

Chemical Analysis Report

CEN-DIST-2017-02-28-02

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

Event Description: **Jackson Canal/Lk Amoret + D&B**
Request ID: **RQ-2017-02-27-53**
Customer: **CEN-DIST**
Project ID: **SMP**

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

For additional information please contact
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Certified by: Colin Wright, Program Administrator

Date Certified: 27-MAR-2017 12:24

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray 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: Lake Amoret 85m SW of Center

Collection Date/Time: 02/27/2017 11:25

Field ID: G4CE0072

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1875954	EPA 180.1 Rev. 2.0	Turbidity	7.4		NTU	P320677	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P321452	
		Sulfate	19	A	mg SO4/L	P321621	
	SM 2120 B	Color (true)	25		PCU	P320667	
	SM 2320 B-97	Total Alkalinity	23		mg CaCO3/L	P321207	
	SM 2540 C-97	TDS	80		mg/L	P321095	
	SM 2540 D-97	TSS	8	I	mg/L	P321059	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P321042	
1875957	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P320998	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P320882	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P320828	
	EPA 365.1 Rev. 2.0	Total-P	0.085		mg P/L	P320725	
	SM 5310 B-00	Organic Carbon	7.4		mg C/L	P320853	
1875960	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P320680	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Amoret 85m SW of Center (Duplicate)

Collection Date/Time: 02/27/2017 11:25

Field ID: G4CE0072_D

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1875955	EPA 180.1 Rev. 2.0	Turbidity	7.5		NTU	P320677	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P321452	
		Sulfate	20		mg SO4/L	P321623	
	SM 2120 B	Color (true)	26		PCU	P320667	
	SM 2320 B-97	Total Alkalinity	23		mg CaCO3/L	P321207	
	SM 2540 C-97	TDS	73		mg/L	P321095	
	SM 2540 D-97	TSS	10	I	mg/L	P321059	
	SM 4500 F-C-97	Fluoride	0.039	I	mg F/L	P321042	
1875958	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P320998	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P320882	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P320828	
	EPA 365.1 Rev. 2.0	Total-P	0.085		mg P/L	P320725	
	SM 5310 B-00	Organic Carbon	7.3		mg C/L	P320853	
1875961	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P320680	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Field Blank

Collection Date/Time: 02/27/2017 11:35

Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1875951	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P320677	

Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1875951	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P321452	
		Sulfate	0.20	U	mg SO4/L	P321623	
	SM 2120 B	Color (true)	2.5	U	PCU	P320667	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P321207	
	SM 2540 C-97	TDS	15	U	mg/L	P321092	
	SM 2540 D-97	TSS	2	U	mg/L	P321056	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P321042	
1875952	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P320998	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P320882	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P320828	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P320725	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P320853	
1875953	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P320680	
1875977	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P321026	
		Iron	30	U	ug/L	P321026	
		Magnesium	0.040	U	mg/L	P321026	
		Potassium	0.30	U	mg/L	P321026	
		Sodium	0.50	U	mg/L	P321026	
		Zinc	5.0	U	ug/L	P321026	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P321026	
		Cadmium	0.020	U	ug/L	P321026	
		Chromium	0.40	U	ug/L	P321026	
		Copper	0.20	U	ug/L	P321026	
		Lead	0.050	U	ug/L	P321026	
		Nickel	0.20	U	ug/L	P321026	
		Silver	0.010	U	ug/L	P321026	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Jackson Canal 1100m DS of Control Structure Collection Date/Time: 02/27/2017 13:10

Field ID: G4CE0060

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1875956	EPA 180.1 Rev. 2.0	Turbidity	1.1	A	NTU	P320677	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P321452	
		Sulfate	0.68		mg SO4/L	P321621	
	SM 2120 B	Color (true)	88		PCU	P320667	
	SM 2320 B-97	Total Alkalinity	20		mg CaCO3/L	P321207	
	SM 2540 C-97	TDS	70		mg/L	P321095	
	SM 2540 D-97	TSS	2	I	mg/L	P321059	
	SM 4500 F-C-97	Fluoride	0.089	I	mg F/L	P321042	
1875959	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P320998	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P320881	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P320828	
	EPA 365.1 Rev. 2.0	Total-P	0.041		mg P/L	P320725	

