

Chemical Analysis Report

WAS-SECT-2018-07-18-01

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

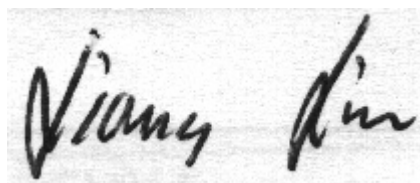
Event Description: **Wakulla BMAP**
Request ID: **RQ-2018-07-16-16**
Customer: **WAS-SECT**
Project ID: **BMAP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 08-AUG-2018 15:13

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

Case Narrative

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

Results for the following analytical groups are included in this report: Metals, Nutrients and Pesticides.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Wakulla River at CR 365

Collection Date/Time: 07/17/2018 10:35

Field ID: 34879

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2008226	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P348691	
	EPA 300.0 Rev. 2.1	Chloride	7.7		mg Cl/L	P349062	
		Sulfate	9.6		mg SO4/L	P349065	
	SM 2120 B	Color (true)	8.8		PCU	P348712	
	SM 2320 B-97	Total Alkalinity	144		mg CaCO3/L	P348843	
	SM 2540 C-97	TDS	167		mg/L	P349269	
	SM 2540 D-97	TSS	3	I	mg/L	P349275	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P348849	
2008227	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P348997	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P348840	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P348759	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P348884	
	SM 5310 B-00	Organic Carbon	1.4		mg C/L	P348929	
2008228	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P348686	
2008232	EPA 8321B	2,4-D	0.0020	U	ug/L	P348626	
		Bentazon	8.0E-04	U	ug/L	P348626	
		MCP	0.0020	U	ug/L	P348626	MS
		Triclopyr**	0.0040	U	ug/L	P348626	MS
		Imidacloprid	0.0020	U	ug/L	P348626	
		Diuron	0.0020	U	ug/L	P348626	
		Pyraclostrobin**	0.0020	U	ug/L	P348626	
		Primidone**	0.0040	U	ug/L	P348626	
		Linuron	0.0040	U	ug/L	P348626	
		Acetaminophen**	0.0080	U	ug/L	P348626	
		Fenuron	0.016	U	ug/L	P348626	
		Imazapyr**	0.0040	U	ug/L	P348626	
		Carbamazepine**	4.0E-04	U	ug/L	P348626	
		Fluridone**	6.8E-04	I	ug/L	P348626	
		Hydrocodone**	8.0E-04	U	ug/L	P348626	
		Naproxen**	0.0080	U	ug/L	P348626	
		Ibuprofen**	0.020	U	ug/L	P348626	
		Sucralose**	0.045		ug/L	P348751	
		Acesulfame K**	0.10	U	ug/L	P348751	
2008233	EPA 200.7 Rev. 4.4	Calcium	47.7		mg/L	P348660	
		Iron	30	U	ug/L	P348660	
		Magnesium	10.3		mg/L	P348660	
		Potassium	0.62	I	mg/L	P348660	
		Sodium	5.4		mg/L	P348660	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P348660	
		Arsenic	0.67		ug/L	P348660	
		Cadmium	0.020	U	ug/L	P348660	
		Chromium	0.78	I	ug/L	P348660	
		Copper	0.20	U	ug/L	P348660	

Field ID: 34879

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2008233	EPA 200.8 Rev. 5.4	Lead	0.050	U	ug/L	P348660	
		Nickel	0.20	U	ug/L	P348660	
		Silver	0.010	U	ug/L	P349023	

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: P348691

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348660

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: P348660

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349023

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349062

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349065

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348997

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348840

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348840

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348759

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348884

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348686

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

Reference Method: EPA 8321B
Batch ID: P348626

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	4.0E-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: P348751

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: P348712

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P348843

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

Reference Method: SM 2540 C-97
Batch ID: P349269

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P349275

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P348849

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P348929

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: P348660

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	108		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	105		P	85 - 115
Sodium	101		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348660

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	99.9		P	85 - 115
Copper	99.2		P	85 - 115
Lead	99.9		P	85 - 115
Nickel	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349062

