

Confidentiality Requested:

Yes No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form ACO-1

January 2018

Form must be Typed

Form must be Signed

All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # _____

Name: _____

Address 1: _____

Address 2: _____

City: _____ State: _____ Zip: _____ + _____

Contact Person: _____

Phone: (_____) _____

CONTRACTOR: License # _____

Name: _____

Wellsite Geologist: _____

Purchaser: _____

Designate Type of Completion:

New Well Re-Entry Workover

Oil WSW SWD

Gas DH EOR

OG GSW

CM (Coal Bed Methane)

Cathodic Other (Core, Expl., etc.): _____

If Workover/Re-entry: Old Well Info as follows:

Operator: _____

Well Name: _____

Original Comp. Date: _____ Original Total Depth: _____

Deepening Re-perf. Conv. to EOR Conv. to SWD

Plug Back Liner Conv. to GSW Conv. to Producer

Commingled Permit #: _____

Dual Completion Permit #: _____

SWD Permit #: _____

EOR Permit #: _____

GSW Permit #: _____

Spud Date or Date Reached TD Completion Date or Recompletion Date

API No.: _____

Spot Description: _____

_____ - _____ - _____ Sec. _____ Twp. _____ S. R. _____ East West

_____ Feet from North / South Line of Section

_____ Feet from East / West Line of Section

Footages Calculated from Nearest Outside Section Corner:

NE NW SE SW

GPS Location: Lat: _____, Long: _____
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum: NAD27 NAD83 WGS84

County: _____

Lease Name: _____ Well #: _____

Field Name: _____

Producing Formation: _____

Elevation: Ground: _____ Kelly Bushing: _____

Total Vertical Depth: _____ Plug Back Total Depth: _____

Amount of Surface Pipe Set and Cemented at: _____ Feet

Multiple Stage Cementing Collar Used? Yes No

If yes, show depth set: _____ Feet

If Alternate II completion, cement circulated from: _____

feet depth to: _____ w/ _____ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: _____ ppm Fluid volume: _____ bbls

Dewatering method used: _____

Location of fluid disposal if hauled offsite:

Operator Name: _____

Lease Name: _____ License #: _____

Quarter _____ Sec. _____ Twp. _____ S. R. _____ East West

County: _____ Permit #: _____

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

Confidentiality Requested

Date: _____

Confidential Release Date: _____

Wireline Log Received Drill Stem Tests Received

Geologist Report / Mud Logs Received

UIC Distribution

ALT I II III Approved by: _____ Date: _____

Operator Name: _____ Lease Name: _____ Well #: _____

Sec. _____ Twp. _____ S. R. _____ East West County: _____

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i> Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Geologist Report / Mud Logs <input type="checkbox"/> Yes <input type="checkbox"/> No List All E. Logs Run: _____	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

1. Did you perform a hydraulic fracturing treatment on this well? Yes No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? Yes No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? Yes No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/Injection:	Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____			
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio Gravity

DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <i>(Submit ACO-4)</i>	PRODUCTION INTERVAL: Top Bottom
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Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	KEITH 1-5
Doc ID	1515445

All Electric Logs Run

DIL
DUCP
MEL
BHCS

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY **Murfin Drilling Company Inc.**

LEASE **Keith #1-5**

FIELD **499Tnl & 1998Tnl**

LOCATION **5 TWP 3S RGE 37W**

SIC **1361**

COUNTY **Cheyenne STATE Kansas**

CONTRACTOR **Murfin Drilling Company Inc. Rig #7**

SPUD **3/16/2020 COMP 3/25/2020**

RTD **5:100' LTD 5:102'**

MUD UP **3649' TYPE MUD Chemical**

SAMPLES SAVED FROM **4050 TO 5100**

DRILLING TIME KEPT FROM **4050 TO 5100**

SAMPLES EXAMINED FROM **4050 TO 5100**

GEOLOGICAL SUPERVISION FROM **3998**

GEOLOGIST ON WELL **Robert D. Hendrix**

PROFITABLE DUAL PRODUCTION

MINORITARY SERVICE PROVIDER

WOMAN-OWNED BUSINESS

MINORITY SERVICE PROVIDER

WOMAN-OWNED BUSINESS

FORMERLY DUAL PRODUCTION

MINORITY SERVICE PROVIDER

WOMAN-OWNED BUSINESS

FORMERLY DUAL PRODUCTION

MINORITY SERVICE PROVIDER

WOMAN-OWNED BUSINESS

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FORMERLY DUAL PRODUCTION

MINORITY SERVICE PROVIDER

WOMAN-OWNED BUSINESS

FORMERLY DUAL PRODUCTION

MINORITY SERVICE PROVIDER

WOMAN-OWNED BUSINESS

FORMERLY DUAL PRODUCTION

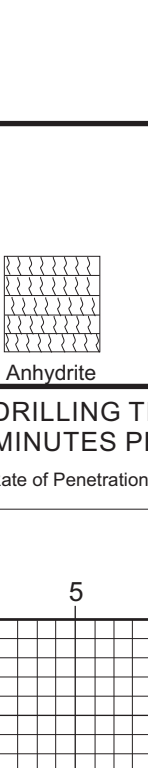
MINORITY SERVICE PROVIDER

ELEVATIONS
KB **3437**
DF _____
GL **3432**

Measurements Are All From **Kelly Busting**
CASING CONDUCTOR **8-5/8" at 395'**
SURFACE **8-5/8" at 395'**
PRODUCTION _____

