

Chemical Analysis Report

WQAP-2019-11-05-01

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-2019-10-21-59**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 22-NOV-2019 19:28



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: HAB_110419_Lake_Lotta

Collection Date/Time: 11/04/2019 12:15

Field ID: HAB-CE-0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2133251	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P373681	
		Cylindrospermopsin**	0.25	U	ug/L	P373681	
		Desmethyl microcystin LR**	0.25	U	ug/L	P373681	
		Microcystin LA**	0.25	U	ug/L	P373681	
		Microcystin LF**	0.25	U	ug/L	P373681	
		Microcystin LR**	0.25	U	ug/L	P373681	
		Microcystin LW**	0.25	U	ug/L	P373681	
		Microcystin LY**	0.25	U	ug/L	P373681	
		Microcystin RR**	0.25	U	ug/L	P373681	
		Microcystin WR**	0.50	U	ug/L	P373681	
		Microcystin YR**	0.25	U	ug/L	P373681	
2133252	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P373980	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.79		mg N/L	P373856	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P373935	
	EPA 365.1 Rev. 2.0	Total-P	0.082		mg P/L	P373792	
2133253	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.028		mg P/L	P373713	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373980

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373856

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373935

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P373792

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P373713

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

Reference Method: EPA 8321B
Batch ID: P373681

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: P373980

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373856

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373935

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: P373792

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P373713

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.1		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P373681

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	112		P	40 - 140
Cylindrospermopsin	106		P	40 - 140
Desmethyl microcystin LR	105		P	40 - 140
Microcystin LA	131		P	40 - 140
Microcystin LF	96.9		P	40 - 140
Microcystin LR	110		P	40 - 140
Microcystin LW	119		P	40 - 140
Microcystin LY	115		P	40 - 140
Microcystin RR	126		P	40 - 140
Microcystin WR	130		P	40 - 140
Microcystin YR	121		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373980

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2133285	Ammonia-N	97.6	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373856

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2133171	Kjeldahl Nitrogen	105	98.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2133221	NO2NO3-N	95.6	96.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P373792

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2133024	Total-P	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P373713

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2133276	O-Phosphate-P	98.7	99.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P373681

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2133251	Anatoxin-a	111	109	P/P	40 - 140
2133251	Cylindrospermopsin	96.4	101	P/P	40 - 140
2133251	Desmethyl microcystin LR	119	108	P/P	40 - 140
2133251	Microcystin LA	124	118	P/P	40 - 140
2133251	Microcystin LF	97.4	102	P/P	40 - 140
2133251	Microcystin LR	128	113	P/P	40 - 140
2133251	Microcystin LW	112	115	P/P	40 - 140
2133251	Microcystin LY	119	110	P/P	40 - 140
2133251	Microcystin RR	132	134	P/P	40 - 140
2133251	Microcystin WR	129	132	P/P	40 - 140
2133251	Microcystin YR	128	130	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373980

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2133285	Ammonia-N	0.538	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P373856

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2133171	Kjeldahl Nitrogen	5.02	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2133221	NO2NO3-N	0.752	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P373792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2133024	Total-P	0.191	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P373713

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2133276	O-Phosphate-P	0.707	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P373681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2133251	Anatoxin-a	2.23	Spike	P	0 - 30
2133251	Cylindrospermopsin	4.24	Spike	P	0 - 30
2133251	Desmethyl microcystin LR	9.40	Spike	P	0 - 30
2133251	Microcystin LA	5.15	Spike	P	0 - 30
2133251	Microcystin LF	4.77	Spike	P	0 - 30
2133251	Microcystin LR	11.9	Spike	P	0 - 30
2133251	Microcystin LW	3.14	Spike	P	0 - 30
2133251	Microcystin LY	8.56	Spike	P	0 - 30
2133251	Microcystin RR	1.16	Spike	P	0 - 30
2133251	Microcystin WR	1.59	Spike	P	0 - 30
2133251	Microcystin YR	1.66	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2133251
Field Sample ID: HAB-CE-0001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	107	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A95485
Included Lab Sample IDs: 2133251

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	117	101	P/P	50 - 160
Cylindrospermopsin	107	94.8	P/P	60 - 160
Desmethyl microcystin LR	113	99.1	P/P	60 - 160
Microcystin LA	132	110	P/P	50 - 160
Microcystin LF	96.0	80.4	P/P	60 - 160
Microcystin LR	105	103	P/P	60 - 160
Microcystin LW	108	103	P/P	60 - 160
Microcystin LY	112	102	P/P	60 - 160
Microcystin RR	133	119	P/P	60 - 160
Microcystin WR	122	114	P/P	60 - 160
Microcystin YR	115	114	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A95489
Included Lab Sample IDs: 2133253

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A95552
Included Lab Sample IDs: 2133252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A95591
Included Lab Sample IDs: 2133252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.5	91.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A95595
Included Lab Sample IDs: 2133252

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A95616
Included Lab Sample IDs: 2133252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	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	97.4	97.6	98.2			0.538
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.0	105	98.7			5.02
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	95.6	96.6			0.752
EPA 365.1 Rev. 2.0	Total-P	99.0	102	101			0.191
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.1	98.7	99.4			0.707
EPA 8321B	Anatoxin-a	112	111	109			2.23
	Cylindrospermopsin	106	96.4	101			4.24
	Desmethyl microcystin LR	105	119	108			9.40
	Microcystin LA	131	124	118			5.15
	Microcystin LF	96.9	97.4	102			4.77
	Microcystin LR	110	128	113			11.9
	Microcystin LW	119	112	115			3.14
	Microcystin LY	115	119	110			8.56
	Microcystin RR	126	132	134			1.16
	Microcystin WR	130	129	132			1.59
	Microcystin YR	121	128	130			1.66

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2133252
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2133252
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2133252
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2133252
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2133253
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2133251

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	11/05/2019			11/06/2019 11:24	Ping Hua	2133252
EPA 351.2 Rev. 2.0	11/05/2019	11/07/2019 12:07	Sima Feizi	11/08/2019 13:48	Virginia P. Brown	2133252
EPA 353.2 Rev. 2.0	11/05/2019			11/07/2019 09:53	Beverly Y. Sanders	2133252
EPA 365.1 Rev. 2.0	11/05/2019	11/06/2019 15:02	Yen Ta	11/07/2019 12:35	Benjamin T. Nordmann	2133252
EPA 365.1 Rev. 2.0 dissolved	11/05/2019			11/05/2019 14:09	Ping Hua	2133253
EPA 8321B	11/05/2019	11/05/2019 11:30	Juyoung Kim	11/05/2019 13:51	Juyoung Kim	2133251