Chemical Analysis Report

CEN-DIST-2019-04-18-02

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

Event Description: **SJR above Woodruff + HA**
Request ID: **RQ-2019-04-15-55**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact
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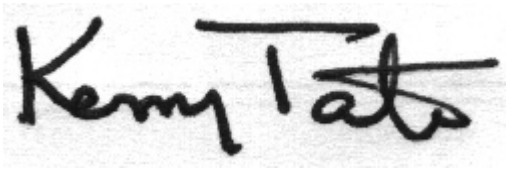
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 06-MAY-2019 11:16



NON-CONFORMANCE REPORT INCLUDED

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

A - Value reported is the mean of two or more determinations.
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value and/or the analysis did not meet established quality control criteria.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: SJR @ 700M SOUTH OF LAKE DEXTER **Collection Date/Time: 04/17/2019 12:35**

Field ID: G2CE0164 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2079222	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P362455	
	EPA 300.0 Rev. 2.1	Chloride	310		mg Cl/L	P362757	
		Sulfate	100	Y	mg SO4/L	P362760	
	SM 2120 B	Color (true)	61		PCU	P362410	
	SM 2320 B-97	Total Alkalinity	82	Y	mg CaCO3/L	P362948	
	SM 2540 C-97	TDS	735	AY	mg/L	P362973	
	SM 2540 D-97	TSS	5	IAY	mg/L	P362749	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P362952	
2079223	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P362695	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P362843	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.020		mg N/L	P362770	
	EPA 365.1 Rev. 2.0	Total-P	0.082		mg P/L	P362652	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P362591	
2079224	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.028		mg P/L	P362461	
2079228	EPA 200.7 Rev. 4.4	Barium	26.5		ug/L	P362614	
		Calcium	60.5		mg/L	P362614	
		Iron	74	I	ug/L	P362614	
		Magnesium	24.7		mg/L	P362614	
		Potassium	5.6		mg/L	P362614	
		Sodium	164		mg/L	P362614	
		Zinc	5.0	U	ug/L	P362614	
	EPA 200.8 Rev. 5.4	Aluminum	34		ug/L	P362614	
		Antimony	0.087	I	ug/L	P362614	
		Arsenic	0.57		ug/L	P362614	
		Boron**	68.4		ug/L	P362614	
		Cadmium	0.020	U	ug/L	P362614	
		Chromium	0.40	U	ug/L	P362614	
		Copper	0.46	I	ug/L	P362614	
		Lead	0.20	U	ug/L	P362614	
		Nickel	0.50	U	ug/L	P362614	
		Selenium	0.20	U	ug/L	P362614	
		Silver	0.010	U	ug/L	P362614	
		Thallium	0.10	U	ug/L	P362614	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2320 B-97: Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2540 C-97: Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample was left out at room temperature overnight, should be stored below 6 degC.

Non-Conformance Report

NCR ID: 7647

Event(s)	Job(s)	Sample(s)	Test(s)
CEN-DIST-2019-04-18-02	TLH-2019-04-18-32	2079222	

NCR Type: CUSTODY **NCR Category: General**

Observation: Samples stored at room temperature overnight on 04/18/2019.

Resolution: Chemistry Administrator notified, samples returned to refrigerator on 04/19/2019 at 12:00. Data will be qualified as appropriate.

Authorized by/Date: Peter D. Kaus 5/3/2019

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P362455

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P362614

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: P362614

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: P362757

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362760

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362695

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: P362843

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362770

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362652

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362461

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

Reference Method: SM 2120 B
Batch ID: P362410

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P362948

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

Reference Method: SM 2540 C-97
Batch ID: P362973

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P362749

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P362952

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P362591

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: P362614

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	96.1		P	85 - 115
Calcium	106		P	85 - 115
Iron	103		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	103		P	85 - 115
Sodium	105		P	85 - 115
Zinc	97.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362614

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.1		P	85 - 115
Antimony	91.8		P	85 - 115
Arsenic	95.2		P	85 - 115
Boron	94.6		P	85 - 115
Cadmium	95.9		P	85 - 115
Chromium	87.7		P	85 - 115
Copper	93.1		P	85 - 115
Lead	96.5		P	85 - 115
Nickel	93.3		P	85 - 115
Selenium	94.2		P	85 - 115
Silver	113		P	85 - 115
Thallium	90.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362757

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362760

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362695

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362843

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362770

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362652

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362461

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

Reference Method: SM 2120 B
Batch ID: P362410

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P362948

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P362952

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P362591

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P362614

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2078912	Barium	95.3		P	80 - 120
2078912	Calcium	98.6		P	80 - 120
2078912	Iron	105		P	80 - 120
2078912	Magnesium	100		P	80 - 120
2078912	Potassium	101		P	80 - 120
2078912	Sodium	99.0		P	80 - 120
2078912	Zinc	97.1		P	80 - 120
2079154	Barium	96.7	97.5	P/P	80 - 120
2079154	Calcium	107	105	P/P	80 - 120
2079154	Iron	106	105	P/P	80 - 120
2079154	Magnesium	112	110	P/P	80 - 120
2079154	Potassium	108	108	P/P	80 - 120
2079154	Sodium	102	102	P/P	80 - 120
2079154	Zinc	98.1	99.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362614