ELECTRICAL SURVEYS

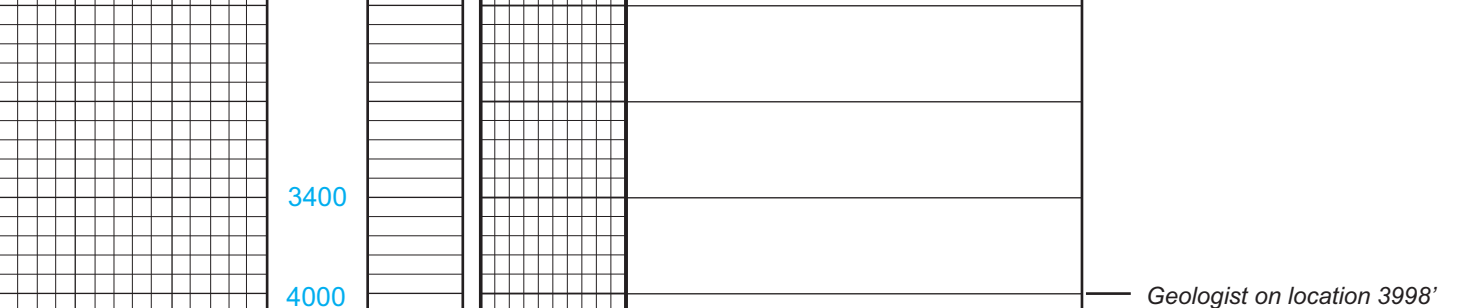
FORMATION TOPS	ELECTRIC LOG	SAMPLE
Anhydrite	3322 (+115)	3323 (+114)
Topeka	4161 (-724)	4160 (-723)
Lansing	4382 (-945)	4378 (-941)
Stark Shale	4603 (-1166)	4605 (-1168)
Mound City	4653 (-12160)	4659 (-12122)
Ft Scott	4783 (-1346)	4784 (-1347)
Oakley	4860 (-1423)	4860 (-1423)
Mississippian	NVL	5084 (-1663)



AP# 15-023-21542

REMARKS: Logging run was attempted twice, 1st time stacked out at 400' bottom of surface casing then again at 480' on the second try. Went in reamed area then went to bottom and circulated 1hr to clean out debris. Logs were successfully ran on third try.

LEGEND



DEPTH	LITHOLOGY	SAMPLE DESCRIPTION	REMARKS
3300	Anhydrite		Anhydrite 3323 (+114)
3350	Anhydrite		Base Anhydrite 3358 (+79)
3400	Anhydrite		
3500	Anhydrite		
3600	Anhydrite		
3700	Anhydrite		
3800	Anhydrite		
3900	Anhydrite		
4000	Anhydrite		Geologist on location 3998' at 9:21 pm 3/18/2020 Bit Trip at 3998' to change from PDC to button. Strap out of hole was 0.59' short to board.
4100	Anhydrite		
4200	Anhydrite		
4300	Anhydrite		
4400	Anhydrite		
4500	Anhydrite		
4600	Anhydrite		
4700	Anhydrite		
4800	Anhydrite		
4900	Anhydrite		
5000	Anhydrite		
5100	Anhydrite		

DST #1
4395-4465
30-60-30-60
1st open: blow built to 1/4"
2nd open: no blow
Rec: 10' mud
hydro: 2225-2187 psi
ff: 19-22 psi
ff: 24-26 psi
sip: 1196-1122 psi
bht: 127° F

DST #2
4507-4605
30-60-30-60
1st open: bob in 40 seconds
in diesel
2nd open: blow built to 6 1/4"
no returns
Rec: 50' wcm 28/72
250' mow 12/88
1200' mow 3/97
hydro: 2331-2297 psi
ff: 427-666 psi
ff: 662-687 psi
sip: 1348-1344 psi
bht: 133° F
chl: 28,000 ppm

DST #3
4758-4897
30-60-30-60
1st open: blow built to 2 1/2" dsl
2nd open: blow built to 3/4" dsl
no returns
Rec: 65' mud
hydro: 2475-2461 psi
ff: 23-39 psi
ff: 42-55 psi
sip: 1251-1230 psi
bht: 132° F



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc.**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Robert Hendrix

Keith #1-5

5-3s-37w Cheyenne KS

Start Date: 2020.03.20 @ 19:48:00

End Date: 2020.03.21 @ 03:11:30

Job Ticket #: 66490 DST #: 1

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2020.03.24 @ 08:25:46



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

250 N. Water STE 300
Wichita, KS 67202

Keith #1-5

Job Ticket: 66490

DST#: 1

ATTN: Robert Hendrix

Test Start: 2020.03.20 @ 19:48:00

GENERAL INFORMATION:

Formation: **LKC "D"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 22:09:45

Time Test Ended: 03:11:30

Test Type: Conventional Bottom Hole (Initial)

Tester: James Winder

Unit No: 83

Interval: 4395.00 ft (KB) To 4465.00 ft (KB) (TVD)

Reference Elevations: 3437.00 ft (KB)

Total Depth: 4465.00 ft (KB) (TVD)

3432.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8652 Outside

Press@RunDepth: 25.89 psig @ 4396.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2020.03.20

End Date:

2020.03.21

Last Calib.:

2020.03.21

Start Time: 19:48:05

End Time:

03:11:29

Time On Btm:

2020.03.20 @ 22:09:30

Time Off Btm:

