Chemical Analysis Report

WQAP-2019-07-31-04

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-2019-07-22-63**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
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Certified by: Colin Wright, Program Administrator

Date Certified: 14-AUG-2019 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: 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 BUFFUM BLOOM RESPONSE **Collection Date/Time: 07/30/2019 10:10**

Field ID: LAKE BUFFUM BLOOM RESPONSE Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2107351	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P368258	
		Cylindrospermopsin**	0.25	U	ug/L	P368258	
		Microcystin LA**	0.25	U	ug/L	P368258	
		Microcystin LF**	0.25	U	ug/L	P368258	
		Microcystin LR**	0.25	U	ug/L	P368258	
		Microcystin LY**	0.25	U	ug/L	P368258	
		Microcystin RR**	0.25	U	ug/L	P368258	
		Microcystin YR**	0.25	U	ug/L	P368258	
2107352	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P368807	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P368373	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P368383	
	EPA 365.1 Rev. 2.0	Total-P	0.077		mg P/L	P368388	
2107353	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.015		mg P/L	P368254	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368807

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368373

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368383

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368388

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368254

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

Reference Method: EPA 8321B
Batch ID: P368258

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: P368807

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368373

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368383

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368388

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368254

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P368258

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	123		P	40 - 140
Cylindrospermopsin	104		P	40 - 140
Microcystin LA	116		P	40 - 140
Microcystin LF	98.9		P	40 - 140
Microcystin LR	103		P	40 - 140
Microcystin LY	128		P	40 - 140
Microcystin RR	108		P	40 - 140
Microcystin YR	108		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368807

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107340	Ammonia-N	99.7	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107339	Kjeldahl Nitrogen	106	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368383

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107331	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107370	Total-P	92.0	95.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368254

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107353	O-Phosphate-P	96.4	97.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P368258

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107300	Anatoxin-a	126	121	P/P	40 - 140
2107300	Cylindrospermopsin	96.0	90.9	P/P	40 - 140
2107300	Microcystin LA	109	94.3	P/P	40 - 140
2107300	Microcystin LF	88.9	77.9	P/P	40 - 140
2107300	Microcystin LR	104	99.0	P/P	40 - 140
2107300	Microcystin LY	103	94.5	P/P	40 - 140
2107300	Microcystin RR	103	98.5	P/P	40 - 140
2107300	Microcystin YR	105	100	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107340	Ammonia-N	0.629	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107339	Kjeldahl Nitrogen	1.76	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368383

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107331	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107370	Total-P	1.87	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368254

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107353	O-Phosphate-P	0.715	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P368258

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107300	Anatoxin-a	3.67	Spike	P	0 - 30
2107300	Cylindrospermopsin	5.50	Spike	P	0 - 30
2107300	Microcystin LA	14.7	Spike	P	0 - 30
2107300	Microcystin LF	13.2	Spike	P	0 - 30
2107300	Microcystin LR	4.97	Spike	P	0 - 30
2107300	Microcystin LY	8.98	Spike	P	0 - 30
2107300	Microcystin RR	4.81	Spike	P	0 - 30
2107300	Microcystin YR	4.65	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: 2107351
Field Sample ID: LAKE BUFFUM BLOOM RESPONSE

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	112	P	30 - 165

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A93174
Included Lab Sample IDs: 2107353

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

Reference Method: EPA 8321B
Run ID: A93198
Included Lab Sample IDs: 2107351

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	78.7	107	P/P	50 - 160
Cylindrospermopsin	89.2	96.2	P/P	60 - 160
Microcystin LA	108	103	P/P	50 - 160
Microcystin LF	78.9	71.7	P/P	60 - 160
Microcystin LR	99.2	94.9	P/P	60 - 160
Microcystin LY	102	106	P/P	60 - 160
Microcystin RR	98.6	97.4	P/P	60 - 160
Microcystin YR	103	95.5	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A93231
Included Lab Sample IDs: 2107352

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A93256
Included Lab Sample IDs: 2107352

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A93288
Included Lab Sample IDs: 2107352

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	109	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A93406
Included Lab Sample IDs: 2107352

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		Precision		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	99.0	99.7	100			0.629
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	106	109			1.76
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	99.5			0.501
EPA 365.1 Rev. 2.0	Total-P	100	92.0	95.6			1.87
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	96.4	97.2			0.715
EPA 8321B	Anatoxin-a	123	126	121			3.67
	Cylindrospermopsin	104	96.0	90.9			5.50
	Microcystin LA	116	109	94.3			14.7
	Microcystin LF	98.9	88.9	77.9			13.2
	Microcystin LR	103	104	99.0			4.97
	Microcystin LY	128	103	94.5			8.98
	Microcystin RR	108	103	98.5			4.81
	Microcystin YR	108	105	100			4.65

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2107352
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2107352
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2107352
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2107352
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2107353
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2107351

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	07/31/2019			08/10/2019 13:20	Ping Hua	2107352
EPA 351.2 Rev. 2.0	07/31/2019	08/02/2019 12:30	Adrian Shelby	08/06/2019 10:11	Joseph Suarez	2107352
EPA 353.2 Rev. 2.0	07/31/2019			08/02/2019 11:43	Beverly Y. Sanders	2107352
EPA 365.1 Rev. 2.0	07/31/2019	08/02/2019 12:14	Vijayalakshmi Reddy	08/05/2019 09:01	Lipi Saha	2107352
EPA 365.1 Rev. 2.0 dissolved	07/31/2019			07/31/2019 16:28	Jhamieka S. Greenwood	2107353
EPA 8321B	07/31/2019	08/01/2019 09:00	Juyoung Kim	08/01/2019 11:10	Juyoung Kim	2107351