Chemical Analysis Report

SO-DIST-2020-09-04-02

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

Event Description: **2020 SMP : Shell Creek**
Request ID: **RQ-2020-08-31-45**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Nicole Reistad

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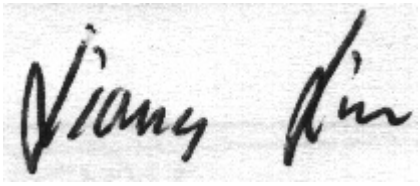
Certified by: Liang Lin, Environmental Administrator

Date Certified: 28-SEP-2020 14:05



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: Shell CR @ Hathaway Park **Collection Date/Time: 09/03/2020 09:10**

Field ID: G3SD0120 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2194590	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P386999	
	EPA 300.0 Rev. 2.1	Chloride	73		mg Cl/L	P387331	
		Sulfate	35		mg SO4/L	P387334	
	SM 2120 B-2011	Color (true)	290		PCU	P387009	
	SM 2320 B-2011	Total Alkalinity	107		mg CaCO3/L	P387126	
	SM 2540 C-2011	TDS	340		mg/L	P387385	
	SM 2540 D-2011	TSS	2	I	mg/L	P387378	
	SM 4500 F-C-2011	Fluoride	0.15		mg F/L	P387130	
2194591	EPA 350.1 Rev. 2.0	Ammonia-N	0.075		mg N/L	P387292	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P387212	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P387137	
	EPA 365.1 Rev. 2.0	Total-P	0.35		mg P/L	P387731	MS
	SM 5310 B-2011	Organic Carbon	28		mg C/L	P387314	
2194592	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.27		mg P/L	P387012	
2194594	EPA 200.7 Rev. 4.4	Barium	24.3		ug/L	P387083	
		Calcium	62.2		mg/L	P387083	
		Iron	990		ug/L	P387083	
		Magnesium	8.55		mg/L	P387083	
		Potassium	6.0		mg/L	P387083	
		Sodium	35.3		mg/L	P387083	
		Zinc	5.0	U	ug/L	P387083	
	EPA 200.8 Rev. 5.4	Aluminum	85		ug/L	P387083	
		Antimony	0.13	I	ug/L	P387083	
		Arsenic	1.63		ug/L	P387083	
		Boron**	49.8		ug/L	P387083	
		Cadmium	0.020	U	ug/L	P387083	
		Chromium	0.82	I	ug/L	P387083	
		Copper	1.71		ug/L	P387083	
		Lead	0.20	U	ug/L	P387083	
		Nickel	0.78	I	ug/L	P387083	
		Selenium	0.32	I	ug/L	P387083	
		Silver	0.010	U	ug/L	P387083	
		Thallium	0.10	U	ug/L	P387083	
	SM 2340B	Hardness	191		mg/L	P387083	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries and relative percent difference are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386999

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387083

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: P387083

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: P387331

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387334

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387292

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: P387212

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387137

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387731

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387012

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

Reference Method: SM 2120 B-2011
Batch ID: P387009

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P387126

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

Reference Method: SM 2540 C-2011
Batch ID: P387385

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P387378

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P387130

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P387314

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: P387083

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	104		P	85 - 115
Iron	102		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	99.4		P	85 - 115
Sodium	104		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387083

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.5		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	94.7		P	85 - 115
Boron	98.9		P	85 - 115
Cadmium	99.0		P	85 - 115
Chromium	105		P	85 - 115
Copper	93.5		P	85 - 115
Lead	100		P	85 - 115
Nickel	93.1		P	85 - 115
Selenium	92.5		P	85 - 115
Silver	101		P	85 - 115
Thallium	99.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387331

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387334

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387292

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387212

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387137

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387731

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387012

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.4		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P387009

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.2		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P387126