2020.03.21 @ 01:12:15

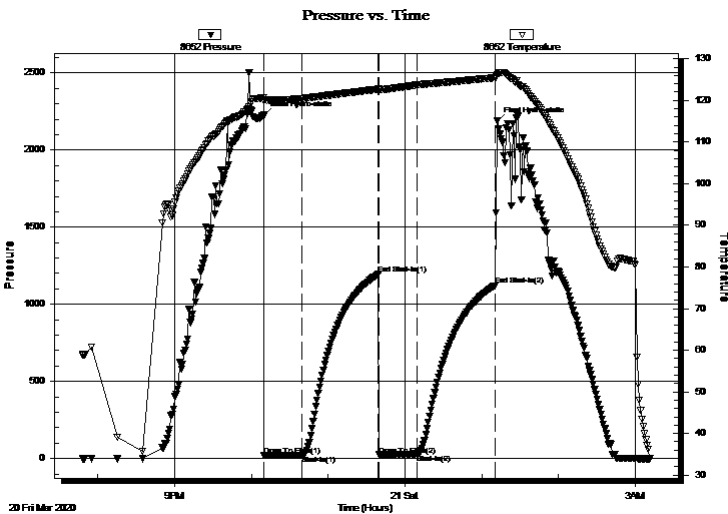
TEST COMMENT: 30 - IF: 1/8" Blow at open, built to just over 1/4" (diesel in bucket)

60 - IS: No blow back

30 - FF: No blow

60 - FS: No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2224.98	120.68	Initial Hydro-static
1	18.97	120.02	Open To Flow (1)
31	21.61	120.45	Shut-In(1)
90	1195.93	122.71	End Shut-In(1)
91	23.95	122.47	Open To Flow (2)
121	25.89	123.74	Shut-In(2)
181	1122.35	125.45	End Shut-In(2)
183	2186.78	126.26	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
10.00	Mud 100%	0.05

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

250 N. Water STE 300
Wichita, KS 67202

Keith #1-5

Job Ticket: 66490

DST#: 1

ATTN: Robert Hendrix

Test Start: 2020.03.20 @ 19:48:00

Tool Information

Drill Pipe:	Length: 4213.00 ft	Diameter: 3.80 inches	Volume: 59.10 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 180.00 ft	Diameter: 2.25 inches	Volume: 0.89 bbl	Weight to Pull Loose: 90000.00 lb
			<u>Total Volume: 59.99 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	27.00 ft			String Weight: Initial 70000.00 lb
Depth to Top Packer:	4395.00 ft			Final 70000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	70.00 ft			
Tool Length:	99.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments: worked through tight spot last 15' before bottom
dragging about 10K coming out for several stands

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Change Over Sub	1.00			4367.00	
Shut In Tool	5.00			4372.00	
Hydraulic tool	5.00			4377.00	
Jars	5.00			4382.00	
Safety Joint	3.00			4385.00	
Packer	5.00			4390.00	29.00 Bottom Of Top Packer
Packer	5.00			4395.00	
Stubb	1.00			4396.00	
Recorder	0.00	6625	Inside	4396.00	
Recorder	0.00	8652	Outside	4396.00	
Perforations	29.00			4425.00	
Blank Spacing	34.00			4459.00	
Perforations	3.00			4462.00	
Bullnose	3.00			4465.00	70.00 Bottom Packers & Anchor

Total Tool Length: 99.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

250 N. Water STE 300
Wichita, KS 67202

Keith #1-5

Job Ticket: 66490

DST#: 1

ATTN: Robert Hendrix

Test Start: 2020.03.20 @ 19:48:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.99 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 600.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
10.00	Mud 100%	0.049

Total Length: 10.00 ft Total Volume: 0.049 bbl

Num Fluid Samples: 0

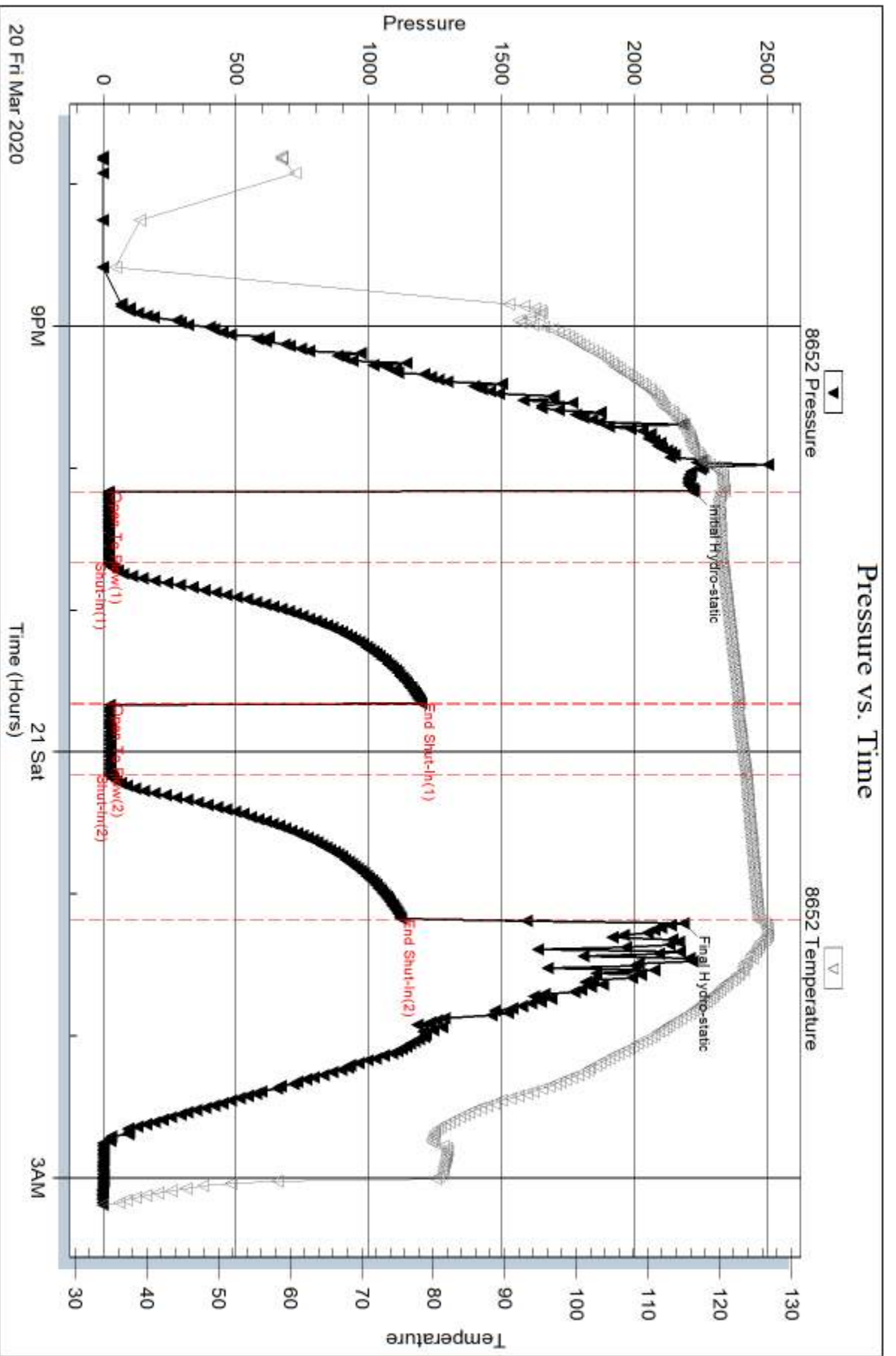
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



