

Chemical Analysis Report

WQAP-2019-08-21-07

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

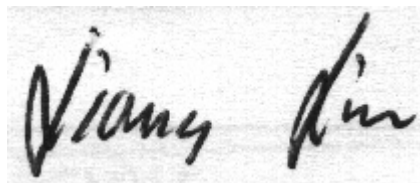
Event Description: **Algal Bloom Response - As needed**
Request ID: **RQ-2019-08-26-46**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2295 Victoria AVE
Suite 364
Fort Myers, FL 33901
Attn: Kirby Wolfe

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 04-SEP-2019 16:23

A handwritten signature in black ink, appearing to read "Liang Lin", is shown 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: Lily Court Canal

Collection Date/Time: 08/20/2019 11:35

Field ID: SD08202019-01

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2113171	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P369414	
		Cylindrospermopsin**	0.25	U	ug/L	P369414	MS
		Microcystin LA**	0.25	U	ug/L	P369414	
		Microcystin LF**	0.25	U	ug/L	P369414	
		Microcystin LR**	0.25	U	ug/L	P369414	RPD
		Microcystin LY**	0.25	U	ug/L	P369414	
		Microcystin RR**	0.25	U	ug/L	P369414	MS, RPD
		Microcystin YR**	0.25	U	ug/L	P369414	MS
2113173	EPA 350.1 Rev. 2.0	Ammonia-N	0.055		mg N/L	P369878	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P369598	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P369579	
	EPA 365.1 Rev. 2.0	Total-P	0.042		mg P/L	P369742	
2113175	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.020		mg P/L	P369448	

Sample Location: Park Shore Marina

Collection Date/Time: 08/20/2019 13:00

Field ID: SD08202019-02

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2113172	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P369414	
		Cylindrospermopsin**	0.25	U	ug/L	P369414	MS
		Microcystin LA**	0.25	U	ug/L	P369414	
		Microcystin LF**	0.25	U	ug/L	P369414	
		Microcystin LR**	0.25	U	ug/L	P369414	RPD
		Microcystin LY**	0.25	U	ug/L	P369414	
		Microcystin RR**	0.25	U	ug/L	P369414	MS, RPD
		Microcystin YR**	0.25	U	ug/L	P369414	MS
2113174	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P369878	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P369598	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P369579	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P369742	
2113176	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369448	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369878

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369598

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369579

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369742

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369448

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

Reference Method: EPA 8321B
Batch ID: P369414

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: P369878

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P369598

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P369579

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: P369742

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P369448

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

Reference Method: EPA 8321B
 Batch ID: P369414

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	93.8		P	40 - 140
Cylindrospermopsin	95.9		P	40 - 140
Microcystin LA	85.5		P	40 - 140
Microcystin LF	89.3		P	40 - 140
Microcystin LR	92.1		P	40 - 140
Microcystin LY	92.1		P	40 - 140
Microcystin RR	92.0		P	40 - 140
Microcystin YR	88.7		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369878

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113121	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369598

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113124	Kjeldahl Nitrogen	99.1	98.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369579

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113124	NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369742

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113173	Total-P	94.4	90.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113125	O-Phosphate-P	99.0	99.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P369414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113070	Anatoxin-a	83.4	84.8	P/P	40 - 140
2113070	Cylindrospermopsin	34.7	42.5	F/P	40 - 140
2113070	Microcystin LA	73.1	68.8	P/P	40 - 140
2113070	Microcystin LF	72.8	77.8	P/P	40 - 140
2113070	Microcystin LR	48.3	75.5	P/P	40 - 140
2113070	Microcystin LY	77.7	73.8	P/P	40 - 140
2113070	Microcystin RR	63.6	39.3	P/F	40 - 140
2113070	Microcystin YR	37.0	39.6	F/F	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P369878

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113121	Ammonia-N	0.394	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P369598