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P387130

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P387314

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: P387083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194273	Barium	104	103	P/P	80 - 120
2194273	Calcium	104		P	80 - 120
2194273	Iron	105	104	P/P	80 - 120
2194273	Magnesium	105	104	P/P	80 - 120
2194273	Potassium	99.3	99.9	P/P	80 - 120
2194273	Sodium	102		P	80 - 120
2194273	Zinc	109	106	P/P	80 - 120
2194439	Barium	103		P	80 - 120
2194439	Calcium	99.2		P	80 - 120
2194439	Iron	101		P	80 - 120
2194439	Magnesium	102		P	80 - 120
2194439	Potassium	97.0		P	80 - 120
2194439	Sodium	99.5		P	80 - 120
2194439	Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194273	Aluminum	92.9	92.9	P/P	80 - 120
2194273	Antimony	105	105	P/P	80 - 120
2194273	Arsenic	97.3	97.4	P/P	80 - 120
2194273	Boron	96.0	95.8	P/P	80 - 120
2194273	Cadmium	101	102	P/P	80 - 120
2194273	Chromium	107	107	P/P	80 - 120
2194273	Copper	95.7	95.4	P/P	80 - 120
2194273	Lead	102	102	P/P	80 - 120
2194273	Nickel	94.4	94.2	P/P	80 - 120
2194273	Selenium	94.1	94.5	P/P	80 - 120
2194273	Silver	100	100	P/P	80 - 120
2194273	Thallium	104	105	P/P	80 - 120
2194439	Aluminum	94.7		P	80 - 120
2194439	Antimony	104		P	80 - 120
2194439	Arsenic	95.2		P	80 - 120
2194439	Boron	98.5		P	80 - 120
2194439	Cadmium	101		P	80 - 120
2194439	Chromium	105		P	80 - 120
2194439	Copper	96.5		P	80 - 120
2194439	Lead	103		P	80 - 120
2194439	Nickel	97.7		P	80 - 120
2194439	Selenium	90.4		P	80 - 120
2194439	Silver	100		P	80 - 120
2194439	Thallium	104		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194472	Chloride	99.1		P	90 - 110
2194716	Chloride	98.5		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387334

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194472	Sulfate	93.8		P	90 - 110
2194716	Sulfate	95.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387292

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194619	Ammonia-N	95.3	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194619	Kjeldahl Nitrogen	107	112	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194490	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387731

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194491	Total-P	109	112	P/F	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P387130

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194618	Fluoride	98.5	99.6	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P387314

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194492	Organic Carbon	96.6	98.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386999

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194478	Turbidity	4.72	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194273	Barium	1.54	Spike	P	0 - 20
2194273	Calcium	0.997	Spike	P	0 - 20
2194273	Iron	0.697	Spike	P	0 - 20
2194273	Magnesium	0.477	Spike	P	0 - 20
2194273	Potassium	0.511	Spike	P	0 - 20
2194273	Sodium	0.415	Spike	P	0 - 20
2194273	Zinc	2.47	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194273	Aluminum	0.0430	Spike	P	0 - 20
2194273	Antimony	0.0302	Spike	P	0 - 20
2194273	Arsenic	0.0480	Spike	P	0 - 20
2194273	Boron	0.226	Spike	P	0 - 20
2194273	Cadmium	0.827	Spike	P	0 - 20
2194273	Chromium	0.159	Spike	P	0 - 20
2194273	Copper	0.374	Spike	P	0 - 20
2194273	Lead	0.0788	Spike	P	0 - 20
2194273	Nickel	0.197	Spike	P	0 - 20
2194273	Selenium	0.510	Spike	P	0 - 20
2194273	Silver	0.114	Spike	P	0 - 20
2194273	Thallium	0.536	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194472	Chloride	0.0776	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194472	Sulfate	0.218	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387292

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194619	Ammonia-N	3.78	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194619	Kjeldahl Nitrogen	4.14	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194490	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387731

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194491	Total-P	1.72	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387009

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194410	Color (true)	7.21	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P387126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194618	Total Alkalinity	3.90	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P387385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194481	TDS	5.61	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P387130

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194618	Fluoride	0.921	Spike	P	0 - 2.8

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P387314

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194492	Organic Carbon	1.41	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A100828
Included Lab Sample IDs: 2194590

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

Reference Method: SM 2120 B-2011
Run ID: A100830
Included Lab Sample IDs: 2194590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	99.7	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A100831
Included Lab Sample IDs: 2194592

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.4	96.9	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A100873
Included Lab Sample IDs: 2194590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.2	103	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A100873
Included Lab Sample IDs: 2194590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	96.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A100874
Included Lab Sample IDs: 2194591

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A100889
Included Lab Sample IDs: 2194594

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.5	99.5	P/P	90 - 110
Calcium	99.0	100	P/P	90 - 110
Iron	98.4	99.3	P/P	90 - 110
Magnesium	97.8	98.5	P/P	90 - 110
Potassium	95.8	96.2	P/P	90 - 110
Sodium	97.9	97.7	P/P	90 - 110
Zinc	99.9	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A100944
Included Lab Sample IDs: 2194591

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A100951
Included Lab Sample IDs: 2194591

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	103	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A100952
Included Lab Sample IDs: 2194591

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.4	97.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100958
Included Lab Sample IDs: 2194590

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100965
Included Lab Sample IDs: 2194594

