

Chemical Analysis Report

CEN-DIST-2017-04-13-02

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

Event Description: **Rose / Stricklandx2 / Spruce / UnBranch 2642**

Request ID: **RQ-2017-04-03-64**

Customer: **CEN-DIST**

Project ID: **SMP**

Send Reports to:

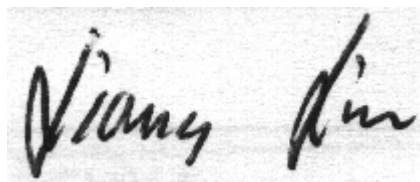
FL Dept. of Environmental Protection
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Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact

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Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 10-MAY-2017 16:19

A handwritten signature in black ink, appearing to read "Liang Lin", is shown 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: Strickland Bay @ 875, East (Downstream) of RR Crossing

Collection Date/Time: 04/12/2017 11:50

Field ID: G5CE0074

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888849	EPA 180.1 Rev. 2.0	Turbidity	4.7		NTU	P323529	
	SM 2320 B-97	Total Alkalinity	130		mg CaCO3/L	P324010	
	SM 2540 D-97	TSS	11		mg/L	P323936	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P324406	
1888850	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P323350	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.34	I	mg N/L	P323556	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323573	
	EPA 365.1 Rev. 2.0	Total-P	0.041		mg P/L	P323510	
	SM 5310 B-00	Organic Carbon	3.0		mg C/L	P323471	
1888851	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.015		mg P/L	P323343	
1888905	EPA 200.7 Rev. 4.4	Iron	300	I	ug/L	P323748	
	EPA 200.8 Rev. 5.4	Arsenic	2.19		ug/L	P323748	
		Cadmium	0.080	U	ug/L	P323748	
		Chromium	1.6	U	ug/L	P323748	
		Copper	0.80	U	ug/L	P323748	
		Lead	0.33	I	ug/L	P323748	
		Nickel	0.80	U	ug/L	P323748	
		Silver	0.040	U	ug/L	P323748	
		Zinc	4.0	U	ug/L	P323748	

Ref. Method and Comment:

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

Sample Location: Strickland Bay @ 100m SW of US1 Bridge

Collection Date/Time: 04/12/2017 12:06

Field ID: G5CE0090

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888855	EPA 180.1 Rev. 2.0	Turbidity	4.6		NTU	P323529	
	SM 2320 B-97	Total Alkalinity	129		mg CaCO3/L	P324010	
	SM 2540 D-97	TSS	11		mg/L	P323936	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P324406	
1888856	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P323350	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33	I	mg N/L	P323556	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323574	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P323510	
	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P323471	
1888857	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P323343	
1888889	EPA 8321B	Sucralose**	0.33		ug/L	P323304	
	USGS O-2060-01	2,4-D	0.0048	I	ug/L	P323392	
		Diuron	0.0040	U	ug/L	P323392	MS
		Fenuron	0.0080	U	ug/L	P323392	
		Imidacloprid	0.0040	U	ug/L	P323392	
		Bentazon	0.11		ug/L	P323392	
		Linuron	0.0040	U	ug/L	P323392	MS, RPD

Field ID: G5CE0090

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888889	USGS O-2060-01	Acetaminophen**	0.010	U	ug/L	P323392	
		MCP	0.0040	U	ug/L	P323392	
		Carbamazepine**	9.1E-04	I	ug/L	P323392	
		Triclopyr**	0.010	U	ug/L	P323392	
		Primidone**	0.0080	U	ug/L	P323392	
		Fluridone**	0.0012	I	ug/L	P323392	
1888906	EPA 200.7 Rev. 4.4	Iron	280	I	ug/L	P323748	
	EPA 200.8 Rev. 5.4	Arsenic	2.11		ug/L	P323748	
		Cadmium	0.080	U	ug/L	P323748	
		Chromium	1.6	U	ug/L	P323748	
		Copper	1.0	I	ug/L	P323748	
		Lead	0.35	U	ug/L	P323748	
		Nickel	0.80	U	ug/L	P323748	
		Silver	0.040	U	ug/L	P323748	
		Zinc	5.5	I	ug/L	P323748	

Ref. Method and Comment:

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

USGS O-2060-01: MS accuracy for bentazon could not be assessed due to high concentration of parameter in the spiked sample.

