Chemical Analysis Report

CEN-DIST-2018-08-17-01

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

Event Description: **Long branch / Salt Creek X2 / Sweet**
Request ID: **RQ-2018-08-13-53**
Customer: **CEN-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 06-SEP-2018 12:06

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: LONG BRANCH @ 0.7 MI DS OF CR 13 **Collection Date/Time: 08/16/2018 10:27**

Field ID: G2CE0036 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2017872	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P350381	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P350644	
		Sulfate	19		mg SO4/L	P350646	
	SM 2120 B	Color (true)	270		PCU	P350378	
	SM 2320 B-97	Total Alkalinity	46		mg CaCO3/L	P350556	
	SM 2540 C-97	TDS	179		mg/L	P350815	
	SM 2540 D-97	TSS	5	I	mg/L	P350806	
	SM 4500 F-C-97	Fluoride	0.069	I	mg F/L	P350559	
2017873	EPA 350.1 Rev. 2.0	Ammonia-N	0.024		mg N/L	P350629	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P350460	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P350527	
	EPA 365.1 Rev. 2.0	Total-P	0.080		mg P/L	P350581	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P350548	
2017874	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.054		mg P/L	P350368	
2017883	EPA 8321B	2,4-D	0.0020	U	ug/L	P350331	
		Bentazon	0.0034		ug/L	P350331	
		MCPP	0.0020	UJ	ug/L	P350331	RPD
		Triclopyr**	0.0040	UJ	ug/L	P350331	RPD
		Imidacloprid	0.0032	I	ug/L	P350331	
		Diuron	0.0030	I	ug/L	P350331	
		Pyraclostrobin**	0.0020	U	ug/L	P350331	
		Primidone**	0.0055	I	ug/L	P350331	
		Linuron	0.0040	U	ug/L	P350331	
		Acetaminophen**	0.0080	U	ug/L	P350331	
		Fenuron	0.016	U	ug/L	P350331	
		Imazapyr**	0.025		ug/L	P350331	
		Carbamazepine**	8.0E-04	U	ug/L	P350331	
		Fluridone**	0.0083		ug/L	P350331	
		Hydrocodone**	8.0E-04	U	ug/L	P350331	
		Naproxen**	0.0080	U	ug/L	P350331	
		Ibuprofen**	0.020	U	ug/L	P350331	
		Sucralose**	0.32		ug/L	P350384	
2017886	EPA 200.7 Rev. 4.4	Calcium	28.2		mg/L	P350432	
		Iron	750		ug/L	P350432	
		Magnesium	1.91		mg/L	P350432	
		Potassium	1.6		mg/L	P350432	
		Sodium	11.5		mg/L	P350432	
		Zinc	6.1	I	ug/L	P350432	
	EPA 200.8 Rev. 5.4	Arsenic	1.22		ug/L	P350432	
		Cadmium	0.020	U	ug/L	P350432	
		Chromium	0.73	I	ug/L	P350432	
		Copper	0.72	I	ug/L	P350432	
		Lead	0.71		ug/L	P350432	

Field ID: G2CE0036 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2017886	EPA 200.8 Rev. 5.4	Nickel	0.57	I	ug/L	P350432	
		Silver	0.010	U	ug/L	P350432	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 8321B: Insufficient sample to perform matrix spikes. Refer to the narrative for an explanation of QC Codes.

Sample Location: SALT CREEK @ PACKARD AVENUE **Collection Date/Time: 08/16/2018 11:40**

