

Chemical Analysis Report

WQAP-2019-08-15-01

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-2019-08-19-48**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 03-SEP-2019 10:17

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 Washington - HAB

Collection Date/Time: 08/14/2019 12:58

Field ID: Lake Washington - HAB

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2111798	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P369045	
		Cylindrospermopsin**	0.25	U	ug/L	P369045	
		Microcystin LA**	0.25	U	ug/L	P369045	
		Microcystin LF**	0.25	U	ug/L	P369045	
		Microcystin LR**	0.25	U	ug/L	P369045	
		Microcystin LY**	0.25	U	ug/L	P369045	
		Microcystin RR**	0.25	U	ug/L	P369045	
		Microcystin YR**	0.25	U	ug/L	P369045	
2111799	EPA 350.1 Rev. 2.0	Ammonia-N	0.29		mg N/L	P369691	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.4		mg N/L	P369364	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P369326	
	EPA 365.1 Rev. 2.0	Total-P	0.38		mg P/L	P369183	
2111800	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.30		mg P/L	P369131	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369691

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369364

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369326

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369183

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369131

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

Reference Method: EPA 8321B
Batch ID: P369045

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	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 LY	0.25	U	ug/L
Microcystin RR	0.25	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: P369691

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369364

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369326

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369183

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369131

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

Reference Method: EPA 8321B
Batch ID: P369045

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	118		P	40 - 140
Cylindrospermopsin	98.8		P	40 - 140
Microcystin LA	91.3		P	40 - 140
Microcystin LF	98.1		P	40 - 140
Microcystin LR	91.2		P	40 - 140
Microcystin LY	94.8		P	40 - 140
Microcystin RR	104		P	40 - 140
Microcystin YR	93.6		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369691

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2111409	Ammonia-N	99.0	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369364

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2111838	Kjeldahl Nitrogen	100	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369326

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2111767	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2111707	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2111903	O-Phosphate-P	96.5	97.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P369045

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2111110	Anatoxin-a	124	125	P/P	40 - 140
2111110	Cylindrospermopsin	97.8	99.4	P/P	40 - 140
2111110	Microcystin LA	87.8	90.2	P/P	40 - 140
2111110	Microcystin LF	101	112	P/P	40 - 140
2111110	Microcystin LR	92.0	102	P/P	40 - 140
2111110	Microcystin LY	92.7	91.0	P/P	40 - 140
2111110	Microcystin RR	93.9	107	P/P	40 - 140
2111110	Microcystin YR	101	106	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P369691

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2111409	Ammonia-N	0.139	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P369364

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2111838	Kjeldahl Nitrogen	1.87	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P369326

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2111767	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P369183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2111707	Total-P	0.604	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P369131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2111903	O-Phosphate-P	0.545	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P369045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2111110	Anatoxin-a	0.552	Spike	P	0 - 30
2111110	Cylindrospermopsin	1.58	Spike	P	0 - 30
2111110	Microcystin LA	2.67	Spike	P	0 - 30
2111110	Microcystin LF	10.8	Spike	P	0 - 30
2111110	Microcystin LR	10.8	Spike	P	0 - 30
2111110	Microcystin LY	1.88	Spike	P	0 - 30
2111110	Microcystin RR	12.7	Spike	P	0 - 30
2111110	Microcystin YR	5.02	Spike	P	0 - 30

* 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: 2111798

Field Sample ID: Lake Washington - HAB

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	99.1	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
 Run ID: A93534
 Included Lab Sample IDs: 2111798

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	107	105	P/P	50 - 160
Cylindrospermopsin	98.9	104	P/P	60 - 160
Microcystin LA	90.0	94.6	P/P	50 - 160
Microcystin LF	99.7	97.3	P/P	60 - 160
Microcystin LR	93.0	95.2	P/P	60 - 160
Microcystin LY	90.6	90.8	P/P	60 - 160
Microcystin RR	105	104	P/P	60 - 160
Microcystin YR	102	95.4	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Run ID: A93541
 Included Lab Sample IDs: 2111800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A93591
 Included Lab Sample IDs: 2111799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Run ID: A93635
 Included Lab Sample IDs: 2111799

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

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A93681
 Included Lab Sample IDs: 2111799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A93798
 Included Lab Sample IDs: 2111799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	102	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	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.0	98.7			0.139
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.4	100	97.8			1.87
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	102	101			0.494
EPA 365.1 Rev. 2.0	Total-P	102	106	105			0.604
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	96.5	97.1			0.545
EPA 8321B	Anatoxin-a	118	124	125			0.552
	Cylindrospermopsin	98.8	97.8	99.4			1.58
	Microcystin LA	91.3	87.8	90.2			2.67
	Microcystin LF	98.1	101	112			10.8
	Microcystin LR	91.2	92.0	102			10.8
	Microcystin LY	94.8	92.7	91.0			1.88
	Microcystin RR	104	93.9	107			12.7
	Microcystin YR	93.6	101	106			5.02

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2111799
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2111799
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2111799
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2111799
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2111800
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2111798

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	08/15/2019			08/26/2019 11:24	Ping Hua	2111799
EPA 351.2 Rev. 2.0	08/15/2019	08/20/2019 12:45	Sima Feizi	08/21/2019 12:56	Joseph Suarez	2111799
EPA 353.2 Rev. 2.0	08/15/2019			08/20/2019 11:04	Beverly Y. Sanders	2111799
EPA 365.1 Rev. 2.0	08/15/2019	08/16/2019 13:30	Vijayalakshmi Reddy	08/19/2019 11:02	Lipi Saha	2111799
EPA 365.1 Rev. 2.0 dissolved	08/15/2019			08/15/2019 14:59	Jhamieka S. Greenwood	2111800
EPA 8321B	08/15/2019	08/15/2019 11:30	Juyoung Kim	08/15/2019 12:14	Juyoung Kim	2111798