USGS O-2060-01: MS accuracy and precision for fluridone could not be assessed due to high concentration of parameter in the spiked sample.

EPA 200.8 Rev. 5.4: The sample required dilution for lead due to matrix interference.

Sample Location: Rose Bay @ 125m NE of Boat Ramp

Collection Date/Time: 04/12/2017 12:39

Field ID: G5CE0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888852	EPA 180.1 Rev. 2.0	Turbidity	4.4		NTU	P323529	
	SM 2320 B-97	Total Alkalinity	133	A	mg CaCO3/L	P324010	
	SM 2540 D-97	TSS	12		mg/L	P323936	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P324406	
1888853	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P323350	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39	I	mg N/L	P323556	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323574	
	EPA 365.1 Rev. 2.0	Total-P	0.043		mg P/L	P323510	
	SM 5310 B-00	Organic Carbon	3.3		mg C/L	P323471	
1888854	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.020		mg P/L	P323343	
1888888	EPA 8321B	Sucralose**	0.32		ug/L	P323304	
	USGS O-2060-01	2,4-D	0.0049	I	ug/L	P323392	
		Diuron	0.0040	U	ug/L	P323392	MS
		Fenuron	0.0080	U	ug/L	P323392	
		Imidacloprid	0.0040	U	ug/L	P323392	
		Bentazon	0.11		ug/L	P323392	
		Linuron	0.0040	U	ug/L	P323392	MS, RPD
		Acetaminophen**	0.010	U	ug/L	P323392	
		MCP	0.0040	U	ug/L	P323392	
		Carbamazepine**	0.0013	I	ug/L	P323392	
		Triclopyr**	0.010	U	ug/L	P323392	

Field ID: G5CE0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888888	USGS O-2060-01	Primidone**	0.0080	U	ug/L	P323392	
		Fluridone**	0.0013	I	ug/L	P323392	

Ref. Method and Comment:

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

USGS O-2060-01: MS accuracy for bentazon could not be assessed due to high concentration of parameter in the spiked sample.

USGS O-2060-01: MS accuracy and precision for fluridone could not be assessed due to high concentration of parameter in the spiked sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P323529

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P323748

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P323748

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
Zinc	1.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P323350

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P323556

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

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P323573

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323574

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323510

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323343

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

Reference Method: EPA 8321B
Batch ID: P323304

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: SM 2320 B-97
Batch ID: P324010

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

Reference Method: SM 2540 D-97
Batch ID: P323936

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P324406

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P323471

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

Reference Method: USGS O-2060-01
Batch ID: P323392

Component	Result	Code	Units
2,4-D	0.0040	U	ug/L
Acetaminophen	0.010	U	ug/L
Bentazon	0.0040	U	ug/L
Carbamazepine	4.0E-04	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: USGS O-2060-01
Batch ID: P323392

Component	Result	Code	Units
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
MCPP	0.0040	U	ug/L
Primidone	0.0080	U	ug/L
Triclopyr	0.010	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323748

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323748

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.0		P	85 - 115
Cadmium	96.0		P	85 - 115
Chromium	96.7		P	85 - 115
Copper	96.8		P	85 - 115
Lead	94.9		P	85 - 115
Nickel	97.5		P	85 - 115
Silver	96.1		P	85 - 115
Zinc	97.2		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323350

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: P323556

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323573

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	94.0		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323574

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	96.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323510

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323343

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

Reference Method: EPA 8321B
Batch ID: P323304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	132		P	40 - 140

Reference Method: SM 2320 B-97
Batch ID: P324010

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

Reference Method: SM 4500 F-C-97
Batch ID: P324406

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P323471

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

Reference Method: USGS O-2060-01
Batch ID: P323392

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	83.2		P	40 - 140
Acetaminophen	76.8		P	40 - 140
Bentazon	134		P	40 - 140
Carbamazepine	97.2		P	40 - 140
Diuron	81.2		P	40 - 140
Fenuron	87.6		P	40 - 140
Fluridone	103		P	40 - 140
Imidacloprid	67.6		P	40 - 160
Linuron	52.8		P	40 - 140
MCP	98.0		P	40 - 140

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: USGS O-2060-01
Batch ID: P323392