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113124	Kjeldahl Nitrogen	0.365	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P369579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113124	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P369742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113173	Total-P	4.37	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P369448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113125	O-Phosphate-P	0.202	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P369414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113070	Anatoxin-a	1.70	Spike	P	0 - 30
2113070	Cylindrospermopsin	20.2	Spike	P	0 - 30
2113070	Microcystin LA	6.06	Spike	P	0 - 30
2113070	Microcystin LF	6.62	Spike	P	0 - 30
2113070	Microcystin LR	44.0	Spike	F	0 - 30
2113070	Microcystin LY	5.14	Spike	P	0 - 30
2113070	Microcystin RR	47.3	Spike	F	0 - 30
2113070	Microcystin YR	6.86	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
 Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Surrogates

Lab Sample ID: 2113171
Field Sample ID: SD08202019-01

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	107	P	30 - 165

Lab Sample ID: 2113172
Field Sample ID: SD08202019-02

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	107	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A93695

Included Lab Sample IDs: 2113175, 2113176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.4	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A93728

Included Lab Sample IDs: 2113171, 2113172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	96.2	94.2	P/P	50 - 160
Cylindrospermopsin	87.9	99.1	P/P	60 - 160
Microcystin LA	89.1	88.0	P/P	50 - 160
Microcystin LF	92.6	92.3	P/P	60 - 160
Microcystin LR	86.2	91.2	P/P	60 - 160
Microcystin LY	91.6	92.9	P/P	60 - 160
Microcystin RR	82.1	91.7	P/P	60 - 160
Microcystin YR	90.4	90.8	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93747

Included Lab Sample IDs: 2113173, 2113174

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A93778

Included Lab Sample IDs: 2113173, 2113174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93834

Included Lab Sample IDs: 2113173, 2113174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A93846

Included Lab Sample IDs: 2113173, 2113174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	107	108	P/P	90 - 110
Ammonia-N	108	107	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	106	104	104			0.394
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.5	99.1	98.7			0.365
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	102	103			0.487
EPA 365.1 Rev. 2.0	Total-P	97.3	94.4	90.2			4.37
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.0	99.2			0.202
EPA 8321B	Anatoxin-a	93.8	83.4	84.8			1.70
	Cylindrospermopsin	95.9	34.7	42.5			20.2
	Microcystin LA	85.5	73.1	68.8			6.06
	Microcystin LF	89.3	72.8	77.8			6.62
	Microcystin LR	92.1	48.3	75.5			44.0
	Microcystin LY	92.1	77.7	73.8			5.14
	Microcystin RR	92.0	63.6	39.3			47.3
	Microcystin YR	88.7	37.0	39.6			6.86

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2113173, 2113174
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2113173, 2113174
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2113173, 2113174
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2113173, 2113174
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2113175, 2113176
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2113171, 2113172

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	08/21/2019			08/28/2019 13:43	Ping Hua	2113173
	08/21/2019			08/28/2019 13:51	Ping Hua	2113174
EPA 351.2 Rev. 2.0	08/21/2019	08/23/2019 11:05	Sima Feizi	08/26/2019 11:12	Joseph Suarez	2113173
	08/21/2019	08/23/2019 11:05	Sima Feizi	08/26/2019 11:14	Joseph Suarez	2113174
EPA 353.2 Rev. 2.0	08/21/2019			08/23/2019 11:27	Beverly Y. Sanders	2113173
	08/21/2019			08/23/2019 11:28	Beverly Y. Sanders	2113174
EPA 365.1 Rev. 2.0	08/21/2019	08/27/2019 13:00	Lipi Saha	08/28/2019 11:44	Lipi Saha	2113173
	08/21/2019	08/27/2019 13:00	Lipi Saha	08/28/2019 11:45	Lipi Saha	2113174
EPA 365.1 Rev. 2.0 dissolved	08/21/2019			08/21/2019 15:28	Jhamieka S. Greenwood	2113175
	08/21/2019			08/21/2019 15:29	Jhamieka S. Greenwood	2113176
EPA 8321B	08/21/2019	08/22/2019 09:00	Juyoung Kim	08/22/2019 16:59	Juyoung Kim	2113171
	08/21/2019	08/22/2019 09:00	Juyoung Kim	08/22/2019 17:16	Juyoung Kim	2113172