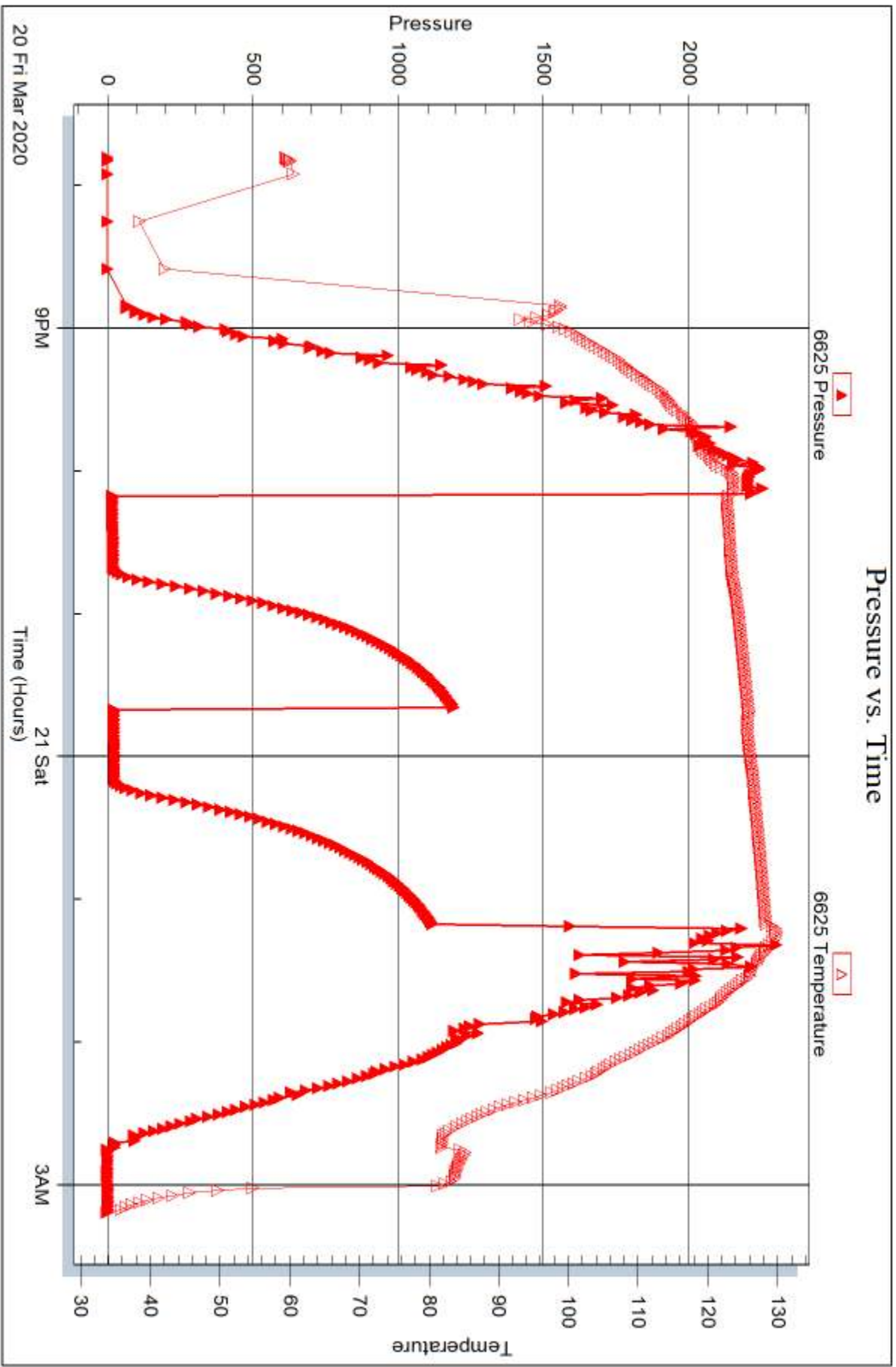
Serial #: 6625

Inside

Murfin Drilling Co., Inc.

