

Chemical Analysis Report

WQAP-2020-11-20-03

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2020-10-05-60**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd Ste 232
Orlando, FL 32803
Attn: Natalie Ayala

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 08-DEC-2020 13:44

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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 Anderson @ N Shore

Collection Date/Time: 11/19/2020 10:30

Field ID: HABCE0030_Anderson

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2208903	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P390305	
		Cylindrospermopsin**	0.25	U	ug/L	P390305	
		Desmethyl microcystin LR**	0.25	U	ug/L	P390305	
		Microcystin LA**	0.25	U	ug/L	P390305	
		Microcystin LF**	0.25	U	ug/L	P390305	
		Microcystin LR**	1.2		ug/L	P390305	
		Microcystin LW**	0.25	U	ug/L	P390305	
		Microcystin LY**	0.25	U	ug/L	P390305	
		Microcystin RR**	0.25	U	ug/L	P390305	
		Microcystin WR**	0.50	U	ug/L	P390305	
		Microcystin YR**	0.25	U	ug/L	P390305	
2208904	EPA 350.1 Rev. 2.0	Ammonia-N	0.031		mg N/L	P390360	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P390508	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.33		mg N/L	P390383	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P390389	
2208905	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P390341	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390360

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390508

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390383

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390389

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390341

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

Reference Method: EPA 8321B
Batch ID: P390305

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: P390360

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: P390508

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390383

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390389

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390341

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P390305

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	104		P	40 - 150
Cylindrospermopsin	96.8		P	40 - 150
Desmethyl microcystin LR	80.0		P	40 - 150
Microcystin LA	104		P	40 - 150
Microcystin LF	78.6		P	40 - 150
Microcystin LR	91.1		P	40 - 150
Microcystin LW	83.8		P	40 - 150
Microcystin LY	108		P	40 - 150
Microcystin RR	126		P	40 - 150
Microcystin WR	103		P	40 - 150
Microcystin YR	98.6		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390360

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208808	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208314	Kjeldahl Nitrogen	101	99.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390383

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208904	NO2NO3-N	99.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208314	Total-P	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390341

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208817	O-Phosphate-P	98.4	98.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P390305

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208815	Anatoxin-a	85.8	91.4	P/P	40 - 150
2208815	Cylindrospermopsin	77.4	82.7	P/P	40 - 150
2208815	Desmethyl microcystin LR	71.3	73.0	P/P	40 - 150
2208815	Microcystin LA	85.6	93.1	P/P	40 - 150
2208815	Microcystin LF	98.9	107	P/P	40 - 150
2208815	Microcystin LR	80.2	89.9	P/P	40 - 150
2208815	Microcystin LW	87.4	88.2	P/P	40 - 150
2208815	Microcystin LY	86.5	95.2	P/P	40 - 150
2208815	Microcystin RR	103	108	P/P	40 - 150
2208815	Microcystin WR	89.1	93.4	P/P	40 - 150
2208815	Microcystin YR	82.1	86.1	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P390360

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208808	Ammonia-N	0.197	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P390508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208314	Kjeldahl Nitrogen	0.735	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P390383

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208904	NO2NO3-N	0.188	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P390389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208314	Total-P	2.08	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P390341

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208817	O-Phosphate-P	0.366	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P390305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208815	Anatoxin-a	6.33	Spike	P	0 - 30
2208815	Cylindrospermopsin	6.64	Spike	P	0 - 30
2208815	Desmethyl microcystin LR	2.47	Spike	P	0 - 30
2208815	Microcystin LA	8.37	Spike	P	0 - 30
2208815	Microcystin LF	7.59	Spike	P	0 - 30
2208815	Microcystin LR	11.4	Spike	P	0 - 30
2208815	Microcystin LW	0.898	Spike	P	0 - 30
2208815	Microcystin LY	9.58	Spike	P	0 - 30
2208815	Microcystin RR	4.39	Spike	P	0 - 30
2208815	Microcystin WR	4.70	Spike	P	0 - 30
2208815	Microcystin YR	4.83	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2208903

Field Sample ID: HABCE0030_Anderson

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	86.5	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	84.5	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A102239

Included Lab Sample IDs: 2208905

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	99.2	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A102241

Included Lab Sample IDs: 2208903

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	96.6	101	P/P	50 - 160
Cylindrospermopsin	100	103	P/P	60 - 160
Desmethyl microcystin LR	92.3	103	P/P	60 - 160
Microcystin LA	122	123	P/P	50 - 160
Microcystin LF	136	134	P/P	50 - 160
Microcystin LR	115	116	P/P	60 - 160
Microcystin LW	121	121	P/P	60 - 160
Microcystin LY	124	124	P/P	60 - 160
Microcystin RR	138	143	P/P	60 - 160
Microcystin WR	119	118	P/P	60 - 160
Microcystin YR	111	108	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102245

Included Lab Sample IDs: 2208904

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A102260

Included Lab Sample IDs: 2208904

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: A102286

Included Lab Sample IDs: 2208904

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102350

Included Lab Sample IDs: 2208904

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	97.0	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 SMP	MS
			LCS			
EPA 350.1 Rev. 2.0	Ammonia-N	101	104	104		0.197
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	101	99.7		0.735
EPA 353.2 Rev. 2.0	NO2NO3-N	102		99.2		0.188
EPA 365.1 Rev. 2.0	Total-P	104	104	106		2.08
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	98.4	98.9		0.366
EPA 8321B	Anatoxin-a	104	85.8	91.4		6.33
	Cylindrospermopsin	96.8	77.4	82.7		6.64
	Desmethyl microcystin LR	80.0	71.3	73.0		2.47
	Microcystin LA	104	85.6	93.1		8.37
	Microcystin LF	78.6	98.9	107		7.59
	Microcystin LR	91.1	80.2	89.9		11.4
	Microcystin LW	83.8	87.4	88.2		0.898
	Microcystin LY	108	86.5	95.2		9.58
	Microcystin RR	126	103	108		4.39
	Microcystin WR	103	89.1	93.4		4.70
	Microcystin YR	98.6	82.1	86.1		4.83

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2208904
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2208904
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2208904
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2208904
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2208905
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2208903

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	11/20/2020			11/22/2020 12:05	Ping Hua	2208904
EPA 351.2 Rev. 2.0	11/20/2020	11/30/2020 12:45	Elliott Rodriguez	12/01/2020 12:05	Elliott Rodriguez	2208904
EPA 353.2 Rev. 2.0	11/20/2020			11/23/2020 10:58	Beverly Y. Sanders	2208904
EPA 365.1 Rev. 2.0	11/20/2020	11/23/2020 20:44	Yen Ta	11/24/2020 14:54	Shengyu Wang	2208904
EPA 365.1 Rev. 2.0 dissolved	11/20/2020			11/20/2020 18:01	Samantha Davila	2208905
EPA 8321B	11/20/2020	11/20/2020 12:00	Juyoung Kim	11/20/2020 16:22	Pramila Ghimire	2208903