

Chemical Analysis Report

WAS-SECT-2018-10-30-01

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

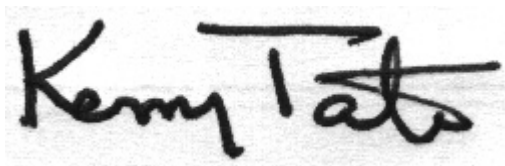
Event Description: **Wakulla BMAP**
Request ID: **RQ-2018-10-15-18**
Customer: **WAS-SECT**
Project ID: **BMAP**

Send Reports to:
FL Dept. of Environmental Protection
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Tallahassee, FL 32399
Attn: Curtis Musson

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 04-DEC-2018 15:09

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Wakulla River Boat Tram

Collection Date/Time: 10/30/2018 10:10

Field ID: 44059

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2037434	EPA 180.1 Rev. 2.0	Turbidity	0.50		NTU	P353928	
	EPA 300.0 Rev. 2.1	Chloride	8.7		mg Cl/L	P354899	MS
		Sulfate	9.8		mg SO4/L	P354902	
	SM 2120 B	Color (true)	14		PCU	P353972	
	SM 2320 B-97	Total Alkalinity	139		mg CaCO3/L	P354355	
	SM 2540 C-97	TDS	176		mg/L	P354572	
	SM 2540 D-97	TSS	2	I	mg/L	P354495	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P354361	
2037435	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P354387	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.14	I	mg N/L	P354214	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.44		mg N/L	P354372	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P354157	
	SM 5310 B-00	Organic Carbon	1.8		mg C/L	P354203	
2037436	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.028		mg P/L	P353931	
2037439	EPA 8321B	2,4-D	0.0020	U	ug/L	P353668	
		Bentazon	8.0E-04	U	ug/L	P353668	
		MCP	0.0020	U	ug/L	P353668	
		Triclopyr**	0.0040	U	ug/L	P353668	
		Imidacloprid	0.0020	U	ug/L	P353668	MS
		Diuron	0.0020	U	ug/L	P353668	
		Pyraclostrobin**	0.0020	U	ug/L	P353668	
		Primidone**	0.0040	U	ug/L	P353668	
		Linuron	0.0040	U	ug/L	P353668	
		Acetaminophen**	0.0080	U	ug/L	P353668	
		Fenuron	0.016	U	ug/L	P353668	
		Imazapyr**	0.0047	I	ug/L	P353668	
		Carbamazepine**	8.0E-04	U	ug/L	P353668	
		Fluridone**	5.1E-04	I	ug/L	P353668	
		Hydrocodone**	8.0E-04	U	ug/L	P353668	
		Naproxen**	0.0080	U	ug/L	P353668	
		Ibuprofen**	0.020	U	ug/L	P353668	
		Sucralose**	0.076		ug/L	P353941	
		Acesulfame K**	0.10	U	ug/L	P353941	
2037440	EPA 200.7 Rev. 4.4	Calcium	46.5		mg/L	P354082	
		Iron	31	I	ug/L	P354082	
		Magnesium	10.4		mg/L	P354082	
		Potassium	0.58	I	mg/L	P354082	
		Sodium	5.8		mg/L	P354082	
		Zinc	5.0	U	ug/L	P354082	
	EPA 200.8 Rev. 5.4	Arsenic	0.68		ug/L	P354082	
		Cadmium	0.020	U	ug/L	P354082	
		Chromium	0.82	I	ug/L	P354982	
		Copper	0.20	U	ug/L	P354082	

Field ID: 44059

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2037440	EPA 200.8 Rev. 5.4	Lead	0.050	U	ug/L	P354082	
		Nickel	0.20	U	ug/L	P354082	
		Silver	0.010	U	ug/L	P354982	

Ref. Method and Comment:

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

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P353928

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354082

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: P354082

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354982

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354899

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354902

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354387

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354214

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354214

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354372

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354157

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353931

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

Reference Method: EPA 8321B
Batch ID: P353668

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: P353941

Component	Result	Code	Units
Acesulfame K	0.10	U	ug/L
Sucralose	0.010	U	ug/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2120 B
Batch ID: P353972