Keith #1-5

DST Test Number: 1



Trilobite Testing, Inc

Ref. No: 66490

Printed: 2020.03.24 @ 08:25:47



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc.**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Robert Hendrix

Keith #1-5

5-3s-37w Cheyenne KS

Start Date: 2020.03.22 @ 00:23:00

End Date: 2020.03.22 @ 08:36:15

Job Ticket #: 66491 DST #: 2

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2020.03.24 @ 08:25:10



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

250 N. Water STE 300
Wichita, KS 67202

Keith #1-5

Job Ticket: 66491

DST#: 2

ATTN: Robert Hendrix

Test Start: 2020.03.22 @ 00:23:00

GENERAL INFORMATION:

Formation: **LKC "H - J"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 02:36:30

Time Test Ended: 08:36:15

Test Type: Conventional Bottom Hole (Reset)

Tester: James Winder

Unit No: 83

Interval: 4507.00 ft (KB) To 4605.00 ft (KB) (TVD)

Reference Elevations: 3437.00 ft (KB)

Total Depth: 4605.00 ft (KB) (TVD)

3432.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8652 Outside

Press@RunDepth: 687.45 psig @ 4508.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2020.03.22

End Date:

2020.03.22

Last Calib.:

2020.03.22

Start Time: 00:23:05

End Time:

08:36:14

Time On Btm:

2020.03.22 @ 02:36:15

Time Off Btm:

2020.03.22 @ 05:40:00

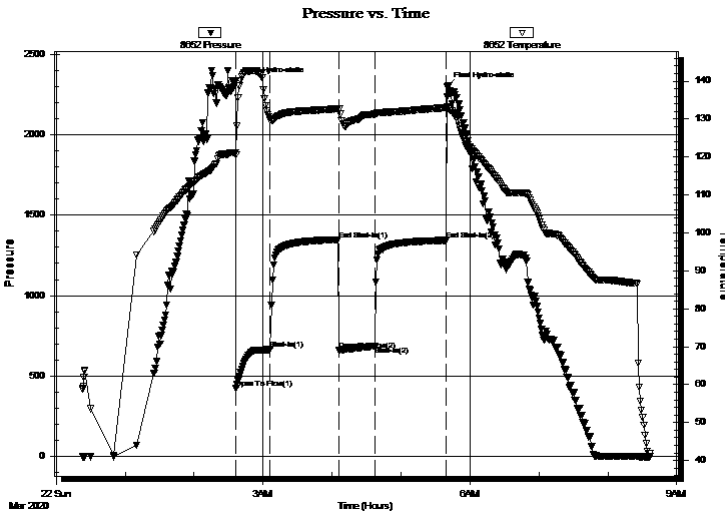
TEST COMMENT: 30 - IF: Blow built to BOB (11") at 40 sec. (diesel in bucket), built to 146"

60 - IS: No blow back

30 - FF: Blow built to 6 1/4"

60 - FS: No blow back

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2331.31	121.10	Initial Hydro-static
1	426.54	120.54	Open To Flow (1)
30	665.76	129.84	Shut-In(1)
90	1348.06	132.74	End Shut-In(1)
90	661.51	132.61	Open To Flow (2)
121	687.45	131.32	Shut-In(2)
184	1343.65	133.00	End Shut-In(2)
184	2297.39	133.26	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
1200.00	SMCW 97%w, 3%m	15.19
250.00	MCW 88%w, 12%m	3.51
50.00	WCM 72%m, 28%w	0.70

* Recovery from multiple tests

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

250 N. Water STE 300
Wichita, KS 67202

Keith #1-5

Job Ticket: 66491

DST#: 2

ATTN: Robert Hendrix

Test Start: 2020.03.22 @ 00:23:00

Tool Information

Drill Pipe:	Length: 4310.00 ft	Diameter: 3.80 inches	Volume: 60.46 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 180.00 ft	Diameter: 2.25 inches	Volume: 0.89 bbl	Weight to Pull Loose: 85000.00 lb
			<u>Total Volume: 61.35 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	12.00 ft			String Weight: Initial 70000.00 lb
Depth to Top Packer:	4507.00 ft			Final 76000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	98.00 ft			
Tool Length:	127.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4479.00	
Shut In Tool	5.00			4484.00	
Hydraulic tool	5.00			4489.00	
Jars	5.00			4494.00	
Safety Joint	3.00			4497.00	
Packer	5.00			4502.00	29.00 Bottom Of Top Packer
Packer	5.00			4507.00	
Stubb	1.00			4508.00	
Recorder	0.00	6625	Inside	4508.00	
Recorder	0.00	8652	Outside	4508.00	
Perforations	29.00			4537.00	
Blank Spacing	65.00			4602.00	
Bullnose	3.00			4605.00	98.00 Bottom Packers & Anchor

Total Tool Length: 127.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

250 N. Water STE 300
Wichita, KS 67202

Keith #1-5

Job Ticket: 66491

DST#: 2

ATTN: Robert Hendrix

Test Start: 2020.03.22 @ 00:23:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

28000 ppm

Viscosity: 70.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.98 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 600.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
1200.00	SMCW 97%w , 3%m	15.193
250.00	MCW 88%w , 12%m	3.507
50.00	WCM 72%m, 28%w	0.701