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349065

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P348997

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348840

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P348759

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: P348759

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P348884

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P348686

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

Reference Method: EPA 8321B
Batch ID: P348626

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	117		P	40 - 150
Acetaminophen	86.6		P	30 - 150
Bentazon	98.1		P	30 - 150
Carbamazepine	80.4		P	40 - 150
Diuron	76.3		P	40 - 150
Fenuron	97.7		P	40 - 150
Fluridone	80.9		P	40 - 150
Hydrocodone	92.2		P	40 - 150
Ibuprofen	101		P	40 - 150
Imazapyr	90.3		P	40 - 150
Imidacloprid	91.8		P	40 - 160
Linuron	84.3		P	40 - 150
MCPP	139		P	40 - 150
Naproxen	116		P	40 - 150
Primidone	94.8		P	40 - 150
Pyraclostrobin	85.1		P	40 - 150
Triclopyr	136		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P348751

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Acesulfame K	78.3		P	40 - 140
Sucralose	92.0		P	40 - 150

Reference Method: SM 2120 B
Batch ID: P348712

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.5		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P348843

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P348849

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.8		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P348929

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348660

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2007909	Calcium	104		P	80 - 120
2007909	Iron	106		P	80 - 120
2007909	Magnesium	108		P	80 - 120
2007909	Potassium	100		P	80 - 120
2007909	Sodium	99.3		P	80 - 120
2007909	Zinc	107		P	80 - 120
2008233	Calcium	106		P	80 - 120
2008233	Iron	107	107	P/P	80 - 120
2008233	Magnesium	107		P	80 - 120
2008233	Potassium	103	102	P/P	80 - 120
2008233	Sodium	101		P	80 - 120
2008233	Zinc	101	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348660

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2007909	Arsenic	105		P	80 - 120
2007909	Cadmium	107		P	80 - 120
2007909	Chromium	101		P	80 - 120
2007909	Copper	103		P	80 - 120
2007909	Lead	104		P	80 - 120
2007909	Nickel	103		P	80 - 120
2008233	Arsenic	102	103	P/P	80 - 120
2008233	Cadmium	104	106	P/P	80 - 120
2008233	Chromium	96.4	98.1	P/P	80 - 120
2008233	Copper	94.8	96.1	P/P	80 - 120
2008233	Lead	101	102	P/P	80 - 120
2008233	Nickel	97.5	99.5	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2008001	Silver	99.2		P	80 - 120
2008141	Silver	103	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349062

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006061	Chloride	108		P	90 - 110
2007924	Chloride	98.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349065

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2006061	Sulfate	106		P	90 - 110
2007924	Sulfate	97.7		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P348997

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2008095	Ammonia-N	101	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P348840

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2008169	Kjeldahl Nitrogen	95.8	97.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P348759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2007832	NO2NO3-N	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P348884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2008248	Total-P	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P348686

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2008228	O-Phosphate-P	94.9	96.4	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P348626

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2009013	2,4-D	139	139	P/P	40 - 150
2009013	Acetaminophen	106	109	P/P	30 - 150
2009013	Bentazon	52.6	54.5	P/P	30 - 150
2009013	Carbamazepine	75.6	81.3	P/P	40 - 150
2009013	Diuron	73.1	78.4	P/P	40 - 150
2009013	Fenuron	77.7	87.3	P/P	40 - 150
2009013	Fluridone	83.2	89.3	P/P	40 - 150
2009013	Hydrocodone	87.3	97.3	P/P	40 - 150
2009013	Ibuprofen	94.3	102	P/P	40 - 150
2009013	Imazapyr	91.8	106	P/P	40 - 150
2009013	Imidacloprid	142	153	P/P	40 - 160
2009013	Linuron	89.6	94.1	P/P	40 - 150
2009013	MCP	162	165	F/F	40 - 150
2009013	Naproxen	103	114	P/P	40 - 150
2009013	Primidone	109	121	P/P	40 - 150
2009013	Pyraclostrobin	86.7	101	P/P	40 - 150
2009013	Triclopyr	162	162	F/F	40 - 150

