

Chemical Analysis Report

CEN-DIST-2018-11-14-02

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

Event Description: **Puzzle Lk Drain**
Request ID: **RQ-2018-11-12-40**
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

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Certified by: Colin Wright, Program Administrator

Date Certified: 30-NOV-2018 13:26

A handwritten signature in black ink, appearing to read "Colin Wright", is shown on a light-colored rectangular 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: SAINT JONHS RIVER @ 300M DOWNSTREAM OF HATBILL PARK RAMP **Collection Date/Time: 11/13/2018 10:35**

Field ID: G3CE0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041092	EPA 180.1 Rev. 2.0	Turbidity	19	A	NTU	P354700	
	EPA 300.0 Rev. 2.1	Chloride	420		mg Cl/L	P355178	
		Sulfate	110		mg SO4/L	P355180	
		Color (true)	130	A	PCU	P354681	
	SM 2320 B-97	Total Alkalinity	72		mg CaCO3/L	P354960	
	SM 2540 C-97	TDS	943		mg/L	P354854	
	SM 2540 D-97	TSS	24		mg/L	P354867	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P354962	
2041093	EPA 350.1 Rev. 2.0	Ammonia-N	0.050		mg N/L	P354939	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P354803	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.26		mg N/L	P354820	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P354829	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P354837	
2041094	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.023		mg P/L	P354682	
2041097	EPA 200.7 Rev. 4.4	Calcium	65.0		mg/L	P354738	
		Iron	1.13E+03		ug/L	P354738	
		Magnesium	27.1		mg/L	P354738	
		Potassium	7.6		mg/L	P354738	
		Sodium	231		mg/L	P354738	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P354738	
		Arsenic	0.90		ug/L	P354738	
		Cadmium	0.020	U	ug/L	P354738	
		Chromium	0.62	I	ug/L	P354738	
		Copper	0.77	I	ug/L	P354738	
		Lead	1.09		ug/L	P354738	
		Nickel	0.51	I	ug/L	P354738	
		Silver	0.010	U	ug/L	P354738	

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: P354700

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354738

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: P354738

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: P355178

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355180

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354939

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354803

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: P354820

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354829

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354682

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

Reference Method: SM 2120 B
Batch ID: P354681

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P354960

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

Reference Method: SM 2540 C-97
Batch ID: P354854

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P354867

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P354962

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P354837

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: P354738

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	99.6		P	85 - 115
Iron	99.1		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	99.5		P	85 - 115
Sodium	101		P	85 - 115
Zinc	96.4		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354738

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355178

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355180

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354939

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354803

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354820

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354829

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354682

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.5		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P354681

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.1		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P354960

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

Reference Method: SM 4500 F-C-97
Batch ID: P354962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354837

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041219	Calcium	98.9	102	P/P	80 - 120
2041219	Iron	98.0	101	P/P	80 - 120
2041219	Magnesium	99.9	103	P/P	80 - 120
2041219	Potassium	101	104	P/P	80 - 120
2041219	Sodium	103		P	80 - 120
2041219	Zinc	97.2	99.3	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041219	Arsenic	105	104	P/P	80 - 120
2041219	Cadmium	104	105	P/P	80 - 120
2041219	Chromium	109	103	P/P	80 - 120
2041219	Copper	116	104	P/P	80 - 120
2041219	Lead	105	101	P/P	80 - 120
2041219	Nickel	104	103	P/P	80 - 120
2041219	Silver	99.5	99.0	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355178

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2039565	Chloride	99.2		P	90 - 110
2041072	Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2039565	Sulfate	97.4		P	90 - 110
2041072	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041105	Ammonia-N	98.9	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354803

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041080	Kjeldahl Nitrogen	102	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354820

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040971	NO2NO3-N	102	102	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354829

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040992	Total-P	102	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040993	O-Phosphate-P	93.4	94.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P354962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040905	Fluoride	100	99.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040987	Organic Carbon	105	98.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P354700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041092	Turbidity	2.57	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041219	Calcium	2.87	Spike	P	0 - 20
2041219	Iron	2.98	Spike	P	0 - 20
2041219	Magnesium	2.96	Spike	P	0 - 20
2041219	Potassium	3.65	Spike	P	0 - 20
2041219	Sodium	0.985	Spike	P	0 - 20
2041219	Zinc	2.10	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041219	Arsenic	1.08	Spike	P	0 - 20
2041219	Cadmium	1.23	Spike	P	0 - 20
2041219	Chromium	5.56	Spike	P	0 - 20
2041219	Copper	11.5	Spike	P	0 - 20
2041219	Lead	4.09	Spike	P	0 - 20
2041219	Nickel	1.24	Spike	P	0 - 20
2041219	Silver	0.439	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2039565	Chloride	0.173	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2039565	Sulfate	0.855	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041105	Ammonia-N	0.0407	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041080	Kjeldahl Nitrogen	1.57	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354820

