

Chemical Analysis Report

WQAP-2021-02-10-01

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-2020-12-07-38**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 02-MAR-2021 10:59

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Black Creek Canal - Ebbside Ct

Collection Date/Time: 02/09/2021 11:15

Field ID: HAB-SW-0027

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2224546	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P393585	
		Cylindrospermopsin	0.25	U	ug/L	P393585	
		Desmethyl microcystin LR	0.25	U	ug/L	P393585	
		Microcystin HIR**	0.25	U	ug/L	P393585	
		Microcystin HtyR**	0.25	U	ug/L	P393585	
		Microcystin LA	0.25	U	ug/L	P393585	
		Microcystin LF	0.25	U	ug/L	P393585	
		Microcystin LR	0.25	U	ug/L	P393585	
		Microcystin LW	0.25	U	ug/L	P393585	
		Microcystin LY	0.25	U	ug/L	P393585	
		Microcystin RR	0.25	U	ug/L	P393585	
		Microcystin WR	0.50	U	ug/L	P393585	
		Microcystin YR	0.25	U	ug/L	P393585	
2224547	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P393632	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.55		mg N/L	P393663	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.051		mg N/L	P393657	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P393715	
2224548	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P393605	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393632

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393663

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393657

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393715

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393605

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

Reference Method: EPA 8321B
Batch ID: P393585

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 HIR	0.25	U	ug/L
Microcystin HtyR	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: P393632

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393663

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393657

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: P393715

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393605

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.8		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P393585

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	115		P	40 - 150
Cylindrospermopsin	94.8		P	40 - 150
Desmethyl microcystin LR	97.1		P	40 - 150
Microcystin HIR	109		P	40 - 150
Microcystin HtyR	99.8		P	40 - 150
Microcystin LA	92.6		P	40 - 150
Microcystin LF	100		P	40 - 150
Microcystin LR	87.6		P	40 - 150
Microcystin LW	109		P	40 - 150
Microcystin LY	115		P	40 - 150
Microcystin RR	111		P	40 - 150
Microcystin WR	101		P	40 - 150
Microcystin YR	97.4		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393632

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2224228	Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2223304	Kjeldahl Nitrogen	109	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393657

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2224547	NO2NO3-N	99.9	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393715

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2224267	Total-P	102	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2224477	O-Phosphate-P	99.8	97.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P393585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2224192	Anatoxin-a	122	108	P/P	40 - 150
2224192	Cylindrospermopsin	91.5	85.6	P/P	40 - 150
2224192	Desmethyl microcystin LR	111	102	P/P	40 - 150
2224192	Microcystin HiLR	116	107	P/P	40 - 150
2224192	Microcystin HtyR	101	95.4	P/P	40 - 150
2224192	Microcystin LA	93.8	84.6	P/P	40 - 150
2224192	Microcystin LF	80.0	88.9	P/P	40 - 150
2224192	Microcystin LR	104	99.4	P/P	40 - 150
2224192	Microcystin LW	79.6	77.4	P/P	40 - 150
2224192	Microcystin LY	103	94.2	P/P	40 - 150
2224192	Microcystin RR	104	92.8	P/P	40 - 150
2224192	Microcystin WR	111	94.0	P/P	40 - 150
2224192	Microcystin YR	114	96.7	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P393632

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2224228	Ammonia-N	0.0510	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P393663

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2223304	Kjeldahl Nitrogen	3.17	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P393657

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2224547	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P393715

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2224267	Total-P	2.25	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P393605

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2224477	O-Phosphate-P	1.54	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P393585

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2224192	Anatoxin-a	12.1	Spike	P	0 - 30
2224192	Cylindrospermopsin	6.75	Spike	P	0 - 30
2224192	Desmethyl microcystin LR	8.61	Spike	P	0 - 30
2224192	Microcystin HtIR	8.33	Spike	P	0 - 30
2224192	Microcystin HtyR	5.62	Spike	P	0 - 30
2224192	Microcystin LA	10.3	Spike	P	0 - 30
2224192	Microcystin LF	10.6	Spike	P	0 - 30
2224192	Microcystin LR	4.38	Spike	P	0 - 30
2224192	Microcystin LW	2.85	Spike	P	0 - 30
2224192	Microcystin LY	9.05	Spike	P	0 - 30
2224192	Microcystin RR	11.4	Spike	P	0 - 30
2224192	Microcystin WR	16.3	Spike	P	0 - 30
2224192	Microcystin YR	16.7	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2224546

Field Sample ID: HAB-SW-0027

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	86.5	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	65.1	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A103515

Included Lab Sample IDs: 2224548

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103528

Included Lab Sample IDs: 2224547

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

Reference Method: EPA 8321B

Run ID: A103533

Included Lab Sample IDs: 2224546

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	96.6	94.4	P/P	50 - 160
Cylindrospermopsin	84.7	87.9	P/P	60 - 160
Desmethyl microcystin LR	82.3	85.3	P/P	60 - 160
Microcystin HILR	89.9	107	P/P	60 - 160
Microcystin HtyR	87.1	77.9	P/P	60 - 160
Microcystin LA	78.2	82.8	P/P	50 - 160
Microcystin LF	80.8	99.6	P/P	60 - 160
Microcystin LR	81.1	82.4	P/P	60 - 160
Microcystin LW	86.5	70.8	P/P	60 - 160
Microcystin LY	85.8	76.8	P/P	60 - 160
Microcystin RR	96.3	91.3	P/P	60 - 160
Microcystin WR	95.8	97.5	P/P	60 - 160
Microcystin YR	79.6	82.1	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103535

Included Lab Sample IDs: 2224547

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A103576

Included Lab Sample IDs: 2224547

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103604

Included Lab Sample IDs: 2224547

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	97.8	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	Precision SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	103	103	103			0.0510
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	109	105			3.17
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	99.9	99.9			0.0
EPA 365.1 Rev. 2.0	Total-P	99.5	102	99.7			2.25
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.8	99.8	97.9			1.54
EPA 8321B	Anatoxin-a	115	122	108			12.1
	Cylindrospermopsin	94.8	91.5	85.6			6.75
	Desmethyl microcystin LR	97.1	111	102			8.61
	Microcystin HiLR	109	116	107			8.33
	Microcystin HtyR	99.8	101	95.4			5.62
	Microcystin LA	92.6	93.8	84.6			10.3
	Microcystin LF	100	80.0	88.9			10.6
	Microcystin LR	87.6	104	99.4			4.38
	Microcystin LW	109	79.6	77.4			2.85
	Microcystin LY	115	103	94.2			9.05
	Microcystin RR	111	104	92.8			11.4
	Microcystin WR	101	111	94.0			16.3
	Microcystin YR	97.4	114	96.7			16.7

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2224547
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2224547
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2224547
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2224547
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2224548
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2224546

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	02/10/2021			02/10/2021 17:54	Ping Hua	2224547
EPA 351.2 Rev. 2.0	02/10/2021	02/11/2021 12:21	Yen Ta	02/12/2021 17:22	Virginia P. Brown	2224547
EPA 353.2 Rev. 2.0	02/10/2021			02/11/2021 09:44	Beverly Y. Sanders	2224547
EPA 365.1 Rev. 2.0	02/10/2021	02/12/2021 14:20	Lipi Saha	02/16/2021 11:48	Shengyu Wang	2224547
EPA 365.1 Rev. 2.0 dissolved	02/10/2021			02/10/2021 12:01	Virginia P. Brown	2224548
EPA 8321B	02/10/2021	02/10/2021 11:00	Pramila Ghimire	02/10/2021 22:23	Pramila Ghimire	2224546