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P354355

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

Reference Method: SM 2540 C-97
Batch ID: P354572

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P354495

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P354361

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P354203

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: P354082

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	102		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	103		P	85 - 115
Sodium	101		P	85 - 115
Zinc	99.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P354082

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	108		P	85 - 115
Cadmium	107		P	85 - 115
Copper	103		P	85 - 115
Lead	105		P	85 - 115
Nickel	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P354982

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	103		P	85 - 115
Silver	98.5		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P354899

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P354902

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P354387

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: P354214

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P354372

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: P354372

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

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P354157

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P353931

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

Reference Method: EPA 8321B

Batch ID: P353668

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	88.5		P	40 - 150
Acetaminophen	112		P	30 - 150
Bentazon	88.8		P	30 - 150
Carbamazepine	86.0		P	40 - 150
Diuron	80.3		P	40 - 150
Fenuron	133		P	40 - 150
Fluridone	91.2		P	40 - 150
Hydrocodone	116		P	40 - 150
Ibuprofen	90.8		P	40 - 150
Imazapyr	103		P	40 - 150
Imidacloprid	110		P	40 - 160
Linuron	78.8		P	40 - 150
MCPP	110		P	40 - 150
Naproxen	105		P	40 - 150
Primidone	110		P	40 - 150
Pyraclostrobin	67.5		P	40 - 150
Triclopyr	116		P	40 - 150

Reference Method: EPA 8321B

Batch ID: P353941

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Acesulfame K	74.4		P	40 - 150
Sucralose	91.9		P	40 - 150

Reference Method: SM 2120 B

Batch ID: P353972

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P354355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P354361

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354203

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354082

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037372	Calcium	100		P	80 - 120
2037372	Iron	97.7		P	80 - 120
2037372	Magnesium	99.1		P	80 - 120
2037372	Potassium	99.6		P	80 - 120
2037372	Sodium	95.7		P	80 - 120
2037372	Zinc	98.3		P	80 - 120
2037593	Calcium	103		P	80 - 120
2037593	Iron	101	101	P/P	80 - 120
2037593	Magnesium	107	106	P/P	80 - 120
2037593	Potassium	104	103	P/P	80 - 120
2037593	Sodium	97.2		P	80 - 120
2037593	Zinc	103	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354082

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037372	Arsenic	107		P	80 - 120
2037372	Cadmium	108		P	80 - 120
2037372	Copper	101		P	80 - 120
2037372	Lead	104		P	80 - 120
2037372	Nickel	100		P	80 - 120
2037593	Arsenic	107	105	P/P	80 - 120
2037593	Cadmium	108	106	P/P	80 - 120
2037593	Copper	103	102	P/P	80 - 120
2037593	Lead	105	104	P/P	80 - 120
2037593	Nickel	102	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037440	Chromium	103	102	P/P	80 - 120
2037440	Silver	98.9	97.9	P/P	80 - 120
2037637	Chromium	101		P	80 - 120
2037637	Silver	97.1		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354899

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037278	Chloride	90.0		P	90 - 110
2037582	Chloride	86.0		F	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037278	Sulfate	95.9		P	90 - 110
2037582	Sulfate	90.6		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354387

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037355	Ammonia-N	101	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037355	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354372

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037340	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354157

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037352	Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037353	O-Phosphate-P	96.4	96.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P353668

