

Chemical Analysis Report

CEN-DIST-2018-02-06-01

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

Event Description: **Long Branch**
Request ID: **RQ-2018-02-05-72**
Customer: **CEN-DIST**
Project ID: **BMAP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 06-MAR-2018 13:52



Case Narrative

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

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

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

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

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

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: Long Branch @ 0.7 mi DS of CR 13 (3030)

Collection Date/Time: 02/05/2018 10:43

Field ID: G2CE0036

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1964762	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P339409	
	EPA 300.0 Rev. 2.1	Chloride	37		mg Cl/L	P339701	
		Sulfate	19		mg SO4/L	P339706	
	SM 2120 B	Color (true)	78		PCU	P339425	
	SM 2320 B-97	Total Alkalinity	102		mg CaCO3/L	P340123	
	SM 2540 C-97	TDS	260		mg/L	P339749	
	SM 2540 D-97	TSS	2	I	mg/L	P339688	
	SM 4500 F-C-97	Fluoride	0.091	I	mg F/L	P340137	
1964763	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P339774	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.56		mg N/L	P339560	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P339851	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P339581	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P339914	
1964764	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P339448	
1964771	EPA 8321B	2,4-D	0.0020	U	ug/L	P339218	
		Sucralose**	0.46		ug/L	P339388	
		Bentazon	0.0023	I	ug/L	P339218	
		MCP	0.0020	U	ug/L	P339218	
		Triclopyr**	0.0040	U	ug/L	P339218	
		Imidacloprid	0.0020	U	ug/L	P339218	
		Diuron	0.0020	U	ug/L	P339218	
		Primidone**	0.0040	U	ug/L	P339218	
		Linuron	0.0040	U	ug/L	P339218	
		Acetaminophen**	0.0080	U	ug/L	P339218	
		Fenuron	0.0080	U	ug/L	P339218	
		Carbamazepine**	0.0015	I	ug/L	P339218	
		Fluridone**	0.0033		ug/L	P339218	
1964772	EPA 200.7 Rev. 4.4	Calcium	51.3		mg/L	P339505	
		Iron	590		ug/L	P339505	
		Magnesium	3.13		mg/L	P339505	
		Potassium	2.6		mg/L	P339505	
		Sodium	22.6		mg/L	P339505	
		Zinc	5.0	U	ug/L	P339505	
	EPA 200.8 Rev. 5.4	Arsenic	0.70		ug/L	P339505	
		Cadmium	0.020	U	ug/L	P339505	
		Chromium	0.54	I	ug/L	P340191	
		Copper	0.36	I	ug/L	P339505	
		Lead	0.24		ug/L	P339505	
		Nickel	0.28	I	ug/L	P340191	
		Silver	0.010	U	ug/L	P339505	

Ref. Method and Comment:

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

EPA 8321B: MS accuracy for 2,4-D could not be assessed due to high concentration of parameter in the spiked sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339409

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339505

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: P339505

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
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340191

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339701

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339706

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339774

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339560

Component	Result	Code	Units
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Quality Assurance Report

Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339560

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339851

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: P339581

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339448

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

Reference Method: EPA 8321B
Batch ID: P339218

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	0.0080	U	ug/L
Fluridone	8.0E-04	U	ug/L
Imidacloprid	0.0020	U	ug/L
Linuron	0.0040	U	ug/L
MCPP	0.0020	U	ug/L
Primidone	0.0040	U	ug/L
Triclopyr	0.0040	U	ug/L

Reference Method: EPA 8321B
Batch ID: P339388

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: SM 2120 B
Batch ID: P339425

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P340123

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

Reference Method: SM 2540 C-97
Batch ID: P339749

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P339688

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P340137

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P339914

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: P339505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	105		P	85 - 115
Magnesium	111		P	85 - 115
Potassium	104		P	85 - 115
Sodium	105		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	106		P	85 - 115
Cadmium	104		P	85 - 115
Copper	102		P	85 - 115
Lead	107		P	85 - 115
Silver	91.4		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340191

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	98.3		P	85 - 115
Nickel	99.6		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339701

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339706

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339774

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339560

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339851

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339581

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: P339448

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

Reference Method: EPA 8321B
Batch ID: P339218

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	71.2		P	40 - 150
Acetaminophen	109		P	30 - 150
Bentazon	84.2		P	30 - 150

