

Chemical Analysis Report

WQAP-2019-10-09-03

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

Event Description: **Algal Bloom Response - As needed**
Request ID: **RQ-2019-09-02-39**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 25-OCT-2019 19:05



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 O E. Observation Shoal

Collection Date/Time: 10/08/2019 10:45

Field ID: SD-100819-001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2126396	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P372176	
		Cylindrospermopsin**	0.25	U	ug/L	P372176	
		Microcystin LA**	0.25	U	ug/L	P372176	
		Microcystin LF**	0.25	U	ug/L	P372176	
		Microcystin LR**	0.55	I	ug/L	P372176	
		Microcystin LY**	0.25	U	ug/L	P372176	
		Microcystin RR**	0.25	U	ug/L	P372176	
		Microcystin YR**	0.25	U	ug/L	P372176	
2126398	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P372453	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P372341	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.16		mg N/L	P372438	
	EPA 365.1 Rev. 2.0	Total-P	0.069		mg P/L	P372346	
2126400	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.038		mg P/L	P372257	

Sample Location: Lake O E. Observation Island

Collection Date/Time: 10/08/2019 11:15

Field ID: SD-100819-002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2126397	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P372176	
		Cylindrospermopsin**	0.25	U	ug/L	P372176	
		Microcystin LA**	0.25	U	ug/L	P372176	
		Microcystin LF**	0.25	U	ug/L	P372176	
		Microcystin LR**	0.26	I	ug/L	P372176	
		Microcystin LY**	0.25	U	ug/L	P372176	
		Microcystin RR**	0.25	U	ug/L	P372176	
		Microcystin YR**	0.25	U	ug/L	P372176	
2126399	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P372453	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.98		mg N/L	P372341	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.33		mg N/L	P372438	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P372346	
2126401	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.062		mg P/L	P372257	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372453

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372341

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372438

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372346

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372257

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

Reference Method: EPA 8321B
Batch ID: P372176

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	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 LY	0.25	U	ug/L
Microcystin RR	0.25	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: P372453

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: P372341

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372438

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372346

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372257

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

Reference Method: EPA 8321B
Batch ID: P372176

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	127		P	40 - 140
Cylindrospermopsin	108		P	40 - 140
Microcystin LA	113		P	40 - 140
Microcystin LF	134		P	40 - 140
Microcystin LR	100		P	40 - 140
Microcystin LY	124		P	40 - 140
Microcystin RR	113		P	40 - 140
Microcystin YR	102		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372453

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126374	Ammonia-N	97.3	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372341

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126773	Kjeldahl Nitrogen	96.6	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372438

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126398	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126360	Total-P	97.5	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126400	O-Phosphate-P	97.3	97.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P372176

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126373	Anatoxin-a	136	123	P/P	40 - 140
2126373	Cylindrospermopsin	103	92.8	P/P	40 - 140
2126373	Microcystin LA	111	99.1	P/P	40 - 140
2126373	Microcystin LF	128	121	P/P	40 - 140
2126373	Microcystin LR	95.3	84.8	P/P	40 - 140
2126373	Microcystin LY	110	99.2	P/P	40 - 140
2126373	Microcystin RR	113	100	P/P	40 - 140
2126373	Microcystin YR	98.3	89.2	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P372453

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126374	Ammonia-N	0.593	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P372341

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126773	Kjeldahl Nitrogen	3.01	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P372438

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126398	NO2NO3-N	0.830	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P372346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126360	Total-P	2.53	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P372257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126400	O-Phosphate-P	0.369	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P372176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126373	Anatoxin-a	10.3	Spike	P	0 - 30
2126373	Cylindrospermopsin	10.1	Spike	P	0 - 30
2126373	Microcystin LA	11.2	Spike	P	0 - 30
2126373	Microcystin LF	5.56	Spike	P	0 - 30
2126373	Microcystin LR	11.6	Spike	P	0 - 30
2126373	Microcystin LY	9.97	Spike	P	0 - 30
2126373	Microcystin RR	11.4	Spike	P	0 - 30
2126373	Microcystin YR	9.63	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2126396
Field Sample ID: SD-100819-001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	93.7	P	30 - 165

Lab Sample ID: 2126397
Field Sample ID: SD-100819-002

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	95.1	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94852

Included Lab Sample IDs: 2126400, 2126401

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.6	98.2	P/P	90 - 110
O-Phosphate-P	99.6	98.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A94855

Included Lab Sample IDs: 2126396, 2126397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	116	118	P/P	50 - 160
Cylindrospermopsin	106	102	P/P	60 - 160
Microcystin LA	73.9	94.5	P/P	50 - 160
Microcystin LF	122	114	P/P	60 - 160
Microcystin LR	102	98.6	P/P	60 - 160
Microcystin LY	83.2	93.5	P/P	60 - 160
Microcystin RR	112	109	P/P	60 - 160
Microcystin YR	113	92.6	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94889

Included Lab Sample IDs: 2126398, 2126399

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94931

Included Lab Sample IDs: 2126398, 2126399

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.3	95.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94935

Included Lab Sample IDs: 2126398, 2126399

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	101	P/P	90 - 110
Ammonia-N	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94964

Included Lab Sample IDs: 2126398, 2126399

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	104	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	101	97.3	98.1			0.593
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.2	96.6	101			3.01
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	100	102			0.830
EPA 365.1 Rev. 2.0	Total-P	100	97.5	101			2.53
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	97.3	97.8			0.369
EPA 8321B	Anatoxin-a	127	136	123			10.3
	Cylindrospermopsin	108	103	92.8			10.1
	Microcystin LA	113	111	99.1			11.2
	Microcystin LF	134	128	121			5.56
	Microcystin LR	100	95.3	84.8			11.6
	Microcystin LY	124	110	99.2			9.97
	Microcystin RR	113	113	100			11.4
	Microcystin YR	102	98.3	89.2			9.63

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2126398, 2126399
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2126398, 2126399
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2126398, 2126399
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2126398, 2126399
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2126400, 2126401
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2126396, 2126397

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	10/09/2019			10/11/2019 14:33	Ping Hua	2126399
	10/09/2019			10/11/2019 15:33	Ping Hua	2126398
EPA 351.2 Rev. 2.0	10/09/2019	10/11/2019 11:17	Sima Feizi	10/14/2019 16:56	Jhamieka S. Greenwood	2126398
	10/09/2019	10/11/2019 11:17	Sima Feizi	10/14/2019 16:58	Jhamieka S. Greenwood	2126399
EPA 353.2 Rev. 2.0	10/09/2019			10/11/2019 11:11	Beverly Y. Sanders	2126398
	10/09/2019			10/11/2019 11:12	Beverly Y. Sanders	2126399
EPA 365.1 Rev. 2.0	10/09/2019	10/10/2019 14:40	Lipi Saha	10/14/2019 15:12	Rosalyn Ballman	2126398
	10/09/2019	10/10/2019 14:40	Lipi Saha	10/14/2019 15:13	Rosalyn Ballman	2126399
EPA 365.1 Rev. 2.0 dissolved	10/09/2019			10/09/2019 16:44	Julia Storbeck	2126400
	10/09/2019			10/09/2019 17:19	Julia Storbeck	2126401
EPA 8321B	10/09/2019	10/10/2019 09:00	Juyoung Kim	10/10/2019 11:27	Juyoung Kim	2126396
	10/09/2019	10/10/2019 09:00	Juyoung Kim	10/10/2019 11:44	Juyoung Kim	2126397