

Chemical Analysis Report

SO-DIST-2023-10-10-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response -SOROC w/ blank**
Request ID: **RQ-2023-09-18-61**
Customer: **SO-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
Attn: John Barrington

For additional information please contact
Colin Wright, Ph.D.
Chris Bowen, B.S.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 17-OCT-2023 08:58

A handwritten signature in black ink, appearing to read "Colin Wright", is placed over a light blue rectangular background.

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: Caloosahatchee River - Coral Point Dr

Collection Date/Time: 10/09/2023 11:30

Field ID: HAB-SD-100923-1130

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2443792	DEP SOP: NU-094-1	Color (true)	110		PCU	P436304	
2443797	EPA 350.1 Rev. 2.0	Ammonia-N	0.073		mg N/L	P436424	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P436430	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.062		mg N/L	P436381	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P436351	
2443802	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.082		mg P/L	P436296	
2443811	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P436079	
		Cylindrospermopsin	0.10	U	ug/L	P436078	
		Desmethyl microcystin LR	0.25	U	ug/L	P436078	
		Microcystin HilR	0.25	U	ug/L	P436078	
		Microcystin HtyR	0.25	U	ug/L	P436078	
		Microcystin LA	0.10	U	ug/L	P436078	
		Microcystin LF	0.10	U	ug/L	P436078	
		Microcystin LR	0.25	U	ug/L	P436078	
		Microcystin LW	0.25	U	ug/L	P436078	
		Microcystin LY	0.10	U	ug/L	P436078	
		Microcystin RR	0.10	U	ug/L	P436078	
		Microcystin WR	0.50	U	ug/L	P436078	
		Neosaxitoxin	0.50	U	ug/L	P436079	
		Microcystin YR	0.25	U	ug/L	P436078	
		Saxitoxin	0.50	U	ug/L	P436079	
		Nodularin-R	0.10	U	ug/L	P436078	

Sample Location: Caloosahatchee River - N of Loftons Island

Collection Date/Time: 10/09/2023 10:35

Field ID: HAB-SD-100923-1035

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2443790	DEP SOP: NU-094-1	Color (true)	200		PCU	P436304	
2443795	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P436424	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P436428	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P436381	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P436351	
2443800	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P436296	
2443809	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P436079	
		Cylindrospermopsin	0.10	U	ug/L	P436078	
		Desmethyl microcystin LR	0.25	U	ug/L	P436078	
		Microcystin HiLR	0.25	U	ug/L	P436078	
		Microcystin HtyR	0.25	U	ug/L	P436078	
		Microcystin LA	0.10	U	ug/L	P436078	
		Microcystin LF	0.10	U	ug/L	P436078	
		Microcystin LR	0.25	U	ug/L	P436078	
		Microcystin LW	0.25	U	ug/L	P436078	
		Microcystin LY	0.10	U	ug/L	P436078	
		Microcystin RR	0.10	U	ug/L	P436078	
		Microcystin WR	0.50	U	ug/L	P436078	
		Neosaxitoxin	0.50	U	ug/L	P436079	
		Microcystin YR	0.25	U	ug/L	P436078	
		Saxitoxin	0.50	U	ug/L	P436079	
		Nodularin-R	0.10	U	ug/L	P436078	

Sample Location: Caloosahatchee River - End of Coon Rd

Collection Date/Time: 10/09/2023 12:05

Field ID: HAB-SD-100923-1205

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2443793	DEP SOP: NU-094-1	Color (true)	200		PCU	P436304	
2443798	EPA 350.1 Rev. 2.0	Ammonia-N	0.093		mg N/L	P436424	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P436430	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P436381	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P436351	
2443803	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P436296	
2443812	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P436079	
		Cylindrospermopsin	0.10	U	ug/L	P436078	
		Desmethyl microcystin LR	0.25	U	ug/L	P436078	
		Microcystin HilR	0.25	U	ug/L	P436078	
		Microcystin HtyR	0.25	U	ug/L	P436078	
		Microcystin LA	0.10	U	ug/L	P436078	
		Microcystin LF	0.10	U	ug/L	P436078	
		Microcystin LR	0.25	U	ug/L	P436078	
		Microcystin LW	0.25	U	ug/L	P436078	
		Microcystin LY	0.10	U	ug/L	P436078	
		Microcystin RR	0.10	U	ug/L	P436078	
		Microcystin WR	0.50	U	ug/L	P436078	
		Neosaxitoxin	0.50	U	ug/L	P436079	
		Microcystin YR	0.25	U	ug/L	P436078	
		Saxitoxin	0.50	U	ug/L	P436079	
		Nodularin-R	0.10	U	ug/L	P436078	