Total Length: 1500.00 ft Total Volume: 19.401 bbl

Num Fluid Samples: 0

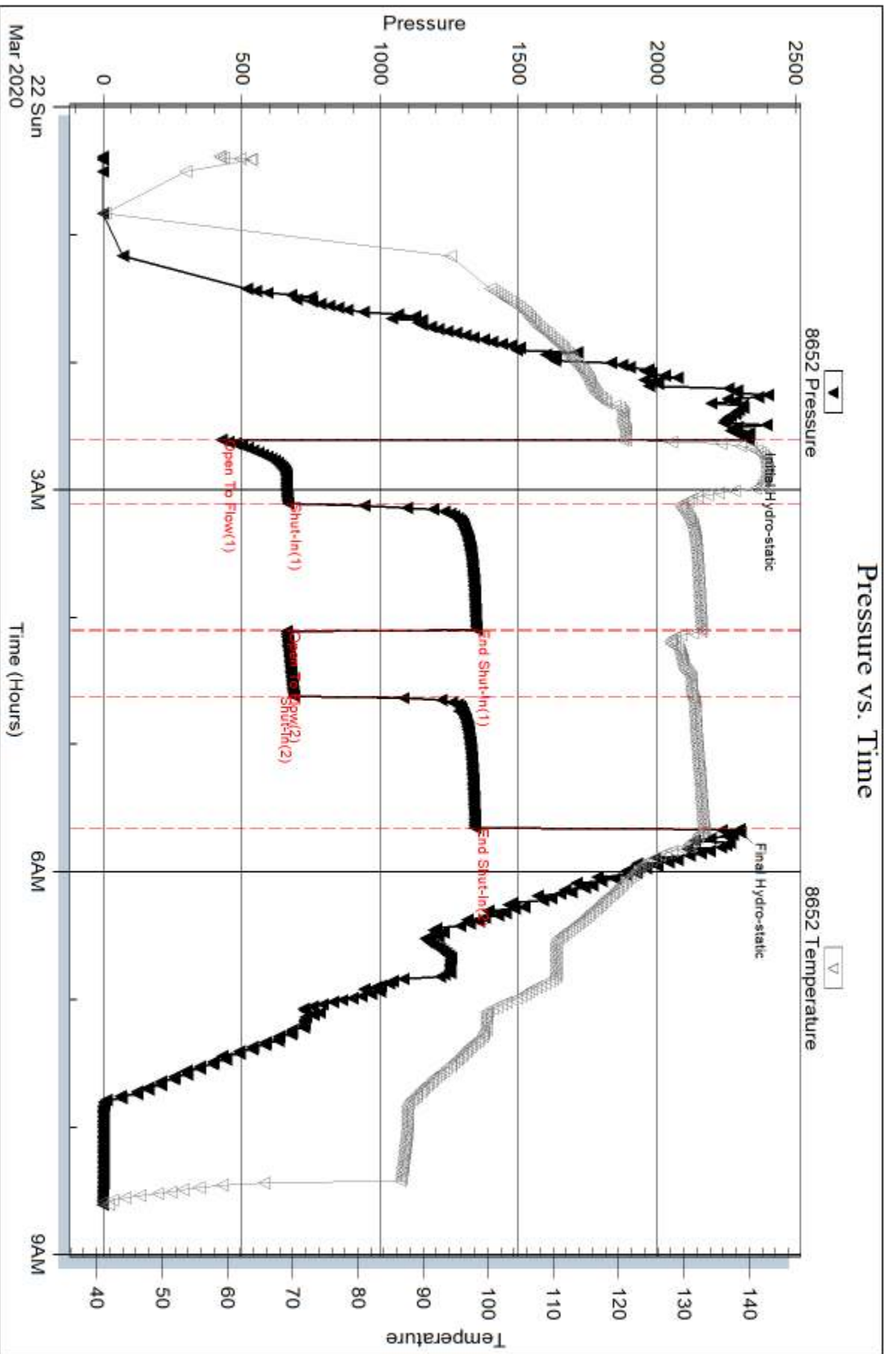
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW = .475 ohms @ 36.7 deg F Chlorides = 28,000 ppm



