Chemical Analysis Report

WQAP-2021-12-28-01

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-2021-12-06-11**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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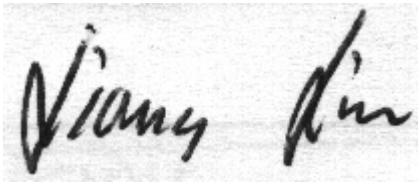
Date Certified: 14-JAN-2022 15:32



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 Estelle - NE Lobe **Collection Date/Time: 12/27/2021 11:00**

Field ID: HABCE0103_LakeEstelle1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2296680	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P407900	
		Cylindrospermopsin	0.10	U	ug/L	P407900	
		Desmethyl microcystin LR	0.25	U	ug/L	P407900	
		Microcystin HilR**	0.25	U	ug/L	P407900	
		Microcystin HtyR**	0.25	U	ug/L	P407900	
		Microcystin LA	0.89		ug/L	P407900	
		Microcystin LF	0.10	U	ug/L	P407900	
		Microcystin LR	0.60	I	ug/L	P407900	
		Microcystin LW	0.25	U	ug/L	P407900	
		Microcystin LY	0.10	U	ug/L	P407900	
		Microcystin RR	0.10	U	ug/L	P407900	
		Microcystin WR	0.50	U	ug/L	P407900	
		Microcystin YR	0.25	U	ug/L	P407900	
		Nodularin-R**	0.10	U	ug/L	P407900	
2296681	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P408292	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80	J	mg N/L	P408076	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.070		mg N/L	P407945	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P408004	MS
2296682	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P407933	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408292

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408076

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407945

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408004

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407933

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

Reference Method: EPA 8321B
Batch ID: P407900

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HilR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408292

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408076

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407945

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408004

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407933

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.5		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P407900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	78.2		P	40 - 150
Cylindrospermopsin	88.2		P	40 - 150
Desmethyl microcystin LR	84.8		P	40 - 150
Microcystin HilR	79.9		P	40 - 150
Microcystin HtyR	91.5		P	40 - 150
Microcystin LA	106		P	40 - 150
Microcystin LF	102		P	40 - 150
Microcystin LR	77.6		P	40 - 150
Microcystin LW	102		P	40 - 150
Microcystin LY	98.4		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	93.2		P	40 - 150
Microcystin YR	92.4		P	40 - 150
Nodularin-R	88.7		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408292

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296681	Ammonia-N	96.2	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408076

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296681	Kjeldahl Nitrogen	116	101	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407945

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296681	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408004

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296649	Total-P	111	111	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407933

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296682	O-Phosphate-P	101	99.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P407900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296660	Anatoxin-a	105	105	P/P	40 - 150
2296660	Cylindrospermopsin	126	132	P/P	40 - 150
2296660	Desmethyl microcystin LR	92.1	110	P/P	40 - 150
2296660	Microcystin HilR	91.8	98.3	P/P	40 - 150
2296660	Microcystin HtyR	97.5	106	P/P	40 - 150
2296660	Microcystin LA	100	102	P/P	40 - 150
2296660	Microcystin LF	95.2	92.4	P/P	40 - 150
2296660	Microcystin LR	99.6	102	P/P	40 - 150
2296660	Microcystin LW	102	97.4	P/P	40 - 150
2296660	Microcystin LY	97.9	101	P/P	40 - 150
2296660	Microcystin RR	105	111	P/P	40 - 150
2296660	Microcystin WR	99.4	102	P/P	40 - 150
2296660	Microcystin YR	104	111	P/P	40 - 150
2296660	Nodularin-R	100	104	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408292

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296681	Ammonia-N	0.826	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408076

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296681	Kjeldahl Nitrogen	8.52	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407945