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040971	NO2NO3-N	0.491	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040992	Total-P	5.33	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040993	O-Phosphate-P	0.959	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P354681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041092	Color (true)	1.17	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P354960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040905	Total Alkalinity	1.24	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P354854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041022	TDS	5.20	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P354962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040905	Fluoride	0.473	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P354837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040987	Organic Carbon	4.21	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: A87755
Included Lab Sample IDs: 2041092

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A87756
Included Lab Sample IDs: 2041094

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A87763
Included Lab Sample IDs: 2041092

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A87823
Included Lab Sample IDs: 2041093

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: A87828
Included Lab Sample IDs: 2041093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	97.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A87843
Included Lab Sample IDs: 2041097

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	94.6	96.0	P/P	90 - 110
Iron	95.4	96.8	P/P	90 - 110
Magnesium	95.8	97.0	P/P	90 - 110
Potassium	97.0	98.0	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	97.9	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A87853
Included Lab Sample IDs: 2041093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87871

Included Lab Sample IDs: 2041093

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: A87886

Included Lab Sample IDs: 2041092

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.0	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A87886

Included Lab Sample IDs: 2041092

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87890

Included Lab Sample IDs: 2041093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87903

Included Lab Sample IDs: 2041097

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	103	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	103	104	P/P	90 - 110
Copper	104	105	P/P	90 - 110
Lead	101	102	P/P	90 - 110
Nickel	102	104	P/P	90 - 110
Silver	98.4	98.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A87993

Included Lab Sample IDs: 2041092

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	103	P/P	90 - 110
Sulfate	103	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	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					2.57	
EPA 200.7 Rev. 4.4	Calcium	99.6	98.9	102			2.87
	Iron	99.1	98.0	101			2.98
	Magnesium	102	99.9	103			2.96
	Potassium	99.5	101	104			3.65
	Sodium	101	103				0.985
	Zinc	96.4	97.2	99.3			2.10
EPA 200.8 Rev. 5.4	Arsenic	105	105	104			1.08
	Cadmium	105	104	105			1.23
	Chromium	104	109	103			5.56
	Copper	104	116	104			11.5
	Lead	101	105	101			4.09
	Nickel	103	104	103			1.24
	Silver	101	99.5	99.0			0.439
EPA 300.0 Rev. 2.1	Chloride	103	99.2	99.1		0.173	
	Sulfate	103	97.4	101		0.855	
EPA 350.1 Rev. 2.0	Ammonia-N	98.5	98.9	98.8			0.0407
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	102	99.2			1.57
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	102	102			0.491
EPA 365.1 Rev. 2.0	Total-P	97.8	102	97.0			5.33
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.5	93.4	94.3			0.959
SM 2120 B	Color (true)	99.1				1.17	
SM 2320 B-97	Total Alkalinity	101				1.24	
SM 2540 C-97	TDS					5.20	
SM 4500 F-C-97	Fluoride	97.7	100	99.5			0.473
SM 5310 B-00	Organic Carbon	97.1	105	98.4			4.21

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2041092
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2041097
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2041097
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2041092
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2041092
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2041093
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2041093
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2041093
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2041093
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2041094
SM 2120 B / E31780	True Color measured at 450 nm	2041092
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2041092
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2041092
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2041092
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2041092

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2041093

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	11/14/2018			11/14/2018 15:20	Megan Treadwell	2041092
EPA 200.7 Rev. 4.4	11/14/2018	11/15/2018 14:35	Elliott D. Healy	11/16/2018 16:20	Betina Topolski	2041097
	11/14/2018	11/15/2018 14:35	Elliott D. Healy	11/16/2018 16:28	Betina Topolski	2041097
EPA 200.8 Rev. 5.4	11/14/2018	11/15/2018 14:35	Elliott D. Healy	11/20/2018 20:48	Allison Taylor	2041097
EPA 300.0 Rev. 2.1	11/14/2018			11/28/2018 02:41	Lipi Saha	2041092
EPA 350.1 Rev. 2.0	11/14/2018			11/15/2018 12:15	Ping Hua	2041093
EPA 351.2 Rev. 2.0	11/14/2018	11/16/2018 11:30	Adrian Shelby	11/20/2018 09:52	Joseph Suarez	2041093
EPA 353.2 Rev. 2.0	11/14/2018			11/16/2018 11:35	Beverly Y. Sanders	2041093
EPA 365.1 Rev. 2.0	11/14/2018	11/16/2018 12:50	Sima Feizi	11/19/2018 10:12	Beverly Y. Sanders	2041093
EPA 365.1 Rev. 2.0 dissolved	11/14/2018			11/14/2018 16:41	Jhamieka S. Greenwood	2041094
SM 2120 B	11/14/2018			11/14/2018 16:57	Chelsea Hernandez	2041092
SM 2320 B-97	11/14/2018			11/16/2018 02:57	Dale L. Simmons	2041092
SM 2540 C-97	11/14/2018			11/15/2018 14:02	Yijie Li	2041092
SM 2540 D-97	11/14/2018			11/15/2018 14:02	Yijie Li	2041092
SM 4500 F-C-97	11/14/2018			11/16/2018 02:57	Dale L. Simmons	2041092
SM 5310 B-00	11/14/2018			11/15/2018 10:23	Megan Treadwell	2041093