Chemical Analysis Report

WQAP-2019-08-23-03

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-2019-08-19-47**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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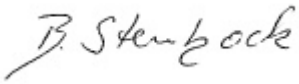
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 06-SEP-2019 18:59



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: Mosquito_Lagoon_0822 **Collection Date/Time: 08/22/2019 13:05**

Field ID: Mosquito_Lagoon_0822 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2114313	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P369635	
		Cylindrospermopsin**	0.25	U	ug/L	P369635	
		Microcystin LA**	0.25	U	ug/L	P369635	
		Microcystin LF**	0.25	U	ug/L	P369635	
		Microcystin LR**	0.25	U	ug/L	P369635	
		Microcystin LY**	0.25	U	ug/L	P369635	
		Microcystin RR**	0.25	U	ug/L	P369635	
		Microcystin YR**	0.25	U	ug/L	P369635	
2114315	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P370097	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P369714	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P369711	
	EPA 365.1 Rev. 2.0	Total-P	0.068		mg P/L	P369742	
2114317	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369899	

Sample Location: Mosquito_Lagoon_0822_2 **Collection Date/Time: 08/22/2019 13:20**

Field ID: Mosquito_Lagoon_0822_2 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2114314	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P369635	
		Cylindrospermopsin**	0.25	U	ug/L	P369635	
		Microcystin LA**	0.25	U	ug/L	P369635	
		Microcystin LF**	0.25	U	ug/L	P369635	
		Microcystin LR**	0.25	U	ug/L	P369635	
		Microcystin LY**	0.25	U	ug/L	P369635	
		Microcystin RR**	0.25	U	ug/L	P369635	
		Microcystin YR**	0.25	U	ug/L	P369635	
2114316	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P370097	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P369714	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P369711	
	EPA 365.1 Rev. 2.0	Total-P	0.068		mg P/L	P369742	
2114318	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369899	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370097

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369714

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369711

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369742

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369899

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

Reference Method: EPA 8321B
Batch ID: P369635

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: P370097

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369714

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369711

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369742

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369899

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

Reference Method: EPA 8321B
Batch ID: P369635

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	117		P	40 - 140
Cylindrospermopsin	92.4		P	40 - 140
Microcystin LA	81.4		P	40 - 140
Microcystin LF	108		P	40 - 140
Microcystin LR	107		P	40 - 140
Microcystin LY	85.9		P	40 - 140
Microcystin RR	105		P	40 - 140
Microcystin YR	95.3		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2114718	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369714

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2114235	Kjeldahl Nitrogen	97.9	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369711

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2114235	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369742

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113173	Total-P	94.4	90.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369899

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2114298	O-Phosphate-P	98.0	98.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P369635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2114292	Anatoxin-a	133	128	P/P	40 - 140
2114292	Cylindrospermopsin	100	82.6	P/P	40 - 140
2114292	Microcystin LA	69.9	73.6	P/P	40 - 140
2114292	Microcystin LF	93.4	77.9	P/P	40 - 140
2114292	Microcystin LR	126	112	P/P	40 - 140
2114292	Microcystin LY	70.0	64.4	P/P	40 - 140
2114292	Microcystin RR	114	103	P/P	40 - 140
2114292	Microcystin YR	107	99.5	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2114718	Ammonia-N	0.490	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2114235	Kjeldahl Nitrogen	0.339	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369711

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2114235	NO2NO3-N	0.480	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113173	Total-P	4.37	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369899

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2114298	O-Phosphate-P	0.0599	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P369635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2114292	Anatoxin-a	3.90	Spike	P	0 - 30
2114292	Cylindrospermopsin	19.5	Spike	P	0 - 30
2114292	Microcystin LA	5.22	Spike	P	0 - 30
2114292	Microcystin LF	18.1	Spike	P	0 - 30
2114292	Microcystin LR	12.2	Spike	P	0 - 30
2114292	Microcystin LY	8.31	Spike	P	0 - 30
2114292	Microcystin RR	10.5	Spike	P	0 - 30
2114292	Microcystin YR	7.36	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: 2114313
Field Sample ID: Mosquito_Lagoon_0822

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	96.6	P	30 - 165

Lab Sample ID: 2114314
Field Sample ID: Mosquito_Lagoon_0822_2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	76.3	P	30 - 165

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A93803
Included Lab Sample IDs: 2114315, 2114316

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

Reference Method: EPA 8321B
Run ID: A93804
Included Lab Sample IDs: 2114313, 2114314

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	93.0	120	P/P	50 - 160
Cylindrospermopsin	87.7	105	P/P	60 - 160
Microcystin LA	104	93.1	P/P	50 - 160
Microcystin LF	123	90.4	P/P	60 - 160
Microcystin LR	113	114	P/P	60 - 160
Microcystin LY	97.3	85.7	P/P	60 - 160
Microcystin RR	107	111	P/P	60 - 160
Microcystin YR	107	96.5	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A93834
Included Lab Sample IDs: 2114315, 2114316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A93865
Included Lab Sample IDs: 2114317, 2114318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A93884
Included Lab Sample IDs: 2114315, 2114316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.4	98.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A93962
Included Lab Sample IDs: 2114315, 2114316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	100	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	97.9	101	101			0.490
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.5	97.9	98.3			0.339
EPA 353.2 Rev. 2.0	NO2NO3-N	101	101	101			0.480
EPA 365.1 Rev. 2.0	Total-P	97.3	94.4	90.2			4.37
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	98.0	98.1			0.0599
EPA 8321B	Anatoxin-a	117	133	128			3.90
	Cylindrospermopsin	92.4	100	82.6			19.5
	Microcystin LA	81.4	69.9	73.6			5.22
	Microcystin LF	108	93.4	77.9			18.1
	Microcystin LR	107	126	112			12.2
	Microcystin LY	85.9	70.0	64.4			8.31
	Microcystin RR	105	114	103			10.5
	Microcystin YR	95.3	107	99.5			7.36

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2114315, 2114316
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2114315, 2114316
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2114315, 2114316
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2114315, 2114316
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2114317, 2114318
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2114313, 2114314

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	08/23/2019			09/03/2019 11:32	Ping Hua	2114315
	08/23/2019			09/03/2019 11:33	Ping Hua	2114316
EPA 351.2 Rev. 2.0	08/23/2019	08/27/2019 11:30	Sima Feizi	08/28/2019 16:48	Julia Storbeck	2114315
	08/23/2019	08/27/2019 11:30	Sima Feizi	08/28/2019 16:49	Julia Storbeck	2114316
EPA 353.2 Rev. 2.0	08/23/2019			08/27/2019 09:40	Beverly Y. Sanders	2114315
	08/23/2019			08/27/2019 09:41	Beverly Y. Sanders	2114316
EPA 365.1 Rev. 2.0	08/23/2019	08/27/2019 13:00	Lipi Saha	08/28/2019 11:47	Lipi Saha	2114315
	08/23/2019	08/27/2019 13:00	Lipi Saha	08/28/2019 11:48	Lipi Saha	2114316
EPA 365.1 Rev. 2.0 dissolved	08/23/2019			08/23/2019 14:46	Lipi Saha	2114317
	08/23/2019			08/23/2019 14:47	Lipi Saha	2114318
EPA 8321B	08/23/2019	08/27/2019 09:00	Juyoung Kim	08/27/2019 11:10	Juyoung Kim	2114313
	08/23/2019	08/27/2019 09:00	Juyoung Kim	08/27/2019 11:26	Juyoung Kim	2114314