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2078912	Aluminum	90.8		P	80 - 120
2078912	Antimony	91.8		P	80 - 120
2078912	Arsenic	94.4		P	80 - 120
2078912	Boron	95.9		P	80 - 120
2078912	Cadmium	95.1		P	80 - 120
2078912	Chromium	87.5		P	80 - 120
2078912	Copper	89.4		P	80 - 120
2078912	Lead	96.4		P	80 - 120
2078912	Nickel	90.6		P	80 - 120
2078912	Selenium	92.2		P	80 - 120
2078912	Silver	112		P	80 - 120
2078912	Thallium	112		P	80 - 120
2079154	Aluminum	91.0	89.6	P/P	80 - 120
2079154	Antimony	90.2	89.8	P/P	80 - 120
2079154	Arsenic	92.6	92.6	P/P	80 - 120
2079154	Boron	95.7	94.3	P/P	80 - 120
2079154	Cadmium	94.0	92.7	P/P	80 - 120
2079154	Chromium	89.2	88.4	P/P	80 - 120
2079154	Copper	93.2	93.2	P/P	80 - 120
2079154	Lead	96.8	96.4	P/P	80 - 120
2079154	Nickel	93.1	93.1	P/P	80 - 120
2079154	Selenium	91.2	91.5	P/P	80 - 120
2079154	Silver	110	112	P/P	80 - 120
2079154	Thallium	109	111	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079142	Chloride	99.3		P	90 - 110
2079243	Chloride	97.6		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362760

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079142	Sulfate	100		P	90 - 110
2079243	Sulfate	97.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362695

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079173	Ammonia-N	98.6	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362843

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079163	Kjeldahl Nitrogen	91.4	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362770

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079173	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362652

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079223	Total-P	101	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362461

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079175	O-Phosphate-P	95.8	97.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P362952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079060	Fluoride	98.5	98.5	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P362591

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079061	Organic Carbon	99.8	100	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P362455

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079243	Turbidity	4.99	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P362614

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079154	Barium	0.856	Spike	P	0 - 20
2079154	Calcium	1.79	Spike	P	0 - 20
2079154	Iron	1.16	Spike	P	0 - 20
2079154	Magnesium	1.57	Spike	P	0 - 20
2079154	Potassium	0.811	Spike	P	0 - 20
2079154	Sodium	0.138	Spike	P	0 - 20
2079154	Zinc	1.25	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362614

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079154	Aluminum	1.37	Spike	P	0 - 20
2079154	Antimony	0.522	Spike	P	0 - 20
2079154	Arsenic	0.0398	Spike	P	0 - 20
2079154	Boron	1.38	Spike	P	0 - 20
2079154	Cadmium	1.49	Spike	P	0 - 20
2079154	Chromium	0.876	Spike	P	0 - 20
2079154	Copper	0.0551	Spike	P	0 - 20
2079154	Lead	0.408	Spike	P	0 - 20
2079154	Nickel	0.0864	Spike	P	0 - 20
2079154	Selenium	0.387	Spike	P	0 - 20
2079154	Silver	1.17	Spike	P	0 - 20
2079154	Thallium	1.91	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079243	Chloride	0.375	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362760

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079243	Sulfate	0.0690	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362695

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079173	Ammonia-N	0.554	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079163	Kjeldahl Nitrogen	3.77	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362770

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079173	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079223	Total-P	2.25	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362461

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079175	O-Phosphate-P	1.86	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P362410

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079169	Color (true)	0.426	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P362948

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079060	Total Alkalinity	0.265	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P362973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079222	TDS	0.272	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P362952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079060	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P362591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079061	Organic Carbon	0.243	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: A90814
Included Lab Sample IDs: 2079222

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A90832
Included Lab Sample IDs: 2079222

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A90833
Included Lab Sample IDs: 2079224

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

Reference Method: SM 5310 B-00
Run ID: A90876
Included Lab Sample IDs: 2079223

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A90940
Included Lab Sample IDs: 2079223

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A90961
Included Lab Sample IDs: 2079222

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A90968
Included Lab Sample IDs: 2079223

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A90983
Included Lab Sample IDs: 2079228

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.8	98.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A90983
Included Lab Sample IDs: 2079228

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	97.6	98.8	P/P	90 - 110
Sodium	100	102	P/P	90 - 110
Zinc	102	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A90993
Included Lab Sample IDs: 2079228

