

Chemical Analysis Report

CEN-DIST-2018-09-25-03

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

Event Description: **SJR (2964) - VolCo**
Request ID: **RQ-2018-09-10-47**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 22-OCT-2018 11:04

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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: LAKE HARNEY OUTFALL IN CENTER OF SJR (2964) **Collection Date/Time: 09/24/2018 10:53**

Field ID: G2CE0173

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028024	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P352235	
	EPA 300.0 Rev. 2.1	Chloride	120		mg Cl/L	P352579	
		Sulfate	18		mg SO4/L	P352581	
		Color (true)	260		PCU	P352239	
	SM 2320 B-97	Total Alkalinity	48		mg CaCO3/L	P352644	
	SM 2540 C-97	TDS	330		mg/L	P352739	
	SM 2540 D-97	TSS	2	I	mg/L	P352590	
	SM 4500 F-C-97	Fluoride	0.090	I	mg F/L	P352649	
2028025	EPA 350.1 Rev. 2.0	Ammonia-N	0.057		mg N/L	P352623	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P352399	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P352268	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P352374	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P352350	
2028026	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.082		mg P/L	P352223	
2028029	EPA 200.7 Rev. 4.4	Calcium	26.9		mg/L	P352333	
		Iron	580		ug/L	P352333	
		Magnesium	8.66		mg/L	P352333	
		Potassium	2.9		mg/L	P352333	
		Sodium	67.2		mg/L	P352333	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P352333	
		Arsenic	0.75		ug/L	P352333	
		Cadmium	0.020	U	ug/L	P352333	
		Chromium	0.40	U	ug/L	P352333	
		Copper	0.34	I	ug/L	P352333	
		Lead	1.11		ug/L	P352333	
		Nickel	0.25	I	ug/L	P352333	
		Silver	0.010	U	ug/L	P352333	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P352235

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352333

Component	Result	Code	Units
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: P352333

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352579

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352581

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352623

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352399

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352268

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352374

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352223

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

Reference Method: SM 2120 B
Batch ID: P352239

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P352644

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

Reference Method: SM 2540 C-97
Batch ID: P352739

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P352590

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P352649

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P352350

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: P352333

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	105		P	85 - 115
Magnesium	111		P	85 - 115
Potassium	107		P	85 - 115
Sodium	105		P	85 - 115
Zinc	99.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352333

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	105		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	100		P	85 - 115
Copper	103		P	85 - 115
Lead	102		P	85 - 115
Nickel	104		P	85 - 115
Silver	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352579

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352581

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352623

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352399

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352268

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352374

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352223

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

Reference Method: SM 2120 B
Batch ID: P352239

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.7		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P352644

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P352649

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352350

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352333

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028016	Calcium	99.2		P	80 - 120
2028016	Iron	107		P	80 - 120
2028016	Magnesium	112		P	80 - 120
2028016	Potassium	107		P	80 - 120
2028016	Sodium	101		P	80 - 120
2028016	Zinc	104		P	80 - 120
2028142	Calcium	102		P	80 - 120
2028142	Iron	103	102	P/P	80 - 120
2028142	Magnesium	109	107	P/P	80 - 120
2028142	Potassium	106	104	P/P	80 - 120
2028142	Sodium	102		P	80 - 120
2028142	Zinc	98.8	98.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352333

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028016	Arsenic	102		P	80 - 120
2028016	Cadmium	102		P	80 - 120
2028016	Chromium	99.9		P	80 - 120
2028016	Copper	99.5		P	80 - 120
2028016	Lead	100		P	80 - 120
2028016	Nickel	99.4		P	80 - 120
2028016	Silver	106		P	80 - 120
2028142	Arsenic	101	101	P/P	80 - 120
2028142	Cadmium	103	104	P/P	80 - 120
2028142	Chromium	102	103	P/P	80 - 120
2028142	Copper	99.0	99.9	P/P	80 - 120
2028142	Lead	101	101	P/P	80 - 120
2028142	Nickel	98.5	99.4	P/P	80 - 120
2028142	Silver	106	106	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352579

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027984	Chloride	93.9		P	90 - 110
2028147	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352581

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027984	Sulfate	91.8		P	90 - 110
2028147	Sulfate	99.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352623

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027957	Ammonia-N	103	102	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352399

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027987	Kjeldahl Nitrogen	99.8	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028025	NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352374

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028118	Total-P	103	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352223

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028119	O-Phosphate-P	90.0	90.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P352649

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027917	Fluoride	97.3	97.3	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352350

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027985	Organic Carbon	96.1	95.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P352235

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028147	Turbidity	0.647	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352333

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028142	Calcium	0.522	Spike	P	0 - 20
2028142	Iron	0.869	Spike	P	0 - 20
2028142	Magnesium	1.13	Spike	P	0 - 20
2028142	Potassium	1.91	Spike	P	0 - 20
2028142	Sodium	0.551	Spike	P	0 - 20
2028142	Zinc	0.798	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352333

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028142	Arsenic	0.531	Spike	P	0 - 20
2028142	Cadmium	1.37	Spike	P	0 - 20
2028142	Chromium	0.748	Spike	P	0 - 20
2028142	Copper	0.881	Spike	P	0 - 20
2028142	Lead	0.205	Spike	P	0 - 20
2028142	Nickel	0.814	Spike	P	0 - 20
2028142	Silver	0.324	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027984	Chloride	3.49	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P352581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027984	Sulfate	3.61	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027957	Ammonia-N	0.403	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352399

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027987	Kjeldahl Nitrogen	2.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028025	NO2NO3-N	0.310	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352374

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028118	Total-P	3.27	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352223

