

Chemical Analysis Report

TLH-ROC-2018-12-10-01

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

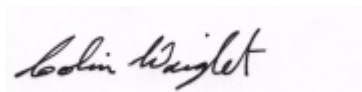
Event Description: **G2 Run 5**
Request ID: **RQ-2018-12-10-48**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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Tallahassee, FL 32399
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Certified by: Colin Wright, Program Administrator

Date Certified: 07-JAN-2019 15:23

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals, 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: Mosquito Creek @ SR269

Collection Date/Time: 12/10/2018 12:50

Field ID: G2TLHR0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047632	EPA 180.1 Rev. 2.0	Turbidity	17		NTU	P355974	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P356210	
		Sulfate	1.1		mg SO4/L	P356212	
	SM 2120 B	Color (true)	46		PCU	P355964	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P356128	
	SM 2540 C-97	TDS	53		mg/L	P356304	
	SM 2540 D-97	TSS	2	I	mg/L	P356082	
	SM 4500 F-C-97	Fluoride	0.051	I	mg F/L	P356131	
2047633	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P356260	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P356226	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.43		mg N/L	P356134	
	EPA 365.1 Rev. 2.0	Total-P	0.056		mg P/L	P356175	
	SM 5310 B-00	Organic Carbon	6.2		mg C/L	P355980	
2047634	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P356026	
2047640	EPA 8321B	2,4-D	0.0020	U	ug/L	P355712	
		Bentazon	0.0020	I	ug/L	P355712	
		MCP	0.0020	U	ug/L	P355712	
		Triclopyr**	0.0040	U	ug/L	P355712	
		Imidacloprid	0.0074	I	ug/L	P355712	
		Diuron	0.0025	I	ug/L	P355712	
		Pyraclostrobin**	0.0020	U	ug/L	P355712	
		Primidone**	0.0040	U	ug/L	P355712	
		Linuron	0.0040	U	ug/L	P355712	
		Acetaminophen**	0.0080	U	ug/L	P355712	
		Fenuron	0.016	U	ug/L	P355712	
		Imazapyr**	0.0041	I	ug/L	P355712	
		Carbamazepine**	8.0E-04	U	ug/L	P355712	
		Fluridone**	4.0E-04	U	ug/L	P355712	
		Hydrocodone**	0.0020	U	ug/L	P355712	
		Naproxen**	0.0080	U	ug/L	P355712	
		Ibuprofen**	0.020	U	ug/L	P355712	
		Sucralose**	0.032	I	ug/L	P355853	
2047641	EPA 200.7 Rev. 4.4	Calcium	5.41		mg/L	P355944	
		Iron	1.08E+03		ug/L	P355944	
		Magnesium	2.55		mg/L	P355944	
		Potassium	1.2	I	mg/L	P355944	
		Sodium	2.2		mg/L	P355944	
		Zinc	5.0	U	ug/L	P355944	
	EPA 200.8 Rev. 5.4	Arsenic	0.63		ug/L	P355944	
		Cadmium	0.020	U	ug/L	P355944	
		Chromium	1.2	I	ug/L	P355944	
		Copper	1.53		ug/L	P356654	
		Lead	0.70		ug/L	P355944	

Field ID: G2TLHR0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047641	EPA 200.8 Rev. 5.4	Nickel	0.49	I	ug/L	P355944	
		Silver	0.010	U	ug/L	P355944	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed on 12/29/2018.

Sample Location: South Mosquito Creek @ Power Line

Collection Date/Time: 12/10/2018 13:15

Field ID: G2TLHR0039

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047629	EPA 180.1 Rev. 2.0	Turbidity	21		NTU	P355974	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P356210	
		Sulfate	1.1		mg SO4/L	P356212	
	SM 2120 B	Color (true)	40	A	PCU	P355964	
	SM 2320 B-97	Total Alkalinity	15		mg CaCO3/L	P356128	
	SM 2540 C-97	TDS	52		mg/L	P356304	
	SM 2540 D-97	TSS	10		mg/L	P356082	
	SM 4500 F-C-97	Fluoride	0.050	I	mg F/L	P356131	
2047630	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P356260	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P356226	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.27		mg N/L	P356134	
	EPA 365.1 Rev. 2.0	Total-P	0.064		mg P/L	P356175	
	SM 5310 B-00	Organic Carbon	5.6		mg C/L	P355980	
2047631	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P356026	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355974