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Primidone	61.2		P	40 - 140
Triclopyr	100		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887121	Iron	102		P	70 - 130
1887254	Iron	94.1	93.5	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887121	Arsenic	110		P	70 - 130
1887121	Cadmium	99.9		P	70 - 130
1887121	Chromium	94.6		P	70 - 130
1887121	Copper	98.3		P	70 - 130
1887121	Lead	103		P	70 - 130
1887121	Nickel	102		P	70 - 130
1887121	Silver	96.1		P	70 - 130
1887121	Zinc	100		P	70 - 130
1887254	Arsenic	108	107	P/P	70 - 130
1887254	Cadmium	101	101	P/P	70 - 130
1887254	Chromium	91.4	91.1	P/P	70 - 130
1887254	Copper	93.7	93.9	P/P	70 - 130
1887254	Lead	103	103	P/P	70 - 130
1887254	Nickel	99.8	99.2	P/P	70 - 130
1887254	Silver	93.9	94.3	P/P	70 - 130
1887254	Zinc	94.8	92.6	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323350

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888715	Ammonia-N	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323556

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888718	Kjeldahl Nitrogen	96.7	90.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323573

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888644	NO2NO3-N	97.0	97.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323574

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888853	NO2NO3-N	96.5	93.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888853	Total-P	98.4	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888578	O-Phosphate-P	94.2	94.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P323304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888590	Sucralose	134	123	P/P	40 - 140

Reference Method: SM 4500 F-C-97
Batch ID: P324406

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1889318	Fluoride	103	102	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P323471

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888091	Organic Carbon	99.9	102	P/P	85 - 115

Reference Method: USGS O-2060-01
Batch ID: P323392

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888781	2,4-D	131	127	P/P	40 - 140
1888781	Acetaminophen	79.6	66.8	P/P	40 - 140
1888781	Carbamazepine	47.2	52.8	P/P	40 - 140
1888781	Diuron	40.8	37.2	P/F	40 - 140
1888781	Fenuron	42.0	41.2	P/P	40 - 140
1888781	Imidacloprid	67.3	72.9	P/P	40 - 160
1888781	Linuron	24.8	33.6	F/F	40 - 140
1888781	MCP	137	123	P/P	40 - 140
1888781	Primidone	53.6	58.0	P/P	40 - 140
1888781	Triclopyr	106	74.8	P/P	40 - 140

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888793	Turbidity	0.409	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323748

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887254	Iron	0.612	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323748

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887254	Arsenic	0.373	Spike	P	0 - 20
1887254	Cadmium	0.600	Spike	P	0 - 20
1887254	Chromium	0.363	Spike	P	0 - 20
1887254	Copper	0.185	Spike	P	0 - 20
1887254	Lead	0.141	Spike	P	0 - 20
1887254	Nickel	0.590	Spike	P	0 - 20
1887254	Silver	0.400	Spike	P	0 - 20
1887254	Zinc	1.73	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323350

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888715	Ammonia-N	1.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888718	Kjeldahl Nitrogen	6.18	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323573

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888644	NO2NO3-N	0.514	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323574

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888853	NO2NO3-N	3.16	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P323510

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888853	Total-P	1.33	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P323343

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888578	O-Phosphate-P	0.651	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P323304

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888590	Sucralose	6.38	Spike	P	0 - 30

Reference Method: SM 2320 B-97

Batch ID: P324010

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888852	Total Alkalinity	1.11	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97

Batch ID: P324406

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1889318	Fluoride	0.464	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00

Batch ID: P323471

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888091	Organic Carbon	1.35	Spike	P	0 - 20

Reference Method: USGS O-2060-01

Batch ID: P323392

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888781	2,4-D	2.50	Spike	P	0 - 30
1888781	Acetaminophen	17.5	Spike	P	0 - 30
1888781	Bentazon	3.17	Spike	P	0 - 30
1888781	Carbamazepine	10.9	Spike	P	0 - 30
1888781	Diuron	9.23	Spike	P	0 - 30
1888781	Fenuron	1.92	Spike	P	0 - 30
1888781	Imidacloprid	6.90	Spike	P	0 - 30
1888781	Linuron	30.0	Spike	F	0 - 30
1888781	MCP	10.8	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: USGS O-2060-01
Batch ID: P323392

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888781	Primidone	7.89	Spike	P	0 - 30
1888781	Triclopyr	14.0	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: 1888888
Field Sample ID: G5CE0073

