Chemical Analysis Report

WQAP-2021-08-31-01

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-2021-08-02-13**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Date Certified: 23-SEP-2021 09:43

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: Trout Lake Canal-35m from FL-19 **Collection Date/Time: 08/30/2021 13:30**

Field ID: HABCE0077_TroutLakeCanal Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272719	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P403171	
		Cylindrospermopsin	0.10	U	ug/L	P403171	
		Desmethyl microcystin LR	0.25	U	ug/L	P403171	
		Microcystin HilR**	0.25	U	ug/L	P403171	
		Microcystin HtyR**	0.25	U	ug/L	P403171	
		Microcystin LA	0.10	U	ug/L	P403171	
		Microcystin LF	0.10	U	ug/L	P403171	
		Microcystin LR	0.25	U	ug/L	P403171	
		Microcystin LW	0.25	U	ug/L	P403171	
		Microcystin LY	0.10	U	ug/L	P403171	
		Microcystin RR	0.10	U	ug/L	P403171	
		Microcystin WR	0.50	U	ug/L	P403171	
		Microcystin YR	0.25	U	ug/L	P403171	
		Nodularin-R**	0.10	U	ug/L	P403171	
2272727	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P403322	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P403356	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.032		mg N/L	P403294	
	EPA 365.1 Rev. 2.0	Total-P	0.055		mg P/L	P403246	
2272731	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403219	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Dead River-Residential Canal S of 441 **Collection Date/Time: 08/30/2021 12:15**

Field ID: HABCE0081_DeadRiver Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272720	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P403171	
		Cylindrospermopsin	0.10	U	ug/L	P403171	
		Desmethyl microcystin LR	0.25	U	ug/L	P403171	
		Microcystin HilR**	0.25	U	ug/L	P403171	
		Microcystin HtyR**	0.25	U	ug/L	P403171	
		Microcystin LA	0.10	U	ug/L	P403171	
		Microcystin LF	0.10	U	ug/L	P403171	
		Microcystin LR	0.25	U	ug/L	P403171	
		Microcystin LW	0.25	U	ug/L	P403171	
		Microcystin LY	0.10	U	ug/L	P403171	
		Microcystin RR	0.10	U	ug/L	P403171	
		Microcystin WR	0.50	U	ug/L	P403171	
		Microcystin YR	0.25	U	ug/L	P403171	
		Nodularin-R**	0.10	U	ug/L	P403171	
2272728	EPA 350.1 Rev. 2.0	Ammonia-N	0.076		mg N/L	P403322	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P403356	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P403294	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P403246	
2272732	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403219	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Eustis-Canal Near Linda Lane **Collection Date/Time: 08/30/2021 12:00**

Field ID: HABCE0092_LakeEustis2 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272721	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P403171	
		Cylindrospermopsin	0.10	U	ug/L	P403171	
		Desmethyl microcystin LR	0.25	U	ug/L	P403171	
		Microcystin HilR**	0.25	U	ug/L	P403171	
		Microcystin HtyR**	0.25	U	ug/L	P403171	
		Microcystin LA	0.10	U	ug/L	P403171	
		Microcystin LF	0.10	U	ug/L	P403171	
		Microcystin LR	0.25	U	ug/L	P403171	
		Microcystin LW	0.25	U	ug/L	P403171	
		Microcystin LY	0.10	U	ug/L	P403171	
		Microcystin RR	0.10	U	ug/L	P403171	
		Microcystin WR	0.50	U	ug/L	P403171	
		Microcystin YR	0.25	U	ug/L	P403171	
		Nodularin-R**	0.10	U	ug/L	P403171	
2272729	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P403322	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2	J	mg N/L	P403357	RPD
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.039		mg N/L	P403295	
	EPA 365.1 Rev. 2.0	Total-P	0.057		mg P/L	P403246	
2272733	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403219	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample. Refer to the Lab Analysis Report for an explanation of QC Codes.