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355944

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: P355944

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356654

Component	Result	Code	Units
Copper	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356210

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356212

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356260

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356226

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356226

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356134

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356175

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356026

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

Reference Method: EPA 8321B
Batch ID: P355712

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	0.0020	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
MCP	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: P355853

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: SM 2120 B
Batch ID: P355964

Component	Result	Code	Units
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Quality Assurance Report

Method Blank Results

Reference Method: SM 2120 B
Batch ID: P355964

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P356128

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

Reference Method: SM 2540 C-97
Batch ID: P356304

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356082

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356131

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P355980

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: P355944

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	105		P	85 - 115
Sodium	108		P	85 - 115
Zinc	99.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355944

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	102		P	85 - 115
Lead	102		P	85 - 115
Nickel	101		P	85 - 115
Silver	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356654

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356210

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356212

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356260

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356226

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	109		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356134

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P356134

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P356175

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P356026

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

Reference Method: EPA 8321B
 Batch ID: P355712

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	76.2		P	40 - 150
Acetaminophen	92.6		P	30 - 150
Bentazon	74.7		P	30 - 150
Carbamazepine	80.8		P	40 - 150
Diuron	81.8		P	40 - 150
Fenuron	112		P	40 - 150
Fluridone	107		P	40 - 150
Hydrocodone	102		P	40 - 150
Ibuprofen	64.2		P	40 - 150
Imazapyr	112		P	40 - 150
Imidacloprid	78.5		P	40 - 160
Linuron	76.1		P	40 - 150
MCPP	95.0		P	40 - 150
Naproxen	77.5		P	40 - 150
Primidone	86.2		P	40 - 150
Pyraclostrobin	52.3		P	40 - 150
Triclopyr	58.3		P	40 - 150

Reference Method: EPA 8321B
 Batch ID: P355853

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	99.8		P	40 - 150

Reference Method: SM 2120 B
 Batch ID: P355964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	90 - 110

Reference Method: SM 2320 B-97
 Batch ID: P356128

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

Reference Method: SM 2320 B-97
Batch ID: P356128

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.5		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P356131

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355980

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355944

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047184	Calcium	104		P	80 - 120
2047184	Iron	103		P	80 - 120
2047184	Magnesium	109		P	80 - 120
2047184	Potassium	103		P	80 - 120
2047184	Sodium	108		P	80 - 120
2047184	Zinc	101		P	80 - 120
2047437	Calcium	102		P	80 - 120
2047437	Iron	99.0	102	P/P	80 - 120
2047437	Magnesium	99.3	104	P/P	80 - 120
2047437	Potassium	100	106	P/P	80 - 120
2047437	Sodium	109		P	80 - 120
2047437	Zinc	98.3	94.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355944

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047184	Arsenic	103		P	80 - 120
2047184	Cadmium	103		P	80 - 120
2047184	Chromium	102		P	80 - 120
2047184	Lead	103		P	80 - 120
2047184	Nickel	102		P	80 - 120
2047184	Silver	98.9		P	80 - 120
2047437	Arsenic	106	106	P/P	80 - 120
2047437	Cadmium	103	105	P/P	80 - 120
2047437	Chromium	104	105	P/P	80 - 120
2047437	Lead	104	104	P/P	80 - 120
2047437	Nickel	104	104	P/P	80 - 120
2047437	Silver	89.3	100	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2044663	Copper	107		P	80 - 120
2047182	Copper	102	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356210

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047281	Chloride	93.9		P	90 - 110
2047629	Chloride	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047281	Sulfate	93.5		P	90 - 110
2047629	Sulfate	95.8		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356260

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047653	Ammonia-N	97.4	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356226

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047268	Kjeldahl Nitrogen	106	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047630	NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356175

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047693	Total-P	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047755	O-Phosphate-P	94.4	95.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P355712