Field ID: G2CE0088 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2017884	EPA 8321B	2,4-D	0.0021	I	ug/L	P350331	
		Bentazon	0.0022	I	ug/L	P350331	
		MCPP	0.0020	UJ	ug/L	P350331	RPD
		Triclopyr**	0.0040	UJ	ug/L	P350331	RPD
		Imidacloprid	0.0020	U	ug/L	P350331	
		Diuron	0.0020	U	ug/L	P350331	
		Pyraclostrobin**	0.0020	U	ug/L	P350331	
		Primidone**	0.0040	U	ug/L	P350331	
		Linuron	0.0040	U	ug/L	P350331	
		Acetaminophen**	0.0080	U	ug/L	P350331	
		Fenuron	0.016	U	ug/L	P350331	
		Imazapyr**	0.095		ug/L	P350331	
		Carbamazepine**	8.0E-04	U	ug/L	P350331	
		Fluridone**	0.0044		ug/L	P350331	
		Hydrocodone**	8.0E-04	U	ug/L	P350331	
		Naproxen**	0.0080	U	ug/L	P350331	
		Ibuprofen**	0.020	U	ug/L	P350331	
		Sucralose**	0.21		ug/L	P350384	

Ref. Method and Comment:
EPA 8321B: Insufficient sample to perform matrix spikes. Refer to the narrative for an explanation of QC Codes.

Sample Location: SALT CREEK @ STONE STREET **Collection Date/Time: 08/16/2018 11:51**

Field ID: G2CE0143 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2017885	EPA 8321B	2,4-D	0.0020	U	ug/L	P350331	
		Bentazon	0.0020	I	ug/L	P350331	
		MCPP	0.0020	UJ	ug/L	P350331	RPD
		Triclopyr**	0.0040	UJ	ug/L	P350331	RPD
		Imidacloprid	0.0086		ug/L	P350331	
		Diuron	0.0020	U	ug/L	P350331	
		Pyraclostrobin**	0.0020	U	ug/L	P350331	
		Primidone**	0.0040	U	ug/L	P350331	
		Linuron	0.0040	U	ug/L	P350331	
		Acetaminophen**	0.0080	U	ug/L	P350331	
		Fenuron	0.016	U	ug/L	P350331	
		Imazapyr**	0.0040	U	ug/L	P350331	
		Carbamazepine**	8.0E-04	U	ug/L	P350331	
		Fluridone**	4.0E-04	U	ug/L	P350331	
		Hydrocodone**	8.0E-04	U	ug/L	P350331	
		Naproxen**	0.0080	U	ug/L	P350331	
		Ibuprofen**	0.020	U	ug/L	P350331	
		Sucralose**	0.031	I	ug/L	P350384	

Ref. Method and Comment:
EPA 8321B: Insufficient sample to perform matrix spikes. Refer to the narrative for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P350381

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350432

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: P350432

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: P350644

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350646

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350629

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350460

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350527

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350581

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350368

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

Reference Method: EPA 8321B
Batch ID: P350331

Component	Result	Code	Units
2,4-D	0.0020	U	ug/L
Acetaminophen	0.0080	U	ug/L
Bentazon	8.0E-04	U	ug/L
Carbamazepine	8.0E-04	U	ug/L
Diuron	0.0020	U	ug/L
Fenuron	0.016	U	ug/L
Fluridone	4.0E-04	U	ug/L
Hydrocodone	8.0E-04	U	ug/L
Ibuprofen	0.020	U	ug/L
Imazapyr	0.0040	U	ug/L
Imidacloprid	0.0020	U	ug/L
Linuron	0.0040	U	ug/L
MCPP	0.0020	U	ug/L
Naproxen	0.0080	U	ug/L
Primidone	0.0040	U	ug/L
Pyraclostrobin	0.0020	U	ug/L
Triclopyr	0.0040	U	ug/L

Reference Method: EPA 8321B
Batch ID: P350384

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: SM 2120 B
Batch ID: P350378

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P350556

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P350556

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

Reference Method: SM 2540 C-97
Batch ID: P350815

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P350806

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P350559

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P350548

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350432

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	103		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	100		P	85 - 115
Sodium	98.0		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350432

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	102		P	85 - 115
Copper	99.0		P	85 - 115
Lead	102		P	85 - 115
Nickel	101		P	85 - 115
Silver	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350644

