Chemical Analysis Report

SO-DIST-2020-11-06-01

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

Event Description: **Shell creek**
Request ID: **RQ-2020-11-09-21**
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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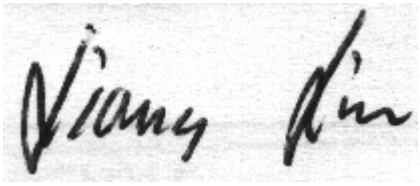
Certified by: Liang Lin, Environmental Administrator

Date Certified: 30-NOV-2020 13:56



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: 11/05/2020 10:15**

Field ID: G3SD0120 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2207022	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P389884	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P390002	
		Sulfate	54		mg SO4/L	P390004	
	SM 2120 B-2011	Color (true)	130		PCU	P389879	
	SM 2320 B-2011	Total Alkalinity	149		mg CaCO3/L	P389994	
	SM 2540 C-2011	TDS	485		mg/L	P390170	
	SM 2540 D-2011	TSS	2	I	mg/L	P390147	
	SM 4500 F-C-2011	Fluoride	0.19		mg F/L	P389995	
2207023	EPA 350.1 Rev. 2.0	Ammonia-N	0.023		mg N/L	P389900	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P389954	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P389915	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P389935	
	SM 5310 B-2011	Organic Carbon	19		mg C/L	P390046	
2207024	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.080		mg P/L	P389888	
2207028	EPA 200.7 Rev. 4.4	Barium	31.8		ug/L	P389937	
		Calcium	82.8		mg/L	P389937	
		Iron	410		ug/L	P389937	
		Magnesium	10.6		mg/L	P389937	
		Potassium	8.5		mg/L	P389937	
		Sodium	51.8		mg/L	P389937	
		Zinc	5.0	U	ug/L	P389937	
	EPA 200.8 Rev. 5.4	Aluminum	42		ug/L	P389937	
		Antimony	0.20	I	ug/L	P389937	
		Arsenic	1.18		ug/L	P389937	
		Beryllium	0.010	U	ug/L	P389937	
		Boron**	58.8		ug/L	P389937	
		Cadmium	0.020	U	ug/L	P389937	
		Chromium	0.42	I	ug/L	P389937	
		Copper	1.15		ug/L	P389937	
		Lead	0.20	U	ug/L	P389937	
		Nickel	1.0	I	ug/L	P389937	
		Selenium	0.38	I	ug/L	P389937	MS
		Silver	0.010	U	ug/L	P389937	
		Thallium	0.10	U	ug/L	P389937	
	SM 2340B	Hardness	250		mg/L	P389937	

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: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P389884

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P389937

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: P389937

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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: P390002

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390004

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389900

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: P389954

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389915

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389935

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389888

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

Reference Method: SM 2120 B-2011
Batch ID: P389879

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P389994

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

Reference Method: SM 2540 C-2011
Batch ID: P390170

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P390147

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P389995

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: P390046

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: P389937

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	91.2		P	85 - 115
Calcium	99.2		P	85 - 115
Iron	100		P	85 - 115
Magnesium	98.7		P	85 - 115
Potassium	90.2		P	85 - 115
Sodium	99.1		P	85 - 115
Zinc	87.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P389937

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	99.3		P	85 - 115
Arsenic	100		P	85 - 115
Beryllium	99.3		P	85 - 115
Boron	100		P	85 - 115
Cadmium	99.0		P	85 - 115
Chromium	99.3		P	85 - 115
Copper	98.0		P	85 - 115
Lead	103		P	85 - 115
Nickel	97.7		P	85 - 115
Selenium	99.4		P	85 - 115
Silver	109		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390002

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390004

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389954

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389915

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: P389935

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389888

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.5		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P389879

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

Reference Method: SM 2320 B-2011
Batch ID: P389994

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P389995

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.5		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P390046