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046826	2,4-D	68.5	75.9	P/P	40 - 150
2046826	Acetaminophen	102	125	P/P	30 - 150
2046826	Bentazon	42.1	33.6	P/P	30 - 150
2046826	Carbamazepine	76.6	72.1	P/P	40 - 150
2046826	Diuron	62.0	62.4	P/P	40 - 150
2046826	Fenuron	92.2	104	P/P	40 - 150
2046826	Fluridone	104	108	P/P	40 - 150
2046826	Hydrocodone	100	103	P/P	40 - 150
2046826	Ibuprofen	54.4	61.9	P/P	40 - 150
2046826	Imazapyr	109	127	P/P	40 - 150
2046826	Imidacloprid	129	134	P/P	40 - 160
2046826	Linuron	59.3	61.2	P/P	40 - 150
2046826	MCPP	83.5	92.5	P/P	40 - 150
2046826	Naproxen	56.8	69.1	P/P	40 - 150
2046826	Primidone	96.9	91.6	P/P	40 - 150
2046826	Pyraclostrobin	51.2	59.3	P/P	40 - 150
2046826	Triclopyr	44.5	49.9	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P355853

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

Reference Method: EPA 8321B
Batch ID: P355853

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2046826	Sucralose	95.3	106	P/P	40 - 150

Reference Method: SM 4500 F-C-97
Batch ID: P356131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047779	Fluoride	99.7	98.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355980

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047218	Organic Carbon	93.8	92.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047651	Turbidity	3.28	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355944

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047437	Calcium	1.92	Spike	P	0 - 20
2047437	Iron	2.91	Spike	P	0 - 20
2047437	Magnesium	3.05	Spike	P	0 - 20
2047437	Potassium	3.36	Spike	P	0 - 20
2047437	Sodium	1.67	Spike	P	0 - 20
2047437	Zinc	3.69	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355944

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047437	Arsenic	0.118	Spike	P	0 - 20
2047437	Cadmium	2.05	Spike	P	0 - 20
2047437	Chromium	1.00	Spike	P	0 - 20
2047437	Lead	0.359	Spike	P	0 - 20
2047437	Nickel	0.470	Spike	P	0 - 20
2047437	Silver	11.8	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047182	Copper	0.228	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047281	Chloride	1.40	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047281	Sulfate	2.08	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047653	Ammonia-N	0.486	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356226

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047268	Kjeldahl Nitrogen	0.720	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047630	NO2NO3-N	0.420	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047693	Total-P	0.306	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047755	O-Phosphate-P	1.05	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P355712

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046826	2,4-D	7.32	Spike	P	0 - 30
2046826	Acetaminophen	15.5	Spike	P	0 - 30
2046826	Bentazon	13.6	Spike	P	0 - 30
2046826	Carbamazepine	4.42	Spike	P	0 - 30
2046826	Diuron	0.455	Spike	P	0 - 30
2046826	Fenuron	11.7	Spike	P	0 - 30
2046826	Fluridone	4.37	Spike	P	0 - 30
2046826	Hydrocodone	2.63	Spike	P	0 - 30
2046826	Ibuprofen	12.9	Spike	P	0 - 30
2046826	Imazapyr	7.43	Spike	P	0 - 30
2046826	Imidacloprid	3.24	Spike	P	0 - 30
2046826	Linuron	3.20	Spike	P	0 - 30
2046826	MCP	9.16	Spike	P	0 - 30
2046826	Naproxen	19.6	Spike	P	0 - 30
2046826	Primidone	5.64	Spike	P	0 - 30
2046826	Pyraclostrobin	14.6	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P355712

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046826	Triclopyr	11.4	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P355853

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2046826	Sucralose	7.76	Spike	P	0 - 30

Reference Method: SM 2120 B
Batch ID: P355964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047629	Color (true)	1.81	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P356128

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047779	Total Alkalinity	0.672	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P356304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047281	TDS	5.05	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047779	Fluoride	0.470	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P355980

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047218	Organic Carbon	0.667	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: 2047640

Field Sample ID: G2TLHR0015

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	64.8	P	30 - 160
EPA 8321B	Acetaminophen-d4	102	P	30 - 160
EPA 8321B	Carbamazepine-d10	67.7	P	30 - 160
EPA 8321B	Diuron-d6	67.5	P	30 - 160
EPA 8321B	Ibuprofen-d3	57.9	P	30 - 160
EPA 8321B	Primidone-d5	83.1	P	30 - 160
EPA 8321B	Sucralose-d6	95.0	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A88283

Included Lab Sample IDs: 2047629, 2047632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	100	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A88286

Included Lab Sample IDs: 2047629, 2047632

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

Reference Method: SM 5310 B-00

Run ID: A88287

Included Lab Sample IDs: 2047630, 2047633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	92.6	91.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A88299

