

Chemical Analysis Report

CEN-DIST-2023-10-24-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-07-17-26**
Customer: **CEN-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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Date Certified: 09-NOV-2023 11:38



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Nutrients and Pesticides.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Rowena - near NE corner

Collection Date/Time: 10/23/2023 09:46

Field ID: HABCE0057

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2446617	DEP SOP: NU-094-1	Color (true)	11		PCU	P436927	
2446618	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P437031	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P436949	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P437073	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P437205	
2446619	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P436931	
2446620	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P436959	
		Cylindrospermopsin	0.12	I	ug/L	P436958	
		Desmethyl microcystin LR	0.25	U	ug/L	P436958	
		Microcystin HiLR	0.25	U	ug/L	P436958	
		Microcystin HtyR	0.25	U	ug/L	P436958	
		Microcystin LA	0.10	U	ug/L	P436958	
		Microcystin LF	0.10	U	ug/L	P436958	
		Microcystin LR	0.25	U	ug/L	P436958	
		Microcystin LW	0.25	U	ug/L	P436958	
		Microcystin LY	0.10	U	ug/L	P436958	
		Microcystin RR	0.10	U	ug/L	P436958	
		Microcystin WR	0.50	U	ug/L	P436958	
		Neosaxitoxin	0.50	U	ug/L	P436959	
		Microcystin YR	0.25	U	ug/L	P436958	
		Saxitoxin	0.50	U	ug/L	P436959	
		Nodularin-R	0.10	U	ug/L	P436958	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P436927

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437031

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436949

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437073

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437205

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436931

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

Reference Method: EPA 8321B
Batch ID: P436958

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: P436959

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: P436927

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437031

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: P436949

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437073

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: P437205

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436931

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

Reference Method: EPA 8321B
Batch ID: P436958

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	93.6		P	40 - 160
Desmethyl microcystin LR	86.8		P	40 - 160
Microcystin HILR	86.4		P	40 - 160
Microcystin HtyR	90.5		P	40 - 160
Microcystin LA	95.3		P	40 - 160
Microcystin LF	89.0		P	40 - 160
Microcystin LR	90.5		P	40 - 160
Microcystin LW	86.5		P	40 - 160
Microcystin LY	93.1		P	40 - 160
Microcystin RR	85.7		P	40 - 160
Microcystin WR	84.6		P	40 - 160
Microcystin YR	82.4		P	40 - 160
Nodularin-R	89.2		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P436959

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	95.4		P	40 - 150
Neosaxitoxin	79.7		P	40 - 150
Saxitoxin	78.8		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437031

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446618	Ammonia-N	101	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446618	Kjeldahl Nitrogen	98.0	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446552	NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446594	Total-P	109	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446598	O-Phosphate-P	97.9	97.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P436958

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446620	Cylindrospermopsin	86.0	91.8	P/P	40 - 160
2446620	Desmethyl microcystin LR	84.8	86.9	P/P	40 - 160
2446620	Microcystin HiLR	81.4	86.1	P/P	40 - 160
2446620	Microcystin HtyR	79.5	85.9	P/P	40 - 160
2446620	Microcystin LA	87.6	92.6	P/P	40 - 160
2446620	Microcystin LF	82.1	86.7	P/P	40 - 160
2446620	Microcystin LR	86.7	90.7	P/P	40 - 160
2446620	Microcystin LW	81.6	89.4	P/P	40 - 160
2446620	Microcystin LY	81.5	81.5	P/P	40 - 160
2446620	Microcystin RR	81.3	83.7	P/P	40 - 160
2446620	Microcystin WR	82.7	84.8	P/P	40 - 160
2446620	Microcystin YR	73.8	78.8	P/P	40 - 160
2446620	Nodularin-R	84.3	86.4	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P436959

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446620	Anatoxin-a	83.1	96.6	P/P	40 - 150
2446620	Neosaxitoxin	56.0	58.1	P/P	40 - 150
2446620	Saxitoxin	64.7	67.9	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P436927

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446683	Color (true)	0.774	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437031

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446618	Ammonia-N	2.97	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446618	Kjeldahl Nitrogen	3.09	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437073

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446552	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446594	Total-P	1.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P436931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446598	O-Phosphate-P	0.0883	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P436958

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446620	Cylindrospermopsin	6.40	Spike	P	0 - 30
2446620	Desmethyl microcystin LR	2.44	Spike	P	0 - 30
2446620	Microcystin HtIR	5.58	Spike	P	0 - 30
2446620	Microcystin HtyR	7.76	Spike	P	0 - 30
2446620	Microcystin LA	5.54	Spike	P	0 - 30
2446620	Microcystin LF	5.39	Spike	P	0 - 30
2446620	Microcystin LR	4.53	Spike	P	0 - 30
2446620	Microcystin LW	9.16	Spike	P	0 - 30
2446620	Microcystin LY	0.0173	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P436958

