Chemical Analysis Report

NE-DIST-2016-02-16-01

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

Event Description: **UEC South**
Request ID: **RQ-2016-02-15-53**
Customer: **NE-DIST**
Project ID: **SMP**

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8800 Baymeadows Way West
Jacksonville, FL 32256-7577
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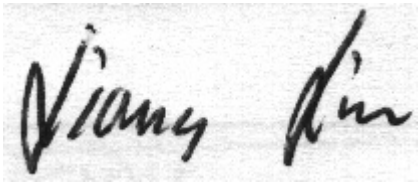
Certified by: Liang Lin, Environmental Administrator

Date Certified: 07-MAR-2016 14:50



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: 27010189 Wildwood at Wildwood **Collection Date/Time: 02/15/2016 11:05**

Field ID: 27010189 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1771416	EPA 180.1 Rev. 2.0	Turbidity	1.1	A	NTU	P298696	
	EPA 300.0 Rev. 2.1	Chloride	48		mg Cl/L	P298902	
		Sulfate	17		mg SO4/L	P298904	
	SM 2120 B	Color (true)	320		PCU	P298686	
	SM 2320 B-97	Total Alkalinity	21		mg CaCO3/L	P299344	
	SM 2540 C-97	TDS	202		mg/L	P299081	
	SM 2540 D-97	TSS	2	I	mg/L	P299019	
	SM 4500 F-C-97	Fluoride	0.051	I	mg F/L	P299044	
1771419	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P298874	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P299000	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P299060	
	EPA 365.1 Rev. 2.0	Total-P	0.085		mg P/L	P298896	
	SM 5310 B-00	Organic Carbon	38		mg C/L	P299137	
1771422	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.060		mg P/L	P298676	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: 27010060 Cracker at 204 **Collection Date/Time: 02/15/2016 10:30**

Field ID: 27010060 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1771417	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P298696	
	EPA 300.0 Rev. 2.1	Chloride	46		mg Cl/L	P298902	
		Sulfate	16		mg SO4/L	P298904	
	SM 2120 B	Color (true)	270		PCU	P298686	
	SM 2320 B-97	Total Alkalinity	44		mg CaCO3/L	P299344	
	SM 2540 C-97	TDS	199		mg/L	P299081	
	SM 2540 D-97	TSS	2	I	mg/L	P299019	
	SM 4500 F-C-97	Fluoride	0.061	I	mg F/L	P299044	
1771420	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P298874	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P299000	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P299060	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P298896	
	SM 5310 B-00	Organic Carbon	29		mg C/L	P299137	
1771423	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.057		mg P/L	P298676	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: G5NE0005 PalmCst.canal Old kin **Collection Date/Time: 02/15/2016 09:00**

Field ID: G5NE0005 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1771418	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P298696	
	EPA 300.0 Rev. 2.1	Chloride	39		mg Cl/L	P298902	
		Sulfate	17		mg SO4/L	P298904	

Field ID: G5NE0005 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1771418	SM 2120 B	Color (true)	100	A	PCU	P298686	
	SM 2320 B-97	Total Alkalinity	85		mg CaCO3/L	P299387	RPD
	SM 2540 C-97	TDS	197		mg/L	P299081	
	SM 2540 D-97	TSS	2	U	mg/L	P299019	
	SM 4500 F-C-97	Fluoride	0.089	I	mg F/L	P299044	
1771421	EPA 350.1 Rev. 2.0	Ammonia-N	0.048		mg N/L	P298874	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P299000	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P299061	
	EPA 365.1 Rev. 2.0	Total-P	0.072		mg P/L	P298896	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P299137	
1771424	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.048		mg P/L	P298676	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: G5NE0016 ICW St.Joe walkway **Collection Date/Time: 02/15/2016 09:35**

Field ID: G5NE0016 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1771425	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P298696	
	SM 2320 B-97	Total Alkalinity	122		mg CaCO3/L	P298966	
	SM 2540 D-97	TSS	4	I	mg/L	P299021	
	SM 4500 F-C-97	Fluoride	0.95		mg F/L	P298957	
1771426	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P298871	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P298952	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P299094	
	EPA 365.1 Rev. 2.0	Total-P	0.21		mg P/L	P298994	
	SM 5310 B-00	Organic Carbon	5.3		mg C/L	P298949	
1771427	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.027		mg P/L	P298677	
1771436	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P298723	
		Zinc	20	U	ug/L	P298723	
	EPA 200.8 Rev. 5.4	Arsenic	1.5	I	ug/L	P298723	
		Cadmium	0.25	U	ug/L	P298723	
		Chromium	1.5	U	ug/L	P298723	
		Copper	2.5	U	ug/L	P298723	
		Lead	1.0	U	ug/L	P298723	
		Nickel	1.2	U	ug/L	P298723	
		Silver	0.12	U	ug/L	P298723	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The sample required dilution due to matrix interference.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298696