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036302	2,4-D	142	130	P/P	40 - 150
2036302	Acetaminophen	115	111	P/P	30 - 150
2036302	Bentazon	55.5	53.2	P/P	30 - 150
2036302	Carbamazepine	79.4	77.7	P/P	40 - 150
2036302	Diuron	59.7	59.0	P/P	40 - 150
2036302	Fenuron	107	115	P/P	40 - 150
2036302	Fluridone	89.0	87.5	P/P	40 - 150
2036302	Hydrocodone	115	108	P/P	40 - 150
2036302	Ibuprofen	72.5	76.5	P/P	40 - 150
2036302	Imazapyr	111	109	P/P	40 - 150
2036302	Imidacloprid	164	161	F/F	40 - 160
2036302	Linuron	65.0	62.2	P/P	40 - 150
2036302	MCP	142	149	P/P	40 - 150
2036302	Naproxen	94.8	93.5	P/P	40 - 150
2036302	Primidone	98.0	99.6	P/P	40 - 150
2036302	Pyraclostrobin	62.2	63.6	P/P	40 - 150
2036302	Triclopyr	135	134	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P353941

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: P353941

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037201	Acesulfame K	145	147	P/P	40 - 150
2037201	Sucralose	97.7	104	P/P	40 - 150

Reference Method: SM 5310 B-00
Batch ID: P354203

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2037281	Organic Carbon	93.5	94.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P353928

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037448	Turbidity	4.08	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354082

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037593	Calcium	1.64	Spike	P	0 - 20
2037593	Iron	0.365	Spike	P	0 - 20
2037593	Magnesium	0.178	Spike	P	0 - 20
2037593	Potassium	0.304	Spike	P	0 - 20
2037593	Sodium	1.15	Spike	P	0 - 20
2037593	Zinc	0.318	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354082

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037593	Arsenic	1.18	Spike	P	0 - 20
2037593	Cadmium	1.13	Spike	P	0 - 20
2037593	Copper	1.75	Spike	P	0 - 20
2037593	Lead	1.51	Spike	P	0 - 20
2037593	Nickel	1.07	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037440	Chromium	0.900	Spike	P	0 - 20
2037440	Silver	0.956	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354899

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037278	Chloride	3.44	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037355	Ammonia-N	1.60	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037355	Kjeldahl Nitrogen	0.604	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354372

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037340	NO2NO3-N	0.712	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037352	Total-P	0.247	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037353	O-Phosphate-P	0.416	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P353668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036302	2,4-D	8.59	Spike	P	0 - 30
2036302	Acetaminophen	3.62	Spike	P	0 - 30
2036302	Bentazon	3.74	Spike	P	0 - 30
2036302	Carbamazepine	2.09	Spike	P	0 - 30
2036302	Diuron	0.966	Spike	P	0 - 30
2036302	Fenuron	7.16	Spike	P	0 - 30
2036302	Fluridone	1.37	Spike	P	0 - 30
2036302	Hydrocodone	6.71	Spike	P	0 - 30
2036302	Ibuprofen	5.35	Spike	P	0 - 30
2036302	Imazapyr	1.08	Spike	P	0 - 30
2036302	Imidacloprid	1.94	Spike	P	0 - 30
2036302	Linuron	4.35	Spike	P	0 - 30
2036302	MCP	4.64	Spike	P	0 - 30
2036302	Naproxen	1.40	Spike	P	0 - 30
2036302	Primidone	1.64	Spike	P	0 - 30
2036302	Pyraclostrobin	2.28	Spike	P	0 - 30
2036302	Triclopyr	1.01	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P353941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 8321B
 Batch ID: P353941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037201	Acesulfame K	1.03	Spike	P	0 - 30
2037201	Sucralose	5.93	Spike	P	0 - 30

Reference Method: SM 2120 B
 Batch ID: P353972

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037348	Color (true)	2.52	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P354355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038201	Total Alkalinity	0.633	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
 Batch ID: P354572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037354	TDS	3.20	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P354361

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038201	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
 Batch ID: P354203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2037281	Organic Carbon	1.09	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: 2037439

Field Sample ID: 44059

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	125	P	30 - 160
EPA 8321B	2,4-D-d3	125	P	30 - 160
EPA 8321B	Acetaminophen-d4	136	P	30 - 160
EPA 8321B	Carbamazepine-d10	95.7	P	30 - 160
EPA 8321B	Diuron-d6	112	P	30 - 160
EPA 8321B	Endothall-d6	119	P	40 - 160
EPA 8321B	Ibuprofen-d3	98.3	P	30 - 160
EPA 8321B	Ibuprofen-d3	98.3	P	30 - 160
EPA 8321B	Primidone-d5	109	P	30 - 160
EPA 8321B	Sucralose-d6	120	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A87395