Sample Location: Lake Eustis - NW Corner **Collection Date/Time: 08/30/2021 11:35**

Field ID: HABCE0075_Eustis Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272722	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P403171	
		Cylindrospermopsin	0.10	U	ug/L	P403171	
		Desmethyl microcystin LR	0.25	U	ug/L	P403171	
		Microcystin HilR**	0.25	U	ug/L	P403171	
		Microcystin HtyR**	0.25	U	ug/L	P403171	
		Microcystin LA	0.10	U	ug/L	P403171	
		Microcystin LF	0.10	U	ug/L	P403171	
		Microcystin LR	0.25	U	ug/L	P403171	
		Microcystin LW	0.25	U	ug/L	P403171	
		Microcystin LY	0.10	U	ug/L	P403171	
		Microcystin RR	0.10	U	ug/L	P403171	
		Microcystin WR	0.50	U	ug/L	P403171	
		Microcystin YR	0.25	U	ug/L	P403171	
		Nodularin-R**	0.10	U	ug/L	P403171	
2272730	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P403322	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P403357	RPD
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P403295	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P403246	
2272734	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403219	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403322

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403356

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403357

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403294

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403295

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403246

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403219

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

Reference Method: EPA 8321B
Batch ID: P403171

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HilR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P403171

Component	Result	Code	Units
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403356

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403357

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403294

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403295

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403246

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403219

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P403171

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	75.7		P	40 - 150
Cylindrospermopsin	95.2		P	40 - 150
Desmethyl microcystin LR	76.0		P	40 - 150
Microcystin HilR	100		P	40 - 150
Microcystin HtyR	89.7		P	40 - 150
Microcystin LA	128		P	40 - 150
Microcystin LF	128		P	40 - 150
Microcystin LR	99.0		P	40 - 150
Microcystin LW	111		P	40 - 150
Microcystin LY	126		P	40 - 150

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P403171

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Microcystin RR	96.8		P	40 - 150
Microcystin WR	92.6		P	40 - 150
Microcystin YR	85.7		P	40 - 150
Nodularin-R	105		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272730	Ammonia-N	95.8	96.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403294

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272687	NO2NO3-N	97.4	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403295

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272730	NO2NO3-N	98.5	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403246

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272772	Total-P	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403219

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272731	O-Phosphate-P	96.3	97.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P403171

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272321	Anatoxin-a	89.0	87.1	P/P	40 - 150
2272321	Cylindrospermopsin	103	99.8	P/P	40 - 150
2272321	Desmethyl microcystin LR	81.2	82.2	P/P	40 - 150
2272321	Microcystin HilR	105	102	P/P	40 - 150
2272321	Microcystin HtyR	95.0	92.6	P/P	40 - 150
2272321	Microcystin LA	119	123	P/P	40 - 150
2272321	Microcystin LF	125	127	P/P	40 - 150
2272321	Microcystin LR	99.5	101	P/P	40 - 150
2272321	Microcystin LW	119	114	P/P	40 - 150
2272321	Microcystin LY	128	123	P/P	40 - 150
2272321	Microcystin RR	103	102	P/P	40 - 150
2272321	Microcystin WR	92.4	88.5	P/P	40 - 150
2272321	Microcystin YR	91.5	89.5	P/P	40 - 150
2272321	Nodularin-R	102	96.9	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272730	Ammonia-N	0.738	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403356

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272687	Kjeldahl Nitrogen	1.64	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272729	Kjeldahl Nitrogen	24.5	Spike	F	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403294

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272687	NO2NO3-N	0.990	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272730	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272772	Total-P	1.34	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403219

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272731	O-Phosphate-P	1.03	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P403171

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272321	Anatoxin-a	2.25	Spike	P	0 - 30
2272321	Cylindrospermopsin	3.42	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P403171