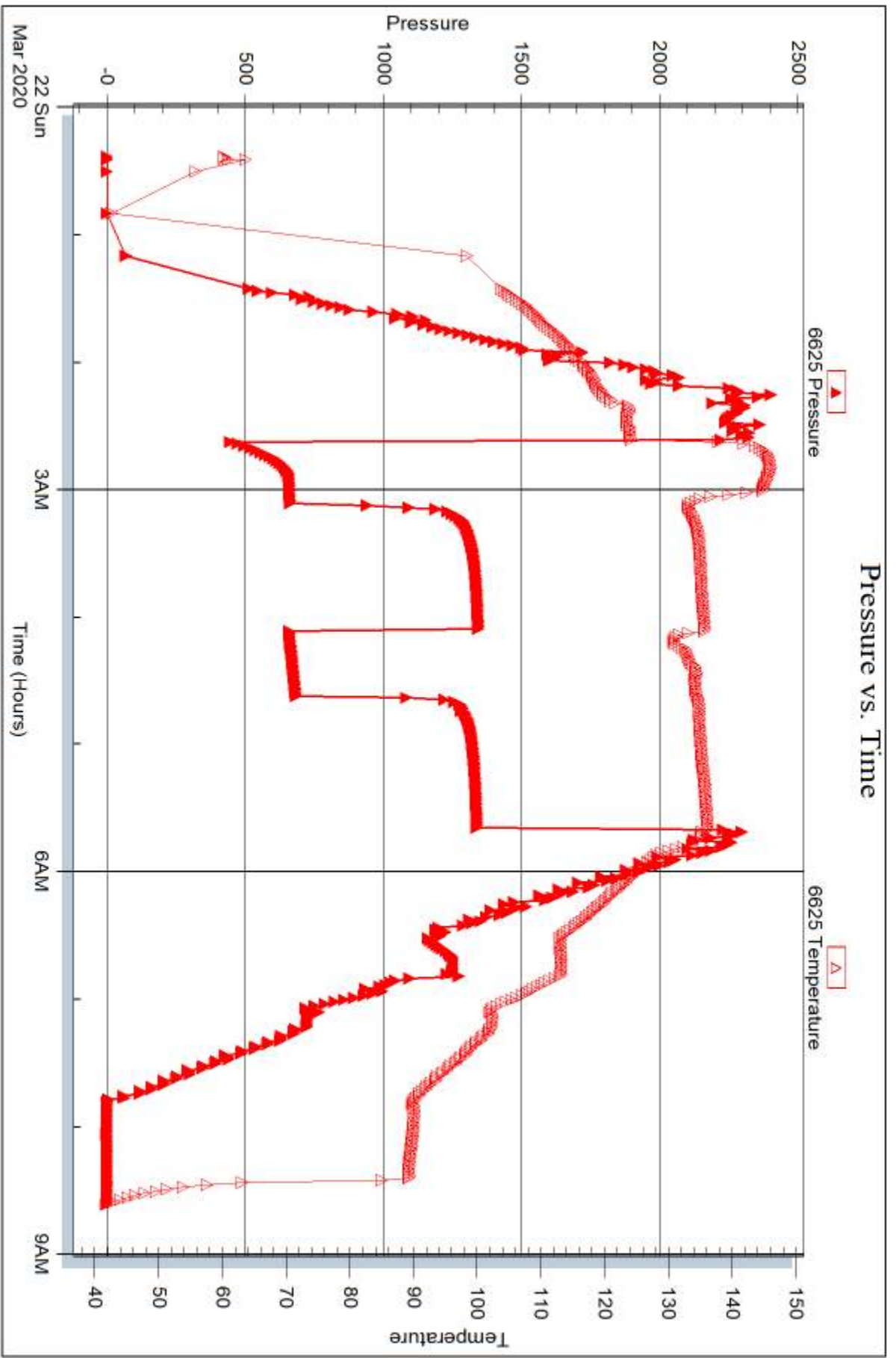
Serial #: 6625

Inside

Murfin Drilling Co., Inc.

Keith #1-5

DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 66491

Printed: 2020.03.24 @ 08:25:11



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc.**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Robert Hendrix

Keith #1-5

5-3s-37w Cheyenne KS

Start Date: 2020.03.23 @ 22:00:00

End Date: 2020.03.24 @ 05:24:30

Job Ticket #: 66492 DST #: 3

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2020.03.24 @ 08:24:35



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

250 N. Water STE 300
Wichita, KS 67202

Keith #1-5

Job Ticket: 66492

DST#: 3

ATTN: Robert Hendrix

Test Start: 2020.03.23 @ 22:00:00

GENERAL INFORMATION:

Formation: **Ft. Scott - Celia**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 00:05:15

Time Test Ended: 05:24:30

Test Type: Conventional Bottom Hole (Reset)

Tester: James Winder

Unit No: 83

Interval: 4758.00 ft (KB) To 4897.00 ft (KB) (TVD)

Reference Elevations: 3437.00 ft (KB)

Total Depth: 4897.00 ft (KB) (TVD)

3432.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

Serial #: 8652 Outside

Press@RunDepth: 55.38 psig @ 4759.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2020.03.23

End Date:

2020.03.24

Last Calib.:

2020.03.24

Start Time:

22:00:05

End Time:

05:24:29

Time On Btm:

2020.03.24 @ 00:05:00

Time Off Btm:

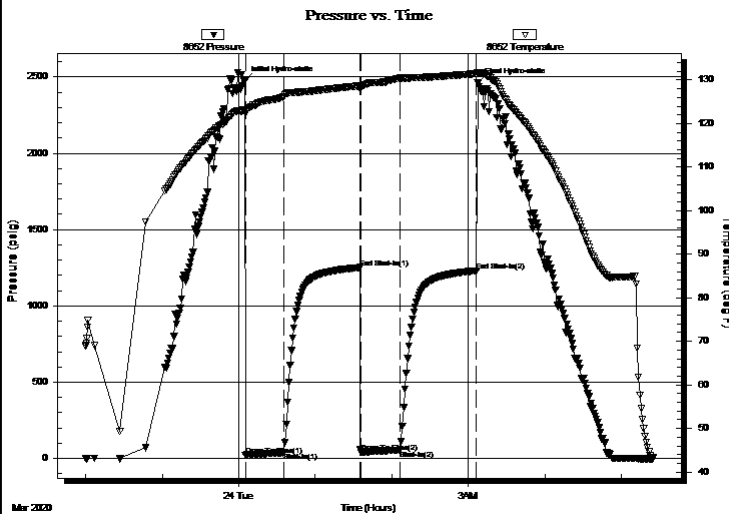
2020.03.24 @ 03:07:15

TEST COMMENT: 30 - IF: 1" Blow at open, built to 2 1/2" (diesel in bucket)

60 - IS: No blow back

30 - FF: Blow built to 3/4"

60 - FS: No blow back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2475.27	123.06	Initial Hydro-static
1	23.14	122.22	Open To Flow (1)
30	38.71	126.17	Shut-In(1)
90	1250.92	128.69	End Shut-In(1)
91	41.84	128.49	Open To Flow (2)
122	55.38	130.43	Shut-In(2)
182	1230.38	131.45	End Shut-In(2)
183	2460.84	131.76	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
65.00	Mud 100%	0.32

