ANALYTICAL REPORT

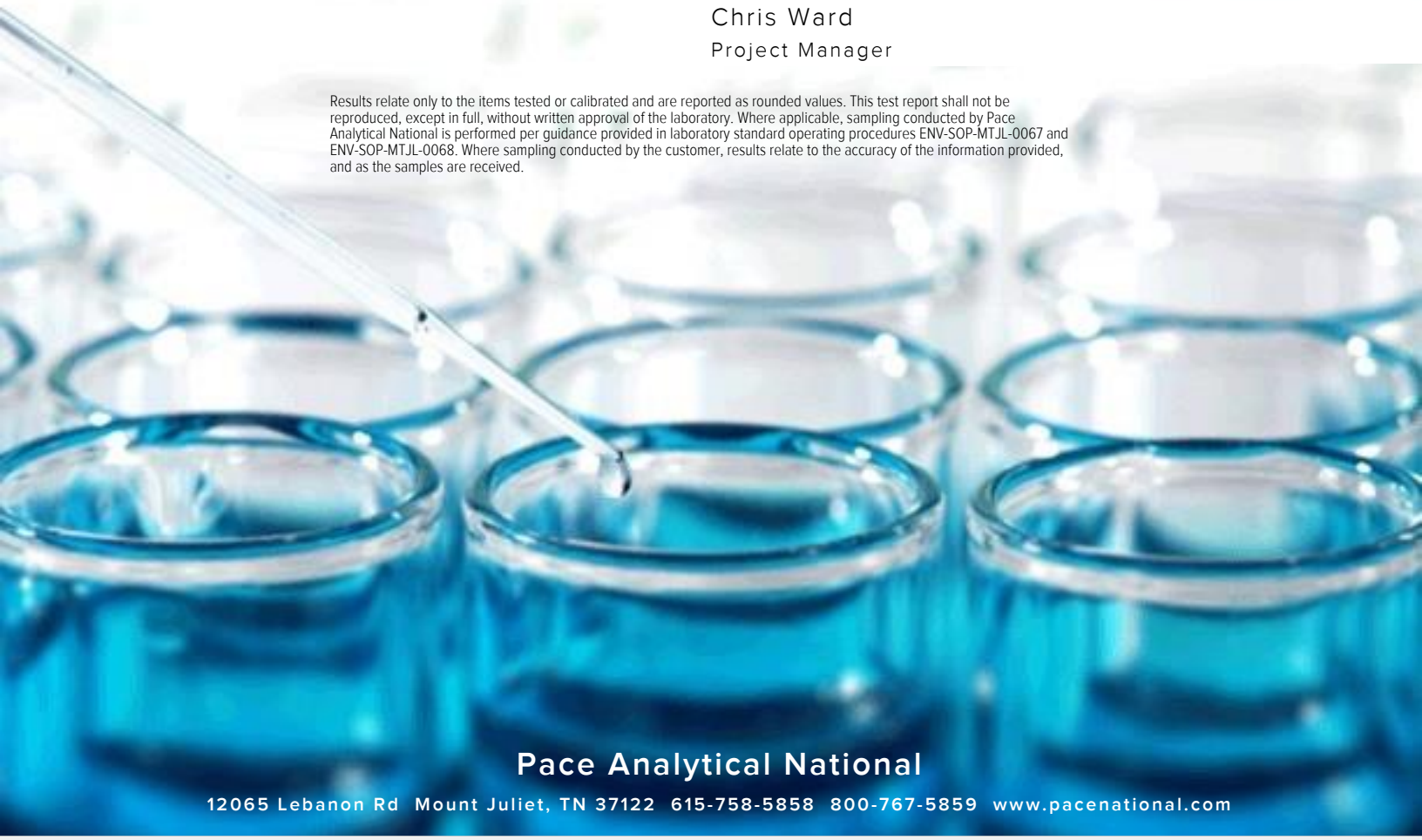
June 29, 2022

Caerus Oil and Gas

Sample Delivery Group:	L1504170
Samples Received:	06/11/2022
Project Number:	
Description:	RA11 Flowline Investigation
Site:	RA11 PAD
Report To:	Brett Middleton 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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SAMPLE SUMMARY

20220610_RA11_BG01@1FT L1504170-01 Solid

Collected by: Jordan Veith
Collected date/time: 06/10/22 10:45
Received date/time: 06/11/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1883524	1	06/27/22 00:58	06/27/22 00:58	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1879901	1	06/16/22 08:00	06/17/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1880054	1	06/15/22 16:06	06/18/22 10:33	ARD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883067	5	06/28/22 16:44	06/28/22 21:33	LD	Mt. Juliet, TN

20220610_RA11_BG02@1FT L1504170-02 Solid

Collected by: Jordan Veith
Collected date/time: 06/10/22 11:10
Received date/time: 06/11/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1883524	1	06/27/22 01:00	06/27/22 01:00	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1879954	1	06/16/22 12:00	06/16/22 14:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1880273	1	06/19/22 07:57	06/20/22 11:10	ARD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883067	5	06/28/22 16:44	06/28/22 21:37	LD	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	3.47		1	06/27/2022 00:58	WG1883524

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.15	T8	1	06/17/2022 10:00	WG1879901

