

Chemical Analysis Report

WQAP-2019-10-11-01

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-2019-09-16-49**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 25-OCT-2019 16:39

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 Grace HAB

Collection Date/Time: 10/10/2019 12:45

Field ID: Lake Grace HAB

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2127246	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P372405	
		Cylindrospermopsin**	0.30	I	ug/L	P372405	
		Microcystin LA**	0.25	U	ug/L	P372405	
		Microcystin LF**	0.25	U	ug/L	P372405	
		Microcystin LR**	0.25	U	ug/L	P372405	
		Microcystin LY**	0.25	U	ug/L	P372405	
		Microcystin RR**	0.25	U	ug/L	P372405	
		Microcystin YR**	0.25	U	ug/L	P372405	
2127247	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P372693	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P372396	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P372443	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P372472	
2127248	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P372366	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372693

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372396

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372443

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372472

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372366

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

Reference Method: EPA 8321B
Batch ID: P372405

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: P372693

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P372396

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P372443

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P372472

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P372366

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

Reference Method: EPA 8321B
 Batch ID: P372405

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	124		P	40 - 140
Cylindrospermopsin	101		P	40 - 140
Microcystin LA	95.0		P	40 - 140
Microcystin LF	116		P	40 - 140
Microcystin LR	101		P	40 - 140
Microcystin LY	95.7		P	40 - 140
Microcystin RR	106		P	40 - 140
Microcystin YR	94.5		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372693

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2127188	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372396

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2127188	Kjeldahl Nitrogen	101	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2127139	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2127247	Total-P	99.8	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372366

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2127140	O-Phosphate-P	95.5	96.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P372405

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2127246	Anatoxin-a	131	136	P/P	40 - 140
2127246	Cylindrospermopsin	95.6	109	P/P	40 - 140
2127246	Microcystin LA	106	102	P/P	40 - 140
2127246	Microcystin LF	120	122	P/P	40 - 140
2127246	Microcystin LR	105	103	P/P	40 - 140
2127246	Microcystin LY	92.0	98.0	P/P	40 - 140
2127246	Microcystin RR	111	114	P/P	40 - 140
2127246	Microcystin YR	98.3	106	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P372693

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2127188	Ammonia-N	1.35	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P372396

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2127188	Kjeldahl Nitrogen	1.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P372443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2127139	NO2NO3-N	0.851	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P372472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2127247	Total-P	2.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P372366

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2127140	O-Phosphate-P	0.693	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P372405

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2127246	Anatoxin-a	3.71	Spike	P	0 - 30
2127246	Cylindrospermopsin	12.4	Spike	P	0 - 30
2127246	Microcystin LA	3.64	Spike	P	0 - 30
2127246	Microcystin LF	2.08	Spike	P	0 - 30
2127246	Microcystin LR	2.27	Spike	P	0 - 30
2127246	Microcystin LY	6.33	Spike	P	0 - 30
2127246	Microcystin RR	3.25	Spike	P	0 - 30
2127246	Microcystin YR	7.32	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2127246
Field Sample ID: Lake Grace HAB

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	114	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94905

Included Lab Sample IDs: 2127248

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94918

Included Lab Sample IDs: 2127247

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

Reference Method: EPA 8321B

Run ID: A94951

Included Lab Sample IDs: 2127246

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	113	127	P/P	50 - 160
Cylindrospermopsin	115	116	P/P	60 - 160
Microcystin LA	96.5	106	P/P	50 - 160
Microcystin LF	104	118	P/P	60 - 160
Microcystin LR	106	101	P/P	60 - 160
Microcystin LY	93.7	102	P/P	60 - 160
Microcystin RR	115	112	P/P	60 - 160
Microcystin YR	104	105	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94982

Included Lab Sample IDs: 2127247

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A95020

Included Lab Sample IDs: 2127247

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A95045

Included Lab Sample IDs: 2127247

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	102	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 SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	101	102			1.35
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	101	103			1.94
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102	101			0.851
EPA 365.1 Rev. 2.0	Total-P	98.0	99.8	97.6			2.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	95.5	96.2			0.693
EPA 8321B	Anatoxin-a	124	131	136			3.71
	Cylindrospermopsin	101	95.6	109			12.4
	Microcystin LA	95.0	106	102			3.64
	Microcystin LF	116	120	122			2.08
	Microcystin LR	101	105	103			2.27
	Microcystin LY	95.7	92.0	98.0			6.33
	Microcystin RR	106	111	114			3.25
	Microcystin YR	94.5	98.3	106			7.32

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2127247
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2127247
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2127247
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2127247
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2127248
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2127246

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	10/11/2019			10/17/2019 12:56	Ping Hua	2127247
EPA 351.2 Rev. 2.0	10/11/2019	10/14/2019 11:32	Sima Feizi	10/15/2019 17:39	Jhamieka S. Greenwood	2127247
EPA 353.2 Rev. 2.0	10/11/2019			10/14/2019 10:45	Beverly Y. Sanders	2127247
EPA 365.1 Rev. 2.0	10/11/2019	10/15/2019 13:09	Lipi Saha	10/16/2019 12:51	Rosalyn Ballman	2127247
EPA 365.1 Rev. 2.0 dissolved	10/11/2019			10/11/2019 15:52	Jhamieka S. Greenwood	2127248
EPA 8321B	10/11/2019	10/15/2019 09:00	Juyoung Kim	10/15/2019 11:09	Juyoung Kim	2127246