Included Lab Sample IDs: 2037434

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A87396

Included Lab Sample IDs: 2037436

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	99.1	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A87413

Included Lab Sample IDs: 2037434

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	99.7	P/P	85 - 115

Reference Method: EPA 8321B

Run ID: A87433

Included Lab Sample IDs: 2037439

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acesulfame K	75.2	81.0	P/P	60 - 160

Reference Method: EPA 8321B

Run ID: A87506

Included Lab Sample IDs: 2037439

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	87.2	84.4	P/P	60 - 160

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87509

Included Lab Sample IDs: 2037440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	104	P/P	90 - 110
Iron	104	103	P/P	90 - 110
Magnesium	105	104	P/P	90 - 110
Potassium	103	102	P/P	90 - 110
Sodium	103	101	P/P	90 - 110
Zinc	101	104	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A87523

Included Lab Sample IDs: 2037435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.9	94.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A87543
Included Lab Sample IDs: 2037439

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	102	105	P/P	50 - 150
Acetaminophen	111	117	P/P	60 - 160
Bentazon	109	119	P/P	50 - 160
Carbamazepine	127	126	P/P	60 - 160
Diuron	115	119	P/P	60 - 150
Fenuron	137	136	P/P	60 - 150
Fluridone	112	119	P/P	60 - 160
Hydrocodone	128	117	P/P	60 - 150
Ibuprofen	75.9	101	P/P	50 - 160
Imazapyr	109	105	P/P	50 - 150
Imidacloprid	127	118	P/P	60 - 160
Linuron	122	119	P/P	60 - 150
MCPP	99.7	101	P/P	50 - 150
Naproxen	126	101	P/P	50 - 160
Primidone	128	124	P/P	60 - 160
Pyraclostrobin	97.1	97.2	P/P	60 - 150
Triclopyr	99.8	105	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A87544
Included Lab Sample IDs: 2037435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A87583
Included Lab Sample IDs: 2037435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	105	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A87599
Included Lab Sample IDs: 2037434

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.8	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A87599
Included Lab Sample IDs: 2037434

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A87603
Included Lab Sample IDs: 2037435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A87603

Included Lab Sample IDs: 2037435

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87606

Included Lab Sample IDs: 2037435

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A87809

Included Lab Sample IDs: 2037434

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.0	102	P/P	90 - 110
Sulfate	95.9	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87854

Included Lab Sample IDs: 2037440

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87944

Included Lab Sample IDs: 2037440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	103	104	P/P	90 - 110
Silver	95.7	97.7	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						4.08	
EPA 200.7 Rev. 4.4	Calcium	102	100	103				1.64
	Iron	102	97.7	101	101			0.365
	Magnesium	107	99.1	107	106			0.178
	Potassium	103	99.6	104	103			0.304
	Sodium	101	95.7	97.2				1.15
	Zinc	99.0	98.3	103	102			0.318
EPA 200.8 Rev. 5.4	Arsenic	108	107	107	105			1.18
	Cadmium	107	108	108	106			1.13
	Chromium	103	103	102	101			0.900
	Copper	103	101	103	102			1.75
	Lead	105	104	105	104			1.51
	Nickel	104	100	102	101			1.07
	Silver	98.5	98.9	97.9	97.1			0.956
EPA 300.0 Rev. 2.1	Chloride	104	90.0	86.0			3.44	
	Sulfate	101	95.9	90.6				
EPA 350.1 Rev. 2.0	Ammonia-N	99.1	101	103				1.60
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	103	104				0.604
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	102					0.712
EPA 365.1 Rev. 2.0	Total-P	97.1	99.8	100				0.247
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.4	96.4	96.0				0.416
EPA 8321B	2,4-D	88.5	142	130				8.59
	Acesulfame K	74.4	145	147				1.03
	Acetaminophen	112	115	111				3.62
	Bentazon	88.8	55.5	53.2				3.74
	Carbamazepine	86.0	79.4	77.7				2.09
	Diuron	80.3	59.7	59.0				0.966
	Fenuron	133	107	115				7.16
	Fluridone	91.2	89.0	87.5				1.37
	Hydrocodone	116	115	108				6.71
	Ibuprofen	90.8	72.5	76.5				5.35
	Imazapyr	103	111	109				1.08
	Imidacloprid	110	164	161				1.94
	Linuron	78.8	65.0	62.2				4.35
	MCPP	110	142	149				4.64
	Naproxen	105	94.8	93.5				1.40
	Primidone	110	98.0	99.6				1.64
	Pyraclostrobin	67.5	62.2	63.6				2.28
	Sucralose	91.9	97.7	104				5.93
	Triclopyr	116	135	134				1.01
SM 2120 B	Color (true)	100					2.52	
SM 2320 B-97	Total Alkalinity	101					0.633	
SM 2540 C-97	TDS						3.20	
SM 4500 F-C-97	Fluoride	99.8						0.0
SM 5310 B-00	Organic Carbon	94.4	93.5	94.5				1.09