Reference Method: EPA 8321B
 Batch ID: P348751

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: P348751

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2008140	Acesulfame K	82.6	97.8	P/P	40 - 140
2008140	Sucralose	81.0	81.9	P/P	40 - 150

Reference Method: SM 4500 F-C-97
Batch ID: P348849

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2008487	Fluoride	97.6	97.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P348929

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2007890	Organic Carbon	92.6	91.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P348691

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008236	Turbidity	3.65	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008233	Calcium	0.369	Spike	P	0 - 20
2008233	Iron	0.0186	Spike	P	0 - 20
2008233	Magnesium	0.143	Spike	P	0 - 20
2008233	Potassium	0.710	Spike	P	0 - 20
2008233	Sodium	0.220	Spike	P	0 - 20
2008233	Zinc	0.966	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008233	Arsenic	1.35	Spike	P	0 - 20
2008233	Cadmium	1.86	Spike	P	0 - 20
2008233	Chromium	1.66	Spike	P	0 - 20
2008233	Copper	1.31	Spike	P	0 - 20
2008233	Lead	1.16	Spike	P	0 - 20
2008233	Nickel	2.08	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008141	Silver	0.366	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349062

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2007924	Chloride	2.45	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P349065

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2007924	Sulfate	2.30	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P348997

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008095	Ammonia-N	1.60	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P348840

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008169	Kjeldahl Nitrogen	1.29	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P348759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2007832	NO2NO3-N	1.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P348884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008248	Total-P	1.07	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P348686

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008228	O-Phosphate-P	1.25	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P348626

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009013	2,4-D	0.511	Spike	P	0 - 30
2009013	Acetaminophen	2.89	Spike	P	0 - 30
2009013	Bentazon	3.14	Spike	P	0 - 30
2009013	Carbamazepine	7.06	Spike	P	0 - 30
2009013	Diuron	7.10	Spike	P	0 - 30
2009013	Fenuron	11.5	Spike	P	0 - 30
2009013	Fluridone	7.03	Spike	P	0 - 30
2009013	Hydrocodone	10.9	Spike	P	0 - 30
2009013	Ibuprofen	7.50	Spike	P	0 - 30
2009013	Imazapyr	12.9	Spike	P	0 - 30
2009013	Imidacloprid	4.97	Spike	P	0 - 30
2009013	Linuron	4.99	Spike	P	0 - 30
2009013	MCP	1.75	Spike	P	0 - 30
2009013	Naproxen	10.1	Spike	P	0 - 30
2009013	Primidone	9.41	Spike	P	0 - 30
2009013	Pyraclostrobin	15.7	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
 Batch ID: P348626

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2009013	Triclopyr	0.178	Spike	P	0 - 30

Reference Method: EPA 8321B
 Batch ID: P348751

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008140	Acesulfame K	16.8	Spike	P	0 - 30
2008140	Sucralose	1.05	Spike	P	0 - 30

Reference Method: SM 2120 B
 Batch ID: P348712

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008237	Color (true)	0.00802	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P348843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008487	Total Alkalinity	0.776	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
 Batch ID: P349269

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008094	TDS	3.31	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P348849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2008487	Fluoride	0.474	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
 Batch ID: P348929

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2007890	Organic Carbon	0.839	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: 2008232

Field Sample ID: 34879

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	131	P	30 - 160
EPA 8321B	Acetaminophen-d4	95.0	P	30 - 160
EPA 8321B	Carbamazepine-d10	91.4	P	30 - 160
EPA 8321B	Diuron-d6	83.1	P	30 - 160
EPA 8321B	Endothall-d6	41.7	P	40 - 160
EPA 8321B	Ibuprofen-d3	116	P	40 - 160
EPA 8321B	Primidone-d5	101	P	30 - 160
EPA 8321B	Sucralose-d6	109	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A85316

Included Lab Sample IDs: 2008228

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	98.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A85317

Included Lab Sample IDs: 2008226

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.5	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A85321

