

Chemical Analysis Report

WQAP-2020-06-18-01

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

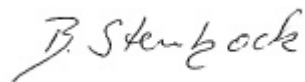
Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2020-03-30-08**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 02-JUL-2020 16:22



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 Mariam - Near Ramp

Collection Date/Time: 06/17/2020 09:40

Field ID: HAB-SW-0017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2177514	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P383336	
		Cylindrospermopsin**	0.25	U	ug/L	P383336	
		Desmethyl microcystin LR**	0.25	U	ug/L	P383336	
		Microcystin LA**	0.25	U	ug/L	P383336	
		Microcystin LF**	0.25	U	ug/L	P383336	
		Microcystin LR**	0.25	U	ug/L	P383336	
		Microcystin LW**	0.25	U	ug/L	P383336	
		Microcystin LY**	0.25	U	ug/L	P383336	
		Microcystin RR**	0.25	U	ug/L	P383336	
		Microcystin WR**	0.50	U	ug/L	P383336	
		Microcystin YR**	0.25	U	ug/L	P383336	
2177515	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P383472	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P383652	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P383427	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P383505	
2177516	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P383420	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383472

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383652

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383427

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383505

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383420

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

Reference Method: EPA 8321B
Batch ID: P383336

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: P383472

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383652

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383427

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: P383505

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383420

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

Reference Method: EPA 8321B
Batch ID: P383336

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	80.7		P	40 - 140
Cylindrospermopsin	86.3		P	40 - 140
Desmethyl microcystin LR	78.0		P	40 - 140
Microcystin LA	84.1		P	40 - 140
Microcystin LF	87.4		P	40 - 140
Microcystin LR	75.6		P	40 - 140
Microcystin LW	87.0		P	40 - 140
Microcystin LY	91.6		P	40 - 140
Microcystin RR	78.9		P	40 - 140
Microcystin WR	78.1		P	40 - 140
Microcystin YR	95.6		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2177419	Ammonia-N	106	109	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383652

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2177553	Kjeldahl Nitrogen	104	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2177419	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2177515	Total-P	102	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383420

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2177579	O-Phosphate-P	94.9	94.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P383336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2177190	Anatoxin-a	74.5	74.8	P/P	40 - 140
2177190	Cylindrospermopsin	84.7	85.3	P/P	40 - 140
2177190	Desmethyl microcystin LR	97.3	97.8	P/P	40 - 140
2177190	Microcystin LA	78.6	78.7	P/P	40 - 140
2177190	Microcystin LF	81.9	74.3	P/P	40 - 140
2177190	Microcystin LR	101	96.3	P/P	40 - 140
2177190	Microcystin LW	52.5	61.4	P/P	40 - 140
2177190	Microcystin LY	80.1	76.9	P/P	40 - 140
2177190	Microcystin RR	80.7	79.4	P/P	40 - 140
2177190	Microcystin WR	59.5	63.8	P/P	40 - 140
2177190	Microcystin YR	118	112	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P383472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2177419	Ammonia-N	2.50	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P383652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2177553	Kjeldahl Nitrogen	2.52	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P383427

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2177419	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P383505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2177515	Total-P	3.93	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P383420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2177579	O-Phosphate-P	0.211	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P383336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2177190	Anatoxin-a	0.322	Spike	P	0 - 30
2177190	Cylindrospermopsin	0.664	Spike	P	0 - 30
2177190	Desmethyl microcystin LR	0.546	Spike	P	0 - 30
2177190	Microcystin LA	0.147	Spike	P	0 - 30
2177190	Microcystin LF	9.77	Spike	P	0 - 30
2177190	Microcystin LR	4.33	Spike	P	0 - 30
2177190	Microcystin LW	15.7	Spike	P	0 - 30
2177190	Microcystin LY	4.09	Spike	P	0 - 30
2177190	Microcystin RR	1.62	Spike	P	0 - 30
2177190	Microcystin WR	6.89	Spike	P	0 - 30
2177190	Microcystin YR	5.04	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2177514
Field Sample ID: HAB-SW-0017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	121	P	40 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A99389
Included Lab Sample IDs: 2177514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	89.4	92.6	P/P	50 - 160
Cylindrospermopsin	96.3	108	P/P	60 - 160
Desmethyl microcystin LR	85.3	113	P/P	60 - 160
Microcystin LA	99.4	107	P/P	50 - 160
Microcystin LF	84.9	112	P/P	60 - 160
Microcystin LR	89.1	118	P/P	60 - 160
Microcystin LW	85.2	100	P/P	60 - 160
Microcystin LY	99.1	120	P/P	60 - 160
Microcystin RR	89.1	103	P/P	60 - 160
Microcystin WR	83.6	100	P/P	60 - 160
Microcystin YR	108	124	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A99408
Included Lab Sample IDs: 2177516

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A99414
Included Lab Sample IDs: 2177515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99434
Included Lab Sample IDs: 2177515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A99463
Included Lab Sample IDs: 2177515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99553
Included Lab Sample IDs: 2177515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.4	94.8	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	102	106	109			2.50
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.3	104	108			2.52
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	99.5	99.5			0.0
EPA 365.1 Rev. 2.0	Total-P	104	102	107			3.93
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.8	94.9	94.7			0.211
EPA 8321B	Anatoxin-a	80.7	74.5	74.8			0.322
	Cylindrospermopsin	86.3	84.7	85.3			0.664
	Desmethyl microcystin LR	78.0	97.3	97.8			0.546
	Microcystin LA	84.1	78.6	78.7			0.147
	Microcystin LF	87.4	81.9	74.3			9.77
	Microcystin LR	75.6	101	96.3			4.33
	Microcystin LW	87.0	52.5	61.4			15.7
	Microcystin LY	91.6	80.1	76.9			4.09
	Microcystin RR	78.9	80.7	79.4			1.62
	Microcystin WR	78.1	59.5	63.8			6.89
	Microcystin YR	95.6	118	112			5.04

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2177515
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2177515
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2177515
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2177515
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2177516
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2177514

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	06/18/2020			06/20/2020 14:19	Ping Hua	2177515
EPA 351.2 Rev. 2.0	06/18/2020	06/25/2020 09:40	Sima Feizi	06/26/2020 09:59	Jhamieka S. Greenwood	2177515
EPA 353.2 Rev. 2.0	06/18/2020			06/19/2020 08:54	Beverly Y. Sanders	2177515
EPA 365.1 Rev. 2.0	06/18/2020	06/22/2020 14:35	Yen Ta	06/23/2020 08:50	Benjamin T. Nordmann	2177515
EPA 365.1 Rev. 2.0 dissolved	06/18/2020			06/18/2020 15:59	Jhamieka S. Greenwood	2177516
EPA 8321B	06/18/2020	06/18/2020 10:40	Juyoung Kim	06/18/2020 12:07	Juyoung Kim	2177514