

Chemical Analysis Report

CEN-DIST-2017-02-24-01

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

Event Description: **Spruce (F)/UnBranch 2641/Groover + D&B**
Request ID: **RQ-2017-02-20-43**
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: Liang Lin, Environmental Administrator

Date Certified: 24-MAR-2017 12:11

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, 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: Spruce Creek at Spruce Creek Blvd

Collection Date/Time: 02/23/2017 13:00

Field ID: G5CE0083

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1875611	EPA 180.1 Rev. 2.0	Turbidity	4.5		NTU	P320492	
	EPA 300.0 Rev. 2.1	Chloride	78		mg Cl/L	P321344	
		Sulfate	19		mg SO4/L	P321346	
	SM 2120 B	Color (true)	60		PCU	P320481	
	SM 2320 B-97	Total Alkalinity	161	A	mg CaCO3/L	P320704	
	SM 2540 C-97	TDS	351		mg/L	P321093	
	SM 2540 D-97	TSS	6	I	mg/L	P321057	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P320896	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.82		mg N/L	P320792	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P320624	
1875612	EPA 353.2 Rev. 2.0	NO2NO3-N	0.93		mg N/L	P320823	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P320549	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P320603	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.058		mg P/L	P320495	
	EPA 200.7 Rev. 4.4	Calcium	67.5		mg/L	P320995	
1875621		Iron	790		ug/L	P320995	
		Magnesium	6.74		mg/L	P320995	
		Potassium	4.2		mg/L	P320995	
		Sodium	41.6		mg/L	P320995	
		Zinc	5.0	U	ug/L	P320995	
	EPA 200.8 Rev. 5.4	Arsenic	0.53		ug/L	P320995	
		Cadmium	0.020	U	ug/L	P320995	
		Chromium	0.46	I	ug/L	P320995	
		Copper	0.81		ug/L	P320995	
		Lead	0.12	I	ug/L	P320995	
		Nickel	0.33	I	ug/L	P320995	
		Silver	0.010	U	ug/L	P320995	
	EPA 8321B	Sucralose**	1.4		ug/L	P320379	
	USGS O-2060-01	Diuron	0.0040	U	ug/L	P320378	MS
		Fenuron	0.0080	U	ug/L	P320378	
1875623		Imidacloprid	0.0040	U	ug/L	P320378	
		Linuron	0.0040	U	ug/L	P320378	
		Acetaminophen**	0.0040	U	ug/L	P320378	
		Carbamazepine**	5.0E-04	I	ug/L	P320378	
		Primidone**	0.0080	U	ug/L	P320378	
		Fluridone**	0.022		ug/L	P320378	MS

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.

EPA 350.1 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: 02/23/2017 13:15

Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1875614	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P320492	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P321344	
		Sulfate	0.20	U	mg SO4/L	P321346	
		Color (true)	2.5	U	PCU	P320481	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P320704	
	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	P320896	
1875615	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P320792	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P320624	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P320824	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P320549	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P320603	
1875616	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P320495	
1875622	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P320995	
		Iron	30	U	ug/L	P320995	
		Magnesium	0.040	U	mg/L	P320995	
		Potassium	0.30	U	mg/L	P320995	
		Sodium	0.50	U	mg/L	P320995	
		Zinc	5.0	U	ug/L	P320995	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P320995	
		Cadmium	0.020	U	ug/L	P320995	
		Chromium	0.40	U	ug/L	P320995	
		Copper	0.20	U	ug/L	P320995	
		Lead	0.050	U	ug/L	P320995	
		Nickel	0.20	U	ug/L	P320995	
		Silver	0.010	U	ug/L	P320995	

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.

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P320492

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P320995

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P320995

Component	Result	Code	Units
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P320995

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: P321344

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321346

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320792

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320624

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320823

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320824

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320549

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P320495

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

Reference Method: EPA 8321B
Batch ID: P320379

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: SM 2120 B
Batch ID: P320481

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P320704

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

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

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P321093

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: P321057

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P320896

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P320603

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

Reference Method: USGS O-2060-01
Batch ID: P320378

Component	Result	Code	Units
Acetaminophen	0.0040	U	ug/L
Carbamazepine	4.0E-04	U	ug/L
Diuron	0.0040	U	ug/L
Fenuron	0.0080	U	ug/L
Fluridone	4.0E-04	U	ug/L
Imidacloprid	0.0040	U	ug/L
Linuron	0.0040	U	ug/L
Primidone	0.0080	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P320995

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	99.9		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	103		P	85 - 115
Sodium	101		P	85 - 115
Zinc	95.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P320995