Included Lab Sample IDs: 2008226

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	105	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A85343

Included Lab Sample IDs: 2008227

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A85355

Included Lab Sample IDs: 2008233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	104	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Magnesium	105	105	P/P	90 - 110
Potassium	100	99.5	P/P	90 - 110
Sodium	101	99.5	P/P	90 - 110
Zinc	105	104	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A85366

Included Lab Sample IDs: 2008226

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

Reference Method: SM 4500 F-C-97

Run ID: A85366

Included Lab Sample IDs: 2008226

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A85392
Included Lab Sample IDs: 2008227

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	96.4	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A85393
Included Lab Sample IDs: 2008232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	101	95.0	P/P	60 - 150

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A85394
Included Lab Sample IDs: 2008233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	100	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Chromium	98.8	98.6	P/P	90 - 110
Copper	100	97.8	P/P	90 - 110
Lead	98.9	99.8	P/P	90 - 110
Nickel	101	98.3	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A85396
Included Lab Sample IDs: 2008232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acesulfame K	120	118	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A85405
Included Lab Sample IDs: 2008227

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.5	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A85408
Included Lab Sample IDs: 2008227

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A85415
Included Lab Sample IDs: 2008227

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A85417

Included Lab Sample IDs: 2008226

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A85557

Included Lab Sample IDs: 2008233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	99.7	101	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A85613

Included Lab Sample IDs: 2008232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bentazon	114	118	P/P	50 - 150
Ibuprofen	83.8	150	P/P	50 - 150
Naproxen	103	83.6	P/P	60 - 150

Reference Method: EPA 8321B

Run ID: A85626

Included Lab Sample IDs: 2008232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Acetaminophen	100	98.2	P/P	60 - 150
Carbamazepine	122	115	P/P	60 - 150
Diuron	118	107	P/P	60 - 150
Fenuron	102	98.7	P/P	60 - 150
Fluridone	108	105	P/P	60 - 160
Hydrocodone	96.5	94.3	P/P	60 - 150
Imazapyr	112	94.2	P/P	50 - 150
Imidacloprid	96.0	90.1	P/P	60 - 150
Linuron	108	99.7	P/P	60 - 150
Primidone	106	105	P/P	60 - 150
Pyraclostrobin	113	109	P/P	60 - 150

Reference Method: EPA 8321B

Run ID: A85629

Included Lab Sample IDs: 2008232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	91.5	128	P/P	50 - 150
MCP	98.3	99.6	P/P	50 - 150
Triclopyr	99.7	96.9	P/P	50 - 160

* 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						3.65	
EPA 200.7 Rev. 4.4	Calcium	105	104	106				0.369
	Iron	108	106	107	107			0.0186
	Magnesium	107	108	107				0.143
	Potassium	105	100	103	102			0.710
	Sodium	101	99.3	101				0.220
	Zinc	102	107	101	102			0.966
EPA 200.8 Rev. 5.4	Arsenic	102	105	102	103			1.35
	Cadmium	103	107	104	106			1.86
	Chromium	99.9	101	96.4	98.1			1.66
	Copper	99.2	103	94.8	96.1			1.31
	Lead	99.9	104	101	102			1.16
	Nickel	101	103	97.5	99.5			2.08
	Silver	101	99.2	103	103			0.366
EPA 300.0 Rev. 2.1	Chloride	99.0	98.7	108			2.45	
	Sulfate	99.4	97.7	106			2.30	
EPA 350.1 Rev. 2.0	Ammonia-N	104	101	103				1.60
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	95.8	97.5				1.29
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	102	104				1.54
EPA 365.1 Rev. 2.0	Total-P	101	101	100				1.07
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.1	94.9	96.4				1.25
EPA 8321B	2,4-D	117	139	139				0.511
	Acesulfame K	78.3	82.6	97.8				16.8
	Acetaminophen	86.6	106	109				2.89
	Bentazon	98.1	52.6	54.5				3.14
	Carbamazepine	80.4	75.6	81.3				7.06
	Diuron	76.3	73.1	78.4				7.10
	Fenuron	97.7	77.7	87.3				11.5
	Fluridone	80.9	83.2	89.3				7.03
	Hydrocodone	92.2	87.3	97.3				10.9
	Ibuprofen	101	94.3	102				7.50
	Imazapyr	90.3	91.8	106				12.9
	Imidacloprid	91.8	142	153				4.97
	Linuron	84.3	89.6	94.1				4.99
	MCPP	139	162	165				1.75
	Naproxen	116	103	114				10.1
	Primidone	94.8	109	121				9.41
	Pyraclostrobin	85.1	86.7	101				15.7
	Sucralose	92.0	81.0	81.9				1.05
	Triclopyr	136	162	162				0.178
SM 2120 B	Color (true)	99.5					0.0080	
SM 2320 B-97	Total Alkalinity	103					0.776	
SM 2540 C-97	TDS						3.31	
SM 4500 F-C-97	Fluoride	97.8	97.6	97.0				0.474
SM 5310 B-00	Organic Carbon	93.2	92.6	91.3				0.839