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298696

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P298723

Component	Result	Code	Units
Iron	30	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P298723

Component	Result	Code	Units
Arsenic	0.25	U	ug/L
Cadmium	0.050	U	ug/L
Chromium	0.30	U	ug/L
Copper	0.50	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.25	U	ug/L
Silver	0.025	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298902

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298904

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298871

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298874

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298952

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299000

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299060

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299061

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299094

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298896

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298994

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298676

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298677

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

Reference Method: SM 2120 B
Batch ID: P298686

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P298966

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

Reference Method: SM 2320 B-97
Batch ID: P299344

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

Reference Method: SM 2320 B-97
Batch ID: P299387

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

Reference Method: SM 2540 C-97
Batch ID: P299081

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P299019

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P299021

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P298957

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P299044

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P298949

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P299137

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: P298723

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	111		P	85 - 115
Zinc	108		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P298723

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.9		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	94.0		P	85 - 115
Copper	91.8		P	85 - 115
Lead	94.9		P	85 - 115
Nickel	89.3		P	85 - 115
Silver	97.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298902

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298904

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298871

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298874

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.9		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298952

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299000

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299060

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299061

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299094

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: P298896

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298994

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298676

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298677

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P298966

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 105

Reference Method: SM 2320 B-97
Batch ID: P299344

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 105

Reference Method: SM 2320 B-97
Batch ID: P299387

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P298957

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	94 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P299044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.0		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P298949

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.3		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P299137

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P298723

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770678	Iron	103	102	P/P	70 - 130
1770678	Zinc	111	113	P/P	70 - 130

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P298723

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770678	Arsenic	97.8	96.8	P/P	70 - 130
1770678	Cadmium	92.9	88.2	P/P	70 - 130
1770678	Chromium	90.2	90.1	P/P	70 - 130
1770678	Copper	92.4	95.3	P/P	70 - 130
1770678	Lead	96.6	98.0	P/P	70 - 130
1770678	Nickel	89.4	95.0	P/P	70 - 130
1770678	Silver	86.9	87.0	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771406	Chloride	102		P	90 - 110
1771612	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298904

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771406	Sulfate	98.8		P	90 - 110
1771612	Sulfate	99.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771426	Ammonia-N	98.6	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298874

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771421	Ammonia-N	98.9	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771251	Kjeldahl Nitrogen	107	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299000

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771398	Kjeldahl Nitrogen	99.7	93.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299060

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771350	NO2NO3-N	96.2		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299061

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771421	NO2NO3-N	98.8	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299094

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1769204	NO2NO3-N	98.2	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771398	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298994

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771251	Total-P	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771287	O-Phosphate-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298677

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771427	O-Phosphate-P	98.7	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P298957

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771810	Fluoride	97.7	100	P/P	94 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P299044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771613	Fluoride	98.8	98.3	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P298949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771900	Organic Carbon	93.5	92.3	P/P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P299137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771316	Organic Carbon	92.6	95.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771416	Turbidity	8.29	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P298723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770678	Iron	1.80	Spike	P	0 - 20
1770678	Zinc	1.62	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P298723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770678	Arsenic	0.898	Spike	P	0 - 20
1770678	Cadmium	5.18	Spike	P	0 - 20
1770678	Chromium	0.120	Spike	P	0 - 20
1770678	Copper	3.10	Spike	P	0 - 20
1770678	Lead	1.47	Spike	P	0 - 20
1770678	Nickel	6.06	Spike	P	0 - 20
1770678	Silver	0.0972	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771406	Chloride	0.0473	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298904

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771406	Sulfate	0.124	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771426	Ammonia-N	0.778	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298874

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771421	Ammonia-N	0.728	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771251	Kjeldahl Nitrogen	2.89	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299000

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771398	Kjeldahl Nitrogen	3.72	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299060

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771350	NO2NO3-N	0.583	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299061

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771421	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299094

