Chemical Analysis Report

CEN-DIST-2017-05-05-01

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

Event Description: **Spruce (F)/Groover**
Request ID: **RQ-2017-05-01-69**
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: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 01-JUN-2017 17:30

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, Nutrients and Pesticides.

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: Mizner's Branch @ 50m Upstream of Main Trail Rd. **Collection Date/Time: 05/04/2017 11:38**

Field ID: G5CE0093 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1896796	EPA 180.1 Rev. 2.0	Turbidity	0.50		NTU	P324724	
	EPA 300.0 Rev. 2.1	Chloride	80		mg Cl/L	P325191	
		Sulfate	9.9		mg SO4/L	P325188	
	SM 2120 B	Color (true)	29		PCU	P324717	
	SM 2320 B-97	Total Alkalinity	209		mg CaCO3/L	P325405	
	SM 2540 C-97	TDS	375		mg/L	P325340	
	SM 2540 D-97	TSS	2	I	mg/L	P325324	
	SM 4500 F-C-97	Fluoride	0.064	I	mg F/L	P325406	
1896797	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P324813	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P324990	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P324976	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P324811	
	SM 5310 B-00	Organic Carbon	9.0		mg C/L	P324767	
1896798	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P324729	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Spruce Creek at Spruce Creek Blvd. **Collection Date/Time: 05/04/2017 12:30**

Field ID: G5CE0023 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1896793	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P324724	
	EPA 300.0 Rev. 2.1	Chloride	68		mg Cl/L	P325191	
		Sulfate	6.2		mg SO4/L	P325188	
	SM 2120 B	Color (true)	41		PCU	P324717	
	SM 2320 B-97	Total Alkalinity	264		mg CaCO3/L	P325465	
	SM 2540 C-97	TDS	418	A	mg/L	P325340	
	SM 2540 D-97	TSS	3	IA	mg/L	P325324	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P325808	
1896794	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P324813	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P324990	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.042		mg N/L	P324976	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P324811	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P324767	
1896795	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.041		mg P/L	P324729	
1896804	EPA 8321B	Sucralose**	0.37		ug/L	P324692	
	USGS O-2060-01	2,4-D	8.0E-04	U	ug/L	P324620	
		Diuron	8.0E-04	U	ug/L	P324620	
		Fenuron	0.0040	U	ug/L	P324620	
		Imidacloprid	0.0027	I	ug/L	P324620	MS
		Bentazon	0.074		ug/L	P324620	
		Linuron	0.0040	U	ug/L	P324620	

Field ID: G5CE0023 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1896804	USGS O-2060-01	Acetaminophen**	0.0080	U	ug/L	P324620	
		MCPP	8.0E-04	U	ug/L	P324620	
		Carbamazepine**	8.0E-04	I	ug/L	P324620	
		Triclopyr**	0.0040	U	ug/L	P324620	
		Primidone**	0.0040	U	ug/L	P324620	
		Fluridone**	0.010		ug/L	P324620	
1896805	EPA 200.7 Rev. 4.4	Calcium	102		mg/L	P325202	
		Iron	470		ug/L	P325202	
		Magnesium	6.87		mg/L	P325202	
		Potassium	1.9		mg/L	P325202	
		Sodium	41.4		mg/L	P325202	
		Zinc	5.0	U	ug/L	P325202	
	EPA 200.8 Rev. 5.4	Arsenic	0.41		ug/L	P325202	
		Cadmium	0.020	U	ug/L	P325202	
		Chromium	0.40	U	ug/L	P325202	
		Copper	0.20	U	ug/L	P325202	
		Lead	0.050	U	ug/L	P325202	
		Nickel	0.20	U	ug/L	P325202	
		Silver	0.010	U	ug/L	P325202	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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: P324724

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325202

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: P325202

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325202

Component	Result	Code	Units
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: P325188