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2008226
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2008233

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	2008233
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2008226
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2008226
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2008227
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2008227
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2008227
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2008227
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2008228
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	2008232
SM 2120 B / E31780	True Color measured at 450 nm	2008226
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2008226
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2008226
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2008226
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2008226
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2008227

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	07/18/2018			07/18/2018 16:18	William L. Brown IV	2008226
EPA 200.7 Rev. 4.4	07/18/2018	07/18/2018 14:50	Elliott D. Healy	07/19/2018 16:11	Betina Topolski	2008233
EPA 200.8 Rev. 5.4	07/18/2018	07/18/2018 14:50	Elliott D. Healy	07/20/2018 18:55	Allison Taylor	2008233
	07/18/2018	07/24/2018 14:10	Elliott D. Healy	07/30/2018 13:37	Robert K Palmer	2008233
EPA 300.0 Rev. 2.1	07/18/2018			07/23/2018 17:09	Lipi Saha	2008226
EPA 350.1 Rev. 2.0	07/18/2018			07/23/2018 12:32	Ping Hua	2008227
EPA 351.2 Rev. 2.0	07/18/2018	07/20/2018 11:00	Adrian Shelby	07/23/2018 10:49	Joseph Suarez	2008227
EPA 353.2 Rev. 2.0	07/18/2018			07/19/2018 11:20	Lauren Bottorf	2008227
EPA 365.1 Rev. 2.0	07/18/2018	07/20/2018 13:40	Sima Feizi	07/23/2018 13:59	Beverly Y. Sanders	2008227
EPA 365.1 Rev. 2.0 dissolved	07/18/2018			07/18/2018 15:10	Julia Storbeck	2008228
EPA 8321B	07/18/2018	07/20/2018 10:00	Hoor Shaik	07/24/2018 23:12	Juyoung Kim	2008232
	07/18/2018	07/20/2018 10:00	Hoor Shaik	07/28/2018 05:19	Juyoung Kim	2008232
	07/18/2018	07/20/2018 10:00	Hoor Shaik	08/02/2018 03:24	Juyoung Kim	2008232
	07/18/2018	07/20/2018 16:00	Mohammad Ghaffari	07/20/2018 22:35	Mohammad Ghaffari	2008232
	07/18/2018	07/20/2018 16:00	Mohammad Ghaffari	07/22/2018 00:03	Mohammad Ghaffari	2008232
SM 2120 B	07/18/2018			07/18/2018 17:21	Tanya Welborn	2008226
SM 2320 B-97	07/18/2018			07/20/2018 03:37	Dale L. Simmons	2008226
SM 2540 C-97	07/18/2018			07/20/2018 14:31	Yijie Li	2008226
SM 2540 D-97	07/18/2018			07/20/2018 14:31	Yijie Li	2008226
SM 4500 F-C-97	07/18/2018			07/20/2018 03:37	Dale L. Simmons	2008226
SM 5310 B-00	07/18/2018			07/20/2018 00:21	Megan Treadwell	2008227