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P389937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2206964	Barium	104	98.6	P/P	80 - 120
2206964	Calcium	105		P	80 - 120
2206964	Iron	104		P	80 - 120
2206964	Magnesium	101		P	80 - 120
2206964	Potassium	103	99.5	P/P	80 - 120
2206964	Sodium	103		P	80 - 120
2206964	Zinc	99.7	96.2	P/P	80 - 120
2207140	Barium	101		P	80 - 120
2207140	Calcium	97.2		P	80 - 120
2207140	Iron	106		P	80 - 120
2207140	Magnesium	106		P	80 - 120
2207140	Potassium	103		P	80 - 120
2207140	Sodium	97.8		P	80 - 120
2207140	Zinc	98.6		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P389937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2206964	Aluminum	98.5	99.5	P/P	80 - 120
2206964	Antimony	102	103	P/P	80 - 120
2206964	Arsenic	106	106	P/P	80 - 120
2206964	Beryllium	96.6	100	P/P	80 - 120
2206964	Boron	99.7	98.8	P/P	80 - 120
2206964	Cadmium	99.3	102	P/P	80 - 120
2206964	Chromium	95.5	95.4	P/P	80 - 120
2206964	Copper	98.0	99.5	P/P	80 - 120
2206964	Lead	104	104	P/P	80 - 120
2206964	Nickel	96.1	97.2	P/P	80 - 120
2206964	Selenium	68.9	69.5	F/F	80 - 120
2206964	Silver	105	106	P/P	80 - 120
2206964	Thallium	103	104	P/P	80 - 120
2207140	Aluminum	96.4		P	80 - 120
2207140	Antimony	100		P	80 - 120
2207140	Arsenic	102		P	80 - 120
2207140	Beryllium	102		P	80 - 120
2207140	Boron	101		P	80 - 120
2207140	Cadmium	100		P	80 - 120
2207140	Chromium	99.3		P	80 - 120
2207140	Copper	101		P	80 - 120
2207140	Lead	102		P	80 - 120
2207140	Nickel	99.1		P	80 - 120
2207140	Selenium	99.0		P	80 - 120
2207140	Silver	106		P	80 - 120
2207140	Thallium	102		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390002

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2206977	Chloride	98.9		P	90 - 110
2207145	Chloride	98.1		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390004

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2206977	Sulfate	98.3		P	90 - 110
2207145	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207126	Ammonia-N	93.3	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207123	Kjeldahl Nitrogen	108	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207023	NO2NO3-N	95.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389888

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207124	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P389995

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207003	Fluoride	99.5	99.5	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P390046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2206978	Organic Carbon	102	105	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P389884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207051	Turbidity	3.47	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P389937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206964	Barium	3.29	Spike	P	0 - 20
2206964	Calcium	1.81	Spike	P	0 - 20
2206964	Iron	3.65	Spike	P	0 - 20
2206964	Magnesium	3.33	Spike	P	0 - 20
2206964	Potassium	2.69	Spike	P	0 - 20
2206964	Sodium	1.28	Spike	P	0 - 20
2206964	Zinc	3.60	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P389937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206964	Aluminum	0.564	Spike	P	0 - 20
2206964	Antimony	0.620	Spike	P	0 - 20
2206964	Arsenic	0.185	Spike	P	0 - 20
2206964	Beryllium	1.70	Spike	P	0 - 20
2206964	Boron	0.758	Spike	P	0 - 20
2206964	Cadmium	2.35	Spike	P	0 - 20
2206964	Chromium	0.161	Spike	P	0 - 20
2206964	Copper	1.47	Spike	P	0 - 20
2206964	Lead	0.356	Spike	P	0 - 20
2206964	Nickel	1.07	Spike	P	0 - 20
2206964	Selenium	0.861	Spike	P	0 - 20
2206964	Silver	0.803	Spike	P	0 - 20
2206964	Thallium	1.04	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390002

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206977	Chloride	0.887	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206977	Sulfate	0.575	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207126	Ammonia-N	7.18	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207123	Kjeldahl Nitrogen	1.74	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207023	NO2NO3-N	1.31	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207004	Total-P	0.669	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207124	O-Phosphate-P	0.494	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P389879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207122	Color (true)	1.22	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P389994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207003	Total Alkalinity	0.553	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P390170

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206981	TDS	4.95	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P389995

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207003	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P390046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206978	Organic Carbon	1.87	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B-2011
Run ID: A102020
Included Lab Sample IDs: 2207022

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	99.7	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A102023
Included Lab Sample IDs: 2207022

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A102024
Included Lab Sample IDs: 2207024

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A102031
Included Lab Sample IDs: 2207023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.0	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A102043
Included Lab Sample IDs: 2207023

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A102065
Included Lab Sample IDs: 2207022

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.5	99.7	P/P	90 - 110
Sulfate	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A102070
Included Lab Sample IDs: 2207023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A102073
Included Lab Sample IDs: 2207023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.7	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A102092
Included Lab Sample IDs: 2207028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.0	98.9	P/P	90 - 110
Calcium	100	99.3	P/P	90 - 110
Iron	100	99.8	P/P	90 - 110
Magnesium	99.4	97.8	P/P	90 - 110
Potassium	98.9	97.7	P/P	90 - 110
Sodium	101	99.7	P/P	90 - 110
Zinc	97.1	97.2	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A102094
Included Lab Sample IDs: 2207022

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.9	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A102094
Included Lab Sample IDs: 2207022

