

Chemical Analysis Report

NE-DIST-2023-09-15-02

Florida DEP Laboratory
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DOH Accreditation E31780

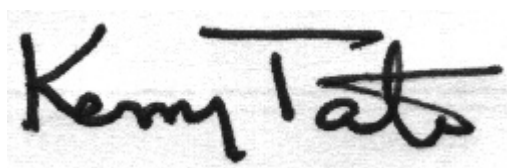
Event Description: **Algae Bloom Response NEROC-as needed**
Request ID: **RQ-2023-07-24-49**
Customer: **NE-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
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8800 Baymeadows Way West
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Attn: Katin Villinger

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 02-OCT-2023 12:15

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

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: Georges Lake - Boat Ramp

Collection Date/Time: 09/14/2023 12:05

Field ID: NEHAB0099

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2437448	DEP SOP: NU-094-1	Color (true)	28		PCU	P435079	
2437449	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P435186	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P435649	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P435656	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P435249	
2437450	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P435096	
2437451	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P434975	
		Cylindrospermopsin	0.10	U	ug/L	P434974	
		Desmethyl microcystin LR	0.25	U	ug/L	P434974	
		Microcystin HilR	0.25	U	ug/L	P434974	
		Microcystin HtyR	0.25	U	ug/L	P434974	
		Microcystin LA	0.10	U	ug/L	P434974	
		Microcystin LF	0.10	U	ug/L	P434974	
		Microcystin LR	0.25	U	ug/L	P434974	
		Microcystin LW	0.25	U	ug/L	P434974	
		Microcystin LY	0.10	U	ug/L	P434974	
		Microcystin RR	0.20	I	ug/L	P434974	
		Microcystin WR	0.50	U	ug/L	P434974	
		Neosaxitoxin	0.50	U	ug/L	P434975	
		Microcystin YR	0.25	U	ug/L	P434974	
		Saxitoxin	0.50	U	ug/L	P434975	
		Nodularin-R	0.10	U	ug/L	P434974	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P435079

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435186

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435649

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P435656

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435249

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P435096

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

Reference Method: EPA 8321B
Batch ID: P434974

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B
Batch ID: P434975

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: P435079

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435186

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435649

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P435656

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435249

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P435096

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.3		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P434974

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	86.7		P	40 - 160
Desmethyl microcystin LR	97.7		P	40 - 160
Microcystin HILR	95.2		P	40 - 160
Microcystin HtyR	96.5		P	40 - 160
Microcystin LA	97.7		P	40 - 160
Microcystin LF	89.5		P	40 - 160
Microcystin LR	94.5		P	40 - 160
Microcystin LW	81.9		P	40 - 160
Microcystin LY	88.8		P	40 - 160
Microcystin RR	90.7		P	40 - 160
Microcystin WR	93.4		P	40 - 160
Microcystin YR	93.4		P	40 - 160
Nodularin-R	96.3		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P434975

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	106		P	40 - 150
Neosaxitoxin	89.3		P	40 - 150
Saxitoxin	94.3		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435186

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437449	Ammonia-N	98.8	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435649

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437461	Kjeldahl Nitrogen	97.7	95.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P435656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437361	NO2NO3-N	97.0	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435249

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437237	Total-P	109	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P435096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437463	O-Phosphate-P	96.5	99.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P434974

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437248	Cylindrospermopsin	89.2	83.9	P/P	40 - 160
2437248	Desmethyl microcystin LR	97.9	92.6	P/P	40 - 160
2437248	Microcystin HiLR	88.2	88.0	P/P	40 - 160
2437248	Microcystin HtyR	87.5	84.0	P/P	40 - 160
2437248	Microcystin LA	89.3	91.5	P/P	40 - 160
2437248	Microcystin LF	103	99.8	P/P	40 - 160
2437248	Microcystin LR	88.9	80.6	P/P	40 - 160
2437248	Microcystin LW	86.6	80.4	P/P	40 - 160
2437248	Microcystin LY	83.9	87.7	P/P	40 - 160
2437248	Microcystin RR	84.9	86.1	P/P	40 - 160
2437248	Microcystin WR	88.1	85.7	P/P	40 - 160
2437248	Microcystin YR	85.4	88.4	P/P	40 - 160
2437248	Nodularin-R	86.7	86.8	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P434975

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437248	Anatoxin-a	108	112	P/P	40 - 150
2437248	Neosaxitoxin	87.0	89.2	P/P	40 - 150
2437248	Saxitoxin	93.5	107	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P435079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437404	Color (true)	0.691	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435186

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437449	Ammonia-N	0.964	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437461	Kjeldahl Nitrogen	1.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P435656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437361	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435249