Field ID: G4CE0060

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1875959	SM 5310 B-00	Organic Carbon	15		mg C/L	P320853	
1875962	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P320680	

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: P320677

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P321026

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: P321026

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: P321452

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321621

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321623

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320998

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320881

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320882

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320828

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320725

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P320680

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

Reference Method: SM 2120 B
Batch ID: P320667

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P321207

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P321092

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P321095

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P321056

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P321059

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P321042

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P320853

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: P321026

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	102		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	102		P	85 - 115
Sodium	94.0		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321026

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.0		P	85 - 115
Cadmium	93.3		P	85 - 115
Chromium	95.5		P	85 - 115
Copper	96.0		P	85 - 115
Lead	91.0		P	85 - 115
Nickel	97.5		P	85 - 115
Silver	90.6		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321452

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	94.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321621

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321623

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320998

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320881

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	105		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320882

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320828

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320725

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	90.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P320680

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
 Batch ID: P321207

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
 Batch ID: P321042

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P320853

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P321026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875858	Calcium	106		P	80 - 120
1875858	Iron	107	102	P/P	80 - 120
1875858	Magnesium	107	102	P/P	80 - 120
1875858	Potassium	104	101	P/P	80 - 120
1875858	Sodium	99.3		P	80 - 120
1875858	Zinc	102	101	P/P	80 - 120
1876277	Calcium	101		P	80 - 120
1876277	Iron	98.7		P	80 - 120
1876277	Magnesium	100		P	80 - 120
1876277	Potassium	98.8		P	80 - 120
1876277	Sodium	97.6		P	80 - 120
1876277	Zinc	98.7		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P321026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875858	Arsenic	96.5	97.6	P/P	80 - 120
1875858	Cadmium	92.9	95.7	P/P	80 - 120
1875858	Chromium	94.3	95.7	P/P	80 - 120
1875858	Copper	95.6	96.3	P/P	80 - 120
1875858	Lead	95.1	94.2	P/P	80 - 120
1875858	Nickel	95.6	95.4	P/P	80 - 120
1875858	Silver	91.1	91.8	P/P	80 - 120
1876277	Arsenic	99.6		P	80 - 120
1876277	Cadmium	96.0		P	80 - 120
1876277	Chromium	93.8		P	80 - 120
1876277	Copper	99.3		P	80 - 120
1876277	Lead	94.7		P	80 - 120
1876277	Nickel	98.4		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1876277	Silver	91.3		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321452

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875920	Chloride	94.9		P	90 - 110
1876124	Chloride	92.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875954	Sulfate	99.3		P	90 - 110
1876123	Sulfate	98.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321623

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1876340	Sulfate	103		P	90 - 110
1876407	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320998

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875924	Ammonia-N	99.5	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875959	Kjeldahl Nitrogen	92.5	96.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875957	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875959	Total-P	95.1	94.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P320680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875962	O-Phosphate-P	97.4	96.2	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P321042

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875792	Fluoride	102	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P320853

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875905	Organic Carbon	96.4	97.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P320677

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875956	Turbidity	4.57	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P321026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875858	Calcium	0.401	Spike	P	0 - 20
1875858	Iron	4.23	Spike	P	0 - 20
1875858	Magnesium	4.41	Spike	P	0 - 20
1875858	Potassium	1.82	Spike	P	0 - 20
1875858	Sodium	0.373	Spike	P	0 - 20
1875858	Zinc	1.17	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875858	Arsenic	1.12	Spike	P	0 - 20
1875858	Cadmium	2.92	Spike	P	0 - 20
1875858	Chromium	1.39	Spike	P	0 - 20
1875858	Copper	0.695	Spike	P	0 - 20
1875858	Lead	0.944	Spike	P	0 - 20
1875858	Nickel	0.205	Spike	P	0 - 20
1875858	Silver	0.850	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875920	Chloride	0.899	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875954	Sulfate	0.136	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1876407	Sulfate	0.0284	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320998

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875924	Ammonia-N	0.435	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875959	Kjeldahl Nitrogen	2.54	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875958	Kjeldahl Nitrogen	2.17	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875957	NO2NO3-N	0.962	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875959	Total-P	0.294	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P320680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875962	O-Phosphate-P	1.09	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
 Batch ID: P320667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875983	Color (true)	0.479	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P321207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1876211	Total Alkalinity	0.106	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
 Batch ID: P321092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875374	TDS	7.97	Sample	P	0 - 10