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028119	O-Phosphate-P	0.333	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P352239

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028066	Color (true)	0.521	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P352644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027917	Total Alkalinity	0.121	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P352739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027984	TDS	4.40	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P352649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027917	Fluoride	0.0	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P352350

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027985	Organic Carbon	0.750	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: A86711

Included Lab Sample IDs: 2028026

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	98.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A86716

Included Lab Sample IDs: 2028024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	104	102	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A86717

Included Lab Sample IDs: 2028024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.6	100	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86724

Included Lab Sample IDs: 2028025

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

Reference Method: SM 5310 B-00

Run ID: A86745

Included Lab Sample IDs: 2028025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.5	95.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86773

Included Lab Sample IDs: 2028025

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86794

Included Lab Sample IDs: 2028025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.8	99.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86803

Included Lab Sample IDs: 2028029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	98.9	P/P	90 - 110
Iron	101	98.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86803

Included Lab Sample IDs: 2028029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Magnesium	101	99.9	P/P	90 - 110
Potassium	101	100	P/P	90 - 110
Sodium	103	98.9	P/P	90 - 110
Zinc	100	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86830

Included Lab Sample IDs: 2028029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.0	97.6	P/P	90 - 110
Cadmium	99.3	99.3	P/P	90 - 110
Chromium	99.8	99.6	P/P	90 - 110
Copper	100	99.0	P/P	90 - 110
Lead	100	99.5	P/P	90 - 110
Nickel	100	98.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86839

Included Lab Sample IDs: 2028024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	99.0	P/P	90 - 110
Sulfate	102	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86854

Included Lab Sample IDs: 2028025

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

Reference Method: SM 2320 B-97

Run ID: A86860

Included Lab Sample IDs: 2028024

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

Reference Method: SM 4500 F-C-97

Run ID: A86860

Included Lab Sample IDs: 2028024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87005

Included Lab Sample IDs: 2028029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87005

Included Lab Sample IDs: 2028029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	101	103	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						0.647	
EPA 200.7 Rev. 4.4	Calcium	103	99.2	102				0.522
	Iron	105	107	103	102			0.869
	Magnesium	111	112	109	107			1.13
	Potassium	107	107	106	104			1.91
	Sodium	105	101	102				0.551
	Zinc	99.3	104	98.8	98.0			0.798
EPA 200.8 Rev. 5.4	Arsenic	105	102	101	101			0.531
	Cadmium	101	102	103	104			1.37
	Chromium	100	99.9	102	103			0.748
	Copper	103	99.5	99.0	99.9			0.881
	Lead	102	100	101	101			0.205
	Nickel	104	99.4	98.5	99.4			0.814
	Silver	107	106	106	106			0.324
EPA 300.0 Rev. 2.1	Chloride	97.0	93.9	101			3.49	
	Sulfate	95.6	91.8	99.5			3.61	
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	103	102				0.403
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	99.8	103				2.28
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	99.5	99.0				0.310
EPA 365.1 Rev. 2.0	Total-P	99.8	103	99.0				3.27
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	90.0	90.3				0.333
SM 2120 B	Color (true)	97.7					0.521	
SM 2320 B-97	Total Alkalinity	101					0.121	
SM 2540 C-97	TDS						4.40	
SM 4500 F-C-97	Fluoride	97.1	97.3	97.3				0.0
SM 5310 B-00	Organic Carbon	95.8	96.1	95.1				0.750

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2028024
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2028029
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2028029
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2028024
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2028024
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2028025
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2028025
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2028025
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2028025
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2028026
SM 2120 B / E31780	True Color measured at 450 nm	2028024
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2028024
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2028024
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2028024
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2028024

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2028025

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	09/25/2018			09/25/2018 16:42	Megan Treadwell	2028024
EPA 200.7 Rev. 4.4	09/25/2018	09/26/2018 17:40	Elliott D. Healy	09/28/2018 14:51	Betina Topolski	2028029
EPA 200.8 Rev. 5.4	09/25/2018	09/26/2018 17:40	Elliott D. Healy	10/01/2018 21:14	Allison Taylor	2028029
	09/25/2018	09/26/2018 17:40	Elliott D. Healy	10/08/2018 21:14	Allison Taylor	2028029
EPA 300.0 Rev. 2.1	09/25/2018			10/02/2018 03:00	Lipi Saha	2028024
EPA 350.1 Rev. 2.0	09/25/2018			10/01/2018 12:10	Ping Hua	2028025
EPA 351.2 Rev. 2.0	09/25/2018	09/27/2018 15:15	Adrian Shelby	09/28/2018 14:14	Joseph Suarez	2028025
EPA 353.2 Rev. 2.0	09/25/2018			09/26/2018 09:55	Beverly Y. Sanders	2028025
EPA 365.1 Rev. 2.0	09/25/2018	09/27/2018 11:30	Sima Feizi	09/28/2018 08:52	Beverly Y. Sanders	2028025
EPA 365.1 Rev. 2.0 dissolved	09/25/2018			09/25/2018 16:39	Julia Storbeck	2028026
SM 2120 B	09/25/2018			09/25/2018 16:33	DeAsia Armster	2028024
SM 2320 B-97	09/25/2018			10/02/2018 13:59	Dale L. Simmons	2028024
SM 2540 C-97	09/25/2018			09/28/2018 15:48	Yijie Li	2028024
SM 2540 D-97	09/25/2018			09/28/2018 15:48	Yijie Li	2028024
SM 4500 F-C-97	09/25/2018			10/02/2018 13:59	Dale L. Simmons	2028024
SM 5310 B-00	09/25/2018			09/27/2018 08:10	Megan Treadwell	2028025