99.6	98.0	99.6			0.979
	Antimony	97.6	102	97.7	96.7			1.01
	Arsenic	104	108	104	104			0.0539
	Boron	103	103	101				1.63
	Cadmium	103	103	104	103			0.375
	Chromium	103	97.6	105	104			1.04
	Copper	103	97.2	106	105			0.416
	Lead	99.6	103	100	99.7			0.356
	Nickel	103	97.5	103	103			0.371
	Selenium	102	101	102	101			0.672
	Silver	99.1	95.1	99.5	98.5			0.966
	Thallium	98.4	104	102	103			0.714
EPA 300.0 Rev. 2.1	Chloride	97.2	93.0	95.5			1.42	
	Sulfate	96.4	95.9	95.8			0.862	
EPA 350.1 Rev. 2.0	Ammonia-N	105	104	104				0.397
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104						2.44
	Kjeldahl Nitrogen	103	109	107				1.64
EPA 353.2 Rev. 2.0	NO2NO3-N	101	96.9	95.4				1.10
EPA 365.1 Rev. 2.0	Total-P	104	103	105				2.05
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.6	97.0	98.5				1.53
SM 2120 B	Color (true)	100					5.53	
SM 2320 B-97	Total Alkalinity	102					0.286	
SM 2540 C-97	TDS						3.88	
SM 4500 F-C-97	Fluoride	97.9	96.7	96.7				0.0
SM 5310 B-00	Organic Carbon	98.1	98.4					0.238

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2054093, 2054094, 2054095
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2054126, 2054127, 2054128
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2054126, 2054127, 2054128
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2054093, 2054094, 2054095
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2054093, 2054094, 2054095
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2054096, 2054097, 2054098
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2054096, 2054097, 2054098
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2054096, 2054097, 2054098
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2054096, 2054097, 2054098

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2054099, 2054100, 2054101
SM 2120 B / E31780	True Color measured at 450 nm	2054093, 2054094, 2054095
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2054093, 2054094, 2054095
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2054093, 2054094, 2054095
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2054093, 2054094, 2054095
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2054093, 2054094, 2054095
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2054096, 2054097, 2054098

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	01/15/2019			01/15/2019 17:10	Megan Treadwell	2054093, 2054094, 2054095
EPA 200.7 Rev. 4.4	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/17/2019 17:42	Betina Topolski	2054126
	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/17/2019 17:50	Betina Topolski	2054127
	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/17/2019 17:56	Betina Topolski	2054128
EPA 200.8 Rev. 5.4	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/18/2019 00:30	Allison Taylor	2054126
	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/18/2019 00:40	Allison Taylor	2054127
	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/18/2019 00:49	Allison Taylor	2054128
	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/22/2019 20:03	Allison Taylor	2054126
	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/22/2019 20:12	Allison Taylor	2054127
	01/15/2019	01/15/2019 18:15	Elliott D. Healy	01/22/2019 20:22	Allison Taylor	2054128
EPA 300.0 Rev. 2.1	01/15/2019			01/16/2019 16:10	Lipi Saha	2054093
	01/15/2019			01/16/2019 18:59	Lipi Saha	2054094
	01/15/2019			01/16/2019 19:11	Lipi Saha	2054095
EPA 350.1 Rev. 2.0	01/15/2019			01/15/2019 14:23	Ping Hua	2054097
	01/15/2019			01/15/2019 14:25	Ping Hua	2054098
	01/15/2019			01/15/2019 14:34	Ping Hua	2054096
EPA 351.2 Rev. 2.0	01/15/2019	01/16/2019 11:15	Adrian Shelby	01/17/2019 14:23	Joseph Suarez	2054096
	01/15/2019	01/16/2019 11:15	Adrian Shelby	01/17/2019 14:24	Joseph Suarez	2054097
	01/15/2019	01/16/2019 11:15	Adrian Shelby	01/17/2019 14:32	Joseph Suarez	2054098
EPA 353.2 Rev. 2.0	01/15/2019			01/16/2019 11:43	Beverly Y. Sanders	2054096
	01/15/2019			01/16/2019 12:27	Beverly Y. Sanders	2054097
	01/15/2019			01/16/2019 12:28	Beverly Y. Sanders	2054098
EPA 365.1 Rev. 2.0	01/15/2019	01/16/2019 12:15	Sima Feizi	01/17/2019 16:35	Rosalyn Ballman	2054096
	01/15/2019	01/16/2019 12:15	Sima Feizi	01/17/2019 16:36	Rosalyn Ballman	2054097
	01/15/2019	01/16/2019 12:15	Sima Feizi	01/17/2019 16:37	Rosalyn Ballman	2054098
EPA 365.1 Rev. 2.0 dissolved	01/15/2019			01/15/2019 14:43	Jhamieka S. Greenwood	2054099
	01/15/2019			01/15/2019 14:44	Jhamieka S. Greenwood	2054100, 2054101
SM 2120 B	01/15/2019			01/15/2019 16:10	Chelsea Hernandez	2054093
	01/15/2019			01/15/2019 16:11	Chelsea Hernandez	2054094
	01/15/2019			01/15/2019 16:12	Chelsea Hernandez	2054095
SM 2320 B-97	01/15/2019			01/21/2019 18:50	Dale L. Simmons	2054093
	01/15/2019			01/21/2019 19:01	Dale L. Simmons	2054094
	01/15/2019			01/21/2019 19:10	Dale L. Simmons	2054095
SM 2540 C-97	01/15/2019			01/17/2019 13:55	Yijie Li	2054093, 2054094, 2054095
SM 2540 D-97	01/15/2019			01/17/2019 13:55	Yijie Li	2054093, 2054094, 2054095
SM 4500 F-C-97	01/15/2019			01/21/2019 18:50	Dale L. Simmons	2054093
	01/15/2019			01/21/2019 19:01	Dale L. Simmons	2054094
	01/15/2019			01/21/2019 19:10	Dale L. Simmons	2054095
SM 5310 B-00	01/15/2019			01/16/2019 16:46	Megan Treadwell	2054096
	01/15/2019			01/16/2019 16:58	Megan Treadwell	2054097

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	01/15/2019			01/16/2019 17:10	Megan Treadwell	2054098