

Chemical Analysis Report

WQAP-2019-07-18-05

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

Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2019-07-08-79**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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13051 N. Telecom Parkway
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 06-AUG-2019 18:19



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: PYCC - NEAR BOCA CIEGA - ALGAL MAT

Collection Date/Time: 07/16/2019 11:40

Field ID: PYCC - NEAR BOCA CIEGA - MAT

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2104248	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P367468	
		Cylindrospermopsin**	0.25	U	ug/L	P367468	
		Microcystin LA**	0.25	U	ug/L	P367468	
		Microcystin LF**	0.25	U	ug/L	P367468	
		Microcystin LR**	0.25	U	ug/L	P367468	
		Microcystin LY**	0.25	U	ug/L	P367468	
		Microcystin RR**	0.25	U	ug/L	P367468	
		Microcystin YR**	0.25	U	ug/L	P367468	

Sample Location: PYCC - NEAR BOCA CIEGA - ALGAL MAT

Collection Date/Time: 07/16/2019 11:40

Field ID: PYCC - NEAR BOCA CIEGA - MAT

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2104249	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P368181	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P367878	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P367873	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P367807	
2104250	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P367524	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368181

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367878

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367873

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367807

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367524

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

Reference Method: EPA 8321B
Batch ID: P367468

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: P368181

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	103		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367878

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367873

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367807

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367524

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

Reference Method: EPA 8321B
Batch ID: P367468

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	94.7		P	40 - 140
Cylindrospermopsin	98.8		P	40 - 140
Microcystin LA	100		P	40 - 140
Microcystin LF	110		P	40 - 140
Microcystin LR	103		P	40 - 140
Microcystin LY	95.3		P	40 - 140
Microcystin RR	104		P	40 - 140
Microcystin YR	116		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368181

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104249	Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367878

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2103850	Kjeldahl Nitrogen	102	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2103848	NO2NO3-N	98.3	98.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367807

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104249	Total-P	93.1	95.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104273	O-Phosphate-P	94.9	96.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P367468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104223	Anatoxin-a	82.2	80.7	P/P	40 - 140
2104223	Cylindrospermopsin	43.4	44.0	P/P	40 - 140
2104223	Microcystin LA	93.7	96.6	P/P	40 - 140
2104223	Microcystin LF	103	96.6	P/P	40 - 140
2104223	Microcystin LR	109	101	P/P	40 - 140
2104223	Microcystin LY	93.9	89.8	P/P	40 - 140
2104223	Microcystin RR	98.7	95.0	P/P	40 - 140
2104223	Microcystin YR	117	114	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P368181

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104249	Ammonia-N	0.116	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P367878

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2103850	Kjeldahl Nitrogen	2.81	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P367873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2103848	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P367807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104249	Total-P	1.87	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P367524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104273	O-Phosphate-P	1.02	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P367468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104223	Anatoxin-a	1.85	Spike	P	0 - 30
2104223	Cylindrospermopsin	1.35	Spike	P	0 - 30
2104223	Microcystin LA	3.01	Spike	P	0 - 30
2104223	Microcystin LF	6.82	Spike	P	0 - 30
2104223	Microcystin LR	7.64	Spike	P	0 - 30
2104223	Microcystin LY	4.48	Spike	P	0 - 30
2104223	Microcystin RR	3.89	Spike	P	0 - 30
2104223	Microcystin YR	2.43	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: 2104248

Field Sample ID: PYCC - NEAR BOCA CIEGA - MAT

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	87.8	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A92877

Included Lab Sample IDs: 2104250

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A92902

Included Lab Sample IDs: 2104248

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	78.1	63.8	P/P	50 - 160
Cylindrospermopsin	72.3	75.8	P/P	60 - 160
Microcystin LA	82.5	67.4	P/P	50 - 160
Microcystin LF	86.4	72.6	P/P	60 - 160
Microcystin LR	95.3	69.6	P/P	60 - 160
Microcystin LY	89.1	69.7	P/P	60 - 160
Microcystin RR	77.7	78.4	P/P	60 - 160
Microcystin YR	97.0	83.3	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93017

Included Lab Sample IDs: 2104249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93020

Included Lab Sample IDs: 2104249

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: A93054

Included Lab Sample IDs: 2104249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	109	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A93145

Included Lab Sample IDs: 2104249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	103	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		Precision	
					LCS	SMP
EPA 350.1 Rev. 2.0	Ammonia-N	103	103	103		0.116
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	102	105		2.81
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.3	98.3		0.0
EPA 365.1 Rev. 2.0	Total-P	102	93.1	95.0		1.87
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	94.9	96.0		1.02
EPA 8321B	Anatoxin-a	94.7	82.2	80.7		1.85
	Cylindrospermopsin	98.8	43.4	44.0		1.35
	Microcystin LA	100	93.7	96.6		3.01
	Microcystin LF	110	103	96.6		6.82
	Microcystin LR	103	109	101		7.64
	Microcystin LY	95.3	93.9	89.8		4.48
	Microcystin RR	104	98.7	95.0		3.89
	Microcystin YR	116	117	114		2.43

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2104249
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2104249
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2104249
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2104249
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2104250
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2104248

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	07/18/2019			07/30/2019 16:10	Virginia P. Brown	2104249
EPA 351.2 Rev. 2.0	07/18/2019	07/25/2019 12:00	Adrian Shelby	07/26/2019 09:37	Joseph Suarez	2104249
EPA 353.2 Rev. 2.0	07/18/2019			07/25/2019 09:16	Beverly Y. Sanders	2104249
EPA 365.1 Rev. 2.0	07/18/2019	07/24/2019 11:15	Vijayalakshmi Reddy	07/25/2019 12:27	Lipi Saha	2104249
EPA 365.1 Rev. 2.0 dissolved	07/18/2019			07/18/2019 15:54	Jhamieka S. Greenwood	2104250
EPA 8321B	07/18/2019	07/19/2019 09:00	Mohammad Ghaffari	07/19/2019 11:23	Mohammad Ghaffari	2104248