Reference Method: SM 2540 C-97
 Batch ID: P321095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875904	TDS	7.69	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P321042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875792	Fluoride	0.480	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
 Batch ID: P320853

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875905	Organic Carbon	0.638	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: A74777
 Included Lab Sample IDs: 1875951, 1875954, 1875955, 1875956

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	95.0	95.3	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A74781

Included Lab Sample IDs: 1875951, 1875954, 1875955, 1875956

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A74782

Included Lab Sample IDs: 1875953, 1875960, 1875961, 1875962

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.7	P/P	90 - 110
O-Phosphate-P	99.2	100	P/P	90 - 110
O-Phosphate-P	99.7	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A74824

Included Lab Sample IDs: 1875957, 1875958

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.4	97.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A74836

Included Lab Sample IDs: 1875952, 1875957, 1875958, 1875959

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A74838

Included Lab Sample IDs: 1875952, 1875959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.5	P/P	90 - 110
Total-P	99.5	98.5	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A74852

Included Lab Sample IDs: 1875952, 1875957, 1875958, 1875959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.7	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A74900

Included Lab Sample IDs: 1875952, 1875957, 1875958, 1875959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	98.0	P/P	90 - 110
Kjeldahl Nitrogen	104	99.1	P/P	90 - 110
Kjeldahl Nitrogen	98.9	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A74904

Included Lab Sample IDs: 1875952, 1875957, 1875958, 1875959

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

Reference Method: SM 4500 F-C-97

Run ID: A74917

Included Lab Sample IDs: 1875951, 1875954, 1875955, 1875956

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A74976

Included Lab Sample IDs: 1875951, 1875954, 1875955, 1875956

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	102	P/P	90 - 110
Total Alkalinity	109	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A74977

Included Lab Sample IDs: 1875951, 1875954, 1875955, 1875956

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	93.5	93.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75007

Included Lab Sample IDs: 1875977

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	101	P/P	90 - 110
Cadmium	98.5	98.6	P/P	90 - 110
Chromium	101	100	P/P	90 - 110
Copper	104	103	P/P	90 - 110
Lead	93.3	92.9	P/P	90 - 110
Nickel	103	102	P/P	90 - 110
Silver	94.8	93.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A75052

Included Lab Sample IDs: 1875977

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	105	102	P/P	95 - 105
Iron	102	104	P/P	95 - 105
Magnesium	103	103	P/P	95 - 105
Potassium	103	102	P/P	95 - 105
Sodium	101	101	P/P	95 - 105
Zinc	102	101	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75123

Included Lab Sample IDs: 1875951, 1875954, 1875955, 1875956

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	100	103	P/P	90 - 110
Sulfate	98.4	101	P/P	90 - 110
Sulfate	99.8	98.4	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				4.57	
EPA 200.7 Rev. 4.4	Calcium	104	106 101			0.401
	Iron	102	107 102 98.7			4.23
	Magnesium	103	107 102 100			4.41
	Potassium	102	104 101 98.8			1.82
	Sodium	94.0	99.3 97.6			0.373
	Zinc	102	102 101 98.7			1.17
EPA 200.8 Rev. 5.4	Arsenic	97.0	96.5 97.6 99.6			1.12
	Cadmium	93.3	92.9 95.7 96.0			2.92
	Chromium	95.5	94.3 95.7 93.8			1.39
	Copper	96.0	95.6 96.3 99.3			0.695
	Lead	91.0	95.1 94.2 94.7			0.944
	Nickel	97.5	95.6 95.4 98.4			0.205
	Silver	90.6	91.1 91.8 91.3			0.850
EPA 300.0 Rev. 2.1	Chloride	94.3	94.9 92.7		0.899	
	Sulfate	100	99.3 98.1		0.136	
	Sulfate	103	102 103		0.0284	
EPA 350.1 Rev. 2.0	Ammonia-N	102	99.5 98.8			0.435
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	92.5 96.9			2.54
	Kjeldahl Nitrogen	102				2.17
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	105	104 104			0.962
EPA 365.1 Rev. 2.0	Total-P	90.8	95.1 94.8			0.294
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.4 96.2			1.09
SM 2120 B	Color (true)				0.479	
SM 2320 B-97	Total Alkalinity	103			0.106	
SM 2540 C-97	TDS				7.97	
	TDS				7.69	
SM 4500 F-C-97	Fluoride	97.3	102 101			0.480
SM 5310 B-00	Organic Carbon	95.5	96.4 97.3			0.638

