

Chemical Analysis Report

WQAP-2020-08-25-01

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-2020-04-13-44**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 16-SEP-2020 14:13

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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: Harbor Isles - NW Lobe

Collection Date/Time: 08/24/2020 12:45

Field ID: HAB-SW-0023

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2191933	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P386559	
		Cylindrospermopsin**	0.25	U	ug/L	P386559	
		Desmethyl microcystin LR**	0.83	I	ug/L	P386559	
		Microcystin LA**	0.25	U	ug/L	P386559	
		Microcystin LF**	0.25	U	ug/L	P386559	
		Microcystin LR**	44		ug/L	P386559	
		Microcystin LW**	0.25	U	ug/L	P386559	
		Microcystin LY**	0.25	U	ug/L	P386559	
		Microcystin RR**	0.25	U	ug/L	P386559	
		Microcystin WR**	0.50	U	ug/L	P386559	
		Microcystin YR**	0.25	U	ug/L	P386559	
2191935	EPA 350.1 Rev. 2.0	Ammonia-N	0.023		mg N/L	P386834	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	7.5		mg N/L	P386611	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.034		mg N/L	P386633	
	EPA 365.1 Rev. 2.0	Total-P	0.23		mg P/L	P386552	
2191937	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386534	

Sample Location: Harbor Isles - Southern Lobe

Collection Date/Time: 08/24/2020 12:30

Field ID: HAB-SW-0008

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2191934	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P386559	
		Cylindrospermopsin**	0.25	U	ug/L	P386559	
		Desmethyl microcystin LR**	0.25	U	ug/L	P386559	
		Microcystin LA**	0.25	U	ug/L	P386559	
		Microcystin LF**	0.25	U	ug/L	P386559	
		Microcystin LR**	28		ug/L	P386559	
		Microcystin LW**	0.25	U	ug/L	P386559	
		Microcystin LY**	0.25	U	ug/L	P386559	
		Microcystin RR**	0.25	U	ug/L	P386559	
		Microcystin WR**	0.50	U	ug/L	P386559	
		Microcystin YR**	0.25	U	ug/L	P386559	
2191936	EPA 350.1 Rev. 2.0	Ammonia-N	0.056		mg N/L	P386834	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.5		mg N/L	P386611	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P386633	
	EPA 365.1 Rev. 2.0	Total-P	0.083		mg P/L	P386552	
2191938	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P386534	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386834

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386611

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386633

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386552

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386534

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

Reference Method: EPA 8321B
Batch ID: P386559

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: P386834

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386611

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386633

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: P386552

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386534

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

Reference Method: EPA 8321B
Batch ID: P386559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	88.4		P	40 - 140
Cylindrospermopsin	106		P	40 - 140
Desmethyl microcystin LR	114		P	40 - 140
Microcystin LA	118		P	40 - 140
Microcystin LF	114		P	40 - 140
Microcystin LR	100		P	40 - 140
Microcystin LW	117		P	40 - 140
Microcystin LY	107		P	40 - 140
Microcystin RR	104		P	40 - 140
Microcystin WR	115		P	40 - 140
Microcystin YR	111		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P386834

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192749	Ammonia-N	104	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P386611

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192088	Kjeldahl Nitrogen	108	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P386633

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191618	NO2NO3-N	97.8	98.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P386552

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191936	Total-P	106	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P386534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191938	O-Phosphate-P	99.2	99.7	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P386559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191894	Anatoxin-a	75.4	80.8	P/P	40 - 140
2191894	Cylindrospermopsin	96.3	101	P/P	40 - 140
2191894	Desmethyl microcystin LR	122	139	P/P	40 - 140
2191894	Microcystin LA	106	123	P/P	40 - 140
2191894	Microcystin LF	98.0	114	P/P	40 - 140
2191894	Microcystin LR	110	128	P/P	40 - 140
2191894	Microcystin LW	110	114	P/P	40 - 140
2191894	Microcystin LY	107	123	P/P	40 - 140
2191894	Microcystin RR	107	118	P/P	40 - 140
2191894	Microcystin WR	115	132	P/P	40 - 140
2191894	Microcystin YR	125	139	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386834

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192749	Ammonia-N	1.99	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386611

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192088	Kjeldahl Nitrogen	1.02	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386633

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191618	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386552