Sample Location: Hancock Creek - Moody Ramp

Collection Date/Time: 10/09/2023 10:55

Field ID: HAB-SD-100923-1055

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2443791	DEP SOP: NU-094-1	Color (true)	130		PCU	P436304	
2443796	EPA 350.1 Rev. 2.0	Ammonia-N	0.061		mg N/L	P436424	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P436430	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P436381	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P436351	
2443801	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P436296	
2443810	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P436079	
		Cylindrospermopsin	0.10	U	ug/L	P436078	
		Desmethyl microcystin LR	0.25	U	ug/L	P436078	
		Microcystin HilR	0.25	U	ug/L	P436078	
		Microcystin HtyR	0.25	U	ug/L	P436078	
		Microcystin LA	0.10	U	ug/L	P436078	
		Microcystin LF	0.10	U	ug/L	P436078	
		Microcystin LR	0.25	U	ug/L	P436078	
		Microcystin LW	0.25	U	ug/L	P436078	
		Microcystin LY	0.10	U	ug/L	P436078	
		Microcystin RR	0.10	U	ug/L	P436078	
		Microcystin WR	0.50	U	ug/L	P436078	
		Neosaxitoxin	0.50	U	ug/L	P436079	
		Microcystin YR	0.25	U	ug/L	P436078	
		Saxitoxin	0.50	U	ug/L	P436079	
		Nodularin-R	0.10	U	ug/L	P436078	

Sample Location: Able Canal - Connie Ave N

Collection Date/Time: 10/09/2023 13:00

Field ID: HAB-SD-100923-1300

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2443794	DEP SOP: NU-094-1	Color (true)	42	A	PCU	P436304	
2443799	EPA 350.1 Rev. 2.0	Ammonia-N	0.091		mg N/L	P436484	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P436430	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.070		mg N/L	P436381	
	EPA 365.1 Rev. 2.0	Total-P	0.069		mg P/L	P436351	
2443804	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.037		mg P/L	P436297	
2443813	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P436079	
		Cylindrospermopsin	0.10	U	ug/L	P436078	
		Desmethyl microcystin LR	0.25	U	ug/L	P436078	
		Microcystin HilR	0.25	U	ug/L	P436078	
		Microcystin HtyR	0.25	U	ug/L	P436078	
		Microcystin LA	0.10	U	ug/L	P436078	
		Microcystin LF	0.10	U	ug/L	P436078	
		Microcystin LR	0.25	U	ug/L	P436078	
		Microcystin LW	0.25	U	ug/L	P436078	
		Microcystin LY	0.10	U	ug/L	P436078	
		Microcystin RR	0.10	U	ug/L	P436078	
		Microcystin WR	0.50	U	ug/L	P436078	
		Neosaxitoxin	0.50	U	ug/L	P436079	
		Microcystin YR	0.25	U	ug/L	P436078	
		Saxitoxin	0.50	U	ug/L	P436079	
		Nodularin-R	0.10	U	ug/L	P436078	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P436304

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P436424

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P436484

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436428

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436430

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436381

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P436351

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436296

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436297

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B

Batch ID: P436078

Component	Result	Code	Units
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
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

Reference Method: EPA 8321B

Batch ID: P436079

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P436304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P436424

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P436484

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436428

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436430

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436381

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P436351

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: P436296

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436297

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B

Batch ID: P436078

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	109		P	40 - 160
Desmethyl microcystin LR	103		P	40 - 160
Microcystin HilR	91.9		P	40 - 160
Microcystin HtyR	96.9		P	40 - 160
Microcystin LA	93.8		P	40 - 160
Microcystin LF	95.3		P	40 - 160
Microcystin LR	97.1		P	40 - 160
Microcystin LW	91.3		P	40 - 160
Microcystin LY	93.4		P	40 - 160
Microcystin RR	102		P	40 - 160
Microcystin WR	95.8		P	40 - 160
Microcystin YR	92.4		P	40 - 160
Nodularin-R	96.6		P	40 - 160