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	132	P	40 - 150
USGS O-2060-01	2,4-D-d3	107	P	40 - 150
USGS O-2060-01	Acetaminophen-d4	73.4	P	30 - 150
USGS O-2060-01	Carbamazepine-d10	102	P	40 - 160
USGS O-2060-01	Diuron-d6	56.6	P	30 - 150
USGS O-2060-01	Primidone-d5	81.4	P	40 - 150

Lab Sample ID: 1888889
Field Sample ID: G5CE0090

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	110	P	40 - 150
USGS O-2060-01	2,4-D-d3	110	P	40 - 150
USGS O-2060-01	Acetaminophen-d4	64.2	P	30 - 150
USGS O-2060-01	Carbamazepine-d10	102	P	40 - 160
USGS O-2060-01	Diuron-d6	61.4	P	30 - 150
USGS O-2060-01	Primidone-d5	72.6	P	40 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A75771
Included Lab Sample IDs: 1888851, 1888854, 1888857

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.7	96.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75772
Included Lab Sample IDs: 1888850, 1888853, 1888856

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A75783

Included Lab Sample IDs: 1888888, 1888889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	97.2	139	P/P	60 - 150

Reference Method: SM 5310 B-00

Run ID: A75802

Included Lab Sample IDs: 1888850, 1888853, 1888856

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A75831

Included Lab Sample IDs: 1888849, 1888852, 1888855

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A75838

Included Lab Sample IDs: 1888850, 1888853, 1888856

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	94.0	92.5	P/P	90 - 110
NO2NO3-N	94.5	94.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75856

Included Lab Sample IDs: 1888856

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	107	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75872

Included Lab Sample IDs: 1888850, 1888853, 1888856

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	105	P/P	90 - 110
Kjeldahl Nitrogen	105	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75873

Included Lab Sample IDs: 1888850, 1888853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.5	P/P	90 - 110
Total-P	99.5	99.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75972

Included Lab Sample IDs: 1888905, 1888906

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	94.9	93.8	P/P	90 - 110
Cadmium	97.0	95.1	P/P	90 - 110
Chromium	97.6	95.3	P/P	90 - 110
Copper	92.0	91.0	P/P	90 - 110
Lead	95.8	94.4	P/P	90 - 110
Nickel	91.3	90.8	P/P	90 - 110
Silver	95.2	94.0	P/P	90 - 110
Zinc	93.9	92.6	P/P	90 - 110

Reference Method: USGS O-2060-01

Run ID: A75985

Included Lab Sample IDs: 1888888, 1888889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	98.0	94.6	P/P	50 - 150
Bentazon	88.2	85.4	P/P	50 - 150
MCP	102	104	P/P	50 - 150
Triclopyr	83.8	79.8	P/P	50 - 150

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A75991

Included Lab Sample IDs: 1888905, 1888906

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	96.7	95.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A75995

Included Lab Sample IDs: 1888849, 1888852, 1888855

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	100	P/P	90 - 110

Reference Method: USGS O-2060-01

Run ID: A76024

Included Lab Sample IDs: 1888888, 1888889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acetaminophen	140	149	P/P	60 - 150
Carbamazepine	121	136	P/P	60 - 150
Diuron	147	102	P/P	60 - 150
Fenuron	128	125	P/P	60 - 150
Fluridone	150	131	P/P	60 - 150
Imidacloprid	102	100	P/P	60 - 150
Linuron	60.4	66.8	P/P	60 - 150
Primidone	111	98.0	P/P	60 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A76097

Included Lab Sample IDs: 1888906

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	95.0	96.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A76126