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

Reference Method: SM 5310 B-2011
Run ID: A102121
Included Lab Sample IDs: 2207023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A102248
Included Lab Sample IDs: 2207028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	99.7	98.7	P/P	90 - 110
Arsenic	101	99.6	P/P	90 - 110
Boron	104	100	P/P	90 - 110
Cadmium	99.8	97.9	P/P	90 - 110
Chromium	99.6	96.7	P/P	90 - 110
Copper	99.0	97.4	P/P	90 - 110
Lead	103	101	P/P	90 - 110
Nickel	100	98.8	P/P	90 - 110
Thallium	99.0	96.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A102273
Included Lab Sample IDs: 2207028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	98.7	P/P	90 - 110
Beryllium	101	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A102273
Included Lab Sample IDs: 2207028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	100	102	P/P	90 - 110
Silver	105	104	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						3.47	
EPA 200.7 Rev. 4.4	Barium	91.2	104	98.6	101			3.29
	Calcium	99.2	105	97.2				1.81
	Iron	100	104	106				3.65
	Magnesium	98.7	101	106				3.33
	Potassium	90.2	103	99.5	103			2.69
	Sodium	99.1	103	97.8				1.28
	Zinc	87.9	99.7	96.2	98.6			3.60
EPA 200.8 Rev. 5.4	Aluminum	102	98.5	99.5	96.4			0.564
	Antimony	99.3	102	103	100			0.620
	Arsenic	100	106	106	102			0.185
	Beryllium	99.3	96.6	100	102			1.70
	Boron	100	99.7	98.8	101			0.758
	Cadmium	99.0	99.3	102	100			2.35
	Chromium	99.3	95.5	95.4	99.3			0.161
	Copper	98.0	98.0	99.5	101			1.47
	Lead	103	104	104	102			0.356
	Nickel	97.7	96.1	97.2	99.1			1.07
	Selenium	99.4	68.9	69.5	99.0			0.861
	Silver	109	105	106	106			0.803
	Thallium	102	103	104	102			1.04
EPA 300.0 Rev. 2.1	Chloride	99.4	98.9	98.1			0.887	
	Sulfate	99.8	98.3	98.4			0.575	
EPA 350.1 Rev. 2.0	Ammonia-N	94.7	93.3	103				7.18
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	108	106				1.74
EPA 353.2 Rev. 2.0	NO2NO3-N	101	95.5	98.0				1.31
EPA 365.1 Rev. 2.0	Total-P	102						0.669
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	101	102				0.494
SM 2120 B-2011	Color (true)	104					1.22	
SM 2320 B-2011	Total Alkalinity	102					0.553	
SM 2540 C-2011	TDS						4.95	
SM 4500 F-C-2011	Fluoride	99.5	99.5	99.5				0.0
SM 5310 B-2011	Organic Carbon	102	102	105				1.87

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2207022
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2207028
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2207028
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2207022
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2207022
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2207023
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2207023
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2207023
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2207023
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2207024
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2207022
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2207022
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2207028

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2207022
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2207022
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2207022
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2207023

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	11/06/2020			11/06/2020 15:46	Yen Ta	2207022
EPA 200.7 Rev. 4.4	11/06/2020	11/09/2020 14:50	Elliott D. Healy	11/10/2020 18:56	Betina Topolski	2207028
EPA 200.8 Rev. 5.4	11/06/2020	11/09/2020 14:50	Elliott D. Healy	11/22/2020 00:08	Alexander Thompson	2207028
	11/06/2020	11/09/2020 14:50	Elliott D. Healy	11/23/2020 23:14	Alexander Thompson	2207028
EPA 300.0 Rev. 2.1	11/06/2020			11/10/2020 23:18	Lipi Saha	2207022
EPA 350.1 Rev. 2.0	11/06/2020			11/08/2020 11:43	Ping Hua	2207023
EPA 351.2 Rev. 2.0	11/06/2020	11/09/2020 13:30	David Boose	11/10/2020 12:47	Elliott Rodriguez	2207023
EPA 353.2 Rev. 2.0	11/06/2020			11/09/2020 08:53	Beverly Y. Sanders	2207023
EPA 365.1 Rev. 2.0	11/06/2020	11/09/2020 12:24	Yen Ta	11/10/2020 13:10	Benjamin T. Nordmann	2207023
EPA 365.1 Rev. 2.0 dissolved	11/06/2020			11/06/2020 17:09	Ping Hua	2207024
SM 2120 B-2011	11/06/2020			11/06/2020 15:54	Benjamin T. Nordmann	2207022
SM 2320 B-2011	11/06/2020			11/09/2020 17:54	Dale L. Simmons	2207022
SM 2340B	11/06/2020			11/10/2020 18:56	Betina Topolski	2207028
SM 2540 C-2011	11/06/2020			11/09/2020 13:51	Yijie Li	2207022
SM 2540 D-2011	11/06/2020			11/09/2020 13:51	Yijie Li	2207022
SM 4500 F-C-2011	11/06/2020			11/09/2020 17:54	Dale L. Simmons	2207022
SM 5310 B-2011	11/06/2020			11/12/2020 18:14	Touraj Touran	2207023