Reference Method: EPA 8321B

Batch ID: P436079

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	111		P	40 - 150
Neosaxitoxin	99.5		P	40 - 150
Saxitoxin	97.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P436424

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443731	Ammonia-N	97.8	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P436484

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2442346	Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443795	Kjeldahl Nitrogen	100	95.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443915	Kjeldahl Nitrogen	90.5	95.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436381

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443796	NO2NO3-N	98.0	95.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P436351

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443858	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443754	O-Phosphate-P	95.8	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436297

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443804	O-Phosphate-P	98.2	98.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P436078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443336	Cylindrospermopsin	105	93.1	P/P	40 - 160
2443336	Desmethyl microcystin LR	82.2	90.9	P/P	40 - 160
2443336	Microcystin H1LR	95.2	91.2	P/P	40 - 160
2443336	Microcystin HtyR	91.5	83.1	P/P	40 - 160

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P436078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443336	Microcystin LA	87.4	93.9	P/P	40 - 160
2443336	Microcystin LF	90.7	98.3	P/P	40 - 160
2443336	Microcystin LR	93.6	90.7	P/P	40 - 160
2443336	Microcystin LW	89.9	90.1	P/P	40 - 160
2443336	Microcystin LY	98.7	84.2	P/P	40 - 160
2443336	Microcystin RR	93.8	94.0	P/P	40 - 160
2443336	Microcystin WR	88.7	87.4	P/P	40 - 160
2443336	Microcystin YR	83.0	96.2	P/P	40 - 160
2443336	Nodularin-R	80.1	88.1	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P436079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2443336	Anatoxin-a	113	116	P/P	40 - 150
2443336	Neosaxitoxin	103	108	P/P	40 - 150
2443336	Saxitoxin	104	109	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P436304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443794	Color (true)	0.342	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P436424

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443731	Ammonia-N	2.63	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P436484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2442346	Ammonia-N	0.353	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443795	Kjeldahl Nitrogen	3.13	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443915	Kjeldahl Nitrogen	3.73	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443796	NO2NO3-N	1.64	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P436351

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443858	Total-P	1.21	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443754	O-Phosphate-P	1.86	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436297

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443804	O-Phosphate-P	0.516	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P436078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443336	Cylindrospermopsin	11.7	Spike	P	0 - 30
2443336	Desmethyl microcystin LR	9.50	Spike	P	0 - 30
2443336	Microcystin HILR	4.26	Spike	P	0 - 30
2443336	Microcystin HtyR	9.55	Spike	P	0 - 30
2443336	Microcystin LA	5.11	Spike	P	0 - 30
2443336	Microcystin LF	8.04	Spike	P	0 - 30
2443336	Microcystin LR	2.92	Spike	P	0 - 30
2443336	Microcystin LW	0.267	Spike	P	0 - 30
2443336	Microcystin LY	15.8	Spike	P	0 - 30
2443336	Microcystin RR	0.142	Spike	P	0 - 30
2443336	Microcystin WR	1.45	Spike	P	0 - 30
2443336	Microcystin YR	14.7	Spike	P	0 - 30
2443336	Nodularin-R	9.60	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P436079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2443336	Anatoxin-a	2.87	Spike	P	0 - 30
2443336	Neosaxitoxin	4.72	Spike	P	0 - 30
2443336	Saxitoxin	4.68	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2443809
Field Sample ID: HAB-SD-100923-1035

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	86.6	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	106	P	30 - 160

Lab Sample ID: 2443810
Field Sample ID: HAB-SD-100923-1055

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	85.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	107	P	30 - 160

Lab Sample ID: 2443811
Field Sample ID: HAB-SD-100923-1130

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	83.9	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	111	P	30 - 160

Lab Sample ID: 2443812
Field Sample ID: HAB-SD-100923-1205

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	86.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	103	P	30 - 160

Lab Sample ID: 2443813
Field Sample ID: HAB-SD-100923-1300

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	84.8	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	102	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A122052

Included Lab Sample IDs: 2443800, 2443801, 2443802, 2443803, 2443804

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	98.9	P/P	90 - 110
O-Phosphate-P	98.9	99.1	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A122053