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
 Batch ID: P339218

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Carbamazepine	94.0		P	40 - 150
Diuron	86.8		P	40 - 150
Fenuron	115		P	40 - 150
Fluridone	86.2		P	40 - 150
Imidacloprid	95.2		P	40 - 160
Linuron	89.5		P	40 - 150
MCPP	81.1		P	40 - 150
Primidone	107		P	40 - 150
Triclopyr	73.8		P	40 - 150

Reference Method: EPA 8321B
 Batch ID: P339388

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	97.0		P	40 - 150

Reference Method: SM 2320 B-97
 Batch ID: P340123

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.5		P	95 - 108

Reference Method: SM 4500 F-C-97
 Batch ID: P340137

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.5		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P339914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P339505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964772	Calcium	100		P	80 - 120
1964772	Iron	107		P	80 - 120
1964772	Magnesium	109		P	80 - 120
1964772	Potassium	102		P	80 - 120
1964772	Sodium	103		P	80 - 120
1964772	Zinc	105		P	80 - 120
1964978	Calcium	103		P	80 - 120
1964978	Iron	107	106	P/P	80 - 120
1964978	Magnesium	111	109	P/P	80 - 120
1964978	Potassium	103	103	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964978	Sodium	105		P	80 - 120
1964978	Zinc	106	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964772	Arsenic	108		P	80 - 120
1964772	Cadmium	104		P	80 - 120
1964772	Copper	105		P	80 - 120
1964772	Lead	108		P	80 - 120
1964772	Silver	90.2		P	80 - 120
1964978	Arsenic	108	108	P/P	80 - 120
1964978	Cadmium	103	108	P/P	80 - 120
1964978	Copper	99.1	99.8	P/P	80 - 120
1964978	Lead	109	110	P/P	80 - 120
1964978	Silver	91.0	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964772	Chromium	98.8		P	80 - 120
1964772	Nickel	97.8		P	80 - 120
1964979	Chromium	99.2	97.9	P/P	80 - 120
1964979	Nickel	99.1	98.0	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339701

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964687	Chloride	97.1		P	90 - 110
1964822	Chloride	95.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964687	Sulfate	95.8		P	90 - 110
1964822	Sulfate	93.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339774

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964763	Ammonia-N	97.1	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964763	Kjeldahl Nitrogen	96.8	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339851

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964730	NO2NO3-N	98.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339581

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964806	Total-P	97.0	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964604	O-Phosphate-P	97.0	97.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P339218

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963931	Acetaminophen	134	126	P/P	30 - 150
1963931	Bentazon	68.5	57.0	P/P	30 - 150
1963931	Carbamazepine	93.4	90.7	P/P	40 - 150
1963931	Diuron	84.6	77.4	P/P	40 - 150
1963931	Fenuron	98.1	88.2	P/P	40 - 150
1963931	Fluridone	71.6	66.0	P/P	40 - 150
1963931	Imidacloprid	149	153	P/P	40 - 160
1963931	Linuron	85.7	87.7	P/P	40 - 150
1963931	MCP	64.2	59.4	P/P	40 - 150
1963931	Primidone	127	113	P/P	40 - 150
1963931	Triclopyr	64.7	52.8	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P339388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964717	Sucralose	100	102	P/P	40 - 150

Reference Method: SM 4500 F-C-97
Batch ID: P340137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964822	Fluoride	95.5	96.1	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P339914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964688	Organic Carbon	96.3	95.9	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964728	Turbidity	2.09	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964978	Calcium	0.104	Spike	P	0 - 20
1964978	Iron	1.22	Spike	P	0 - 20
1964978	Magnesium	1.12	Spike	P	0 - 20
1964978	Potassium	0.178	Spike	P	0 - 20
1964978	Sodium	0.365	Spike	P	0 - 20
1964978	Zinc	2.35	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964978	Arsenic	0.595	Spike	P	0 - 20
1964978	Cadmium	4.50	Spike	P	0 - 20
1964978	Copper	0.665	Spike	P	0 - 20
1964978	Lead	0.718	Spike	P	0 - 20
1964978	Silver	10.5	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964979	Chromium	1.26	Spike	P	0 - 20
1964979	Nickel	1.17	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964822	Chloride	0.0559	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964822	Sulfate	0.0422	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964763	Ammonia-N	2.70	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964763	Kjeldahl Nitrogen	4.92	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964730	NO2NO3-N	1.51	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964806	Total-P	5.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964604	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P339218