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	103		P	85 - 115
Copper	102		P	85 - 115
Lead	94.6		P	85 - 115
Nickel	102		P	85 - 115
Silver	96.5		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321344

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321344

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321346

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320792

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320624

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: P320823

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320824

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: P320549

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P320495

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.6		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P320379

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	81.5		P	40 - 140

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
 Batch ID: P320704

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
 Batch ID: P320896

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.0		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P320603

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.9		P	85 - 115

Reference Method: USGS O-2060-01
 Batch ID: P320378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Acetaminophen	69.6		P	40 - 140
Carbamazepine	96.8		P	40 - 140
Diuron	80.4		P	40 - 140
Fenuron	83.2		P	40 - 140
Fluridone	76.8		P	40 - 140
Imidacloprid	77.2		P	40 - 160
Linuron	78.8		P	40 - 140
Primidone	93.6		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P320995

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1874126	Calcium	101		P	80 - 120
1874126	Iron	98.7		P	80 - 120
1874126	Magnesium	98.6		P	80 - 120
1874126	Potassium	103		P	80 - 120
1874126	Sodium	98.3		P	80 - 120
1874126	Zinc	95.8		P	80 - 120
1875820	Calcium	103		P	80 - 120
1875820	Iron	102	100	P/P	80 - 120
1875820	Magnesium	102	100	P/P	80 - 120
1875820	Potassium	102	101	P/P	80 - 120
1875820	Sodium	101		P	80 - 120
1875820	Zinc	98.5	97.3	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P320995

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P320995

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1874126	Arsenic	104		P	80 - 120
1874126	Cadmium	102		P	80 - 120
1874126	Chromium	104		P	80 - 120
1874126	Copper	101		P	80 - 120
1874126	Lead	94.4		P	80 - 120
1874126	Nickel	102		P	80 - 120
1874126	Silver	97.5		P	80 - 120
1875820	Arsenic	105	105	P/P	80 - 120
1875820	Cadmium	102	102	P/P	80 - 120
1875820	Chromium	102	103	P/P	80 - 120
1875820	Copper	102	103	P/P	80 - 120
1875820	Lead	97.2	97.7	P/P	80 - 120
1875820	Nickel	102	102	P/P	80 - 120
1875820	Silver	97.9	98.5	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321344

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875689	Chloride	101		P	90 - 110
1875695	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875689	Sulfate	98.5		P	90 - 110
1875695	Sulfate	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320624

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875709	Kjeldahl Nitrogen	102	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320823

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875347	NO2NO3-N	101	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320824

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875517	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875708	Total-P	97.8	97.4	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P320495

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875613	O-Phosphate-P	93.9	96.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P320379

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875132	Sucralose	95.0	103	P/P	40 - 140

Reference Method: SM 4500 F-C-97
Batch ID: P320896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875611	Fluoride	99.9	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P320603

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875431	Organic Carbon	96.1	97.8	P/P	85 - 115

Reference Method: USGS O-2060-01
Batch ID: P320378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1875966	Acetaminophen	66.0	53.6	P/P	40 - 140
1875966	Carbamazepine	51.0	55.8	P/P	40 - 140
1875966	Diuron	40.8	36.8	P/F	40 - 140
1875966	Fenuron	45.6	47.6	P/P	40 - 140
1875966	Fluridone	37.7	44.0	F/P	40 - 140
1875966	Imidacloprid	86.7	107	P/P	40 - 160
1875966	Linuron	59.6	63.6	P/P	40 - 140
1875966	Primidone	59.2	68.0	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P320492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875374	Turbidity	5.79	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P320995

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875820	Calcium	0.652	Spike	P	0 - 20
1875820	Iron	1.41	Spike	P	0 - 20
1875820	Magnesium	1.14	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P320995

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875820	Potassium	1.26	Spike	P	0 - 20
1875820	Sodium	0.882	Spike	P	0 - 20
1875820	Zinc	1.30	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P320995

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875820	Arsenic	0.328	Spike	P	0 - 20
1875820	Cadmium	0.365	Spike	P	0 - 20
1875820	Chromium	0.297	Spike	P	0 - 20
1875820	Copper	0.204	Spike	P	0 - 20
1875820	Lead	0.534	Spike	P	0 - 20
1875820	Nickel	0.00481	Spike	P	0 - 20
1875820	Silver	0.526	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P321344

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875689	Chloride	1.02	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875375	Ammonia-N	1.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320624

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875709	Kjeldahl Nitrogen	4.00	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875347	NO2NO3-N	1.36	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875517	NO2NO3-N	0.477	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875708	Total-P	0.378	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P320495

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875613	O-Phosphate-P	1.64	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P320379

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875132	Sucralose	3.21	Spike	P	0 - 30