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272321	Desmethyl microcystin LR	1.17	Spike	P	0 - 30
2272321	Microcystin HilR	3.04	Spike	P	0 - 30
2272321	Microcystin HtyR	2.55	Spike	P	0 - 30
2272321	Microcystin LA	2.77	Spike	P	0 - 30
2272321	Microcystin LF	1.07	Spike	P	0 - 30
2272321	Microcystin LR	1.05	Spike	P	0 - 30
2272321	Microcystin LW	4.20	Spike	P	0 - 30
2272321	Microcystin LY	4.03	Spike	P	0 - 30
2272321	Microcystin RR	1.54	Spike	P	0 - 30
2272321	Microcystin WR	4.25	Spike	P	0 - 30
2272321	Microcystin YR	2.20	Spike	P	0 - 30
2272321	Nodularin-R	5.01	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2272719
Field Sample ID: HABCE0077_TroutLakeCanal

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	131	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	103	P	30 - 160

Lab Sample ID: 2272720
Field Sample ID: HABCE0081_DeadRiver

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	127	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	118	P	30 - 160

Lab Sample ID: 2272721
Field Sample ID: HABCE0092_LakeEustis2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	124	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	129	P	30 - 160

Lab Sample ID: 2272722
Field Sample ID: HABCE0075_Eustis

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	122	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	124	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A107576
Included Lab Sample IDs: 2272731, 2272732, 2272733, 2272734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A107579
Included Lab Sample IDs: 2272719, 2272720, 2272721, 2272722

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	77.0	74.7	P/P	50 - 160
Anatoxin-a	78.2	77.0	P/P	50 - 160
Cylindrospermopsin	94.8	97.9	P/P	50 - 160
Cylindrospermopsin	97.9	96.4	P/P	50 - 160
Desmethyl microcystin LR	79.8	83.4	P/P	50 - 160
Desmethyl microcystin LR	83.4	83.3	P/P	50 - 160
Microcystin HilR	108	99.2	P/P	50 - 160
Microcystin HilR	95.3	108	P/P	50 - 160
Microcystin HtyR	88.6	99.9	P/P	50 - 160
Microcystin HtyR	99.9	97.1	P/P	50 - 160
Microcystin LA	122	140	P/P	50 - 160
Microcystin LA	140	136	P/P	50 - 160
Microcystin LF	111	123	P/P	50 - 160
Microcystin LF	123	118	P/P	50 - 160
Microcystin LR	105	99.2	P/P	50 - 160
Microcystin LR	99.2	105	P/P	50 - 160
Microcystin LW	102	112	P/P	50 - 160
Microcystin LW	112	108	P/P	50 - 160
Microcystin LY	121	132	P/P	50 - 160
Microcystin LY	132	124	P/P	50 - 160
Microcystin RR	103	98.2	P/P	50 - 160
Microcystin RR	97.6	103	P/P	50 - 160
Microcystin WR	81.0	90.2	P/P	50 - 160
Microcystin WR	90.2	92.3	P/P	50 - 160
Microcystin YR	91.8	94.2	P/P	50 - 160
Microcystin YR	94.2	95.4	P/P	50 - 160
Nodularin-R	107	107	P/P	50 - 160
Nodularin-R	107	107	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A107613
Included Lab Sample IDs: 2272727, 2272728, 2272729, 2272730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	98.0	P/P	90 - 110
NO2NO3-N	99.5	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107615
Included Lab Sample IDs: 2272729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.4	99.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A107618
Included Lab Sample IDs: 2272727, 2272728, 2272729, 2272730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.1	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107622
Included Lab Sample IDs: 2272727, 2272728, 2272730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107660
Included Lab Sample IDs: 2272727, 2272728, 2272729, 2272730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	96.0	P/P	90 - 110
Kjeldahl Nitrogen	99.6	96.3	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	MS
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	95.8	96.6			0.738
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.7					1.64
	Kjeldahl Nitrogen	93.6					24.5
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	97.4	96.4			0.990
	NO2NO3-N	98.0	98.5	98.5			0.0
EPA 365.1 Rev. 2.0	Total-P	106	103	104			1.34
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	96.3	97.3			1.03
EPA 8321B	Anatoxin-a	75.7	89.0	87.1			2.25
	Cylindrospermopsin	95.2	103	99.8			3.42
	Desmethyl microcystin LR	76.0	81.2	82.2			1.17
	Microcystin HilR	100	105	102			3.04
	Microcystin HtyR	89.7	95.0	92.6			2.55
	Microcystin LA	128	119	123			2.77
	Microcystin LF	128	125	127			1.07
	Microcystin LR	99.0	99.5	101			1.05
	Microcystin LW	111	119	114			4.20
	Microcystin LY	126	128	123			4.03
	Microcystin RR	96.8	103	102			1.54
	Microcystin WR	92.6	92.4	88.5			4.25
	Microcystin YR	85.7	91.5	89.5			2.20
	Nodularin-R	105	102	96.9			5.01