Included Lab Sample IDs: 2443790, 2443791, 2443792, 2443793, 2443794

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A122094

Included Lab Sample IDs: 2443795, 2443796, 2443797, 2443798, 2443799

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

Reference Method: EPA 8321B

Run ID: A122102

Included Lab Sample IDs: 2443809, 2443810, 2443811, 2443812, 2443813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	107	108	P/P	50 - 160
Anatoxin-a	108	129	P/P	50 - 160
Neosaxitoxin	105	134	P/P	50 - 160
Neosaxitoxin	122	105	P/P	50 - 160
Saxitoxin	109	130	P/P	50 - 160
Saxitoxin	116	109	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A122104

Included Lab Sample IDs: 2443809, 2443810, 2443811, 2443812, 2443813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	100	108	P/P	60 - 160
Cylindrospermopsin	108	107	P/P	60 - 160
Desmethyl microcystin LR	106	110	P/P	50 - 160
Desmethyl microcystin LR	110	106	P/P	50 - 160
Microcystin HiIR	100	116	P/P	60 - 160
Microcystin HiIR	116	106	P/P	60 - 160
Microcystin HtyR	105	107	P/P	60 - 160
Microcystin HtyR	106	105	P/P	60 - 160
Microcystin LA	115	106	P/P	50 - 160
Microcystin LA	99.3	115	P/P	50 - 160
Microcystin LF	110	119	P/P	60 - 160
Microcystin LF	119	118	P/P	60 - 160
Microcystin LR	101	109	P/P	60 - 160
Microcystin LR	109	111	P/P	60 - 160
Microcystin LW	101	103	P/P	60 - 160
Microcystin LW	103	106	P/P	60 - 160
Microcystin LY	102	99.9	P/P	60 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A122104

Included Lab Sample IDs: 2443809, 2443810, 2443811, 2443812, 2443813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Microcystin LY	96.3	102	P/P	60 - 160
Microcystin RR	112	119	P/P	60 - 160
Microcystin RR	119	111	P/P	60 - 160
Microcystin WR	100	103	P/P	60 - 160
Microcystin WR	103	105	P/P	60 - 160
Microcystin YR	105	95.6	P/P	60 - 160
Microcystin YR	105	105	P/P	60 - 160
Nodularin-R	103	105	P/P	60 - 160
Nodularin-R	105	106	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A122117

Included Lab Sample IDs: 2443795, 2443796, 2443797, 2443798

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A122135

Included Lab Sample IDs: 2443795, 2443796, 2443797, 2443798, 2443799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A122139

Included Lab Sample IDs: 2443795, 2443796, 2443797, 2443798, 2443799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	102	P/P	90 - 110
Kjeldahl Nitrogen	95.4	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A122140

Included Lab Sample IDs: 2443799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.4	98.3	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
DEP SOP: NU-094-1	Color (true)	103				0.342
EPA 350.1 Rev. 2.0	Ammonia-N	101	97.8	101		2.63
	Ammonia-N	99.4	100	101		0.353
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	100	95.1		3.13
	Kjeldahl Nitrogen	105	90.5	95.0		3.73
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	98.0	95.5		1.64
EPA 365.1 Rev. 2.0	Total-P	105	102	103		1.21
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	95.8	97.6		1.86
	O-Phosphate-P	101	98.2	98.9		0.516
EPA 8321B	Anatoxin-a	111	113	116		2.87
	Cylindrospermopsin	109	105	93.1		11.7
	Desmethyl microcystin LR	103	82.2	90.9		9.50
	Microcystin HiLR	91.9	95.2	91.2		4.26
	Microcystin HtyR	96.9	91.5	83.1		9.55
	Microcystin LA	93.8	87.4	93.9		5.11
	Microcystin LF	95.3	90.7	98.3		8.04
	Microcystin LR	97.1	93.6	90.7		2.92
	Microcystin LW	91.3	89.9	90.1		0.267
	Microcystin LY	93.4	98.7	84.2		15.8
	Microcystin RR	102	93.8	94.0		0.142
	Microcystin WR	95.8	88.7	87.4		1.45
	Microcystin YR	92.4	83.0	96.2		14.7
	Neosaxitoxin	99.5	103	108		4.72
	Nodularin-R	96.6	80.1	88.1		9.60
	Saxitoxin	97.1	104	109		4.68