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350646

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350629

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350527

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350581

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350368

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

Reference Method: EPA 8321B
Batch ID: P350331

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	101	75.1	P/P	40 - 150
Acetaminophen	131	113	P/P	30 - 150
Bentazon	110	99.5	P/P	30 - 150
Carbamazepine	92.3	90.0	P/P	40 - 150
Diuron	91.6	95.4	P/P	40 - 150
Fenuron	117	107	P/P	40 - 150
Fluridone	79.5	76.8	P/P	40 - 150
Hydrocodone	105	101	P/P	40 - 150
Ibuprofen	88.3	81.8	P/P	40 - 150
Imazapyr	102	98.2	P/P	40 - 150
Imidacloprid	113	106	P/P	40 - 160
Linuron	76.1	74.7	P/P	40 - 150
MCPP	109	72.1	P/P	40 - 150
Naproxen	93.1	70.1	P/P	40 - 150
Primidone	109	108	P/P	40 - 150
Pyraclostrobin	78.9	74.0	P/P	40 - 150
Triclopyr	100	64.7	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P350384

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	96.1		P	40 - 150

Reference Method: SM 2120 B
Batch ID: P350378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.4		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P350556

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P350559

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P350559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.3		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350548

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.1		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350432

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017739	Calcium	105		P	80 - 120
2017739	Iron	104		P	80 - 120
2017739	Magnesium	101		P	80 - 120
2017739	Potassium	99.4		P	80 - 120
2017739	Sodium	99.1		P	80 - 120
2017739	Zinc	105		P	80 - 120
2017915	Calcium	104		P	80 - 120
2017915	Iron	103	104	P/P	80 - 120
2017915	Magnesium	104	107	P/P	80 - 120
2017915	Potassium	101	103	P/P	80 - 120
2017915	Sodium	97.3		P	80 - 120
2017915	Zinc	111	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350432

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017739	Arsenic	106		P	80 - 120
2017739	Cadmium	109		P	80 - 120
2017739	Chromium	103		P	80 - 120
2017739	Copper	101		P	80 - 120
2017739	Lead	105		P	80 - 120
2017739	Nickel	102		P	80 - 120
2017739	Silver	102		P	80 - 120
2017915	Arsenic	98.5	107	P/P	80 - 120
2017915	Cadmium	101	108	P/P	80 - 120
2017915	Chromium	96.5	103	P/P	80 - 120
2017915	Copper	93.2	101	P/P	80 - 120
2017915	Lead	98.1	106	P/P	80 - 120
2017915	Nickel	94.2	103	P/P	80 - 120
2017915	Silver	97.6	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017839	Chloride	98.8		P	90 - 110
2017971	Chloride	96.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017839	Sulfate	101		P	90 - 110
2017971	Sulfate	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350629

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017776	Ammonia-N	98.5	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350527

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017776	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350581

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017903	Total-P	99.0	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017905	O-Phosphate-P	98.1	98.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P350384

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017883	Sucralose	110	119	P/P	40 - 150

Reference Method: SM 4500 F-C-97
Batch ID: P350559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018328	Fluoride	96.2	96.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2017596	Organic Carbon	108		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P350381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017971	Turbidity	2.54	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350432

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017915	Calcium	0.0335	Spike	P	0 - 20
2017915	Iron	1.09	Spike	P	0 - 20
2017915	Magnesium	1.44	Spike	P	0 - 20
2017915	Potassium	1.26	Spike	P	0 - 20
2017915	Sodium	0.994	Spike	P	0 - 20
2017915	Zinc	2.21	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350432