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769204	NO2NO3-N	1.85	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771398	Total-P	0.334	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771251	Total-P	2.23	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771287	O-Phosphate-P	0.295	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298677

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771427	O-Phosphate-P	1.50	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P298686

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771418	Color (true)	0.0966	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P298966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771810	Total Alkalinity	1.29	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P299344

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771613	Total Alkalinity	4.67	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P299387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771612	Total Alkalinity	5.00	Sample	F	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P299081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771349	TDS	1.97	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 2540 D-97
Batch ID: P299021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771001	TSS	5.88	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P298957

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771810	Fluoride	0.987	Spike	P	0 - 3.7

Reference Method: SM 4500 F-C-97
Batch ID: P299044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771613	Fluoride	0.487	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P298949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771900	Organic Carbon	1.15	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P299137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771316	Organic Carbon	1.89	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A67625
Included Lab Sample IDs: 1771422, 1771423, 1771424, 1771427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	97.2	P/P	90 - 110
O-Phosphate-P	98.9	98.0	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A67630
Included Lab Sample IDs: 1771416, 1771417, 1771418

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	102	P/P	85 - 115

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A67632
Included Lab Sample IDs: 1771416, 1771417, 1771418, 1771425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	101	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A67638
Included Lab Sample IDs: 1771416, 1771417, 1771418

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Chloride	101	100	P/P	90 - 110
Sulfate	97.6	99.0	P/P	90 - 110
Sulfate	99.0	95.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A67680
Included Lab Sample IDs: 1771419, 1771420, 1771421, 1771426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.9	P/P	90 - 110
Ammonia-N	99.1	99.8	P/P	90 - 110
Ammonia-N	99.9	100	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A67710
Included Lab Sample IDs: 1771426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.4	95.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A67712
Included Lab Sample IDs: 1771425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	99.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A67716
Included Lab Sample IDs: 1771425

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67717
Included Lab Sample IDs: 1771419, 1771420, 1771421

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67737
Included Lab Sample IDs: 1771426

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

Reference Method: SM 4500 F-C-97
Run ID: A67743
Included Lab Sample IDs: 1771416, 1771417, 1771418

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A67752
Included Lab Sample IDs: 1771419, 1771420, 1771421

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A67757
Included Lab Sample IDs: 1771419, 1771420, 1771421, 1771426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	101	P/P	90 - 110
Kjeldahl Nitrogen	103	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A67764
Included Lab Sample IDs: 1771426

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

Reference Method: SM 5310 B-00
Run ID: A67778
Included Lab Sample IDs: 1771419, 1771420, 1771421

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.7	94.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A67816
Included Lab Sample IDs: 1771436

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	104	103	P/P	90 - 110
Zinc	107	108	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A67858
Included Lab Sample IDs: 1771416, 1771417

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

Reference Method: SM 2320 B-97
Run ID: A67871
Included Lab Sample IDs: 1771418

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.5	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A67934
Included Lab Sample IDs: 1771436

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.5	100	P/P	90 - 110
Cadmium	101	95.3	P/P	90 - 110
Chromium	95.7	95.8	P/P	90 - 110
Copper	94.9	100	P/P	90 - 110
Lead	101	99.3	P/P	90 - 110
Nickel	95.8	101	P/P	90 - 110
Silver	95.1	93.3	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					8.29	
EPA 200.7 Rev. 4.4	Iron	111	103	102			1.80
	Zinc	108	111	113			1.62
EPA 200.8 Rev. 5.4	Arsenic	97.9	97.8	96.8			0.898
	Cadmium	102	92.9	88.2			5.18
	Chromium	94.0	90.2	90.1			0.120
	Copper	91.8	92.4	95.3			3.10
	Lead	94.9	96.6	98.0			1.47
	Nickel	89.3	89.4	95.0			6.06
	Silver	97.7	86.9	87.0			0.0972
EPA 300.0 Rev. 2.1	Chloride	104	102	102		0.0473	
	Sulfate	100	98.8	99.4		0.124	
EPA 350.1 Rev. 2.0	Ammonia-N	95.9	98.6	99.6			0.778
	Ammonia-N	97.9	98.9	100			0.728
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.3	107	104			2.89
	Kjeldahl Nitrogen	96.8	99.7	93.3			3.72
EPA 353.2 Rev. 2.0	NO2NO3-N	101	96.2				0.583
	NO2NO3-N	101	98.8	98.8			0.0
	NO2NO3-N	101	98.2	100			1.85