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296681	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296649	Total-P	0.274	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296682	O-Phosphate-P	1.10	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P407900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296660	Anatoxin-a	0.0153	Spike	P	0 - 30
2296660	Cylindrospermopsin	4.42	Spike	P	0 - 30
2296660	Desmethyl microcystin LR	17.7	Spike	P	0 - 30
2296660	Microcystin HilR	6.90	Spike	P	0 - 30
2296660	Microcystin HtyR	8.49	Spike	P	0 - 30
2296660	Microcystin LA	1.44	Spike	P	0 - 30
2296660	Microcystin LF	2.97	Spike	P	0 - 30
2296660	Microcystin LR	2.24	Spike	P	0 - 30
2296660	Microcystin LW	4.30	Spike	P	0 - 30
2296660	Microcystin LY	3.25	Spike	P	0 - 30
2296660	Microcystin RR	5.31	Spike	P	0 - 30
2296660	Microcystin WR	3.00	Spike	P	0 - 30
2296660	Microcystin YR	6.21	Spike	P	0 - 30
2296660	Nodularin-R	4.08	Spike	P	0 - 30

Quality Assurance Report
Precision

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2296680
Field Sample ID: HABCE0103_LakeEstelle1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	79.5	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	82.9	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A109590
Included Lab Sample IDs: 2296682

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

Reference Method: EPA 8321B
Run ID: A109599
Included Lab Sample IDs: 2296680

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	77.0	60.5	P/P	50 - 160
Cylindrospermopsin	102	109	P/P	50 - 160
Desmethyl microcystin LR	100	104	P/P	50 - 160
Microcystin HilR	89.1	94.1	P/P	50 - 160
Microcystin HtyR	101	108	P/P	50 - 160
Microcystin LA	116	112	P/P	50 - 160
Microcystin LF	105	114	P/P	50 - 160
Microcystin LR	88.1	97.1	P/P	50 - 160
Microcystin LW	112	109	P/P	50 - 160
Microcystin LY	105	110	P/P	50 - 160
Microcystin RR	114	120	P/P	50 - 160
Microcystin WR	103	105	P/P	50 - 160
Microcystin YR	99.1	110	P/P	50 - 160
Nodularin-R	100	99.6	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A109600
Included Lab Sample IDs: 2296681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A109706
Included Lab Sample IDs: 2296681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.8	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A109713
Included Lab Sample IDs: 2296681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.2	96.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A109770
Included Lab Sample IDs: 2296681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	97.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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	99.4	96.2	97.2			0.826
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.5	116	101			8.52
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	103			0.0
EPA 365.1 Rev. 2.0	Total-P	108	111	111			0.274
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	101	99.7			1.10
EPA 8321B	Anatoxin-a	78.2	105	105			0.0153
	Cylindrospermopsin	88.2	126	132			4.42
	Desmethyl microcystin LR	84.8	92.1	110			17.7
	Microcystin HilR	79.9	91.8	98.3			6.90
	Microcystin HtyR	91.5	97.5	106			8.49
	Microcystin LA	106	100	102			1.44
	Microcystin LF	102	95.2	92.4			2.97
	Microcystin LR	77.6	99.6	102			2.24
	Microcystin LW	102	102	97.4			4.30
	Microcystin LY	98.4	97.9	101			3.25
	Microcystin RR	105	105	111			5.31
	Microcystin WR	93.2	99.4	102			3.00
	Microcystin YR	92.4	104	111			6.21
	Nodularin-R	88.7	100	104			4.08

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2296681
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2296681
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2296681
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2296681
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2296682
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2296680

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	12/28/2021			01/10/2022 10:29	Ping Hua	2296681
EPA 351.2 Rev. 2.0	12/28/2021	01/05/2022 09:59	Samantha L Bates	01/06/2022 17:59	Alexandra J Mattheus	2296681
EPA 353.2 Rev. 2.0	12/28/2021			12/29/2021 08:47	Beverly Y. Sanders	2296681
EPA 365.1 Rev. 2.0	12/28/2021	01/04/2022 16:25	Simonne.V. Calhoun	01/06/2022 15:53	Shengyu Ding	2296681
EPA 365.1 Rev. 2.0 dissolved	12/28/2021			12/28/2021 15:01	James L Waggerby	2296682
EPA 8321B	12/28/2021	12/28/2021 11:00	Manjita Shrestha	12/28/2021 17:38	Manjita Shrestha	2296680