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017915	Arsenic	7.68	Spike	P	0 - 20
2017915	Cadmium	6.38	Spike	P	0 - 20
2017915	Chromium	6.87	Spike	P	0 - 20
2017915	Copper	7.64	Spike	P	0 - 20
2017915	Lead	7.46	Spike	P	0 - 20
2017915	Nickel	8.72	Spike	P	0 - 20
2017915	Silver	4.46	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017839	Chloride	0.272	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017839	Sulfate	0.0437	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017776	Ammonia-N	2.14	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017897	Kjeldahl Nitrogen	5.50	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017776	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017903	Total-P	0.210	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017905	O-Phosphate-P	0.204	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P350331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
LFB	2,4-D	29.6	LCS	P	0 - 30
LFB	Acetaminophen	15.4	LCS	P	0 - 30
LFB	Bentazon	10.3	LCS	P	0 - 30
LFB	Carbamazepine	2.51	LCS	P	0 - 30
LFB	Diuron	4.14	LCS	P	0 - 30
LFB	Fenuron	8.57	LCS	P	0 - 30
LFB	Fluridone	3.51	LCS	P	0 - 30
LFB	Hydrocodone	3.72	LCS	P	0 - 30
LFB	Ibuprofen	7.63	LCS	P	0 - 30
LFB	Imazapyr	4.06	LCS	P	0 - 30
LFB	Imidacloprid	6.58	LCS	P	0 - 30
LFB	Linuron	1.81	LCS	P	0 - 30
LFB	MCPP	40.5	LCS	F	0 - 30
LFB	Naproxen	28.2	LCS	P	0 - 30
LFB	Primidone	1.36	LCS	P	0 - 30
LFB	Pyraclostrobin	6.43	LCS	P	0 - 30
LFB	Triclopyr	42.9	LCS	F	0 - 30

Reference Method: EPA 8321B
Batch ID: P350384

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

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P350384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017883	Sucralose	6.80	Spike	P	0 - 30

Reference Method: SM 2120 B
Batch ID: P350378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017901	Color (true)	4.88	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P350556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018328	Total Alkalinity	0.733	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P350815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017839	TDS	0.593	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P350559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018328	Fluoride	0.467	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P350548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017596	Organic Carbon	0.448	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Surrogates

Lab Sample ID: 2017883
Field Sample ID: G2CE0036

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	94.1	P	30 - 160
EPA 8321B	Acetaminophen-d4	148	P	30 - 160
EPA 8321B	Carbamazepine-d10	61.1	P	30 - 160
EPA 8321B	Diuron-d6	68.4	P	30 - 160
EPA 8321B	Ibuprofen-d3	85.7	P	30 - 160
EPA 8321B	Primidone-d5	78.9	P	30 - 160
EPA 8321B	Sucralose-d6	104	P	40 - 160

Lab Sample ID: 2017884
Field Sample ID: G2CE0088

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	82.6	P	30 - 160
EPA 8321B	Acetaminophen-d4	143	P	30 - 160
EPA 8321B	Carbamazepine-d10	62.2	P	30 - 160
EPA 8321B	Diuron-d6	43.0	P	30 - 160
EPA 8321B	Ibuprofen-d3	86.4	P	30 - 160
EPA 8321B	Primidone-d5	67.6	P	30 - 160
EPA 8321B	Sucralose-d6	132	P	40 - 160

Lab Sample ID: 2017885
Field Sample ID: G2CE0143

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	101	P	30 - 160
EPA 8321B	Acetaminophen-d4	152	P	30 - 160
EPA 8321B	Carbamazepine-d10	64.8	P	30 - 160
EPA 8321B	Diuron-d6	55.6	P	30 - 160
EPA 8321B	Ibuprofen-d3	83.8	P	30 - 160
EPA 8321B	Primidone-d5	77.3	P	30 - 160
EPA 8321B	Sucralose-d6	122	P	40 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A85971
Included Lab Sample IDs: 2017874

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

Reference Method: SM 2120 B
Run ID: A85974
Included Lab Sample IDs: 2017872

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	99.8	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A85975
Included Lab Sample IDs: 2017872

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	104	P/P	95 - 105

Reference Method: EPA 8321B
Run ID: A85983
Included Lab Sample IDs: 2017883, 2017884, 2017885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	100	96.4	P/P	60 - 160
Sucralose	85.4	100	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A86029
Included Lab Sample IDs: 2017873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	95.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A86032
Included Lab Sample IDs: 2017873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A86036
Included Lab Sample IDs: 2017873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	96.4	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A86040
Included Lab Sample IDs: 2017872