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1875951, 1875954, 1875955, 1875956
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1875977

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1875977
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1875951, 1875954, 1875955, 1875956
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1875951, 1875954, 1875955, 1875956
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1875952, 1875957, 1875958, 1875959
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1875952, 1875957, 1875958, 1875959
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1875952, 1875957, 1875958, 1875959
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1875952, 1875957, 1875958, 1875959
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1875953, 1875960, 1875961, 1875962
SM 2120 B / E31780	True Color measured at 450 nm	1875951, 1875954, 1875955, 1875956
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1875951, 1875954, 1875955, 1875956
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1875951, 1875954, 1875955, 1875956
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1875951, 1875954, 1875955, 1875956
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1875951, 1875954, 1875955, 1875956
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1875952, 1875957, 1875958, 1875959

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	02/28/2017			02/28/2017 14:48	Sima Feizi	1875951, 1875954, 1875955, 1875956
EPA 200.7 Rev. 4.4	02/28/2017	03/06/2017	Elliott D. Healy	03/08/2017	Joshua Ayres	1875977
EPA 200.8 Rev. 5.4	02/28/2017	03/06/2017	Elliott D. Healy	03/09/2017	Betina Topolski	1875977
EPA 300.0 Rev. 2.1	02/28/2017			03/10/2017	Elisa J Lutz	1875951, 1875954, 1875955, 1875956
	02/28/2017			03/14/2017	Elisa J Lutz	1875954, 1875956
	02/28/2017			03/15/2017	Elisa J Lutz	1875951, 1875955
EPA 350.1 Rev. 2.0	02/28/2017			03/02/2017	Sofia Elnemr	1875952, 1875957, 1875958, 1875959
EPA 351.2 Rev. 2.0	02/28/2017	03/03/2017	Adrian Shelby	03/06/2017	Joseph Suarez	1875952, 1875957, 1875958, 1875959
EPA 353.2 Rev. 2.0	02/28/2017			03/02/2017	Beverly Y. Sanders	1875952, 1875957, 1875958, 1875959
EPA 365.1 Rev. 2.0	02/28/2017	03/01/2017	Vijayalakshmi Reddy	03/01/2017	Lipi Saha	1875957, 1875958
	02/28/2017	03/01/2017	Vijayalakshmi Reddy	03/02/2017	Lipi Saha	1875952, 1875959
EPA 365.1 Rev. 2.0 dissolved	02/28/2017			02/28/2017 15:22	Julia Storbeck	1875962
	02/28/2017			02/28/2017 15:43	Julia Storbeck	1875953
	02/28/2017			02/28/2017 15:54	Julia Storbeck	1875960
	02/28/2017			02/28/2017 15:55	Julia Storbeck	1875961
SM 2120 B	02/28/2017			02/28/2017 15:20	Julie Michelle Frank	1875951
	02/28/2017			02/28/2017 15:21	Julie Michelle Frank	1875954
	02/28/2017			02/28/2017 15:22	Julie Michelle Frank	1875955
	02/28/2017			02/28/2017 15:23	Julie Michelle Frank	1875956
SM 2320 B-97	02/28/2017			03/09/2017	Dale L. Simmons	1875951, 1875954, 1875955, 1875956
SM 2540 C-97	02/28/2017			03/01/2017	Yijie Li	1875951, 1875954, 1875955, 1875956
SM 2540 D-97	02/28/2017			03/01/2017	Yijie Li	1875951, 1875954, 1875955, 1875956
SM 4500 F-C-97	02/28/2017			03/04/2017	Dale L. Simmons	1875951, 1875954, 1875955, 1875956
SM 5310 B-00	02/28/2017			03/02/2017	Julie Michelle Frank	1875952, 1875957, 1875958, 1875959