Chemical Analysis Report

WQAP-2020-06-12-01

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

Event Description: **Algal Bloom Response - SOROC**
Request ID: **RQ-2019-12-30-14**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 22-JUN-2020 14:06

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: Jackson Creek @ Skipper Rd. **Collection Date/Time: 06/11/2020 11:40**

Field ID: Jackson Creek @ Skipper Rd. Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2176024	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P383131	
		Cylindrospermopsin**	0.25	U	ug/L	P383131	
		Desmethyl microcystin LR**	0.25	U	ug/L	P383131	
		Microcystin LA**	0.25	U	ug/L	P383131	
		Microcystin LF**	0.25	U	ug/L	P383131	
		Microcystin LR**	0.25	U	ug/L	P383131	
		Microcystin LW**	0.25	U	ug/L	P383131	
		Microcystin LY**	0.25	U	ug/L	P383131	
		Microcystin RR**	0.25	U	ug/L	P383131	
		Microcystin WR**	0.50	U	ug/L	P383131	
		Microcystin YR**	0.25	U	ug/L	P383131	
2176025	EPA 350.1 Rev. 2.0	Ammonia-N	0.15		mg N/L	P383179	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P383267	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.26		mg N/L	P383206	
	EPA 365.1 Rev. 2.0	Total-P	0.089		mg P/L	P383231	
2176026	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.047		mg P/L	P383165	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383179

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383206

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383231

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383165

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

Reference Method: EPA 8321B
Batch ID: P383131

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: P383179

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383206

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383165

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

Reference Method: EPA 8321B
Batch ID: P383131

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	92.0		P	40 - 140
Cylindrospermopsin	116		P	40 - 140
Desmethyl microcystin LR	101		P	40 - 140
Microcystin LA	110		P	40 - 140
Microcystin LF	113		P	40 - 140
Microcystin LR	102		P	40 - 140
Microcystin LW	115		P	40 - 140
Microcystin LY	117		P	40 - 140
Microcystin RR	105		P	40 - 140
Microcystin WR	95.3		P	40 - 140
Microcystin YR	90.6		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176033	Ammonia-N	99.0	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2175972	Kjeldahl Nitrogen	100	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383206

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176033	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176005	Total-P	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176059	O-Phosphate-P	98.9	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P383131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176046	Anatoxin-a	88.5	89.1	P/P	40 - 140
2176046	Cylindrospermopsin	115	132	P/P	40 - 140
2176046	Desmethyl microcystin LR	107	110	P/P	40 - 140
2176046	Microcystin LA	103	112	P/P	40 - 140
2176046	Microcystin LF	124	128	P/P	40 - 140
2176046	Microcystin LR	109	115	P/P	40 - 140
2176046	Microcystin LW	103	111	P/P	40 - 140
2176046	Microcystin LY	116	122	P/P	40 - 140
2176046	Microcystin RR	105	115	P/P	40 - 140
2176046	Microcystin WR	91.6	95.0	P/P	40 - 140
2176046	Microcystin YR	93.2	96.3	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176033	Ammonia-N	1.82	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2175972	Kjeldahl Nitrogen	1.05	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176033	NO2NO3-N	1.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176005	Total-P	1.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176059	O-Phosphate-P	0.605	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P383131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176046	Anatoxin-a	0.678	Spike	P	0 - 30
2176046	Cylindrospermopsin	14.0	Spike	P	0 - 30
2176046	Desmethyl microcystin LR	3.20	Spike	P	0 - 30
2176046	Microcystin LA	8.35	Spike	P	0 - 30
2176046	Microcystin LF	3.01	Spike	P	0 - 30
2176046	Microcystin LR	5.58	Spike	P	0 - 30
2176046	Microcystin LW	7.48	Spike	P	0 - 30
2176046	Microcystin LY	5.12	Spike	P	0 - 30
2176046	Microcystin RR	9.93	Spike	P	0 - 30
2176046	Microcystin WR	3.65	Spike	P	0 - 30
2176046	Microcystin YR	3.19	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2176024
Field Sample ID: Jackson Creek @ Skipper Rd.

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	114	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A99308
Included Lab Sample IDs: 2176026

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99311
Included Lab Sample IDs: 2176025

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

Reference Method: EPA 8321B
Run ID: A99312
Included Lab Sample IDs: 2176024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	92.3	87.5	P/P	50 - 160
Cylindrospermopsin	120	113	P/P	60 - 160
Desmethyl microcystin LR	110	104	P/P	60 - 160
Microcystin LA	112	113	P/P	50 - 160
Microcystin LF	148	123	P/P	60 - 160
Microcystin LR	114	111	P/P	60 - 160
Microcystin LW	128	111	P/P	60 - 160
Microcystin LY	129	121	P/P	60 - 160
Microcystin RR	111	108	P/P	60 - 160
Microcystin WR	106	110	P/P	60 - 160
Microcystin YR	98.2	99.4	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A99318
Included Lab Sample IDs: 2176025

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A99360
Included Lab Sample IDs: 2176025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99379
Included Lab Sample IDs: 2176025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.6	97.6	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	99.2	99.0	97.0			1.82
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	100	102			1.05
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	100	99.5			1.00
EPA 365.1 Rev. 2.0	Total-P	106	104	106			1.65
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.9	99.5			0.605
EPA 8321B	Anatoxin-a	92.0	88.5	89.1			0.678
	Cylindrospermopsin	116	115	132			14.0
	Desmethyl microcystin LR	101	107	110			3.20
	Microcystin LA	110	103	112			8.35
	Microcystin LF	113	124	128			3.01
	Microcystin LR	102	109	115			5.58
	Microcystin LW	115	103	111			7.48
	Microcystin LY	117	116	122			5.12
	Microcystin RR	105	105	115			9.93
	Microcystin WR	95.3	91.6	95.0			3.65
	Microcystin YR	90.6	93.2	96.3			3.19

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2176025
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2176025
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2176025
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2176025
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2176026
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2176024

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	06/12/2020			06/14/2020 11:45	Ping Hua	2176025
EPA 351.2 Rev. 2.0	06/12/2020	06/16/2020 11:50	Sima Feizi	06/17/2020 12:03	Jhamieka S. Greenwood	2176025
EPA 353.2 Rev. 2.0	06/12/2020			06/15/2020 08:18	Beverly Y. Sanders	2176025
EPA 365.1 Rev. 2.0	06/12/2020	06/15/2020 15:28	Yen Ta	06/16/2020 13:45	Lipi Saha	2176025
EPA 365.1 Rev. 2.0 dissolved	06/12/2020			06/12/2020 21:16	Julia Storbeck	2176026
EPA 8321B	06/12/2020	06/12/2020 12:30	Juyoung Kim	06/13/2020 20:36	Juyoung Kim	2176024