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A86040
Included Lab Sample IDs: 2017872

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A86042
Included Lab Sample IDs: 2017886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	104	P/P	90 - 110
Iron	99.0	101	P/P	90 - 110
Magnesium	99.2	101	P/P	90 - 110
Potassium	98.0	99.2	P/P	90 - 110
Sodium	98.1	98.8	P/P	90 - 110
Zinc	103	106	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A86049
Included Lab Sample IDs: 2017872

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A86067
Included Lab Sample IDs: 2017873

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A86076
Included Lab Sample IDs: 2017873

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A86106
Included Lab Sample IDs: 2017886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.7	99.1	P/P	90 - 110
Cadmium	100	99.8	P/P	90 - 110
Chromium	97.4	99.0	P/P	90 - 110
Copper	96.8	97.4	P/P	90 - 110
Lead	105	104	P/P	90 - 110
Nickel	97.1	97.5	P/P	90 - 110
Silver	98.1	98.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A86112
Included Lab Sample IDs: 2017883, 2017884, 2017885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	100	106	P/P	50 - 150
Bentazon	139	150	P/P	50 - 160
Ibuprofen	86.6	117	P/P	50 - 160
MCPP	111	112	P/P	50 - 150
Naproxen	90.5	84.8	P/P	50 - 160
Triclopyr	93.2	97.8	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A86195
Included Lab Sample IDs: 2017883, 2017884, 2017885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acetaminophen	117	106	P/P	60 - 150
Carbamazepine	99.5	100	P/P	60 - 150
Diuron	120	119	P/P	60 - 150
Fenuron	109	108	P/P	60 - 150
Fluridone	110	111	P/P	60 - 160
Hydrocodone	113	110	P/P	60 - 150
Imazapyr	99.8	95.9	P/P	50 - 150
Imidacloprid	111	109	P/P	60 - 150
Linuron	107	104	P/P	60 - 150
Primidone	112	100	P/P	60 - 150
Pyraclostrobin	94.5	96.6	P/P	60 - 150

* 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							2.54	
EPA 200.7 Rev. 4.4	Calcium	102		105	104				0.0335
	Iron	103		104	103	104			1.09
	Magnesium	106		101	104	107			1.44
	Potassium	100		99.4	101	103			1.26
	Sodium	98.0		99.1	97.3				0.994
	Zinc	102		105	111	108			2.21
EPA 200.8 Rev. 5.4	Arsenic	102		106	98.5	107			7.68
	Cadmium	105		109	101	108			6.38
	Chromium	102		103	96.5	103			6.87
	Copper	99.0		101	93.2	101			7.64
	Lead	102		105	98.1	106			7.46
	Nickel	101		102	94.2	103			8.72
	Silver	101		102	97.6	102			4.46
EPA 300.0 Rev. 2.1	Chloride	99.7		98.8	96.1			0.272	
	Sulfate	99.7		101	97.3			0.0437	
EPA 350.1 Rev. 2.0	Ammonia-N	99.1		98.5	101				2.14
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106							5.50
EPA 353.2 Rev. 2.0	NO2NO3-N	101		100	100				0.0
EPA 365.1 Rev. 2.0	Total-P	96.8		99.0	99.3				0.210
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5		98.1	98.3				0.204
EPA 8321B	2,4-D	101	75.1				29.6		
	Acetaminophen	131	113				15.4		
	Bentazon	110	99.5				10.3		
	Carbamazepine	92.3	90.0				2.51		
	Diuron	91.6	95.4				4.14		
	Fenuron	117	107				8.57		
	Fluridone	79.5	76.8				3.51		
	Hydrocodone	105	101				3.72		
	Ibuprofen	88.3	81.8				7.63		
	Imazapyr	102	98.2				4.06		
	Imidacloprid	113	106				6.58		
	Linuron	76.1	74.7				1.81		
	MCPP	109	72.1				40.5		
	Naproxen	93.1	70.1				28.2		
	Primidone	109	108				1.36		
	Pyraclostrobin	78.9	74.0				6.43		
	Sucralose	96.1		110	119				6.80
	Triclopyr	100	64.7				42.9		
SM 2120 B	Color (true)	98.4						4.88	
SM 2320 B-97	Total Alkalinity	104						0.733	
SM 2540 C-97	TDS							0.593	
SM 4500 F-C-97	Fluoride	96.3		96.2	96.7				0.467
SM 5310 B-00	Organic Carbon	98.1		108					0.448