Reference Method: SM 2120 B
Batch ID: P320481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875428	Color (true)	0.0801	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P320704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875611	Total Alkalinity	0.447	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: P321093

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875430	TDS	5.97	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P321057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875430	TSS	9.52	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P320896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875611	Fluoride	0.986	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P320603

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875431	Organic Carbon	1.21	Spike	P	0 - 20

Reference Method: USGS O-2060-01
Batch ID: P320378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1875966	Acetaminophen	20.7	Spike	P	0 - 30
1875966	Carbamazepine	8.82	Spike	P	0 - 30
1875966	Diuron	10.2	Spike	P	0 - 30
1875966	Fenuron	4.29	Spike	P	0 - 30
1875966	Fluridone	15.3	Spike	P	0 - 30
1875966	Imidacloprid	20.0	Spike	P	0 - 30
1875966	Linuron	6.49	Spike	P	0 - 30
1875966	Primidone	13.8	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: 1875623
Field Sample ID: G5CE0083

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	110	P	40 - 150
USGS O-2060-01	Acetaminophen-d4	78.0	P	30 - 150
USGS O-2060-01	Carbamazepine-d10	67.0	P	40 - 160
USGS O-2060-01	Diuron-d6	47.0	P	40 - 150
USGS O-2060-01	Primidone-d5	65.2	P	40 - 150

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A74715
Included Lab Sample IDs: 1875611, 1875614

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	95.5	96.0	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A74720

Included Lab Sample IDs: 1875611, 1875614

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A74721

Included Lab Sample IDs: 1875613, 1875616

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.1	98.3	P/P	90 - 110
O-Phosphate-P	98.3	96.9	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A74729

Included Lab Sample IDs: 1875623

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	115	127	P/P	60 - 150

Reference Method: SM 5310 B-00

Run ID: A74754

Included Lab Sample IDs: 1875612, 1875615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.8	96.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A74766

Included Lab Sample IDs: 1875612

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A74773

Included Lab Sample IDs: 1875615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A74790

Included Lab Sample IDs: 1875612, 1875615

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

Reference Method: SM 2320 B-97

Run ID: A74795

Included Lab Sample IDs: 1875611, 1875614

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A74822

Included Lab Sample IDs: 1875612, 1875615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	101	P/P	90 - 110
Ammonia-N	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A74836

Included Lab Sample IDs: 1875612, 1875615

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

Reference Method: SM 4500 F-C-97

Run ID: A74865

Included Lab Sample IDs: 1875611, 1875614

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Reference Method: USGS O-2060-01

Run ID: A74876

Included Lab Sample IDs: 1875623

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acetaminophen	131	132	P/P	60 - 150
Carbamazepine	126	128	P/P	60 - 150
Diuron	115	115	P/P	60 - 150
Fenuron	108	112	P/P	60 - 150
Fluridone	104	104	P/P	60 - 150
Imidacloprid	100	99.2	P/P	60 - 150
Linuron	98.4	138	P/P	60 - 150
Primidone	128	121	P/P	60 - 150

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A74975

Included Lab Sample IDs: 1875621, 1875622

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	102	P/P	90 - 110
Cadmium	98.8	99.3	P/P	90 - 110
Chromium	101	101	P/P	90 - 110
Copper	102	101	P/P	90 - 110
Lead	91.6	92.2	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Silver	95.0	95.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A74977

Included Lab Sample IDs: 1875611, 1875614

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
 Run ID: A74977
 Included Lab Sample IDs: 1875611, 1875614

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.3	104	P/P	90 - 110
Sulfate	94.6	97.5	P/P	90 - 110
Sulfate	94.7	94.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
 Run ID: A75052
 Included Lab Sample IDs: 1875621, 1875622

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	106	101	P/P	90 - 110
Calcium	99.1	100	P/P	90 - 110
Iron	100	97.2	P/P	90 - 110
Iron	98.0	97.0	P/P	90 - 110
Magnesium	102	98.1	P/P	90 - 110
Magnesium	97.8	98.4	P/P	90 - 110
Potassium	104	101	P/P	90 - 110
Potassium	99.6	101	P/P	90 - 110
Sodium	102	98.8	P/P	90 - 110
Sodium	99.0	98.9	P/P	90 - 110
Zinc	103	97.8	P/P	90 - 110
Zinc	97.8	99.3	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				5.79	
EPA 200.7 Rev. 4.4	Calcium	102	101 103			0.652
	Iron	99.9	98.7 102 100			1.41
	Magnesium	101	98.6 102 100			1.14
	Potassium	103	103 102 101			1.26
	Sodium	101	98.3 101			0.882
	Zinc	95.9	95.8 98.5 97.3			1.30
EPA 200.8 Rev. 5.4	Arsenic	104	104 105 105			0.328
	Cadmium	102	102 102 102			0.365
	Chromium	103	104 102 103			0.297
	Copper	102	101 102 103			0.204
	Lead	94.6	94.4 97.2 97.7			0.534
	Nickel	102	102 102 102			0.0048
	Silver	96.5	97.5 97.9 98.5			0.526
EPA 300.0 Rev. 2.1	Chloride	101	101 101		1.02	
	Sulfate	100	98.5 98.8			
EPA 350.1 Rev. 2.0	Ammonia-N	100				1.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	102 96.4			4.00
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101 103			1.36