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.7	95.8	P/P	90 - 110
Antimony	91.9	93.4	P/P	90 - 110
Arsenic	94.7	93.6	P/P	90 - 110
Boron	101	100	P/P	90 - 110
Cadmium	95.0	95.6	P/P	90 - 110
Chromium	97.1	96.3	P/P	90 - 110
Copper	95.2	94.6	P/P	90 - 110
Lead	101	100	P/P	90 - 110
Nickel	95.3	94.3	P/P	90 - 110
Selenium	95.5	93.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A90998
Included Lab Sample IDs: 2079223

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A91020
Included Lab Sample IDs: 2079223

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.0	96.9	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A91045
Included Lab Sample IDs: 2079222

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	107	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A91045
Included Lab Sample IDs: 2079222

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A91077
Included Lab Sample IDs: 2079228

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	102	102	P/P	90 - 110
Thallium	95.6	94.5	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						4.99	
EPA 200.7 Rev. 4.4	Barium	96.1	95.3	96.7	97.5			0.856
	Calcium	106	98.6	107	105			1.79
	Iron	103	105	106	105			1.16
	Magnesium	110	100	112	110			1.57
	Potassium	103	101	108	108			0.811
	Sodium	105	99.0	102	102			0.138
	Zinc	97.0	97.1	98.1	99.4			1.25
EPA 200.8 Rev. 5.4	Aluminum	93.1	90.8	91.0	89.6			1.37
	Antimony	91.8	91.8	90.2	89.8			0.522
	Arsenic	95.2	94.4	92.6	92.6			0.0398
	Boron	94.6	95.9	95.7	94.3			1.38
	Cadmium	95.9	95.1	94.0	92.7			1.49
	Chromium	87.7	87.5	89.2	88.4			0.876
	Copper	93.1	89.4	93.2	93.2			0.0551
	Lead	96.5	96.4	96.8	96.4			0.408
	Nickel	93.3	90.6	93.1	93.1			0.0864
	Selenium	94.2	92.2	91.2	91.5			0.387
	Silver	113	112	110	112			1.17
	Thallium	90.8	112	109	111			1.91
EPA 300.0 Rev. 2.1	Chloride	98.0	97.6	99.3			0.375	
	Sulfate	98.7	97.7	100			0.0690	
EPA 350.1 Rev. 2.0	Ammonia-N	103	98.6	99.3				0.554
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.6	91.4	97.8				3.77
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	100	99.5				0.501
EPA 365.1 Rev. 2.0	Total-P	95.7	101	104				2.25
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	95.8	97.6				1.86
SM 2120 B	Color (true)	104					0.426	
SM 2320 B-97	Total Alkalinity	102					0.265	
SM 2540 C-97	TDS						0.272	
SM 4500 F-C-97	Fluoride	99.3	98.5	98.5				0.0
SM 5310 B-00	Organic Carbon	101	99.8	100				0.243

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2079222
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2079228
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2079228
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2079222
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2079222
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2079223
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2079223
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2079223
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2079223

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	2079224
SM 2120 B / E31780	True Color measured at 450 nm	2079222
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2079222
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2079222
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2079222
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2079222
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2079223

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	04/18/2019			04/18/2019 16:29	Adrian Shelby	2079222
EPA 200.7 Rev. 4.4	04/18/2019	04/22/2019 15:30	Elliott D. Healy	04/24/2019 14:54	Betina Topolski	2079228
EPA 200.8 Rev. 5.4	04/18/2019	04/22/2019 15:30	Elliott D. Healy	04/24/2019 22:51	Robert K Palmer	2079228
	04/18/2019	04/22/2019 15:30	Elliott D. Healy	04/29/2019 22:51	Robert K Palmer	2079228
EPA 300.0 Rev. 2.1	04/18/2019			04/23/2019 19:03	Jhamieka S. Greenwood	2079222
EPA 350.1 Rev. 2.0	04/18/2019			04/23/2019 15:55	Julia Storbeck	2079223
EPA 351.2 Rev. 2.0	04/18/2019	04/25/2019 12:15	Adrian Shelby	04/26/2019 10:39	Joseph Suarez	2079223
EPA 353.2 Rev. 2.0	04/18/2019			04/24/2019 10:42	Beverly Y. Sanders	2079223
EPA 365.1 Rev. 2.0	04/18/2019	04/24/2019 15:26	Sima Feizi	04/25/2019 11:33	Rosalyn Ballman	2079223
EPA 365.1 Rev. 2.0 dissolved	04/18/2019			04/18/2019 17:24	Julia Storbeck	2079224
SM 2120 B	04/18/2019			04/18/2019 12:18	Mariam Hanna	2079222
SM 2320 B-97	04/18/2019			04/26/2019 12:49	Dale L. Simmons	2079222
SM 2540 C-97	04/18/2019			04/22/2019 18:03	Mariam Hanna	2079222
SM 2540 D-97	04/18/2019			04/22/2019 18:35	Mariam Hanna	2079222
SM 4500 F-C-97	04/18/2019			04/26/2019 12:49	Dale L. Simmons	2079222
SM 5310 B-00	04/18/2019			04/20/2019 00:44	Julia Storbeck	2079223