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2017872
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2017886

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2017886
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2017872
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2017872
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2017873
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2017873
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2017873
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2017873
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2017874
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	2017883, 2017884, 2017885
SM 2120 B / E31780	True Color measured at 450 nm	2017872
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2017872
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2017872
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2017872
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2017872
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2017873

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	08/17/2018			08/17/2018 15:47	Julia Storbeck	2017872
EPA 200.7 Rev. 4.4	08/17/2018	08/20/2018 13:00	Elliott D. Healy	08/21/2018 15:43	Betina Topolski	2017886
EPA 200.8 Rev. 5.4	08/17/2018	08/20/2018 13:00	Elliott D. Healy	08/23/2018 21:53	Allison Taylor	2017886
EPA 300.0 Rev. 2.1	08/17/2018			08/22/2018 22:56	Lipi Saha	2017872
EPA 350.1 Rev. 2.0	08/17/2018			08/22/2018 13:31	Ping Hua	2017873
EPA 351.2 Rev. 2.0	08/17/2018	08/20/2018 11:00	Adrian Shelby	08/21/2018 12:42	Joseph Suarez	2017873
EPA 353.2 Rev. 2.0	08/17/2018			08/21/2018 14:11	Lauren Bottorf	2017873
EPA 365.1 Rev. 2.0	08/17/2018	08/22/2018 13:40	Sima Feizi	08/23/2018 10:02	Beverly Y. Sanders	2017873
EPA 365.1 Rev. 2.0 dissolved	08/17/2018			08/17/2018 13:21	Lipi Saha	2017874
EPA 8321B	08/17/2018	08/17/2018 15:30	Mohammad Ghaffari	08/18/2018 13:49	Mohammad Ghaffari	2017883
	08/17/2018	08/17/2018 15:30	Mohammad Ghaffari	08/18/2018 14:19	Mohammad Ghaffari	2017884
	08/17/2018	08/17/2018 15:30	Mohammad Ghaffari	08/18/2018 14:33	Mohammad Ghaffari	2017885
	08/17/2018	08/21/2018 15:00	Hoor Shaik	08/25/2018 08:17	Juyoung Kim	2017883
	08/17/2018	08/21/2018 15:00	Hoor Shaik	08/25/2018 08:51	Juyoung Kim	2017884
	08/17/2018	08/21/2018 15:00	Hoor Shaik	08/25/2018 09:26	Juyoung Kim	2017885
	08/17/2018	08/21/2018 15:00	Hoor Shaik	08/25/2018 18:32	Juyoung Kim	2017883
	08/17/2018	08/21/2018 15:00	Hoor Shaik	08/25/2018 19:07	Juyoung Kim	2017884
	08/17/2018	08/21/2018 15:00	Hoor Shaik	08/25/2018 19:42	Juyoung Kim	2017885
SM 2120 B	08/17/2018			08/17/2018 16:24	Julia Storbeck	2017872
SM 2320 B-97	08/17/2018			08/21/2018 21:32	Dale L. Simmons	2017872
SM 2540 C-97	08/17/2018			08/22/2018 15:33	Yijie Li	2017872
SM 2540 D-97	08/17/2018			08/22/2018 15:33	Yijie Li	2017872
SM 4500 F-C-97	08/17/2018			08/21/2018 21:32	Dale L. Simmons	2017872
SM 5310 B-00	08/17/2018			08/21/2018 01:47	Megan Treadwell	2017873