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191936	Total-P	3.47	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191938	O-Phosphate-P	0.481	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P386559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191894	Anatoxin-a	6.92	Spike	P	0 - 30
2191894	Cylindrospermopsin	3.21	Spike	P	0 - 30
2191894	Desmethyl microcystin LR	13.0	Spike	P	0 - 30
2191894	Microcystin LA	15.2	Spike	P	0 - 30
2191894	Microcystin LF	15.3	Spike	P	0 - 30
2191894	Microcystin LR	14.4	Spike	P	0 - 30
2191894	Microcystin LW	3.12	Spike	P	0 - 30
2191894	Microcystin LY	13.9	Spike	P	0 - 30
2191894	Microcystin RR	9.60	Spike	P	0 - 30
2191894	Microcystin WR	13.6	Spike	P	0 - 30
2191894	Microcystin YR	11.1	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2191933
Field Sample ID: HAB-SW-0023

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	90.9	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	103	P	30 - 160

Lab Sample ID: 2191934
Field Sample ID: HAB-SW-0008

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	117	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	92.6	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100644

Included Lab Sample IDs: 2191937, 2191938

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100666

Included Lab Sample IDs: 2191935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100681

Included Lab Sample IDs: 2191935, 2191936

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

Reference Method: EPA 8321B

Run ID: A100683

Included Lab Sample IDs: 2191933, 2191934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	85.0	90.8	P/P	50 - 160
Cylindrospermopsin	106	107	P/P	60 - 160
Desmethyl microcystin LR	111	118	P/P	60 - 160
Microcystin LA	121	107	P/P	50 - 160
Microcystin LF	123	111	P/P	60 - 160
Microcystin LR	108	102	P/P	60 - 160
Microcystin LW	106	99.3	P/P	60 - 160
Microcystin LY	109	96.4	P/P	60 - 160
Microcystin RR	98.1	103	P/P	60 - 160
Microcystin WR	119	111	P/P	60 - 160
Microcystin YR	115	94.9	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100695

Included Lab Sample IDs: 2191936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.5	95.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100700

Included Lab Sample IDs: 2191935, 2191936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	108	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100761

Included Lab Sample IDs: 2191935, 2191936

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	99.6	104	101			1.99
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	108	107			1.02
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	97.8	98.3			0.487
EPA 365.1 Rev. 2.0	Total-P	103	106	102			3.47
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	99.2	99.7			0.481
EPA 8321B	Anatoxin-a	88.4	75.4	80.8			6.92
	Cylindrospermopsin	106	96.3	101			3.21
	Desmethyl microcystin LR	114	122	139			13.0
	Microcystin LA	118	106	123			15.2
	Microcystin LF	114	98.0	114			15.3
	Microcystin LR	100	110	128			14.4
	Microcystin LW	117	110	114			3.12
	Microcystin LY	107	107	123			13.9
	Microcystin RR	104	107	118			9.60
	Microcystin WR	115	115	132			13.6
	Microcystin YR	111	125	139			11.1

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2191935, 2191936
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2191935, 2191936
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2191935, 2191936
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2191935, 2191936
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2191937, 2191938
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2191933, 2191934

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	08/25/2020			09/01/2020 19:27	Ping Hua	2191935
	08/25/2020			09/01/2020 19:28	Ping Hua	2191936
EPA 351.2 Rev. 2.0	08/25/2020	08/27/2020 10:15	Sima Feizi	08/28/2020 11:11	Virginia P. Brown	2191935
	08/25/2020	08/27/2020 10:15	Sima Feizi	08/28/2020 11:12	Virginia P. Brown	2191936
EPA 353.2 Rev. 2.0	08/25/2020			08/27/2020 11:13	Beverly Y. Sanders	2191935
	08/25/2020			08/27/2020 11:14	Beverly Y. Sanders	2191936
EPA 365.1 Rev. 2.0	08/25/2020	08/26/2020 12:59	Yen Ta	08/27/2020 08:38	Benjamin T. Nordmann	2191935
	08/25/2020	08/26/2020 12:59	Yen Ta	08/28/2020 09:28	Lipi Saha	2191936
EPA 365.1 Rev. 2.0 dissolved	08/25/2020			08/25/2020 16:06	Blanca Fach	2191938
	08/25/2020			08/25/2020 16:09	Blanca Fach	2191937
EPA 8321B	08/25/2020	08/27/2020 08:30	Juyoung Kim	08/27/2020 12:33	Mohammad Ghaffari	2191933
	08/25/2020	08/27/2020 08:30	Juyoung Kim	08/27/2020 12:50	Mohammad Ghaffari	2191934
	08/25/2020	08/27/2020 08:30	Juyoung Kim	08/27/2020 13:06	Mohammad Ghaffari	2191933
	08/25/2020	08/27/2020 08:30	Juyoung Kim	08/27/2020 13:23	Mohammad Ghaffari	2191934