

Chemical Analysis Report

WQAP-2019-06-06-02

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-2019-06-10-39**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637
Attn: Matthew Bearden

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Date Certified: 20-JUN-2019 11:21



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 ROUSSEAU BLOOM RESPONSE

Collection Date/Time: 06/05/2019 12:15

Field ID: LAKE ROUSSEAU

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2092170	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P365355	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P365475	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.34		mg N/L	P365578	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P365486	
2092172	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P365245	

Sample Location: WITHLACOOCHEE RIVER BLOOM

Collection Date/Time: 06/05/2019 13:20

Field ID: WITHLA. RVR BLOOM

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2092169	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P365252	
		Cylindrospermopsin**	0.25	U	ug/L	P365252	
		Microcystin LA**	0.25	U	ug/L	P365252	
		Microcystin LF**	0.25	U	ug/L	P365252	
		Microcystin LR**	0.25	U	ug/L	P365252	
		Microcystin LY**	0.25	U	ug/L	P365252	
		Microcystin RR**	0.25	U	ug/L	P365252	
		Microcystin YR**	0.25	U	ug/L	P365252	

Sample Location: WITHLACOOCHEE RIVER BLOOM

Collection Date/Time: 06/05/2019 13:20

Field ID: WITHLA. RVR BLOOM

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2092171	EPA 350.1 Rev. 2.0	Ammonia-N	0.071		mg N/L	P365355	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P365475	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.37		mg N/L	P365578	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P365486	
2092173	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P365245	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365355

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365475

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365578

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365486

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365245

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

Reference Method: EPA 8321B
Batch ID: P365252

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: P365355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	105		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365475

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365578

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365486

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365245

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

Reference Method: EPA 8321B
Batch ID: P365252

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	102		P	40 - 140
Cylindrospermopsin	100		P	40 - 140
Microcystin LA	101		P	40 - 140
Microcystin LF	140		P	40 - 140
Microcystin LR	98.5		P	40 - 140
Microcystin LY	104		P	40 - 140
Microcystin RR	99.7		P	40 - 140
Microcystin YR	107		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2091434	Ammonia-N	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2092170	Kjeldahl Nitrogen	109	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2092138	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2092138	Total-P	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365245

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2092190	O-Phosphate-P	96.3	96.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P365252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2091426	Anatoxin-a	80.2	105	P/P	40 - 140
2091426	Cylindrospermopsin	97.6	101	P/P	40 - 140
2091426	Microcystin LA	100	96.2	P/P	40 - 140
2091426	Microcystin LF	137	135	P/P	40 - 140
2091426	Microcystin LR	102	108	P/P	40 - 140
2091426	Microcystin LY	109	96.3	P/P	40 - 140
2091426	Microcystin RR	100	104	P/P	40 - 140
2091426	Microcystin YR	104	109	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2091434	Ammonia-N	0.589	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2092170	Kjeldahl Nitrogen	0.0794	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2092138	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2092138	Total-P	1.98	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2092190	O-Phosphate-P	0.207	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P365252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2091426	Anatoxin-a	26.8	Spike	P	0 - 30
2091426	Cylindrospermopsin	3.82	Spike	P	0 - 30
2091426	Microcystin LA	4.03	Spike	P	0 - 30
2091426	Microcystin LF	1.44	Spike	P	0 - 30
2091426	Microcystin LR	5.34	Spike	P	0 - 30
2091426	Microcystin LY	12.0	Spike	P	0 - 30
2091426	Microcystin RR	3.70	Spike	P	0 - 30
2091426	Microcystin YR	5.11	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: 2092169

Field Sample ID: WITHLA. RVR BLOOM

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	111	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A91920

Included Lab Sample IDs: 2092169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	98.5	92.4	P/P	50 - 160
Cylindrospermopsin	102	96.4	P/P	60 - 160
Microcystin LA	102	94.3	P/P	50 - 160
Microcystin LF	124	111	P/P	60 - 160
Microcystin LR	94.5	85.7	P/P	60 - 160
Microcystin LY	106	87.3	P/P	60 - 160
Microcystin RR	97.4	95.9	P/P	60 - 160
Microcystin YR	96.9	92.8	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A91928

Included Lab Sample IDs: 2092172, 2092173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.8	P/P	90 - 110
O-Phosphate-P	98.8	98.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91986

Included Lab Sample IDs: 2092170, 2092171

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	109	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A92073

Included Lab Sample IDs: 2092170, 2092171

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A92093

Included Lab Sample IDs: 2092170, 2092171

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.1	97.8	P/P	90 - 110
Kjeldahl Nitrogen	97.8	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A92110

Included Lab Sample IDs: 2092171

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A92118

Included Lab Sample IDs: 2092170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A92118

Included Lab Sample IDs: 2092170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	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	105	104	105			0.589
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.9	109	109			0.0794
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	97.5	99.0	99.0			0.0
EPA 365.1 Rev. 2.0	Total-P	98.8	100	102			1.98
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	96.3	96.5			0.207
EPA 8321B	Anatoxin-a	102	80.2	105			26.8
	Cylindrospermopsin	100	97.6	101			3.82
	Microcystin LA	101	100	96.2			4.03
	Microcystin LF	140	137	135			1.44
	Microcystin LR	98.5	102	108			5.34
	Microcystin LY	104	109	96.3			12.0
	Microcystin RR	99.7	100	104			3.70
	Microcystin YR	107	104	109			5.11

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2092170, 2092171
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2092170, 2092171
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2092170, 2092171
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2092170, 2092171
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2092172, 2092173
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2092169

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	06/06/2019			06/06/2019 15:42	Ping Hua	2092170
	06/06/2019			06/06/2019 15:43	Ping Hua	2092171
EPA 351.2 Rev. 2.0	06/06/2019	06/12/2019 10:45	Adrian Shelby	06/13/2019 16:09	Joseph Suarez	2092170
	06/06/2019	06/12/2019 10:45	Adrian Shelby	06/13/2019 16:17	Joseph Suarez	2092171
EPA 353.2 Rev. 2.0	06/06/2019			06/13/2019 10:15	Beverly Y. Sanders	2092170
	06/06/2019			06/13/2019 10:16	Beverly Y. Sanders	2092171
EPA 365.1 Rev. 2.0	06/06/2019	06/12/2019 14:05	Sima Feizi	06/13/2019 17:03	Julia Storbeck	2092171
	06/06/2019	06/12/2019 14:05	Sima Feizi	06/14/2019 17:15	Julia Storbeck	2092170
EPA 365.1 Rev. 2.0 dissolved	06/06/2019			06/06/2019 15:09	Jhamieka S. Greenwood	2092172
	06/06/2019			06/06/2019 15:14	Jhamieka S. Greenwood	2092173
EPA 8321B	06/06/2019	06/06/2019 11:32	Juyoung Kim	06/06/2019 13:07	Juyoung Kim	2092169