Sample Narrative:

L1504170-01 WG1879901: 8.15 at 24C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	524		10.0	1	06/18/2022 10:33	WG1880054

Sample Narrative:

L1504170-01 WG1880054: at 25C

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	10.6		0.100	1.00	5	06/28/2022 21:33	WG1883067

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.0310		1	06/27/2022 01:00	WG1883524

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	6.89	T8	1	06/16/2022 14:00	WG1879954

Sample Narrative:

L1504170-02 WG1879954: 6.89 at 24.7C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	38.6		10.0	1	06/20/2022 11:10	WG1880273

Sample Narrative:

L1504170-02 WG1880273: at 25C

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	4.88		0.100	1.00	5	06/28/2022 21:37	WG1883067

L1503728-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1503728-03 06/17/22 10:00 • (DUP) R3804235-2 06/17/22 10:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	8.04	8.01	1	0.374		1

Sample Narrative:

OS: 8.04 at 23.81C

DUP: 8.01 at 24.2C

L1504170-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1504170-01 06/17/22 10:00 • (DUP) R3804235-3 06/17/22 10:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	8.15	8.17	1	0.245		1

Sample Narrative:

OS: 8.15 at 24C

DUP: 8.17 at 24.1C

Laboratory Control Sample (LCS)

(LCS) R3804235-1 06/17/22 10:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.90	99.0	99.0-101	

Sample Narrative:

LCS: 9.9 at 24C

L1504172-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1504172-01 06/16/22 14:00 • (DUP) R3803975-2 06/16/22 14:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	7.91	7.91	1	0.000		1

Sample Narrative:

OS: 7.91 at 24.5C

DUP: 7.91 at 24.6C

L1504176-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1504176-01 06/16/22 14:00 • (DUP) R3803975-3 06/16/22 14:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	8.02	8.01	1	0.125		1

Sample Narrative:

OS: 8.02 at 25C

DUP: 8.01 at 25C

Laboratory Control Sample (LCS)

(LCS) R3803975-1 06/16/22 14:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.92	99.2	99.0-101	

Sample Narrative:

LCS: 9.92 at 24.3C

Method Blank (MB)

(MB) R3804589-1 06/18/22 10:33

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:
BLANK: at 25C

L1503722-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1503722-01 06/18/22 10:33 • (DUP) R3804589-3 06/18/22 10:33

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	116	124	1	6.93		20

Sample Narrative:
OS: at 25C
DUP: at 25C

L1503725-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1503725-02 06/18/22 10:33 • (DUP) R3804589-4 06/18/22 10:33

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	85.7	99.9	1	15.3		20

Sample Narrative:
OS: at 25C
DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3804589-2 06/18/22 10:33

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	287	107	85.0-115	

Sample Narrative:
LCS: at 25C

Method Blank (MB)

(MB) R3804957-1 06/20/22 11:10

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:
BLANK: at 25C

L1502452-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1502452-02 06/20/22 11:10 • (DUP) R3804957-3 06/20/22 11:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1980	1980	1	0.000		20

Sample Narrative:
OS: at 25C
DUP: at 25C

L1504180-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1504180-02 06/20/22 11:10 • (DUP) R3804957-4 06/20/22 11:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	880	829	1	5.97		20

Sample Narrative:
OS: at 25C
DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3804957-2 06/20/22 11:10

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	280	105	85.0-115	

Sample Narrative:
LCS: at 25C

Method Blank (MB)

(MB) R3808626-1 06/28/22 20:08

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00

Laboratory Control Sample (LCS)

(LCS) R3808626-2 06/28/22 20:12

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	91.7	91.7	80.0-120	

L1502682-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1502682-02 06/28/22 20:15 • (MS) R3808626-5 06/28/22 20:25 • (MSD) R3808626-6 06/28/22 20:29

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	99.8	4.09	87.3	88.4	83.2	84.3	5	75.0-125			1.28	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
T8	Sample(s) received past/too close to holding time expiration.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Caerus Oil and Gas
143 Diamond Ave
Parachute, CO 81635

Billing Information: Same as Left

Pres Chk

Report to: Blair Rollins

Email To: brollins@caerusoilandgas.com

Project Description: RA11 Flowline Investigation

City/State Collected: Piceance Creek CO

Phone: Fax: 970-640-6919

Client Project #

Lab Project # CAERUSPCO-KLEIN

Collected by (print): Jordan Veith

Site/Facility ID # RA11 Pad

P.O. #

Collected by (signature): Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: Standard

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Analysis / Container / Preservative: EC, pH, SAR, Arsenic	Remarks	Sample # (lab only)
20220610-RA11-BG01@1ft	Grab	SS	1ft	6/10/2022	10:45	2	X		-01
20220610-RA11-BG02@1ft	Grab	SS	1ft	6/10/2022	11:10	2	X		-02

6/10/2022

Chain of Custody Page ___ of ___

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # 150470

H153

Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier __ _____

Tracking # 5437 8386 1060

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Relinquished by: (Signature)	Date: 6/10/22	Time: 1500	Received by: (Signature)	Temp: 0.4 °C Bottles Received: 4	If preservation required by Login: Date/Time
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 6/11/22 Time: 0900	Hold: Condition: NCF / OK