

Chemical Analysis Report

WQAP-2020-12-11-01

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

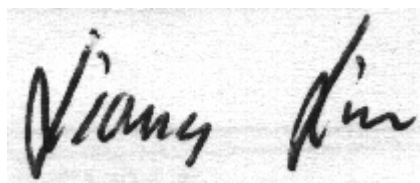
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2020-10-12-32**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 04-JAN-2021 15:09

A handwritten signature in black ink, appearing to read "Liang Lin", 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: 12/10/2020 11:20

Field ID: HABCE0030_Anderson

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2212491	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P391211	
		Cylindrospermopsin**	0.25	U	ug/L	P391211	
		Desmethyl microcystin LR**	0.25	U	ug/L	P391211	
		Microcystin LA**	0.51	I	ug/L	P391211	
		Microcystin LF**	0.25	U	ug/L	P391211	
		Microcystin LR**	1.5		ug/L	P391211	
		Microcystin LW**	0.25	U	ug/L	P391211	
		Microcystin LY**	0.25	U	ug/L	P391211	
		Microcystin RR**	0.25	U	ug/L	P391211	
		Microcystin WR**	0.50	U	ug/L	P391211	
		Microcystin YR**	0.25	U	ug/L	P391211	
2212492	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P391484	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P391451	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P391254	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P391093	
2212493	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P391050	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391484

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391451

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391254

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391093

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391050

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

Reference Method: EPA 8321B
Batch ID: P391211

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: P391484

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P391451

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: P391254

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P391093

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: P391050

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

Reference Method: EPA 8321B
 Batch ID: P391211

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	80.2		P	40 - 150
Cylindrospermopsin	96.0		P	40 - 150
Desmethyl microcystin LR	88.1		P	40 - 150
Microcystin LA	85.3		P	40 - 150
Microcystin LF	94.5		P	40 - 150
Microcystin LR	69.9		P	40 - 150
Microcystin LW	78.8		P	40 - 150
Microcystin LY	87.8		P	40 - 150
Microcystin RR	79.3		P	40 - 150
Microcystin WR	81.3		P	40 - 150
Microcystin YR	70.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391484

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2212492	Ammonia-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391254

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2212492	NO2NO3-N	96.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391093

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2212034	Total-P	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2212394	O-Phosphate-P	99.1	99.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P391211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2212430	Anatoxin-a	65.1	66.0	P/P	40 - 150
2212430	Cylindrospermopsin	72.8	73.2	P/P	40 - 150
2212430	Desmethyl microcystin LR	76.7	79.2	P/P	40 - 150
2212430	Microcystin LA	79.6	89.7	P/P	40 - 150
2212430	Microcystin LF	85.6	83.5	P/P	40 - 150
2212430	Microcystin LR	73.4	70.5	P/P	40 - 150
2212430	Microcystin LW	61.1	56.6	P/P	40 - 150
2212430	Microcystin LY	74.4	80.5	P/P	40 - 150
2212430	Microcystin RR	58.9	58.8	P/P	40 - 150
2212430	Microcystin WR	71.3	81.1	P/P	40 - 150
2212430	Microcystin YR	65.7	69.8	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2212492	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391451

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2212492	Kjeldahl Nitrogen	3.98	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391254

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2212492	NO2NO3-N	0.236	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391093

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2212034	Total-P	1.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2212394	O-Phosphate-P	0.302	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P391211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2212430	Anatoxin-a	1.30	Spike	P	0 - 30
2212430	Cylindrospermopsin	0.602	Spike	P	0 - 30
2212430	Desmethyl microcystin LR	3.31	Spike	P	0 - 30
2212430	Microcystin LA	11.9	Spike	P	0 - 30
2212430	Microcystin LF	2.39	Spike	P	0 - 30
2212430	Microcystin LR	4.09	Spike	P	0 - 30
2212430	Microcystin LW	7.51	Spike	P	0 - 30
2212430	Microcystin LY	7.97	Spike	P	0 - 30
2212430	Microcystin RR	0.0746	Spike	P	0 - 30
2212430	Microcystin WR	12.9	Spike	P	0 - 30
2212430	Microcystin YR	6.04	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2212491

Field Sample ID: HABCE0030_Anderson

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	88.5	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	89.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A102546

Included Lab Sample IDs: 2212493

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A102615

Included Lab Sample IDs: 2212492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A102631

Included Lab Sample IDs: 2212491

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	83.0	86.7	P/P	50 - 160
Cylindrospermopsin	94.0	101	P/P	60 - 160
Desmethyl microcystin LR	88.0	110	P/P	60 - 160
Microcystin LA	86.2	114	P/P	50 - 160
Microcystin LF	99.3	104	P/P	50 - 160
Microcystin LR	92.5	91.3	P/P	60 - 160
Microcystin LW	86.9	82.0	P/P	60 - 160
Microcystin LY	103	96.7	P/P	60 - 160
Microcystin RR	93.0	84.1	P/P	60 - 160
Microcystin WR	88.7	92.6	P/P	60 - 160
Microcystin YR	89.2	82.3	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A102645

Included Lab Sample IDs: 2212492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	102	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102686

Included Lab Sample IDs: 2212492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102694

Included Lab Sample IDs: 2212492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	105	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 SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	96.2	99.0	99.0			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102					3.98
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	96.8				0.236
EPA 365.1 Rev. 2.0	Total-P	102	102	104			1.19
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	99.1	99.4			0.302
EPA 8321B	Anatoxin-a	80.2	65.1	66.0			1.30
	Cylindrospermopsin	96.0	72.8	73.2			0.602
	Desmethyl microcystin LR	88.1	76.7	79.2			3.31
	Microcystin LA	85.3	79.6	89.7			11.9
	Microcystin LF	94.5	85.6	83.5			2.39
	Microcystin LR	69.9	73.4	70.5			4.09
	Microcystin LW	78.8	61.1	56.6			7.51
	Microcystin LY	87.8	74.4	80.5			7.97
	Microcystin RR	79.3	58.9	58.8			0.0746
	Microcystin WR	81.3	71.3	81.1			12.9
	Microcystin YR	70.1	65.7	69.8			6.04

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2212492
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2212492
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2212492
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2212492
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2212493
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2212491

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	12/11/2020			12/20/2020 16:27	Ping Hua	2212492
EPA 351.2 Rev. 2.0	12/11/2020	12/18/2020 10:54	David Boose	12/20/2020 18:30	Julia Storbeck	2212492
EPA 353.2 Rev. 2.0	12/11/2020			12/16/2020 08:54	Beverly Y. Sanders	2212492
EPA 365.1 Rev. 2.0	12/11/2020	12/14/2020 17:37	Shengyu Wang	12/17/2020 13:01	Benjamin T. Nordmann	2212492
EPA 365.1 Rev. 2.0 dissolved	12/11/2020			12/11/2020 15:51	Ping Hua	2212493
EPA 8321B	12/11/2020	12/16/2020 12:00	Juyoung Kim	12/16/2020 17:55	Juyoung Kim	2212491