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2037434
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2037440

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	2037440
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2037434
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2037434
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2037435
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2037435
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2037435
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2037435
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2037436
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	2037439
SM 2120 B / E31780	True Color measured at 450 nm	2037434
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2037434
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2037434
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2037434
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2037434
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2037435

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	10/30/2018			10/30/2018 14:49	Megan Treadwell	2037434
EPA 200.7 Rev. 4.4	10/30/2018	11/01/2018 17:00	Elliott D. Healy	11/02/2018 15:16	Betina Topolski	2037440
EPA 200.8 Rev. 5.4	10/30/2018	11/01/2018 17:00	Elliott D. Healy	11/16/2018 02:00	Allison Taylor	2037440
	10/30/2018	11/20/2018 14:40	Elliott D. Healy	11/22/2018 01:45	Allison Taylor	2037440
EPA 300.0 Rev. 2.1	10/30/2018			11/16/2018 01:59	Lipi Saha	2037434
EPA 350.1 Rev. 2.0	10/30/2018			11/07/2018 14:07	Ping Hua	2037435
EPA 351.2 Rev. 2.0	10/30/2018	11/05/2018 12:00	Adrian Shelby	11/06/2018 16:21	Virginia P. Brown	2037435
EPA 353.2 Rev. 2.0	10/30/2018			11/07/2018 11:55	Lauren Bottorf	2037435
EPA 365.1 Rev. 2.0	10/30/2018	11/02/2018 12:40	Sima Feizi	11/05/2018 15:08	Beverly Y. Sanders	2037435
EPA 365.1 Rev. 2.0 dissolved	10/30/2018			10/30/2018 15:32	Julia Storbeck	2037436
EPA 8321B	10/30/2018	10/31/2018 09:00	Hoor Shaik	11/05/2018 06:53	Juyoung Kim	2037439
	10/30/2018	10/31/2018 09:00	Hoor Shaik	11/06/2018 00:54	Juyoung Kim	2037439
	10/30/2018	10/31/2018 13:15	Rebecca Ware	10/31/2018 14:49	Rebecca Ware	2037439
	10/30/2018	10/31/2018 13:15	Rebecca Ware	11/03/2018 01:23	Mohammad Ghaffari	2037439
SM 2120 B	10/30/2018			10/30/2018 16:46	Chelsea Hernandez	2037434
SM 2320 B-97	10/30/2018			11/06/2018 21:04	Dale L. Simmons	2037434
SM 2540 C-97	10/30/2018			11/02/2018 16:03	Yijie Li	2037434
SM 2540 D-97	10/30/2018			11/02/2018 16:03	Yijie Li	2037434
SM 4500 F-C-97	10/30/2018			11/06/2018 21:04	Dale L. Simmons	2037434
SM 5310 B-00	10/30/2018			11/03/2018 01:17	Megan Treadwell	2037435