Included Lab Sample IDs: 2047631, 2047634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	98.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88324

Included Lab Sample IDs: 2047629, 2047632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.0	98.9	P/P	90 - 110
Chloride	99.3	99.0	P/P	90 - 110
Sulfate	98.2	98.2	P/P	90 - 110
Sulfate	98.8	98.2	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A88326

Included Lab Sample IDs: 2047640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	106	105	P/P	60 - 150

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88336

Included Lab Sample IDs: 2047641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	95.9	101	P/P	90 - 110
Iron	97.2	99.4	P/P	90 - 110
Magnesium	98.1	100	P/P	90 - 110
Potassium	103	105	P/P	90 - 110
Sodium	103	107	P/P	90 - 110
Zinc	96.4	97.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A88339

Included Lab Sample IDs: 2047629, 2047632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88339

Included Lab Sample IDs: 2047629, 2047632

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88340

Included Lab Sample IDs: 2047630, 2047633

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

Reference Method: EPA 8321B

Run ID: A88378

Included Lab Sample IDs: 2047640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	88.6	85.5	P/P	50 - 150
Acetaminophen	99.6	127	P/P	60 - 160
Bentazon	89.8	87.3	P/P	50 - 160
Carbamazepine	113	110	P/P	60 - 160
Diuron	108	107	P/P	60 - 150
Fenuron	106	123	P/P	60 - 150
Fluridone	113	125	P/P	60 - 160
Hydrocodone	99.6	117	P/P	60 - 150
Ibuprofen	87.2	85.6	P/P	50 - 160
Imazapyr	117	108	P/P	50 - 150
Imidacloprid	85.2	89.3	P/P	60 - 160
Linuron	107	108	P/P	60 - 150
MCPP	89.9	86.0	P/P	50 - 150
Naproxen	85.6	79.8	P/P	50 - 160
Primidone	106	119	P/P	60 - 160
Pyraclostrobin	99.2	106	P/P	60 - 150
Triclopyr	93.5	85.8	P/P	50 - 160

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88384

Included Lab Sample IDs: 2047641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	104	102	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Chromium	103	103	P/P	90 - 110
Lead	104	105	P/P	90 - 110
Nickel	105	104	P/P	90 - 110
Silver	99.6	99.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88391

Included Lab Sample IDs: 2047630, 2047633

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A88403

Included Lab Sample IDs: 2047630, 2047633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88416

Included Lab Sample IDs: 2047630, 2047633

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88578

Included Lab Sample IDs: 2047641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	104	107	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						3.28	
EPA 200.7 Rev. 4.4	Calcium	106	104	102				1.92
	Iron	105	103	99.0	102			2.91
	Magnesium	109	109	99.3	104			3.05
	Potassium	105	103	100	106			3.36
	Sodium	108	108	109				1.67
	Zinc	99.0	101	98.3	94.7			3.69
EPA 200.8 Rev. 5.4	Arsenic	103	103	106	106			0.118
	Cadmium	104	103	103	105			2.05
	Chromium	102	102	104	105			1.00
	Copper	107	107	102	102			0.228
	Lead	102	103	104	104			0.359
	Nickel	101	102	104	104			0.470
	Silver	100	98.9	89.3	100			11.8
EPA 300.0 Rev. 2.1	Chloride	97.6	93.9	97.5			1.40	
	Sulfate	96.1	93.5	95.8			2.08	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	97.4	97.9				0.486
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109	106	107				0.720
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.0					0.420
EPA 365.1 Rev. 2.0	Total-P	100	103	103				0.306
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9	94.4	95.4				1.05
EPA 8321B	2,4-D	76.2	68.5	75.9				7.32
	Acetaminophen	92.6	102	125				15.5
	Bentazon	74.7	42.1	33.6				13.6
	Carbamazepine	80.8	76.6	72.1				4.42
	Diuron	81.8	62.0	62.4				0.455
	Fenuron	112	92.2	104				11.7
	Fluridone	107	104	108				4.37
	Hydrocodone	102	100	103				2.63
	Ibuprofen	64.2	54.4	61.9				12.9
	Imazapyr	112	109	127				7.43
	Imidacloprid	78.5	129	134				3.24
	Linuron	76.1	59.3	61.2				3.20
	MCPP	95.0	83.5	92.5				9.16
	Naproxen	77.5	56.8	69.1				19.6
	Primidone	86.2	96.9	91.6				5.64
	Pyraclostrobin	52.3	51.2	59.3				14.6
	Sucralose	99.8	95.3	106				7.76
	Triclopyr	58.3	44.5	49.9				11.4
SM 2120 B	Color (true)	101					1.81	
SM 2320 B-97	Total Alkalinity	99.5					0.672	
SM 2540 C-97	TDS						5.05	
SM 4500 F-C-97	Fluoride	99.0	99.7	98.9				0.470
SM 5310 B-00	Organic Carbon	92.0	93.8	92.6				0.667