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.7	95.2	P/P	90 - 110
Antimony	106	105	P/P	90 - 110
Arsenic	94.6	93.3	P/P	90 - 110
Boron	96.9	98.1	P/P	90 - 110
Cadmium	98.3	96.9	P/P	90 - 110
Chromium	102	101	P/P	90 - 110
Copper	94.1	92.9	P/P	90 - 110
Lead	98.6	97.6	P/P	90 - 110
Nickel	95.7	94.6	P/P	90 - 110
Selenium	95.2	93.9	P/P	90 - 110
Silver	102	100	P/P	90 - 110
Thallium	96.7	94.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101179
Included Lab Sample IDs: 2194591

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	P/P	85 - 115

Quality Assurance Report
Calibration Verification

* 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						4.72	
EPA 200.7 Rev. 4.4	Barium	101	104	103	103			1.54
	Calcium	104	104	99.2				0.997
	Iron	102	105	104	101			0.697
	Magnesium	102	105	104	102			0.477
	Potassium	99.4	99.3	99.9	97.0			0.511
	Sodium	104	102	99.5				0.415
	Zinc	103	109	106	104			2.47
EPA 200.8 Rev. 5.4	Aluminum	93.5	92.9	92.9	94.7			0.0430
	Antimony	103	105	105	104			0.0302
	Arsenic	94.7	97.3	97.4	95.2			0.0480
	Boron	98.9	96.0	95.8	98.5			0.226
	Cadmium	99.0	101	102	101			0.827
	Chromium	105	107	107	105			0.159
	Copper	93.5	95.7	95.4	96.5			0.374
	Lead	100	102	102	103			0.0788
	Nickel	93.1	94.4	94.2	97.7			0.197
	Selenium	92.5	94.1	94.5	90.4			0.510
	Silver	101	100	100	100			0.114
	Thallium	99.3	104	105	104			0.536
EPA 300.0 Rev. 2.1	Chloride	100	99.1	98.5			0.0776	
	Sulfate	98.8	93.8	95.1			0.218	
EPA 350.1 Rev. 2.0	Ammonia-N	99.8	95.3	99.3				3.78
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	107	112				4.14
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	100				0.0
EPA 365.1 Rev. 2.0	Total-P	108	109	112				1.72
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.4						
SM 2120 B-2011	Color (true)	98.2					7.21	
SM 2320 B-2011	Total Alkalinity	99.4					3.90	
SM 2540 C-2011	TDS						5.61	
SM 4500 F-C-2011	Fluoride	98.8	98.5	99.6				0.921
SM 5310 B-2011	Organic Carbon	98.1	96.6	98.4				1.41

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2194590
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2194594
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2194594
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2194590
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2194590
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2194591
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2194591
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2194591
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2194591
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2194592
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2194590
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2194590
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2194594
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2194590

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2194590
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2194590
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2194591

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	09/04/2020			09/04/2020 15:07	Yen Ta	2194590
EPA 200.7 Rev. 4.4	09/04/2020	09/08/2020 14:40	Elliott D. Healy	09/09/2020 17:36	Betina Topolski	2194594
EPA 200.8 Rev. 5.4	09/04/2020	09/08/2020 14:40	Elliott D. Healy	09/14/2020 22:40	Alexander Thompson	2194594
EPA 300.0 Rev. 2.1	09/04/2020			09/11/2020 11:09	Elliott Rodriguez	2194590
EPA 350.1 Rev. 2.0	09/04/2020			09/12/2020 13:37	Ping Hua	2194591
EPA 351.2 Rev. 2.0	09/04/2020	09/10/2020 11:36	Sima Feizi	09/11/2020 15:47	Elliott Rodriguez	2194591
EPA 353.2 Rev. 2.0	09/04/2020			09/09/2020 11:05	Beverly Y. Sanders	2194591
EPA 365.1 Rev. 2.0	09/04/2020	09/23/2020 12:23	Yen Ta	09/24/2020 12:48	Lipi Saha	2194591
EPA 365.1 Rev. 2.0 dissolved	09/04/2020			09/04/2020 15:13	Samantha Davila	2194592
SM 2120 B-2011	09/04/2020			09/04/2020 16:23	Samantha Davila	2194590
SM 2320 B-2011	09/04/2020			09/08/2020 19:55	Dale L. Simmons	2194590
SM 2340B	09/04/2020			09/09/2020 17:36	Betina Topolski	2194594
SM 2540 C-2011	09/04/2020			09/08/2020 15:01	Yijie Li	2194590
SM 2540 D-2011	09/04/2020			09/08/2020 15:26	Yijie Li	2194590
SM 4500 F-C-2011	09/04/2020			09/08/2020 19:55	Dale L. Simmons	2194590
SM 5310 B-2011	09/04/2020			09/12/2020 02:54	David Boose	2194591