

Chemical Analysis Report

WQAP-2020-09-17-01

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

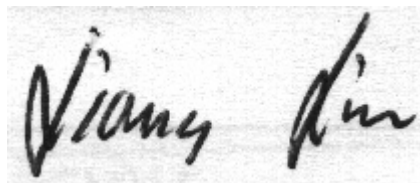
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2020-03-30-15**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd Ste 232
Orlando, FL 32803
Attn: Natalie Ayala

For additional information please contact
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 05-OCT-2020 09:45

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

NON-CONFORMANCE REPORT INCLUDED

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: Indian River Canal @ Aruba Ct

Collection Date/Time: 09/14/2020 14:58

Field ID: HABCE0042_IRLCanal

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2196531	EPA 8321B	Anatoxin-a**	0.25	UY	ug/L	P387457	
		Cylindrospermopsin**	0.25	UY	ug/L	P387457	
		Desmethyl microcystin LR**	0.25	UY	ug/L	P387457	
		Microcystin LA**	0.25	UY	ug/L	P387457	
		Microcystin LF**	0.25	UY	ug/L	P387457	
		Microcystin LR**	0.25	UY	ug/L	P387457	
		Microcystin LW**	0.25	UY	ug/L	P387457	
		Microcystin LY**	0.25	UY	ug/L	P387457	
		Microcystin RR**	0.25	UY	ug/L	P387457	
		Microcystin WR**	0.50	UY	ug/L	P387457	
		Microcystin YR**	0.25	UY	ug/L	P387457	
		Saxitoxin**	0.50	UY	ug/L	P387457	
2196535	EPA 350.1 Rev. 2.0	Ammonia-N	0.010	Y	mg N/L	P387578	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.1	Y	mg N/L	P387549	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	UY	mg N/L	P387602	
	EPA 365.1 Rev. 2.0	Total-P	0.16	Y	mg P/L	P387548	
2196536	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.01	IYQ	mg P/L	P387522	

Ref. Method and Comment:

EPA 8321B: Y - Sample was received with inadequate sample preservation; see NCR report.

EPA 350.1 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.

EPA 351.2 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.

EPA 353.2 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.

EPA 365.1 Rev. 2.0: Total-P: Sample temperature was outside the acceptable range when received at the laboratory.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired prior to receipt. Sample temperature was outside the acceptable range when received at the laboratory.

Non-Conformance Report

NCR ID: 8428

Event(s)

WQAP-2020-09-17-01

Job(s)

Sample(s)

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived one or more days late by FedEx, samples received outside of acceptable temp range.

Resolution: Samples will be qualified as appropriate.
Customer contacted by email.
Biology and Chemistry supervisors notified.

Authorized by/Date: Kerry Tate, Ph.D. 9/18/2020

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387578

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387549

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387602

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387548

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387522

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

Reference Method: EPA 8321B
Batch ID: P387457

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	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 LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387578

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387549

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387602

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: P387548

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387522

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.8		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P387457

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	104		P	40 - 140
Cylindrospermopsin	103		P	40 - 140
Desmethyl microcystin LR	102		P	40 - 140
Microcystin LA	94.0		P	40 - 140
Microcystin LF	96.6		P	40 - 140
Microcystin LR	91.5		P	40 - 140
Microcystin LW	99.1		P	40 - 140
Microcystin LY	93.3		P	40 - 140
Microcystin RR	108		P	40 - 140
Microcystin WR	107		P	40 - 140
Microcystin YR	93.2		P	40 - 140
Saxitoxin	87.1		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P387578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196535	Ammonia-N	97.1	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P387549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196185	Kjeldahl Nitrogen	110	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P387602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196198	NO2NO3-N	97.5	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P387548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196378	Total-P	95.0	95.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P387522

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196643	O-Phosphate-P	95.6	97.2	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P387457

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196270	Anatoxin-a	112	102	P/P	40 - 140
2196270	Cylindrospermopsin	97.3	95.7	P/P	40 - 140
2196270	Desmethyl microcystin LR	107	101	P/P	40 - 140
2196270	Microcystin LA	104	102	P/P	40 - 140
2196270	Microcystin LF	75.8	91.7	P/P	40 - 140
2196270	Microcystin LR	111	101	P/P	40 - 140
2196270	Microcystin LW	87.8	103	P/P	40 - 140
2196270	Microcystin LY	100	91.8	P/P	40 - 140
2196270	Microcystin RR	116	117	P/P	40 - 140
2196270	Microcystin WR	109	102	P/P	40 - 140
2196270	Microcystin YR	105	104	P/P	40 - 140
2196270	Saxitoxin	63.6	59.0	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P387578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196535	Ammonia-N	1.17	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P387549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196185	Kjeldahl Nitrogen	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P387602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196198	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P387548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196378	Total-P	0.629	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P387522

