Chemical Analysis Report

WQAP-2020-12-29-03

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

Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2020-12-07-38**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Date Certified: 15-JAN-2021 08:53

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: Clear Springs Lake - West of Canal **Collection Date/Time: 12/28/2020 11:00**

Field ID: HAB-SW-0025 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2216019	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P391806	
		Cylindrospermopsin**	0.25	U	ug/L	P391806	
		Desmethyl microcystin LR**	0.25	U	ug/L	P391806	
		Microcystin LA**	0.25	U	ug/L	P391806	
		Microcystin LF**	0.25	U	ug/L	P391806	
		Microcystin LR**	0.25	U	ug/L	P391806	
		Microcystin LW**	0.25	U	ug/L	P391806	
		Microcystin LY**	0.25	U	ug/L	P391806	
		Microcystin RR**	0.25	U	ug/L	P391806	
		Microcystin WR**	0.50	U	ug/L	P391806	
		Microcystin YR**	0.25	U	ug/L	P391806	
2216020	EPA 350.1 Rev. 2.0	Ammonia-N	0.18		mg N/L	P391884	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P391935	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.062		mg N/L	P391859	
	EPA 365.1 Rev. 2.0	Total-P	0.21		mg P/L	P391913	
2216021	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P391826	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391884

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391935

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391859

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391913

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391826

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

Reference Method: EPA 8321B
Batch ID: P391806

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: P391884

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: P391935

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391859

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: P391913

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391826

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P391806

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	65.9		P	40 - 150
Cylindrospermopsin	82.2		P	40 - 150
Desmethyl microcystin LR	82.4		P	40 - 150
Microcystin LA	100		P	40 - 150
Microcystin LF	72.9		P	40 - 150
Microcystin LR	69.9		P	40 - 150
Microcystin LW	56.6		P	40 - 150
Microcystin LY	76.6		P	40 - 150
Microcystin RR	68.4		P	40 - 150
Microcystin WR	65.9		P	40 - 150
Microcystin YR	56.1		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216087	Ammonia-N	96.8	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2215932	Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391859

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216020	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391913

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2215916	Total-P	99.8	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391826

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216028	O-Phosphate-P	99.0	99.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P391806

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2215879	Anatoxin-a	61.3	67.3	P/P	40 - 150
2215879	Cylindrospermopsin	68.3	74.4	P/P	40 - 150
2215879	Desmethyl microcystin LR	85.4	96.8	P/P	40 - 150
2215879	Microcystin LA	100	106	P/P	40 - 150
2215879	Microcystin LF	64.5	73.9	P/P	40 - 150
2215879	Microcystin LR	75.1	79.4	P/P	40 - 150
2215879	Microcystin LW	49.8	54.8	P/P	40 - 150
2215879	Microcystin LY	78.6	77.2	P/P	40 - 150
2215879	Microcystin RR	67.4	69.5	P/P	40 - 150
2215879	Microcystin WR	68.5	75.7	P/P	40 - 150
2215879	Microcystin YR	62.5	63.0	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216087	Ammonia-N	0.121	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2215932	Kjeldahl Nitrogen	0.377	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391859

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216020	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391913

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2215916	Total-P	0.0215	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391826

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216028	O-Phosphate-P	0.537	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P391806

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2215879	Anatoxin-a	9.28	Spike	P	0 - 30
2215879	Cylindrospermopsin	8.55	Spike	P	0 - 30
2215879	Desmethyl microcystin LR	12.5	Spike	P	0 - 30
2215879	Microcystin LA	4.98	Spike	P	0 - 30
2215879	Microcystin LF	13.6	Spike	P	0 - 30
2215879	Microcystin LR	5.52	Spike	P	0 - 30
2215879	Microcystin LW	9.50	Spike	P	0 - 30
2215879	Microcystin LY	1.75	Spike	P	0 - 30
2215879	Microcystin RR	3.08	Spike	P	0 - 30
2215879	Microcystin WR	9.95	Spike	P	0 - 30
2215879	Microcystin YR	0.867	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2216019
Field Sample ID: HAB-SW-0025

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	90.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	93.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A102817
Included Lab Sample IDs: 2216021

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.8	98.8	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A102821
Included Lab Sample IDs: 2216019

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	72.9	81.1	P/P	50 - 160
Cylindrospermopsin	96.3	108	P/P	60 - 160
Desmethyl microcystin LR	92.0	104	P/P	60 - 160
Microcystin LA	106	117	P/P	50 - 160
Microcystin LF	86.5	82.1	P/P	50 - 160
Microcystin LR	86.3	87.5	P/P	60 - 160
Microcystin LW	72.6	65.4	P/P	60 - 160
Microcystin LY	90.7	83.2	P/P	60 - 160
Microcystin RR	80.1	89.4	P/P	60 - 160
Microcystin WR	86.3	89.5	P/P	60 - 160
Microcystin YR	74.3	62.8	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A102832
Included Lab Sample IDs: 2216020

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: A102851
Included Lab Sample IDs: 2216020

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A102886
Included Lab Sample IDs: 2216020

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	100	P/P	85 - 115

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A102905
Included Lab Sample IDs: 2216020

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.1	96.4	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	101	96.8	97.0			0.121
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	105	104			0.377
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	101	99.8	99.7			0.0215
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9	99.0	99.6			0.537
EPA 8321B	Anatoxin-a	65.9	61.3	67.3			9.28
	Cylindrospermopsin	82.2	68.3	74.4			8.55
	Desmethyl microcystin LR	82.4	85.4	96.8			12.5
	Microcystin LA	100	100	106			4.98
	Microcystin LF	72.9	64.5	73.9			13.6
	Microcystin LR	69.9	75.1	79.4			5.52
	Microcystin LW	56.6	49.8	54.8			9.50
	Microcystin LY	76.6	78.6	77.2			1.75
	Microcystin RR	68.4	67.4	69.5			3.08
	Microcystin WR	65.9	68.5	75.7			9.95
	Microcystin YR	56.1	62.5	63.0			0.867

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2216020
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2216020
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2216020
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2216020
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2216021
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2216019

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	12/29/2020			01/03/2021 15:13	Ping Hua	2216020
EPA 351.2 Rev. 2.0	12/29/2020	01/04/2021 15:35	David Boose	01/06/2021 14:03	Virginia P. Brown	2216020
EPA 353.2 Rev. 2.0	12/29/2020			12/30/2020 10:10	Beverly Y. Sanders	2216020
EPA 365.1 Rev. 2.0	12/29/2020	01/04/2021 13:12	Yen Ta	01/05/2021 14:37	Lipi Saha	2216020
EPA 365.1 Rev. 2.0 dissolved	12/29/2020			12/29/2020 15:17	Blanca Fach	2216021
EPA 8321B	12/29/2020	12/29/2020 14:30	Pramila Ghimire	12/29/2020 17:55	Pramila Ghimire	2216019