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2047629, 2047632
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2047641

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	2047641
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2047629, 2047632
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2047629, 2047632
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2047630, 2047633
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2047630, 2047633
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2047630, 2047633
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2047630, 2047633
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2047631, 2047634
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	2047640
SM 2120 B / E31780	True Color measured at 450 nm	2047629, 2047632
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2047629, 2047632
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2047629, 2047632
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2047629, 2047632
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2047629, 2047632
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2047630, 2047633

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	12/10/2018			12/11/2018 16:59	Megan Treadwell	2047629, 2047632
EPA 200.7 Rev. 4.4	12/10/2018	12/11/2018 14:55	Elliott D. Healy	12/13/2018 18:51	Betina Topolski	2047641
EPA 200.8 Rev. 5.4	12/10/2018	12/11/2018 14:55	Elliott D. Healy	12/15/2018 05:19	Allison Taylor	2047641
	12/10/2018	12/27/2018 16:45	Elliott D. Healy	12/29/2018 02:47	Allison Taylor	2047641
EPA 300.0 Rev. 2.1	12/10/2018			12/14/2018 16:28	Lipi Saha	2047629
	12/10/2018			12/14/2018 19:22	Lipi Saha	2047632
EPA 350.1 Rev. 2.0	12/10/2018			12/14/2018 10:43	Ping Hua	2047633
	12/10/2018			12/14/2018 10:53	Ping Hua	2047630
EPA 351.2 Rev. 2.0	12/10/2018	12/14/2018 12:30	Adrian Shelby	12/17/2018 16:58	Chelsea Hernandez	2047630
	12/10/2018	12/14/2018 12:30	Adrian Shelby	12/17/2018 17:00	Chelsea Hernandez	2047633
EPA 353.2 Rev. 2.0	12/10/2018			12/12/2018 10:28	Beverly Y. Sanders	2047630
	12/10/2018			12/12/2018 10:35	Beverly Y. Sanders	2047633
EPA 365.1 Rev. 2.0	12/10/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 11:01	Beverly Y. Sanders	2047630
	12/10/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 11:03	Beverly Y. Sanders	2047633
EPA 365.1 Rev. 2.0 dissolved	12/10/2018			12/11/2018 16:52	Jhamieka S. Greenwood	2047634
	12/10/2018			12/11/2018 16:59	Jhamieka S. Greenwood	2047631
EPA 8321B	12/10/2018	12/11/2018 12:30	Rebecca Ware	12/12/2018 18:55	Mohammad Ghaffari	2047640
	12/10/2018	12/12/2018 10:00	Hoor Shaik	12/14/2018 03:08	Juyoung Kim	2047640
SM 2120 B	12/10/2018			12/11/2018 17:23	Chelsea Hernandez	2047629
	12/10/2018			12/11/2018 17:24	Chelsea Hernandez	2047632
SM 2320 B-97	12/10/2018			12/12/2018 19:07	Lauren Bottorf	2047629
	12/10/2018			12/12/2018 19:17	Lauren Bottorf	2047632
SM 2540 C-97	12/10/2018			12/11/2018 16:05	Yijie Li	2047629, 2047632
SM 2540 D-97	12/10/2018			12/11/2018 16:05	Yijie Li	2047629, 2047632
SM 4500 F-C-97	12/10/2018			12/12/2018 19:07	Lauren Bottorf	2047629
	12/10/2018			12/12/2018 19:17	Lauren Bottorf	2047632
SM 5310 B-00	12/10/2018			12/12/2018 02:06	Megan Treadwell	2047630
	12/10/2018			12/12/2018 02:20	Megan Treadwell	2047633