

Chemical Analysis Report

WQAP-2019-04-19-01

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

Event Description: **NEROC Algae Bloom Response-as needed**

Request ID: **RQ-2019-05-06-31**

Customer: **WQAP**

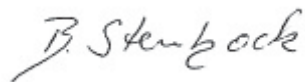
Project ID: **BLOOM-RESP**

Send Reports to:
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8800 Baymeadows Way West
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Date Certified: 07-MAY-2019 17:29



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: Guana Lake 0.6 miles N. of Six Mile Boat Ramp Collection Date/Time: 04/18/2019 09:45

Field ID: Guana Lake 0.6 miles N. of Six

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2079742	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P362589	
		Cylindrospermopsin**	0.25	U	ug/L	P362589	
		Microcystin LA**	0.25	UJ	ug/L	P362589	LCS, MS, RPD
		Microcystin LF**	0.25	UJ	ug/L	P362589	MS, RPD
		Microcystin LR**	0.25	U	ug/L	P362589	
		Microcystin LY**	0.25	UJ	ug/L	P362589	MS, RPD
		Microcystin RR**	0.25	U	ug/L	P362589	
		Microcystin YR**	0.25	UJ	ug/L	P362589	MS
		Saxitoxin**	0.25	UJ	ug/L	P362589	MS

Ref. Method and Comment:

EPA 8321B: Refer to the narrative for an explanation of QC Codes. Method validation for saxitoxin is still in progress. Second source was not analyzed.

Sample Location: Guana Lake 0.6 miles N. of Six Mile Boat Ramp Collection Date/Time: 04/18/2019 09:45

Field ID: Guana Lake 0.6 miles N. of Six

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2079743	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P363029	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P363092	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P362650	
	EPA 365.1 Rev. 2.0	Total-P	0.080		mg P/L	P362983	
2079744	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P362540	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363029

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363092

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362650

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362983

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362540

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

Reference Method: EPA 8321B
Batch ID: P362589

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
Saxitoxin	0.25	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P363029

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: P363092

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.7		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P362650

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: P362983

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P362540

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

Reference Method: EPA 8321B
 Batch ID: P362589

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	109		P	40 - 140
Cylindrospermopsin	102		P	40 - 140
Microcystin LA	146		F	40 - 140
Microcystin LF	97.2		P	40 - 140
Microcystin LR	102		P	40 - 140
Microcystin LY	140		P	40 - 140
Microcystin RR	105		P	40 - 140
Microcystin YR	93.2		P	40 - 140
Saxitoxin	122		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P363029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080011	Ammonia-N	99.7	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P363092

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079304	Kjeldahl Nitrogen	99.4	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P362650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079584	NO2NO3-N	98.6	98.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P362983

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080746	Total-P	93.9	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P362540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079811	O-Phosphate-P	99.7	102	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P362589

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2079742	Anatoxin-a	97.2	98.9	P/P	40 - 140
2079742	Cylindrospermopsin	50.3	46.7	P/P	40 - 140
2079742	Microcystin LA	144	197	F/F	40 - 140
2079742	Microcystin LF	97.7	167	P/F	40 - 140
2079742	Microcystin LR	120	102	P/P	40 - 140
2079742	Microcystin LY	134	189	P/F	40 - 140
2079742	Microcystin RR	114	111	P/P	40 - 140
2079742	Microcystin YR	106	141	P/F	40 - 140
2079742	Saxitoxin	21.0	18.0	F/F	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080011	Ammonia-N	0.676	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079304	Kjeldahl Nitrogen	2.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079584	NO2NO3-N	0.509	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080746	Total-P	5.61	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079811	O-Phosphate-P	1.55	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P362589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2079742	Anatoxin-a	1.68	Spike	P	0 - 30
2079742	Cylindrospermopsin	7.37	Spike	P	0 - 30
2079742	Microcystin LA	30.5	Spike	F	0 - 30
2079742	Microcystin LF	52.5	Spike	F	0 - 30
2079742	Microcystin LR	15.7	Spike	P	0 - 30
2079742	Microcystin LY	33.9	Spike	F	0 - 30
2079742	Microcystin RR	2.95	Spike	P	0 - 30
2079742	Microcystin YR	28.0	Spike	P	0 - 30
2079742	Saxitoxin	15.1	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: 2079742

Field Sample ID: Guana Lake 0.6 miles N. of Six

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	99.0	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A90859

Included Lab Sample IDs: 2079744

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	98.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A90915

Included Lab Sample IDs: 2079742

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	108	104	P/P	50 - 160
Cylindrospermopsin	98.2	81.0	P/P	60 - 160
Microcystin LA	90.0	133	P/P	50 - 160
Microcystin LF	113	148	P/P	60 - 160
Microcystin LR	94.2	87.7	P/P	60 - 160
Microcystin LY	116	145	P/P	60 - 160
Microcystin RR	102	102	P/P	60 - 160
Microcystin YR	88.9	87.5	P/P	60 - 160
Saxitoxin	103	106	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A90918

Included Lab Sample IDs: 2079743

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91070

Included Lab Sample IDs: 2079743

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91103

Included Lab Sample IDs: 2079743

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A91156

Included Lab Sample IDs: 2079743

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.7	92.0	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	101	99.7	98.6			0.676
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.7	99.4	96.4			2.35
EPA 353.2 Rev. 2.0	NO2NO3-N	101	98.6	98.1			0.509
EPA 365.1 Rev. 2.0	Total-P	101	93.9	99.4			5.61
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	106	99.7	102			1.55
EPA 8321B	Anatoxin-a	109	97.2	98.9			1.68
	Cylindrospermopsin	102	50.3	46.7			7.37
	Microcystin LA	146	144	197			30.5
	Microcystin LF	97.2	97.7	167			52.5
	Microcystin LR	102	120	102			15.7
	Microcystin LY	140	134	189			33.9
	Microcystin RR	105	114	111			2.95
	Microcystin YR	93.2	106	141			28.0
	Saxitoxin	122	21.0	18.0			15.1

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2079743
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2079743
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2079743
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2079743
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2079744
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2079742

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	04/19/2019			04/26/2019 11:31	Ping Hua	2079743
EPA 351.2 Rev. 2.0	04/19/2019	04/30/2019 12:15	Adrian Shelby	05/02/2019 13:00	Joseph Suarez	2079743
EPA 353.2 Rev. 2.0	04/19/2019			04/23/2019 11:45	Beverly Y. Sanders	2079743
EPA 365.1 Rev. 2.0	04/19/2019	04/29/2019 13:45	Sima Feizi	04/30/2019 15:52	Rosalyn Ballman	2079743
EPA 365.1 Rev. 2.0 dissolved	04/19/2019			04/19/2019 17:34	Julia Storbeck	2079744
EPA 8321B	04/19/2019	04/22/2019 12:00	Juyoung Kim	04/22/2019 19:33	Juyoung Kim	2079742