

Chemical Analysis Report

WQAP-2019-12-03-01

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

Event Description: **Algal Bloom Response - as needed**
Request ID: **RQ-2019-08-05-47**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 23-DEC-2019 10:27

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: 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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Lake Hunter - Center

Collection Date/Time: 12/02/2019 10:00

Field ID: HAB-SW-0004

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2139934	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P375084	
		Cylindrospermopsin**	0.25	U	ug/L	P375084	
		Desmethyl microcystin LR**	0.25	U	ug/L	P375084	
		Microcystin LA**	0.54	I	ug/L	P375084	
		Microcystin LF**	0.25	U	ug/L	P375084	
		Microcystin LR**	0.72	I	ug/L	P375084	
		Microcystin LW**	0.25	U	ug/L	P375084	
		Microcystin LY**	0.25	U	ug/L	P375084	
		Microcystin RR**	0.25	U	ug/L	P375084	
		Microcystin WR**	0.50	U	ug/L	P375084	
		Microcystin YR**	0.25	U	ug/L	P375084	
2139936	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P375392	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.5		mg N/L	P375223	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P375425	
	EPA 365.1 Rev. 2.0	Total-P	0.27		mg P/L	P375611	
2139938	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.028		mg P/L	P375148	

Sample Location: Scott Lake - Center

Collection Date/Time: 12/02/2019 11:11

Field ID: HAB-SW-0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2139935	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P375084	
		Cylindrospermopsin**	0.25	U	ug/L	P375084	
		Desmethyl microcystin LR**	0.39	I	ug/L	P375084	
		Microcystin LA**	0.25	U	ug/L	P375084	
		Microcystin LF**	0.25	U	ug/L	P375084	
		Microcystin LR**	2.2		ug/L	P375084	
		Microcystin LW**	0.25	U	ug/L	P375084	
		Microcystin LY**	0.25	U	ug/L	P375084	
		Microcystin RR**	0.25	U	ug/L	P375084	
		Microcystin WR**	0.50	U	ug/L	P375084	
		Microcystin YR**	0.25	U	ug/L	P375084	
2139937	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P375392	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P375224	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P375425	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P375611	
2139939	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P375148	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375392

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375223

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375224

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375425

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375611

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375148

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

Reference Method: EPA 8321B
Batch ID: P375084

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin LA	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375392

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375223

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375224

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375425

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: P375611

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375148

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

Reference Method: EPA 8321B
Batch ID: P375084

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	104		P	40 - 140
Cylindrospermopsin	89.8		P	40 - 140
Desmethyl microcystin LR	101		P	40 - 140
Microcystin LA	102		P	40 - 140
Microcystin LF	88.0		P	40 - 140
Microcystin LR	93.6		P	40 - 140
Microcystin LW	83.9		P	40 - 140
Microcystin LY	87.5		P	40 - 140
Microcystin RR	117		P	40 - 140
Microcystin WR	86.0		P	40 - 140
Microcystin YR	88.3		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P375392

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139974	Ammonia-N	100	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P375223

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139691	Kjeldahl Nitrogen	99.2	96.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P375224

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139974	Kjeldahl Nitrogen	106	95.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P375425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139936	NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P375611

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139936	Total-P	96.8	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P375148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139938	O-Phosphate-P	98.1	97.7	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P375084

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139707	Anatoxin-a	100	99.0	P/P	40 - 140
2139707	Cylindrospermopsin	82.2	82.5	P/P	40 - 140
2139707	Desmethyl microcystin LR	99.6	97.1	P/P	40 - 140
2139707	Microcystin LA	87.4	87.3	P/P	40 - 140
2139707	Microcystin LF	83.4	73.0	P/P	40 - 140
2139707	Microcystin LR	110	105	P/P	40 - 140
2139707	Microcystin LW	73.2	71.0	P/P	40 - 140
2139707	Microcystin LY	86.0	81.9	P/P	40 - 140
2139707	Microcystin RR	111	116	P/P	40 - 140
2139707	Microcystin WR	92.3	88.4	P/P	40 - 140
2139707	Microcystin YR	94.4	93.2	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375392

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139974	Ammonia-N	1.98	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375223

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139691	Kjeldahl Nitrogen	1.92	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375224

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139974	Kjeldahl Nitrogen	9.90	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139936	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375611

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139936	Total-P	1.61	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139938	O-Phosphate-P	0.319	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P375084

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139707	Anatoxin-a	1.20	Spike	P	0 - 30
2139707	Cylindrospermopsin	0.425	Spike	P	0 - 30
2139707	Desmethyl microcystin LR	2.60	Spike	P	0 - 30
2139707	Microcystin LA	0.160	Spike	P	0 - 30
2139707	Microcystin LF	13.3	Spike	P	0 - 30
2139707	Microcystin LR	4.52	Spike	P	0 - 30
2139707	Microcystin LW	3.11	Spike	P	0 - 30
2139707	Microcystin LY	4.94	Spike	P	0 - 30
2139707	Microcystin RR	4.43	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P375084