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2272727, 2272728, 2272729, 2272730
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2272727, 2272728, 2272729, 2272730
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2272727, 2272728, 2272729, 2272730
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2272727, 2272728, 2272729, 2272730
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2272731, 2272732, 2272733, 2272734
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2272719, 2272720, 2272721, 2272722

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	08/31/2021			09/02/2021 12:50	Ping Hua	2272730
	08/31/2021			09/02/2021 12:54	Ping Hua	2272727
	08/31/2021			09/02/2021 12:55	Ping Hua	2272728
	08/31/2021			09/02/2021 12:57	Ping Hua	2272729
EPA 351.2 Rev. 2.0	08/31/2021	09/03/2021 13:24	Benjamin T. Nordmann	09/07/2021 11:39	Alexandra J Mattheus	2272727
	08/31/2021	09/03/2021 13:24	Benjamin T. Nordmann	09/07/2021 11:41	Alexandra J Mattheus	2272728
	08/31/2021	09/03/2021 13:24	Benjamin T. Nordmann	09/07/2021 11:51	Alexandra J Mattheus	2272729
	08/31/2021	09/03/2021 13:24	Benjamin T. Nordmann	09/07/2021 11:55	Alexandra J Mattheus	2272730
EPA 353.2 Rev. 2.0	08/31/2021			09/02/2021 09:32	Beverly Y. Sanders	2272727
	08/31/2021			09/02/2021 09:34	Beverly Y. Sanders	2272728
	08/31/2021			09/02/2021 09:41	Beverly Y. Sanders	2272730
	08/31/2021			09/02/2021 09:47	Beverly Y. Sanders	2272729
EPA 365.1 Rev. 2.0	08/31/2021	09/01/2021 14:48	Simonne.V. Calhoun	09/02/2021 10:59	Lipi Saha	2272729
	08/31/2021	09/01/2021 14:48	Simonne.V. Calhoun	09/02/2021 15:19	Lipi Saha	2272727
	08/31/2021	09/01/2021 14:48	Simonne.V. Calhoun	09/02/2021 15:20	Lipi Saha	2272728
	08/31/2021	09/01/2021 14:48	Simonne.V. Calhoun	09/02/2021 15:21	Lipi Saha	2272730
EPA 365.1 Rev. 2.0 dissolved	08/31/2021			08/31/2021 14:31	James L Waggerby	2272731
	08/31/2021			08/31/2021 14:34	James L Waggerby	2272732
	08/31/2021			08/31/2021 14:35	James L Waggerby	2272733, 2272734
EPA 8321B	08/31/2021	08/31/2021 12:00	Mohammad Ghaffari	08/31/2021 16:52	Mohammad Ghaffari	2272719
	08/31/2021	08/31/2021 12:00	Mohammad Ghaffari	08/31/2021 17:25	Mohammad Ghaffari	2272720
	08/31/2021	08/31/2021 12:00	Mohammad Ghaffari	08/31/2021 17:42	Mohammad Ghaffari	2272721
	08/31/2021	08/31/2021 12:00	Mohammad Ghaffari	08/31/2021 17:59	Mohammad Ghaffari	2272722