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325191

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324813

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324990

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324976

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324811

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P324729

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

Reference Method: EPA 8321B
Batch ID: P324692

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2120 B
Batch ID: P324717

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P325405

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

Reference Method: SM 2320 B-97
Batch ID: P325465

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

Reference Method: SM 2540 C-97
Batch ID: P325340

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P325324

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P325406

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P325808

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P324767

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: USGS O-2060-01
Batch ID: P324620

Component	Result	Code	Units
2,4-D	8.0E-04	U	ug/L
Acetaminophen	0.0080	U	ug/L
Bentazon	8.0E-04	U	ug/L
Carbamazepine	4.0E-04	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: USGS O-2060-01
Batch ID: P324620

Component	Result	Code	Units
Diuron	8.0E-04	U	ug/L
Fenuron	0.0040	U	ug/L
Fluridone	4.0E-04	U	ug/L
Imidacloprid	8.0E-04	U	ug/L
Linuron	0.0040	U	ug/L
MCPP	8.0E-04	U	ug/L
Primidone	0.0040	U	ug/L
Triclopyr	0.0040	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	109		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	105		P	85 - 115
Sodium	107		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	102		P	85 - 115
Copper	92.5		P	85 - 115
Lead	96.9		P	85 - 115
Nickel	95.9		P	85 - 115
Silver	92.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325188

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325191

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324813

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324813

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324990

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	104		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324976

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324811

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P324729

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.6		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P324692

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	83.0		P	40 - 140

Reference Method: SM 2320 B-97
Batch ID: P325405

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

Reference Method: SM 2320 B-97
Batch ID: P325465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P325406

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.8		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P325808

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P324767

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.2		P	85 - 115

Reference Method: USGS O-2060-01
Batch ID: P324620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	69.8		P	40 - 140
Acetaminophen	103		P	40 - 140
Bentazon	65.8		P	40 - 140
Carbamazepine	121		P	40 - 140
Diuron	120		P	40 - 140
Fenuron	107		P	40 - 140
Fluridone	107		P	40 - 140
Imidacloprid	117		P	40 - 160
Linuron	120		P	40 - 140
MCPP	80.9		P	40 - 140
Primidone	104		P	40 - 140
Triclopyr	69.4		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325202

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896152	Calcium	105		P	80 - 120
1896152	Iron	107		P	80 - 120
1896152	Magnesium	103		P	80 - 120
1896152	Potassium	103		P	80 - 120
1896152	Sodium	107		P	80 - 120
1896152	Zinc	99.0		P	80 - 120
1897166	Calcium	102		P	80 - 120
1897166	Iron	107	108	P/P	80 - 120
1897166	Magnesium	102		P	80 - 120
1897166	Potassium	101	101	P/P	80 - 120
1897166	Sodium	104	104	P/P	80 - 120
1897166	Zinc	97.7	98.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325202

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896152	Arsenic	101		P	80 - 120
1896152	Cadmium	104		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325202

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896152	Chromium	101		P	80 - 120
1896152	Copper	89.9		P	80 - 120
1896152	Lead	96.5		P	80 - 120
1896152	Nickel	92.8		P	80 - 120
1896152	Silver	92.8		P	80 - 120
1897166	Arsenic	103	102	P/P	80 - 120
1897166	Cadmium	105	102	P/P	80 - 120
1897166	Chromium	104	103	P/P	80 - 120
1897166	Copper	91.0	90.9	P/P	80 - 120
1897166	Lead	97.3	96.1	P/P	80 - 120
1897166	Nickel	93.5	94.1	P/P	80 - 120
1897166	Silver	95.2	93.0	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325188

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896912	Sulfate	94.4		P	90 - 110
1896955	Sulfate	94.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896912	Chloride	98.2		P	90 - 110
1896955	Chloride	95.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896960	Ammonia-N	98.1	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896727	Kjeldahl Nitrogen	99.1	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324976

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896794	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324811

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896797	Total-P	101	105	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P324729

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896920	O-Phosphate-P	95.1	95.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P324692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896739	Sucralose	108	104	P/P	40 - 140