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139707	Microcystin WR	4.37	Spike	P	0 - 30
2139707	Microcystin YR	1.32	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Surrogates

Lab Sample ID: 2139934
Field Sample ID: HAB-SW-0004

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	69.5	P	30 - 165

Lab Sample ID: 2139935
Field Sample ID: HAB-SW-0002

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	68.8	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A96079

Included Lab Sample IDs: 2139938, 2139939

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	92.4	92.8	P/P	90 - 110
O-Phosphate-P	92.8	92.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A96121

Included Lab Sample IDs: 2139934, 2139935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	95.4	94.1	P/P	50 - 160
Cylindrospermopsin	80.4	84.2	P/P	60 - 160
Desmethyl microcystin LR	86.5	90.8	P/P	60 - 160
Microcystin LA	94.7	95.4	P/P	50 - 160
Microcystin LF	72.6	76.4	P/P	60 - 160
Microcystin LR	84.9	89.6	P/P	60 - 160
Microcystin LW	66.6	73.2	P/P	60 - 160
Microcystin LY	76.1	87.1	P/P	60 - 160
Microcystin RR	105	108	P/P	60 - 160
Microcystin WR	84.7	86.3	P/P	60 - 160
Microcystin YR	79.7	86.4	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A96122

Included Lab Sample IDs: 2139936, 2139937

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A96140

Included Lab Sample IDs: 2139936, 2139937

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	97.8	P/P	90 - 110
Kjeldahl Nitrogen	97.8	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A96177

Included Lab Sample IDs: 2139936, 2139937

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A96314

Included Lab Sample IDs: 2139936, 2139937

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

Quality Assurance Report

Calibration Verification

* 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 350.1 Rev. 2.0	Ammonia-N	102	100	102			1.98
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.4	99.2	96.7			1.92
	Kjeldahl Nitrogen	97.9	106	95.4			9.90
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	98.5	99.0			0.506
EPA 365.1 Rev. 2.0	Total-P	103	96.8	99.5			1.61
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	98.1	97.7			0.319
EPA 8321B	Anatoxin-a	104	100	99.0			1.20
	Cylindrospermopsin	89.8	82.2	82.5			0.425
	Desmethyl microcystin LR	101	99.6	97.1			2.60
	Microcystin LA	102	87.4	87.3			0.160
	Microcystin LF	88.0	83.4	73.0			13.3
	Microcystin LR	93.6	110	105			4.52
	Microcystin LW	83.9	73.2	71.0			3.11
	Microcystin LY	87.5	86.0	81.9			4.94
	Microcystin RR	117	111	116			4.43
	Microcystin WR	86.0	92.3	88.4			4.37
	Microcystin YR	88.3	94.4	93.2			1.32

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2139936, 2139937
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2139936, 2139937
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2139936, 2139937
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2139936, 2139937
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2139938, 2139939
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2139934, 2139935

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 350.1 Rev. 2.0	12/03/2019			12/04/2019 12:57	Ping Hua	2139936
	12/03/2019			12/04/2019 12:58	Ping Hua	2139937
EPA 351.2 Rev. 2.0	12/03/2019	12/04/2019 12:22	Sima Feizi	12/05/2019 18:34	Jhamieka S. Greenwood	2139936
	12/03/2019	12/04/2019 12:22	Sima Feizi	12/05/2019 18:46	Jhamieka S. Greenwood	2139937
EPA 353.2 Rev. 2.0	12/03/2019			12/05/2019 09:33	Beverly Y. Sanders	2139936
	12/03/2019			12/05/2019 09:45	Beverly Y. Sanders	2139937
EPA 365.1 Rev. 2.0	12/03/2019	12/11/2019 10:23	Yen Ta	12/12/2019 16:31	Benjamin T. Nordmann	2139936
	12/03/2019	12/11/2019 10:23	Yen Ta	12/12/2019 16:34	Benjamin T. Nordmann	2139937
EPA 365.1 Rev. 2.0 dissolved	12/03/2019			12/03/2019 16:37	Julia Storbeck	2139938
	12/03/2019			12/03/2019 16:51	Julia Storbeck	2139939
EPA 8321B	12/03/2019	12/03/2019 14:00	Juyoung Kim	12/05/2019 12:52	Juyoung Kim	2139934
	12/03/2019	12/03/2019 14:00	Juyoung Kim	12/05/2019 13:08	Juyoung Kim	2139935