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 365.1 Rev. 2.0	Total-P	101	102	103			0.334
	Total-P	101	101	103			2.23
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	102	102			0.295
	O-Phosphate-P	101	98.7	101			1.50
SM 2120 B	Color (true)					0.0966	
SM 2320 B-97	Total Alkalinity	101				1.29	
	Total Alkalinity	104				4.67	
	Total Alkalinity	105				5.00	
SM 2540 C-97	TDS					1.97	
SM 2540 D-97	TSS					5.88	
SM 4500 F-C-97	Fluoride	97.9	97.7	100			0.987
	Fluoride	98.0	98.8	98.3			0.487
SM 5310 B-00	Organic Carbon	95.3	93.5	92.3			1.15
	Organic Carbon	94.4	92.6	95.2			1.89

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1771416, 1771417, 1771418, 1771425
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1771436
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1771436
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1771416, 1771417, 1771418
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1771416, 1771417, 1771418
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1771419, 1771420, 1771421, 1771426
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1771419, 1771420, 1771421, 1771426
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1771419, 1771420, 1771421, 1771426
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1771419, 1771420, 1771421, 1771426
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1771422, 1771423, 1771424, 1771427
SM 2120 B / E31780	True Color measured at 450 nm	1771416, 1771417, 1771418
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1771416, 1771417, 1771418, 1771425
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1771416, 1771417, 1771418
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1771416, 1771417, 1771418, 1771425
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1771416, 1771417, 1771418, 1771425
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1771419, 1771420, 1771421, 1771426

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	02/16/2016			02/16/2016 15:33	Sima Feizi	1771416, 1771417, 1771418, 1771425
EPA 200.7 Rev. 4.4	02/16/2016	02/17/2016	Elliott D. Healy	02/23/2016	Joshua Ayres	1771436
EPA 200.8 Rev. 5.4	02/16/2016	02/17/2016	Elliott D. Healy	03/01/2016	Robert K Palmer	1771436
EPA 300.0 Rev. 2.1	02/16/2016			02/18/2016	Ping Hua	1771416, 1771417, 1771418
EPA 350.1 Rev. 2.0	02/16/2016			02/18/2016	Diana M. Turner	1771419, 1771420, 1771421, 1771426
EPA 351.2 Rev. 2.0	02/16/2016	02/22/2016	Christopher Armour	02/23/2016	Bryan A. Werth	1771419, 1771420, 1771421, 1771426
EPA 353.2 Rev. 2.0	02/16/2016			02/22/2016	Diana M. Turner	1771419, 1771420, 1771421
	02/16/2016			02/23/2016	Peter D. Kaus	1771426
EPA 365.1 Rev. 2.0	02/16/2016	02/19/2016	Christopher Armour	02/19/2016	Lipi Saha	1771419, 1771420, 1771421
	02/16/2016	02/22/2016	Christopher Armour	02/22/2016	Lipi Saha	1771426
EPA 365.1 Rev. 2.0 dissolved	02/16/2016			02/16/2016 14:15	Bryan A. Werth	1771427
	02/16/2016			02/16/2016 14:30	Bryan A. Werth	1771422
	02/16/2016			02/16/2016 14:31	Bryan A. Werth	1771423
	02/16/2016			02/16/2016 14:32	Bryan A. Werth	1771424
SM 2120 B	02/16/2016			02/16/2016 15:22	Blanca Fach	1771418
	02/16/2016			02/16/2016 15:23	Blanca Fach	1771416
	02/16/2016			02/16/2016 15:24	Blanca Fach	1771417
SM 2320 B-97	02/16/2016			02/21/2016	Dale L. Simmons	1771425
	02/16/2016			02/25/2016	Dale L. Simmons	1771416, 1771417
	02/16/2016			02/27/2016	Dale L. Simmons	1771418
SM 2540 C-97	02/16/2016			02/17/2016	Yijie Li	1771416, 1771417, 1771418
SM 2540 D-97	02/16/2016			02/17/2016	Yijie Li	1771416, 1771417, 1771418, 1771425
SM 4500 F-C-97	02/16/2016			02/19/2016	Dale L. Simmons	1771425
	02/16/2016			02/22/2016	Dale L. Simmons	1771416, 1771417, 1771418
SM 5310 B-00	02/16/2016			02/20/2016	Diana M. Turner	1771426
	02/16/2016			02/23/2016	Sofia Elnemr	1771419, 1771420, 1771421