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446620	Microcystin RR	2.87	Spike	P	0 - 30
2446620	Microcystin WR	2.43	Spike	P	0 - 30
2446620	Microcystin YR	6.47	Spike	P	0 - 30
2446620	Nodularin-R	2.52	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P436959

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446620	Anatoxin-a	15.0	Spike	P	0 - 30
2446620	Neosaxitoxin	3.73	Spike	P	0 - 30
2446620	Saxitoxin	4.88	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2446620
Field Sample ID: HABCE0057

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	98.3	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	88.4	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A122317

Included Lab Sample IDs: 2446617

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A122318

Included Lab Sample IDs: 2446619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A122380

Included Lab Sample IDs: 2446618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	99.1	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A122393

Included Lab Sample IDs: 2446620

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	92.4	91.9	P/P	60 - 160
Desmethyl microcystin LR	89.4	84.6	P/P	50 - 160
Microcystin HILR	86.6	85.1	P/P	60 - 160
Microcystin HtyR	88.7	84.5	P/P	60 - 160
Microcystin LA	88.8	88.1	P/P	50 - 160
Microcystin LF	89.6	75.5	P/P	60 - 160
Microcystin LR	88.6	87.3	P/P	60 - 160
Microcystin LW	87.3	81.7	P/P	60 - 160
Microcystin LY	81.0	78.1	P/P	60 - 160
Microcystin RR	85.3	85.9	P/P	60 - 160
Microcystin WR	84.5	83.0	P/P	60 - 160
Microcystin YR	80.4	78.8	P/P	60 - 160
Nodularin-R	83.9	84.6	P/P	60 - 160

Reference Method: EPA 8321B

Run ID: A122394

Included Lab Sample IDs: 2446620

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	93.7	90.8	P/P	50 - 160
Neosaxitoxin	94.8	91.1	P/P	50 - 160
Saxitoxin	89.7	94.1	P/P	50 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A122397

Included Lab Sample IDs: 2446618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.3	94.0	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A122402

Included Lab Sample IDs: 2446618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A122522

Included Lab Sample IDs: 2446618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	100	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)	99.2			0.774	
EPA 350.1 Rev. 2.0	Ammonia-N	100	101	104		2.97
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.9	98.0	102		3.09
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	98.5	99.0		0.506
EPA 365.1 Rev. 2.0	Total-P	108	109	108		1.39
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	97.9	97.8		0.0883
EPA 8321B	Anatoxin-a	95.4	83.1	96.6		15.0
	Cylindrospermopsin	93.6	86.0	91.8		6.40
	Desmethyl microcystin LR	86.8	84.8	86.9		2.44
	Microcystin HiLR	86.4	81.4	86.1		5.58
	Microcystin HtyR	90.5	79.5	85.9		7.76
	Microcystin LA	95.3	87.6	92.6		5.54
	Microcystin LF	89.0	82.1	86.7		5.39
	Microcystin LR	90.5	86.7	90.7		4.53
	Microcystin LW	86.5	81.6	89.4		9.16
	Microcystin LY	93.1	81.5	81.5		0.0173
	Microcystin RR	85.7	81.3	83.7		2.87
	Microcystin WR	84.6	82.7	84.8		2.43
	Microcystin YR	82.4	73.8	78.8		6.47
	Neosaxitoxin	79.7	56.0	58.1		3.73
	Nodularin-R	89.2	84.3	86.4		2.52
	Saxitoxin	78.8	64.7	67.9		4.88

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2446617
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2446618
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2446618
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2446618
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2446618
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2446619
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2446620
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2446620

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	10/24/2023			10/24/2023 15:05	Samantha L Bates	2446617
EPA 350.1 Rev. 2.0	10/24/2023			10/26/2023 09:38	Ping Hua	2446618
EPA 351.2 Rev. 2.0	10/24/2023	10/25/2023 10:05	Samantha L Bates	10/26/2023 12:53	Samantha L Bates	2446618
EPA 353.2 Rev. 2.0	10/24/2023			10/26/2023 14:54	Fadila Guebre	2446618
EPA 365.1 Rev. 2.0	10/24/2023	11/01/2023 12:37	Adam P Silver	11/02/2023 14:45	Chandler E Cox	2446618
EPA 365.1 Rev. 2.0 dissolved	10/24/2023			10/24/2023 15:15	Elise M. Gillis	2446619
EPA 8321B	10/24/2023	10/26/2023 08:00	Hana Lee	10/26/2023 09:00	Tae K Lee	2446620
	10/24/2023	10/26/2023 11:00	Hana Lee	10/26/2023 13:01	Tae K Lee	2446620