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963931	2,4-D	21.5	Spike	P	0 - 30
1963931	Acetaminophen	5.63	Spike	P	0 - 30
1963931	Bentazon	8.15	Spike	P	0 - 30
1963931	Carbamazepine	2.87	Spike	P	0 - 30
1963931	Diuron	8.34	Spike	P	0 - 30
1963931	Fenuron	10.6	Spike	P	0 - 30
1963931	Fluridone	2.79	Spike	P	0 - 30
1963931	Imidacloprid	2.65	Spike	P	0 - 30
1963931	Linuron	2.27	Spike	P	0 - 30
1963931	MCP	7.72	Spike	P	0 - 30
1963931	Primidone	11.2	Spike	P	0 - 30
1963931	Triclopyr	20.2	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
 Batch ID: P339388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964717	Sucralose	1.33	Spike	P	0 - 30

Reference Method: SM 2120 B
 Batch ID: P339425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964751	Color (true)	2.09	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P340123

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964822	Total Alkalinity	2.79	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
 Batch ID: P339749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964652	TDS	3.90	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P340137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964822	Fluoride	0.482	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
 Batch ID: P339914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964688	Organic Carbon	0.381	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: 1964771
 Field Sample ID: G2CE0036

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	64.2	P	30 - 160
EPA 8321B	Acetaminophen-d4	135	P	30 - 160
EPA 8321B	Carbamazepine-d10	91.3	P	30 - 160

Quality Assurance Report Surrogates

Lab Sample ID: 1964771
 Field Sample ID: G2CE0036

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Diuron-d6	91.7	P	30 - 160
EPA 8321B	Primidone-d5	97.6	P	30 - 160
EPA 8321B	Sucralose-d6	115	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
 Run ID: A81879
 Included Lab Sample IDs: 1964762

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: SM 2120 B
 Run ID: A81881
 Included Lab Sample IDs: 1964762

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.9	98.4	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Run ID: A81897
 Included Lab Sample IDs: 1964764

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

Reference Method: EPA 200.8 Rev. 5.4
 Run ID: A81938
 Included Lab Sample IDs: 1964772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	105	104	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Copper	103	102	P/P	90 - 110
Lead	104	106	P/P	90 - 110
Silver	100	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
 Run ID: A81944
 Included Lab Sample IDs: 1964772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.2	99.5	P/P	90 - 110
Iron	98.7	99.2	P/P	90 - 110
Magnesium	99.8	101	P/P	90 - 110
Potassium	99.6	100	P/P	90 - 110
Sodium	100	101	P/P	90 - 110
Zinc	102	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A81947

Included Lab Sample IDs: 1964763

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

Reference Method: EPA 8321B

Run ID: A81950

Included Lab Sample IDs: 1964771

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	103	103	P/P	60 - 150

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A81955

Included Lab Sample IDs: 1964763

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A81969

Included Lab Sample IDs: 1964762

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	100	P/P	90 - 110
Sulfate	101	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A81995

Included Lab Sample IDs: 1964763

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82028

Included Lab Sample IDs: 1964763

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

Reference Method: SM 5310 B-00

Run ID: A82049

Included Lab Sample IDs: 1964763

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.9	95.5	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82122

Included Lab Sample IDs: 1964762

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.0	96.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A82122

Included Lab Sample IDs: 1964762

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	96.6	97.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A82182

Included Lab Sample IDs: 1964772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	99.2	100	P/P	90 - 110
Nickel	99.4	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A82192

Included Lab Sample IDs: 1964771

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	95.4	92.1	P/P	50 - 150
Acetaminophen	106	105	P/P	60 - 150
Bentazon	108	109	P/P	50 - 150
Carbamazepine	110	117	P/P	60 - 150
Diuron	117	111	P/P	60 - 150
Fenuron	114	113	P/P	60 - 150
Fluridone	105	101	P/P	60 - 160
Imidacloprid	99.9	104	P/P	60 - 150
Linuron	129	121	P/P	60 - 150
MCP	97.4	96.3	P/P	50 - 150
Primidone	108	114	P/P	60 - 150
Triclopyr	90.8	90.4	P/P	50 - 150

