Chemical Analysis Report

WQAP-2020-05-19-01

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-2020-04-06-27**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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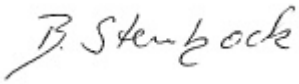
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 02-JUN-2020 15:00



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 Jennie Jewel @ SE Corner **Collection Date/Time: 05/18/2020 10:40**

Field ID: HABCE0029_Jennie Jewel Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2172403	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P382425	
		Cylindrospermopsin**	0.25	U	ug/L	P382425	
		Desmethyl microcystin LR**	0.25	U	ug/L	P382425	
		Microcystin LA**	0.25	U	ug/L	P382425	
		Microcystin LF**	0.25	U	ug/L	P382425	
		Microcystin LR**	0.25	U	ug/L	P382425	
		Microcystin LW**	0.25	U	ug/L	P382425	
		Microcystin LY**	0.25	U	ug/L	P382425	
		Microcystin RR**	0.25	U	ug/L	P382425	
		Microcystin WR**	0.50	U	ug/L	P382425	
		Microcystin YR**	0.25	U	ug/L	P382425	
2172408	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P382519	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P382482	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P382502	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P382549	
2172409	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	U	mg P/L	P382443	

Ref. Method and Comment:
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The MDL was elevated because of sample matrix interference.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P382519

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P382482

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P382502

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P382549

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P382443

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

Reference Method: EPA 8321B
Batch ID: P382425

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: P382519

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P382482

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P382502

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: P382549

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P382443

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

Reference Method: EPA 8321B
Batch ID: P382425

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	134		P	40 - 140
Cylindrospermopsin	109		P	40 - 140
Desmethyl microcystin LR	94.5		P	40 - 140
Microcystin LA	104		P	40 - 140
Microcystin LF	100		P	40 - 140
Microcystin LR	96.6		P	40 - 140
Microcystin LW	90.5		P	40 - 140
Microcystin LY	113		P	40 - 140
Microcystin RR	127		P	40 - 140
Microcystin WR	92.2		P	40 - 140
Microcystin YR	85.0		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P382519

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2172355	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P382482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2172356	Kjeldahl Nitrogen	109	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P382502

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2172389	NO2NO3-N	100	95.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P382549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2172355	Total-P	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P382443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2172409	O-Phosphate-P	91.3	91.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P382425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2172290	Anatoxin-a	129	132	P/P	40 - 140
2172290	Cylindrospermopsin	109	109	P/P	40 - 140
2172290	Desmethyl microcystin LR	91.9	96.2	P/P	40 - 140
2172290	Microcystin LA	105	108	P/P	40 - 140
2172290	Microcystin LF	82.4	93.5	P/P	40 - 140
2172290	Microcystin LR	93.1	100	P/P	40 - 140
2172290	Microcystin LW	79.2	75.9	P/P	40 - 140
2172290	Microcystin LY	97.5	109	P/P	40 - 140
2172290	Microcystin RR	124	128	P/P	40 - 140
2172290	Microcystin WR	85.6	93.1	P/P	40 - 140
2172290	Microcystin YR	95.8	98.7	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P382519

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2172355	Ammonia-N	0.299	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P382482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2172356	Kjeldahl Nitrogen	5.36	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P382502

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2172389	NO2NO3-N	4.60	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P382549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2172355	Total-P	1.76	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P382443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2172409	O-Phosphate-P	0.219	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P382425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2172290	Anatoxin-a	2.50	Spike	P	0 - 30
2172290	Cylindrospermopsin	0.532	Spike	P	0 - 30
2172290	Desmethyl microcystin LR	4.59	Spike	P	0 - 30
2172290	Microcystin LA	2.45	Spike	P	0 - 30
2172290	Microcystin LF	12.7	Spike	P	0 - 30
2172290	Microcystin LR	7.49	Spike	P	0 - 30
2172290	Microcystin LW	4.34	Spike	P	0 - 30
2172290	Microcystin LY	11.4	Spike	P	0 - 30
2172290	Microcystin RR	2.75	Spike	P	0 - 30
2172290	Microcystin WR	8.41	Spike	P	0 - 30
2172290	Microcystin YR	2.92	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2172403
Field Sample ID: HABCE0029_Jennie Jewel

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	74.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A99029
Included Lab Sample IDs: 2172409

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	96.3	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A99037
Included Lab Sample IDs: 2172403

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	97.6	95.4	P/P	50 - 160
Cylindrospermopsin	117	118	P/P	60 - 160
Desmethyl microcystin LR	115	120	P/P	60 - 160
Microcystin LA	104	107	P/P	50 - 160
Microcystin LF	107	108	P/P	60 - 160
Microcystin LR	111	119	P/P	60 - 160
Microcystin LW	108	118	P/P	60 - 160
Microcystin LY	107	106	P/P	60 - 160
Microcystin RR	103	103	P/P	60 - 160
Microcystin WR	107	112	P/P	60 - 160
Microcystin YR	103	107	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99049
Included Lab Sample IDs: 2172408

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A99050
Included Lab Sample IDs: 2172408

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99057
Included Lab Sample IDs: 2172408

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A99092
Included Lab Sample IDs: 2172408

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	98.8	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	99.1	103	104			0.299
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	109	102			5.36
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	95.5			4.60
EPA 365.1 Rev. 2.0	Total-P	105	105	107			1.76
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	91.3	91.1			0.219
EPA 8321B	Anatoxin-a	134	129	132			2.50
	Cylindrospermopsin	109	109	109			0.532
	Desmethyl microcystin LR	94.5	91.9	96.2			4.59
	Microcystin LA	104	105	108			2.45
	Microcystin LF	100	82.4	93.5			12.7
	Microcystin LR	96.6	93.1	100			7.49
	Microcystin LW	90.5	79.2	75.9			4.34
	Microcystin LY	113	97.5	109			11.4
	Microcystin RR	127	124	128			2.75
	Microcystin WR	92.2	85.6	93.1			8.41
	Microcystin YR	85.0	95.8	98.7			2.92

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2172408
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2172408
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2172408
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2172408
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2172409
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2172403

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	05/19/2020			05/25/2020 14:08	Ping Hua	2172408
EPA 351.2 Rev. 2.0	05/19/2020	05/21/2020 12:38	Sima Feizi	05/22/2020 08:49	Jhamieka S. Greenwood	2172408
EPA 353.2 Rev. 2.0	05/19/2020			05/22/2020 10:58	Beverly Y. Sanders	2172408
EPA 365.1 Rev. 2.0	05/19/2020	05/26/2020 16:30	Yen Ta	05/28/2020 09:21	Lipi Saha	2172408
EPA 365.1 Rev. 2.0 dissolved	05/19/2020			05/19/2020 16:51	Jhamieka S. Greenwood	2172409
EPA 8321B	05/19/2020	05/19/2020 15:00	Mohammad Ghaffari	05/21/2020 01:56	Mohammad Ghaffari	2172403