Reference Method: SM 4500 F-C-97
Batch ID: P325406

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896956	Fluoride	102	104	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P325808

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896723	Fluoride	98.7	99.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P324767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1894249	Organic Carbon	103		P	85 - 115

Reference Method: USGS O-2060-01
Batch ID: P324620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1896649	2,4-D	75.0	66.1	P/P	40 - 140
1896649	Acetaminophen	97.3	101	P/P	40 - 140
1896649	Bentazon	73.9	61.4	P/P	40 - 140
1896649	Carbamazepine	111	115	P/P	40 - 140
1896649	Diuron	102	107	P/P	40 - 140
1896649	Fenuron	118	109	P/P	40 - 140
1896649	Fluridone	90.6	93.1	P/P	40 - 140
1896649	Imidacloprid	213	202	F/F	40 - 160
1896649	Linuron	106	104	P/P	40 - 140
1896649	MCPP	69.0	57.4	P/P	40 - 140
1896649	Primidone	108	118	P/P	40 - 140
1896649	Triclopyr	69.4	57.6	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P324724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P324724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896723	Turbidity	16.1	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P325202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897166	Calcium	0.149	Spike	P	0 - 20
1897166	Iron	1.34	Spike	P	0 - 20
1897166	Magnesium	0.491	Spike	P	0 - 20
1897166	Potassium	0.355	Spike	P	0 - 20
1897166	Sodium	0.144	Spike	P	0 - 20
1897166	Zinc	1.12	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P325202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897166	Arsenic	0.312	Spike	P	0 - 20
1897166	Cadmium	2.41	Spike	P	0 - 20
1897166	Chromium	0.961	Spike	P	0 - 20
1897166	Copper	0.135	Spike	P	0 - 20
1897166	Lead	1.21	Spike	P	0 - 20
1897166	Nickel	0.594	Spike	P	0 - 20
1897166	Silver	2.31	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P325191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896955	Chloride	0.214	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896960	Ammonia-N	0.414	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896727	Kjeldahl Nitrogen	0.755	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896794	NO2NO3-N	0.820	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324811

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896797	Total-P	2.58	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P324729

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896920	O-Phosphate-P	0.524	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P324692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896739	Sucralose	3.67	Spike	P	0 - 30

Reference Method: SM 2120 B
Batch ID: P324717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896720	Color (true)	4.50	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P325405

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896956	Total Alkalinity	0.801	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P325465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897738	Total Alkalinity	0.304	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P325340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896793	TDS	1.44	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P325406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896956	Fluoride	1.61	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P325808

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896723	Fluoride	0.480	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P324767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1894249	Organic Carbon	0.482	Spike	P	0 - 20

Reference Method: USGS O-2060-01
Batch ID: P324620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1896649	2,4-D	12.1	Spike	P	0 - 30
1896649	Acetaminophen	3.79	Spike	P	0 - 30
1896649	Bentazon	18.3	Spike	P	0 - 30
1896649	Carbamazepine	3.07	Spike	P	0 - 30
1896649	Diuron	5.07	Spike	P	0 - 30
1896649	Fenuron	8.22	Spike	P	0 - 30
1896649	Fluridone	2.71	Spike	P	0 - 30
1896649	Imidacloprid	5.29	Spike	P	0 - 30
1896649	Linuron	1.67	Spike	P	0 - 30
1896649	MCPP	18.2	Spike	P	0 - 30
1896649	Primidone	8.62	Spike	P	0 - 30
1896649	Triclopyr	18.6	Spike	P	0 - 30

* 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
Surrogates

Lab Sample ID: 1896804
Field Sample ID: G5CE0023

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	98.0	P	40 - 150
USGS O-2060-01	2,4-D-d3	66.9	P	30 - 150
USGS O-2060-01	Acetaminophen-d4	106	P	30 - 150
USGS O-2060-01	Carbamazepine-d10	83.5	P	30 - 160
USGS O-2060-01	Diuron-d6	73.2	P	30 - 150
USGS O-2060-01	Primidone-d5	88.5	P	30 - 150

