

Chemical Analysis Report

WQAP-2019-09-13-01

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

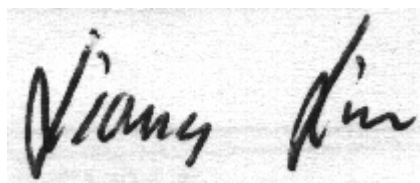
Event Description: **Algal Bloom Response - As needed**
Request ID: **RQ-2019-08-05-56**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Attn: Mike Linger

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 24-SEP-2019 16:43

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: Lake Olivia

Collection Date/Time: 09/12/2019 12:43

Field ID: Lake Olivia

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2119095	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P370736	
		Cylindrospermopsin**	0.52	I	ug/L	P370736	
		Microcystin LA**	0.25	U	ug/L	P370736	
		Microcystin LF**	0.25	U	ug/L	P370736	
		Microcystin LR**	0.25	U	ug/L	P370736	
		Microcystin LY**	0.25	U	ug/L	P370736	
		Microcystin RR**	0.25	U	ug/L	P370736	
		Microcystin YR**	0.25	U	ug/L	P370736	
2119096	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P370929	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P370785	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P370968	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P370790	
2119097	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P370637	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370929

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370785

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370968

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370790

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370637

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

Reference Method: EPA 8321B
Batch ID: P370736

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: P370929

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370785

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370968

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: P370790

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370637

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

Reference Method: EPA 8321B
Batch ID: P370736

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	124		P	40 - 140
Cylindrospermopsin	103		P	40 - 140
Microcystin LA	121		P	40 - 140
Microcystin LF	117		P	40 - 140
Microcystin LR	131		P	40 - 140
Microcystin LY	130		P	40 - 140
Microcystin RR	125		P	40 - 140
Microcystin YR	120		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370929

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119023	Ammonia-N	99.6	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370785

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119096	Kjeldahl Nitrogen	93.6	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119029	NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119023	Total-P	97.2	93.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370637

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119109	O-Phosphate-P	95.9	97.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P370736

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119095	Anatoxin-a	128	124	P/P	40 - 140
2119095	Cylindrospermopsin	97.0	97.1	P/P	40 - 140
2119095	Microcystin LA	117	117	P/P	40 - 140
2119095	Microcystin LF	117	114	P/P	40 - 140
2119095	Microcystin LR	127	121	P/P	40 - 140
2119095	Microcystin LY	120	119	P/P	40 - 140
2119095	Microcystin RR	121	119	P/P	40 - 140
2119095	Microcystin YR	118	124	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370929

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119023	Ammonia-N	0.635	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370785

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119096	Kjeldahl Nitrogen	3.60	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119029	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370790

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119023	Total-P	3.72	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370637

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119109	O-Phosphate-P	1.09	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P370736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119095	Anatoxin-a	2.81	Spike	P	0 - 30
2119095	Cylindrospermopsin	0.145	Spike	P	0 - 30
2119095	Microcystin LA	0.354	Spike	P	0 - 30
2119095	Microcystin LF	3.22	Spike	P	0 - 30
2119095	Microcystin LR	4.26	Spike	P	0 - 30
2119095	Microcystin LY	1.18	Spike	P	0 - 30
2119095	Microcystin RR	1.20	Spike	P	0 - 30
2119095	Microcystin YR	5.24	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: 2119095
Field Sample ID: Lake Olivia

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	109	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94198

Included Lab Sample IDs: 2119097

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.7	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A94259

Included Lab Sample IDs: 2119095

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	105	P/P	50 - 160
Cylindrospermopsin	90.5	91.4	P/P	60 - 160
Microcystin LA	111	112	P/P	50 - 160
Microcystin LF	108	105	P/P	60 - 160
Microcystin LR	118	108	P/P	60 - 160
Microcystin LY	103	114	P/P	60 - 160
Microcystin RR	111	114	P/P	60 - 160
Microcystin YR	114	108	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94317

Included Lab Sample IDs: 2119096

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94318

Included Lab Sample IDs: 2119096

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	98.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94334

Included Lab Sample IDs: 2119096

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94338

Included Lab Sample IDs: 2119096

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	99.6	98.8			0.635
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.5	93.6	98.9			3.60
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	98.0				0.0
EPA 365.1 Rev. 2.0	Total-P	98.4	97.2	93.6			3.72
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	95.9	97.6			1.09
EPA 8321B	Anatoxin-a	124	128	124			2.81
	Cylindrospermopsin	103	97.0	97.1			0.145
	Microcystin LA	121	117	117			0.354
	Microcystin LF	117	117	114			3.22
	Microcystin LR	131	127	121			4.26
	Microcystin LY	130	120	119			1.18
	Microcystin RR	125	121	119			1.20
	Microcystin YR	120	118	124			5.24

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2119096
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2119096
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2119096
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2119096
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2119097
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2119095

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	09/13/2019			09/18/2019 12:19	Ping Hua	2119096
EPA 351.2 Rev. 2.0	09/13/2019	09/17/2019 12:50	Sima Feizi	09/18/2019 14:01	Julia Storbeck	2119096
EPA 353.2 Rev. 2.0	09/13/2019			09/19/2019 10:17	Beverly Y. Sanders	2119096
EPA 365.1 Rev. 2.0	09/13/2019	09/17/2019 13:00	Lipi Saha	09/18/2019 13:39	Rosalyn Ballman	2119096
EPA 365.1 Rev. 2.0 dissolved	09/13/2019			09/13/2019 13:14	Jhamieka S. Greenwood	2119097
EPA 8321B	09/13/2019	09/17/2019 10:00	Juyoung Kim	09/17/2019 10:49	Juyoung Kim	2119095