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	SMP
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	102		
EPA 365.1 Rev. 2.0	Total-P	97.5	97.8	97.4		
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.6	93.9	96.4		
EPA 8321B	Sucralose	81.5	95.0	103		
SM 2120 B	Color (true)					0.0801
SM 2320 B-97	Total Alkalinity	104				0.447
SM 2540 C-97	TDS					7.97
	TDS					5.97
SM 2540 D-97	TSS					9.52
SM 4500 F-C-97	Fluoride	98.0	99.9	101		
SM 5310 B-00	Organic Carbon	97.9	96.1	97.8		
USGS O-2060-01	Acetaminophen	69.6	66.0	53.6		
	Carbamazepine	96.8	51.0	55.8		
	Diuron	80.4	40.8	36.8		
	Fenuron	83.2	45.6	47.6		
	Fluridone	76.8	37.7	44.0		
	Imidacloprid	77.2	86.7	107		
	Linuron	78.8	59.6	63.6		
	Primidone	93.6	59.2	68.0		

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1875611, 1875614
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1875621, 1875622
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1875621, 1875622
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1875611, 1875614
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1875611, 1875614
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1875612, 1875615
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1875612, 1875615
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1875612, 1875615
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1875612, 1875615
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1875613, 1875616
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	1875623
SM 2120 B / E31780	True Color measured at 450 nm	1875611, 1875614
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1875611, 1875614
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1875611, 1875614
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1875611, 1875614
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1875611, 1875614
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1875612, 1875615
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1875623

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	02/24/2017			02/24/2017 16:07	Sima Feizi	1875611, 1875614
EPA 200.7 Rev. 4.4	02/24/2017	03/06/2017	Elliott D. Healy	03/08/2017	Joshua Ayres	1875621, 1875622
EPA 200.8 Rev. 5.4	02/24/2017	03/06/2017	Elliott D. Healy	03/08/2017	Betina Topolski	1875621, 1875622
EPA 300.0 Rev. 2.1	02/24/2017			03/09/2017	Elisa J Lutz	1875611, 1875614
EPA 350.1 Rev. 2.0	02/24/2017			03/01/2017	Sofia Elnemr	1875612, 1875615
EPA 351.2 Rev. 2.0	02/24/2017	02/28/2017	Adrian Shelby	03/01/2017	Joseph Suarez	1875612, 1875615
EPA 353.2 Rev. 2.0	02/24/2017			03/02/2017	Beverly Y. Sanders	1875612, 1875615
EPA 365.1 Rev. 2.0	02/24/2017	02/27/2017	Vijayalakshmi Reddy	02/27/2017	Lipi Saha	1875612
	02/24/2017	02/27/2017	Vijayalakshmi Reddy	02/28/2017	Lipi Saha	1875615
EPA 365.1 Rev. 2.0 dissolved	02/24/2017			02/24/2017 15:57	Virginia P. Brown	1875613
	02/24/2017			02/24/2017 16:06	Virginia P. Brown	1875616
EPA 8321B	02/24/2017	02/24/2017	Mohammad Ghaffari	02/24/2017	Mohammad Ghaffari	1875623
SM 2120 B	02/24/2017			02/24/2017 14:26	Julie Michelle Frank	1875611
	02/24/2017			02/24/2017 14:27	Julie Michelle Frank	1875614
SM 2320 B-97	02/24/2017			03/01/2017	Dale L. Simmons	1875611, 1875614
SM 2540 C-97	02/24/2017			03/01/2017	Yijie Li	1875611, 1875614
SM 2540 D-97	02/24/2017			03/01/2017	Yijie Li	1875611, 1875614
SM 4500 F-C-97	02/24/2017			03/03/2017	Dale L. Simmons	1875611, 1875614
SM 5310 B-00	02/24/2017			02/27/2017	Julie Michelle Frank	1875612, 1875615
USGS O-2060-01	02/24/2017	03/01/2017	Hoor Shaik	03/02/2017	Juyoung Kim	1875623