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437237	Total-P	0.207	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P435096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437463	O-Phosphate-P	2.56	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P434974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437248	Cylindrospermopsin	6.15	Spike	P	0 - 30
2437248	Desmethyl microcystin LR	5.51	Spike	P	0 - 30
2437248	Microcystin HtIR	0.267	Spike	P	0 - 30
2437248	Microcystin HtyR	4.00	Spike	P	0 - 30
2437248	Microcystin LA	2.45	Spike	P	0 - 30
2437248	Microcystin LF	3.50	Spike	P	0 - 30
2437248	Microcystin LR	9.80	Spike	P	0 - 30
2437248	Microcystin LW	7.45	Spike	P	0 - 30
2437248	Microcystin LY	4.41	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P434974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437248	Microcystin RR	1.40	Spike	P	0 - 30
2437248	Microcystin WR	2.80	Spike	P	0 - 30
2437248	Microcystin YR	3.50	Spike	P	0 - 30
2437248	Nodularin-R	0.0787	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P434975

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437248	Anatoxin-a	3.79	Spike	P	0 - 30
2437248	Neosaxitoxin	2.49	Spike	P	0 - 30
2437248	Saxitoxin	13.4	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2437451
Field Sample ID: NEHAB0099

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	100	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	96.1	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A121523
Included Lab Sample IDs: 2437451

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	106	107	P/P	50 - 160
Neosaxitoxin	97.8	99.4	P/P	50 - 160
Saxitoxin	110	110	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A121534
Included Lab Sample IDs: 2437451

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	108	107	P/P	60 - 160
Desmethyl microcystin LR	120	114	P/P	50 - 160
Microcystin H1R	107	105	P/P	60 - 160
Microcystin HtyR	111	106	P/P	60 - 160
Microcystin LA	116	109	P/P	50 - 160
Microcystin LF	108	109	P/P	60 - 160
Microcystin LR	102	98.8	P/P	60 - 160
Microcystin LW	95.1	96.5	P/P	60 - 160
Microcystin LY	105	97.6	P/P	60 - 160
Microcystin RR	107	107	P/P	60 - 160
Microcystin WR	113	110	P/P	60 - 160
Microcystin YR	100	101	P/P	60 - 160
Nodularin-R	105	101	P/P	60 - 160

Reference Method: DEP SOP: NU-094-1
Run ID: A121567
Included Lab Sample IDs: 2437448

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A121572
Included Lab Sample IDs: 2437450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.7	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A121624
Included Lab Sample IDs: 2437449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121698
Included Lab Sample IDs: 2437449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	101	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A121819

Included Lab Sample IDs: 2437449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A121848

Included Lab Sample IDs: 2437449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	103	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
					LCS	
DEP SOP: NU-094-1	Color (true)	99.6			0.691	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	98.8	99.8		0.964
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.6	97.7	95.1		1.94
EPA 353.2 Rev. 2.0	NO2NO3-N	102	97.0	97.5		0.504
EPA 365.1 Rev. 2.0	Total-P	104	109	109		0.207
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	96.5	99.0		2.56
EPA 8321B	Anatoxin-a	106	108	112		3.79
	Cylindrospermopsin	86.7	89.2	83.9		6.15
	Desmethyl microcystin LR	97.7	97.9	92.6		5.51
	Microcystin HiLR	95.2	88.2	88.0		0.267
	Microcystin HtyR	96.5	87.5	84.0		4.00
	Microcystin LA	97.7	89.3	91.5		2.45
	Microcystin LF	89.5	103	99.8		3.50
	Microcystin LR	94.5	88.9	80.6		9.80
	Microcystin LW	81.9	86.6	80.4		7.45
	Microcystin LY	88.8	83.9	87.7		4.41
	Microcystin RR	90.7	84.9	86.1		1.40
	Microcystin WR	93.4	88.1	85.7		2.80
	Microcystin YR	93.4	85.4	88.4		3.50
	Neosaxitoxin	89.3	87.0	89.2		2.49
	Nodularin-R	96.3	86.7	86.8		0.0787
	Saxitoxin	94.3	93.5	107		13.4

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2437448
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2437449
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2437449
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2437449
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2437449
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2437450
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2437451
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2437451

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	09/15/2023			09/15/2023 14:40	Alexis Price	2437448
EPA 350.1 Rev. 2.0	09/15/2023			09/19/2023 11:35	Ping Hua	2437449
EPA 351.2 Rev. 2.0	09/15/2023	09/28/2023 13:28	Simonne.V. Calhoun	09/29/2023 11:13	Ping Hua	2437449
EPA 353.2 Rev. 2.0	09/15/2023			09/27/2023 13:38	Anna M. Plaviak	2437449
EPA 365.1 Rev. 2.0	09/15/2023	09/20/2023 15:00	Alexis Price	09/21/2023 13:51	Simonne.V. Calhoun	2437449
EPA 365.1 Rev. 2.0 dissolved	09/15/2023			09/15/2023 18:05	Adam P Silver	2437450
EPA 8321B	09/15/2023	09/15/2023 13:00	Hana Lee	09/15/2023 17:51	Tae K Lee	2437451
	09/15/2023	09/15/2023 13:00	Hana Lee	09/16/2023 06:05	Tae K Lee	2437451