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A76218
Included Lab Sample IDs: 1896793, 1896796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.4	100	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A76221
Included Lab Sample IDs: 1896793, 1896796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A76222
Included Lab Sample IDs: 1896795, 1896798

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.8	97.9	P/P	90 - 110
O-Phosphate-P	97.9	96.3	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A76230
Included Lab Sample IDs: 1896794, 1896797

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.8	99.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A76241
Included Lab Sample IDs: 1896794, 1896797

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A76259
Included Lab Sample IDs: 1896794, 1896797

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	106	P/P	90 - 110
Total-P	104	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A76269
Included Lab Sample IDs: 1896793, 1896796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	96.9	97.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A76313
Included Lab Sample IDs: 1896794, 1896797

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A76434
Included Lab Sample IDs: 1896794, 1896797

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

Reference Method: SM 2320 B-97
Run ID: A76469
Included Lab Sample IDs: 1896796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A76469
Included Lab Sample IDs: 1896796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.4	99.5	P/P	90 - 110

Reference Method: USGS O-2060-01
Run ID: A76477
Included Lab Sample IDs: 1896804

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	88.4	89.2	P/P	50 - 150
Acetaminophen	115	122	P/P	60 - 150
Bentazon	105	102	P/P	50 - 150
Carbamazepine	124	119	P/P	60 - 150
Diuron	103	134	P/P	60 - 150
Fenuron	120	110	P/P	60 - 150
Fluridone	111	126	P/P	60 - 150
Imidacloprid	106	112	P/P	60 - 150
Linuron	116	118	P/P	60 - 150
MCPP	73.2	83.6	P/P	50 - 150
Primidone	97.6	106	P/P	60 - 150
Triclopyr	84.4	94.0	P/P	50 - 150

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A76490
Included Lab Sample IDs: 1896805

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.7	97.5	P/P	90 - 110
Cadmium	98.1	97.3	P/P	90 - 110
Chromium	101	101	P/P	90 - 110
Copper	93.1	92.7	P/P	90 - 110
Lead	95.0	94.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A76490
Included Lab Sample IDs: 1896805

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	93.7	93.5	P/P	90 - 110
Silver	94.6	94.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A76498
Included Lab Sample IDs: 1896793

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A76547
Included Lab Sample IDs: 1896805

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	99.9	99.6	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Zinc	100	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A76559
Included Lab Sample IDs: 1896804

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	87.5	79.5	P/P	60 - 150

Reference Method: SM 4500 F-C-97
Run ID: A76661
Included Lab Sample IDs: 1896793

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	100	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						16.1	
EPA 200.7 Rev. 4.4	Calcium	102	105	102				0.149
	Iron	109	107	107	108			1.34
	Magnesium	103	103	102				0.491
	Potassium	105	103	101	101			0.355

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 200.7 Rev. 4.4	Sodium	107	107	104	104			0.144
	Zinc	101	99.0	97.7	98.8			1.12
EPA 200.8 Rev. 5.4	Arsenic	101	101	103	102			0.312
	Cadmium	103	104	105	102			2.41
	Chromium	102	101	104	103			0.961
	Copper	92.5	89.9	91.0	90.9			0.135
	Lead	96.9	96.5	97.3	96.1			1.21
	Nickel	95.9	92.8	93.5	94.1			0.594
	Silver	92.9	92.8	95.2	93.0			2.31
EPA 300.0 Rev. 2.1	Chloride	101	95.4	98.2			0.214	
	Sulfate	95.7	94.3	94.4				
EPA 350.1 Rev. 2.0	Ammonia-N	98.1	98.1	97.7				0.414
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	99.1	98.1				0.755
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	102				0.820
EPA 365.1 Rev. 2.0	Total-P	97.6	101	105				2.58
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.6	95.1	95.6				0.524
EPA 8321B	Sucralose	83.0	108	104				3.67
SM 2120 B	Color (true)						4.50	
SM 2320 B-97	Total Alkalinity	103					0.801	
	Total Alkalinity	102					0.304	
SM 2540 C-97	TDS						1.44	
SM 4500 F-C-97	Fluoride	96.8	102	104				1.61
	Fluoride	98.9	98.7	99.4				0.480
SM 5310 B-00	Organic Carbon	99.2	103					0.482
USGS O-2060-01	2,4-D	69.8	75.0	66.1				12.1
	Acetaminophen	103	97.3	101				3.79
	Bentazon	65.8	73.9	61.4				18.3
	Carbamazepine	121	111	115				3.07
	Diuron	120	102	107				5.07
	Fenuron	107	118	109				8.22
	Fluridone	107	93.1	90.6				2.71
	Imidacloprid	117	213	202				5.29
	Linuron	120	106	104				1.67
	MCPP	80.9	69.0	57.4				18.2
	Primidone	104	108	118				8.62
	Triclopyr	69.4	69.4	57.6				18.6