Included Lab Sample IDs: 1888849, 1888852, 1888855

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

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						0.409	
EPA 200.7 Rev. 4.4	Iron	100	94.1	93.5	102			0.612
EPA 200.8 Rev. 5.4	Arsenic	98.0	110	108	107			0.373
	Cadmium	96.0	99.9	101	101			0.600
	Chromium	96.7	94.6	91.4	91.1			0.363
	Copper	96.8	98.3	93.7	93.9			0.185
	Lead	94.9	103	103	103			0.141
	Nickel	97.5	102	99.8	99.2			0.590
	Silver	96.1	96.1	93.9	94.3			0.400
	Zinc	97.2	100	94.8	92.6			1.73
EPA 350.1 Rev. 2.0	Ammonia-N	102	104	105				1.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.8	96.7	90.4				6.18
EPA 353.2 Rev. 2.0	NO2NO3-N	94.0	97.0	97.5				0.514
	NO2NO3-N	96.5	96.5	93.5				3.16
EPA 365.1 Rev. 2.0	Total-P	105	98.4	99.8				1.33
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.7	94.2	94.9				0.651
EPA 8321B	Sucralose	132	134	123				6.38
SM 2320 B-97	Total Alkalinity	102					1.11	
SM 4500 F-C-97	Fluoride	97.7	103	102				0.464
SM 5310 B-00	Organic Carbon	105	99.9	102				1.35
USGS O-2060-01	2,4-D	83.2	131	127				2.50
	Acetaminophen	76.8	79.6	66.8				17.5
	Bentazon	134						3.17
	Carbamazepine	97.2	47.2	52.8				10.9
	Diuron	81.2	40.8	37.2				9.23
	Fenuron	87.6	42.0	41.2				1.92
	Fluridone	103						
	Imidacloprid	67.6	67.3	72.9				6.90
	Linuron	52.8	24.8	33.6				30.0
	MCPD	98.0	137	123				10.8
	Primidone	61.2	53.6	58.0				7.89
	Triclopyr	100	106	74.8				14.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1888849, 1888852, 1888855
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1888905, 1888906
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1888905, 1888906
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1888850, 1888853, 1888856
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1888850, 1888853, 1888856
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1888850, 1888853, 1888856
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1888850, 1888853, 1888856
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1888851, 1888854, 1888857
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	1888888, 1888889
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1888849, 1888852, 1888855
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1888849, 1888852, 1888855
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1888849, 1888852, 1888855
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1888850, 1888853, 1888856
USGS O-2060-01 / E31780	Chlorinated (phenoxy acid) herbicides in water matrices by HPLC/MS/MS	1888888, 1888889
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1888888, 1888889

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	04/13/2017			04/13/2017 16:21	Sima Feizi	1888849, 1888852, 1888855
EPA 200.7 Rev. 4.4	04/13/2017	04/20/2017	Elliott D. Healy	04/25/2017	Martin Acosta	1888905, 1888906
EPA 200.8 Rev. 5.4	04/13/2017	04/20/2017	Elliott D. Healy	04/24/2017	Betina Topolski	1888905, 1888906
	04/13/2017	04/20/2017	Elliott D. Healy	05/01/2017	Betina Topolski	1888906
EPA 350.1 Rev. 2.0	04/13/2017			04/13/2017	Julie Michelle Frank	1888850, 1888853, 1888856
EPA 351.2 Rev. 2.0	04/13/2017	04/18/2017	Adrian Shelby	04/19/2017	Joseph Suarez	1888850, 1888853, 1888856
EPA 353.2 Rev. 2.0	04/13/2017			04/18/2017	Beverly Y. Sanders	1888850, 1888853, 1888856
EPA 365.1 Rev. 2.0	04/13/2017	04/17/2017	Vijayalakshmi Reddy	04/18/2017	Lipi Saha	1888856
	04/13/2017	04/17/2017	Vijayalakshmi Reddy	04/19/2017	Lipi Saha	1888850, 1888853
EPA 365.1 Rev. 2.0 dissolved	04/13/2017			04/13/2017 14:15	Anthony C. Onicha	1888851
	04/13/2017			04/13/2017 14:16	Anthony C. Onicha	1888854
	04/13/2017			04/13/2017 14:17	Anthony C. Onicha	1888857
EPA 8321B	04/13/2017	04/13/2017	Mohammad Ghaffari	04/13/2017	Mohammad Ghaffari	1888888, 1888889
SM 2320 B-97	04/13/2017			04/26/2017	Dale L. Simmons	1888849, 1888852, 1888855
SM 2540 D-97	04/13/2017			04/17/2017	Sima Feizi	1888849, 1888852, 1888855
SM 4500 F-C-97	04/13/2017			05/02/2017	Dale L. Simmons	1888849, 1888852, 1888855
SM 5310 B-00	04/13/2017			04/14/2017	Julie Michelle Frank	1888850, 1888853, 1888856
USGS O-2060-01	04/13/2017	04/16/2017	Hoor Shaik	04/23/2017	Juyoung Kim	1888888, 1888889
	04/13/2017	04/16/2017	Hoor Shaik	04/26/2017	Juyoung Kim	1888888, 1888889