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2443790, 2443791, 2443792, 2443793, 2443794
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2443795, 2443796, 2443797, 2443798, 2443799
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2443795, 2443796, 2443797, 2443798, 2443799
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2443795, 2443796, 2443797, 2443798, 2443799
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2443795, 2443796, 2443797, 2443798, 2443799
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2443800, 2443801, 2443802, 2443803, 2443804
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2443809, 2443810, 2443811, 2443812, 2443813
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2443809, 2443810, 2443811, 2443812, 2443813

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	10/10/2023			10/10/2023 15:45	Chandler E Cox	2443790, 2443791
	10/10/2023			10/10/2023 15:46	Chandler E Cox	2443792
	10/10/2023			10/10/2023 15:47	Chandler E Cox	2443793
	10/10/2023			10/10/2023 15:48	Chandler E Cox	2443794
EPA 350.1 Rev. 2.0	10/10/2023			10/12/2023 13:52	Khloe J Berg	2443795
	10/10/2023			10/12/2023 13:54	Khloe J Berg	2443796
	10/10/2023			10/12/2023 13:55	Khloe J Berg	2443797
	10/10/2023			10/12/2023 13:56	Khloe J Berg	2443798
EPA 351.2 Rev. 2.0	10/10/2023			10/13/2023 12:16	Ping Hua	2443799
	10/10/2023	10/12/2023 13:00	Simonne.V. Calhoun	10/13/2023 10:22	Samantha L Bates	2443795
	10/10/2023	10/12/2023 13:00	Simonne.V. Calhoun	10/13/2023 10:59	Samantha L Bates	2443796
	10/10/2023	10/12/2023 13:00	Simonne.V. Calhoun	10/13/2023 11:01	Samantha L Bates	2443797
EPA 353.2 Rev. 2.0	10/10/2023	10/12/2023 13:00	Simonne.V. Calhoun	10/13/2023 11:03	Samantha L Bates	2443798
	10/10/2023	10/12/2023 13:00	Simonne.V. Calhoun	10/13/2023 11:04	Samantha L Bates	2443799
	10/10/2023			10/11/2023 15:00	Fadila Guebre	2443796
	10/10/2023			10/11/2023 15:06	Fadila Guebre	2443795
EPA 365.1 Rev. 2.0	10/10/2023			10/11/2023 15:07	Fadila Guebre	2443797
	10/10/2023			10/11/2023 15:08	Fadila Guebre	2443798
	10/10/2023			10/11/2023 15:10	Fadila Guebre	2443799
	10/10/2023	10/11/2023 13:38	Adam P Silver	10/13/2023 11:15	James L Waggeberby	2443795
EPA 365.1 Rev. 2.0 dissolved	10/10/2023	10/11/2023 13:38	Adam P Silver	10/13/2023 11:16	James L Waggeberby	2443796
	10/10/2023	10/11/2023 13:38	Adam P Silver	10/13/2023 11:17	James L Waggeberby	2443797
	10/10/2023	10/11/2023 13:38	Adam P Silver	10/13/2023 11:18	James L Waggeberby	2443798
	10/10/2023	10/11/2023 13:38	Adam P Silver	10/13/2023 11:19	James L Waggeberby	2443799
EPA 8321B	10/10/2023			10/10/2023 14:54	Elise M. Gillis	2443800
	10/10/2023			10/10/2023 14:55	Elise M. Gillis	2443801
	10/10/2023			10/10/2023 14:56	Elise M. Gillis	2443802
	10/10/2023			10/10/2023 14:57	Elise M. Gillis	2443803
EPA 8321B	10/10/2023	10/11/2023 12:00	Hana Lee	10/10/2023 15:04	Elise M. Gillis	2443804
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 03:01	Tae K Lee	2443809
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 03:15	Tae K Lee	2443810
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 03:29	Tae K Lee	2443811
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 03:43	Tae K Lee	2443809
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 03:56	Tae K Lee	2443812
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 03:59	Tae K Lee	2443810
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 04:10	Tae K Lee	2443813
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 04:15	Tae K Lee	2443811
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 04:46	Tae K Lee	2443812
	10/10/2023	10/11/2023 12:00	Hana Lee	10/12/2023 05:02	Tae K Lee	2443813