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1896793, 1896796
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1896805
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1896805
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1896793, 1896796
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1896793, 1896796
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1896794, 1896797
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1896794, 1896797

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1896794, 1896797
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1896794, 1896797
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1896795, 1896798
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	1896804
SM 2120 B / E31780	True Color measured at 450 nm	1896793, 1896796
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1896793, 1896796
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1896793, 1896796
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1896793, 1896796
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1896793, 1896796
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1896794, 1896797
USGS O-2060-01 / E31780	Chlorinated (phenoxy acid) herbicides in water matrices by HPLC/MS/MS	1896804
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1896804

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	05/05/2017			05/05/2017 15:29	Sima Feizi	1896793, 1896796
EPA 200.7 Rev. 4.4	05/05/2017	05/12/2017	Elliott D. Healy	05/18/2017	Martin Acosta	1896805
EPA 200.8 Rev. 5.4	05/05/2017	05/12/2017	Elliott D. Healy	05/17/2017	Betina Topolski	1896805
EPA 300.0 Rev. 2.1	05/05/2017			05/11/2017	Ping Hua	1896793, 1896796
EPA 350.1 Rev. 2.0	05/05/2017			05/08/2017	Julia Storbeck	1896794, 1896797
EPA 351.2 Rev. 2.0	05/05/2017	05/11/2017	Adrian Shelby	05/15/2017	Joseph Suarez	1896794, 1896797
EPA 353.2 Rev. 2.0	05/05/2017			05/09/2017	Beverly Y. Sanders	1896794, 1896797
EPA 365.1 Rev. 2.0	05/05/2017	05/08/2017	Vijayalakshmi Reddy	05/09/2017	Christopher Armour	1896794, 1896797
EPA 365.1 Rev. 2.0 dissolved	05/05/2017			05/05/2017 16:46	Anthony C. Onicha	1896795
	05/05/2017			05/05/2017 16:54	Anthony C. Onicha	1896798
EPA 8321B	05/05/2017	05/17/2017	Mohammad Ghaffari	05/18/2017	Mohammad Ghaffari	1896804
SM 2120 B	05/05/2017			05/05/2017 14:59	Julia Storbeck	1896793, 1896796
SM 2320 B-97	05/05/2017			05/16/2017	Dale L. Simmons	1896796
	05/05/2017			05/17/2017	Dale L. Simmons	1896793
SM 2540 C-97	05/05/2017			05/10/2017	Yijie Li	1896793, 1896796
SM 2540 D-97	05/05/2017			05/10/2017	Yijie Li	1896793, 1896796
SM 4500 F-C-97	05/05/2017			05/16/2017	Dale L. Simmons	1896796
	05/05/2017			05/24/2017	Dale L. Simmons	1896793
SM 5310 B-00	05/05/2017			05/06/2017	Julie Michelle Frank	1896794, 1896797
USGS O-2060-01	05/05/2017	05/10/2017	Hoor Shaik	05/16/2017	Juyoung Kim	1896804