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196643	O-Phosphate-P	1.59	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P387457

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196270	Anatoxin-a	9.16	Spike	P	0 - 30
2196270	Cylindrospermopsin	1.72	Spike	P	0 - 30
2196270	Desmethyl microcystin LR	5.11	Spike	P	0 - 30
2196270	Microcystin LA	1.13	Spike	P	0 - 30
2196270	Microcystin LF	19.0	Spike	P	0 - 30
2196270	Microcystin LR	9.81	Spike	P	0 - 30
2196270	Microcystin LW	16.2	Spike	P	0 - 30
2196270	Microcystin LY	8.89	Spike	P	0 - 30
2196270	Microcystin RR	0.0981	Spike	P	0 - 30
2196270	Microcystin WR	6.74	Spike	P	0 - 30
2196270	Microcystin YR	0.511	Spike	P	0 - 30
2196270	Saxitoxin	7.46	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2196531

Field Sample ID: HABCE0042_IRLCanal

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	100	P	30 - 160
EPA 8321B	Microcystin LR-d7	100	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	86.8	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	86.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A101056

Included Lab Sample IDs: 2196531

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	104	107	P/P	50 - 160
Cylindrospermopsin	97.7	101	P/P	60 - 160
Desmethyl microcystin LR	97.2	98.8	P/P	60 - 160
Microcystin LA	97.7	101	P/P	50 - 160
Microcystin LF	88.8	89.0	P/P	50 - 160
Microcystin LR	102	84.5	P/P	60 - 160
Microcystin LW	77.2	94.1	P/P	60 - 160
Microcystin LY	95.6	95.1	P/P	60 - 160
Microcystin RR	98.3	103	P/P	60 - 160
Microcystin WR	95.6	96.8	P/P	60 - 160
Microcystin YR	81.7	85.2	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101061

Included Lab Sample IDs: 2196536

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.4	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A101062

Included Lab Sample IDs: 2196531

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Saxitoxin	92.8	84.8	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101085

Included Lab Sample IDs: 2196535

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101096

Included Lab Sample IDs: 2196535

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101121

Included Lab Sample IDs: 2196535

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	108	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101132

Included Lab Sample IDs: 2196535

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	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	100	97.1	98.5			1.17
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	110	110			0.0
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	97.5	97.5			0.0
EPA 365.1 Rev. 2.0	Total-P	105	95.0	95.6			0.629
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	95.6	97.2			1.59
EPA 8321B	Anatoxin-a	104	112	102			9.16
	Cylindrospermopsin	103	97.3	95.7			1.72
	Desmethyl microcystin LR	102	107	101			5.11
	Microcystin LA	94.0	104	102			1.13
	Microcystin LF	96.6	75.8	91.7			19.0
	Microcystin LR	91.5	111	101			9.81
	Microcystin LW	99.1	87.8	103			16.2
	Microcystin LY	93.3	100	91.8			8.89
	Microcystin RR	108	116	117			0.0981
	Microcystin WR	107	109	102			6.74
	Microcystin YR	93.2	105	104			0.511
	Saxitoxin	87.1	63.6	59.0			7.46

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2196535
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2196535
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2196535
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2196535
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2196536
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2196531
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2196531

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	09/17/2020			09/19/2020 13:13	Ping Hua	2196535
EPA 351.2 Rev. 2.0	09/17/2020	09/18/2020 17:20	David Boose	09/21/2020 16:14	Elliott Rodriguez	2196535
EPA 353.2 Rev. 2.0	09/17/2020			09/21/2020 09:44	Beverly Y. Sanders	2196535
EPA 365.1 Rev. 2.0	09/17/2020	09/18/2020 13:22	Shengyu Wang	09/21/2020 14:41	Benjamin T. Nordmann	2196535
EPA 365.1 Rev. 2.0 dissolved	09/17/2020			09/17/2020 17:13	Julia Storbeck	2196536
EPA 8321B	09/17/2020	09/17/2020 12:00	Mohammad Ghaffari	09/17/2020 13:33	Mohammad Ghaffari	2196531
	09/17/2020	09/17/2020 12:00	Mohammad Ghaffari	09/17/2020 19:09	Mohammad Ghaffari	2196531