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

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

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision	
			LCS			SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.09	
EPA 200.7 Rev. 4.4	Calcium	104	100	103			0.104
	Iron	105	107	107	106		1.22
	Magnesium	111	109	111	109		1.12
	Potassium	104	102	103	103		0.178
	Sodium	105	103	105			0.365
	Zinc	102	105	106	108		2.35
EPA 200.8 Rev. 5.4	Arsenic	106	108	108	108		0.595
	Cadmium	104	104	103	108		4.50
	Chromium	98.3	99.2	97.9	98.8		1.26
	Copper	102	105	99.1	99.8		0.665
	Lead	107	108	109	110		0.718
	Nickel	99.6	99.1	98.0	97.8		1.17

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.8 Rev. 5.4	Silver	91.4	90.2	91.0	101		10.5
EPA 300.0 Rev. 2.1	Chloride	97.5	95.0	97.1		0.0559	
	Sulfate	95.9	93.9	95.8		0.0422	
EPA 350.1 Rev. 2.0	Ammonia-N	100	97.1	101			2.70
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.9	96.8	104			4.92
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	103	98.5	100			1.51
EPA 365.1 Rev. 2.0	Total-P	101	97.0	103			5.54
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.0	97.0			0.0
EPA 8321B	2,4-D	71.2					21.5
	Acetaminophen	109	134	126			5.63
	Bentazon	84.2	68.5	57.0			8.15
	Carbamazepine	94.0	93.4	90.7			2.87
	Diuron	86.8	84.6	77.4			8.34
	Fenuron	115	98.1	88.2			10.6
	Fluridone	86.2	71.6	66.0			2.79
	Imidacloprid	95.2	149	153			2.65
	Linuron	89.5	85.7	87.7			2.27
	MCPP	81.1	64.2	59.4			7.72
	Primidone	107	127	113			11.2
	Sucralose	97.0	100	102			1.33
	Triclopyr	73.8	64.7	52.8			20.2
SM 2120 B	Color (true)					2.09	
SM 2320 B-97	Total Alkalinity	97.5				2.79	
SM 2540 C-97	TDS					3.90	
SM 4500 F-C-97	Fluoride	94.5	95.5	96.1			0.482
SM 5310 B-00	Organic Carbon	96.8	95.9	96.3			0.381

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1964762
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1964772
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1964772
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1964762
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1964762
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1964763
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1964763
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1964763
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1964763
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1964764
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	1964771
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	1964771
SM 2120 B / E31780	True Color measured at 450 nm	1964762
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1964762
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1964762

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1964762
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1964762
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1964763

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	02/06/2018			02/06/2018 17:02	DeAsia Armster	1964762
EPA 200.7 Rev. 4.4	02/06/2018	02/07/2018	Elliott D. Healy	02/08/2018	Martin Acosta	1964772
EPA 200.8 Rev. 5.4	02/06/2018	02/07/2018	Elliott D. Healy	02/08/2018	Nadine Brooks	1964772
	02/06/2018	02/19/2018	Elliott D. Healy	02/20/2018	Nadine Brooks	1964772
EPA 300.0 Rev. 2.1	02/06/2018			02/10/2018	Julia Storbeck	1964762
EPA 350.1 Rev. 2.0	02/06/2018			02/12/2018	Julia Storbeck	1964763
EPA 351.2 Rev. 2.0	02/06/2018	02/08/2018	Adrian Shelby	02/09/2018	Joseph Suarez	1964763
EPA 353.2 Rev. 2.0	02/06/2018			02/13/2018	Lauren Bottorf	1964763
EPA 365.1 Rev. 2.0	02/06/2018	02/08/2018	Sima Feizi	02/09/2018	Lipi Saha	1964763
EPA 365.1 Rev. 2.0 dissolved	02/06/2018			02/06/2018 17:33	Megan Treadwell	1964764
EPA 8321B	02/06/2018	02/06/2018	Juyoung Kim	02/09/2018	Juyoung Kim	1964771
	02/06/2018	02/07/2018	Hoor Shaik	02/09/2018	Julie Michelle Frank	1964771
SM 2120 B	02/06/2018			02/06/2018 19:18	Tanya Welborn	1964762
SM 2320 B-97	02/06/2018			02/16/2018	Dale L. Simmons	1964762
SM 2540 C-97	02/06/2018			02/07/2018	Yijie Li	1964762
SM 2540 D-97	02/06/2018			02/07/2018	Yijie Li	1964762
SM 4500 F-C-97	02/06/2018			02/16/2018	Dale L. Simmons	1964762
SM 5310 B-00	02/06/2018			02/14/2018	Megan Treadwell	1964763