* Recovery from multiple tests

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



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TOOL DIAGRAM

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

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Wichita, KS 67202

Keith #1-5

Job Ticket: 66492

DST#: 3

ATTN: Robert Hendrix

Test Start: 2020.03.23 @ 22:00:00

Tool Information

Drill Pipe:	Length: 4562.00 ft	Diameter: 3.80 inches	Volume: 63.99 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 180.00 ft	Diameter: 2.25 inches	Volume: 0.89 bbl	Weight to Pull Loose: 78000.00 lb
			<u>Total Volume: 64.88 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	13.00 ft			String Weight: Initial 72000.00 lb
Depth to Top Packer:	4758.00 ft			Final 72000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	139.00 ft			
Tool Length:	168.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4730.00	
Shut In Tool	5.00			4735.00	
Hydraulic tool	5.00			4740.00	
Jars	5.00			4745.00	
Safety Joint	3.00			4748.00	
Packer	5.00			4753.00	29.00 Bottom Of Top Packer
Packer	5.00			4758.00	
Stubb	1.00			4759.00	
Recorder	0.00	6625	Inside	4759.00	
Recorder	0.00	8652	Outside	4759.00	
Perforations	6.00			4765.00	
Blank Spacing	129.00			4894.00	
Bullnose	3.00			4897.00	139.00 Bottom Packers & Anchor

Total Tool Length: 168.00



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DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co., Inc.

5-3s-37w Cheyenne KS

250 N. Water STE 300
Wichita, KS 67202

Keith #1-5

Job Ticket: 66492

DST#: 3

ATTN: Robert Hendrix

Test Start: 2020.03.23 @ 22:00:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 59.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.39 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 700.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
65.00	Mud 100%	0.320

Total Length: 65.00 ft Total Volume: 0.320 bbl

Num Fluid Samples: 0

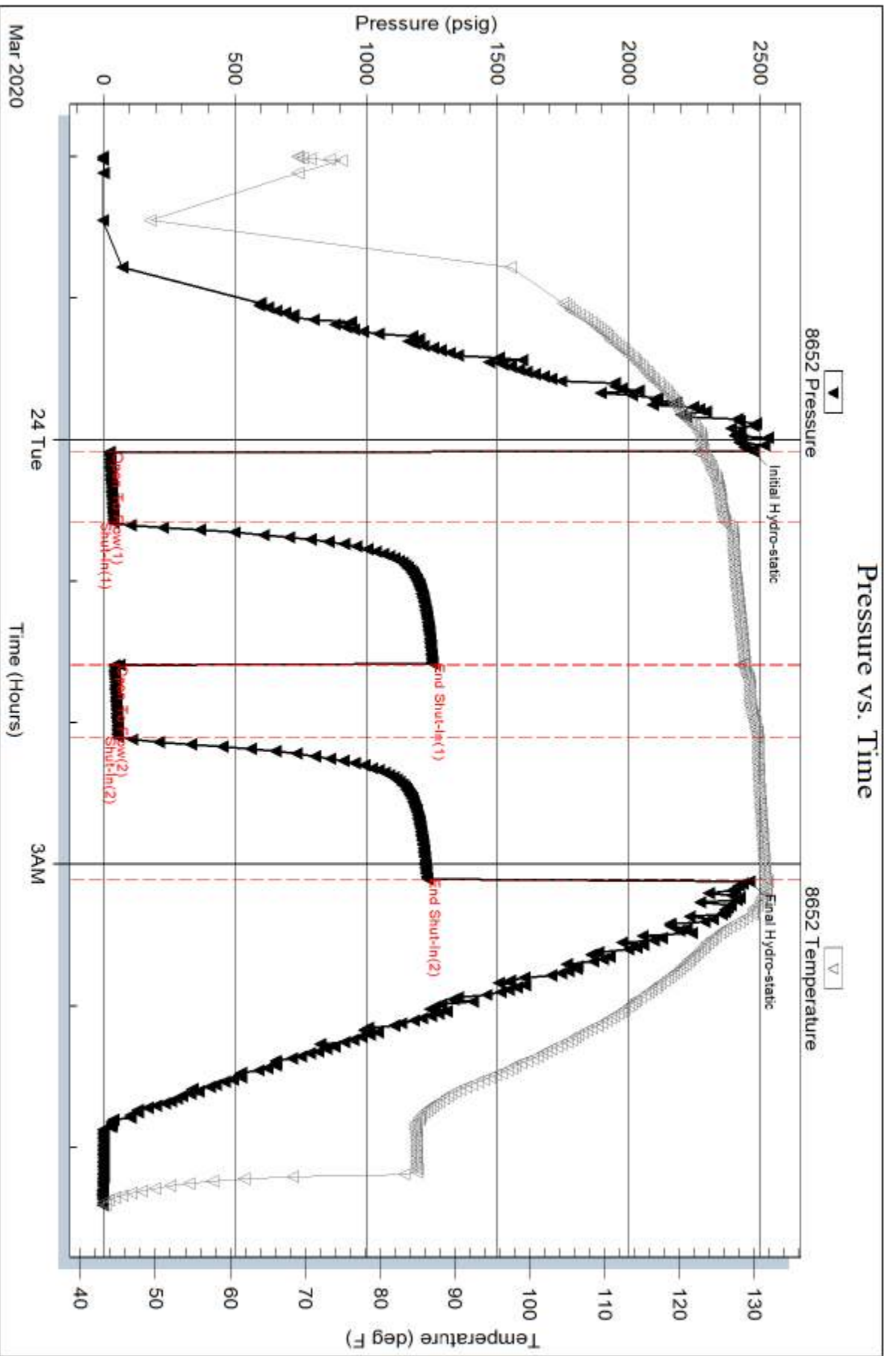
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



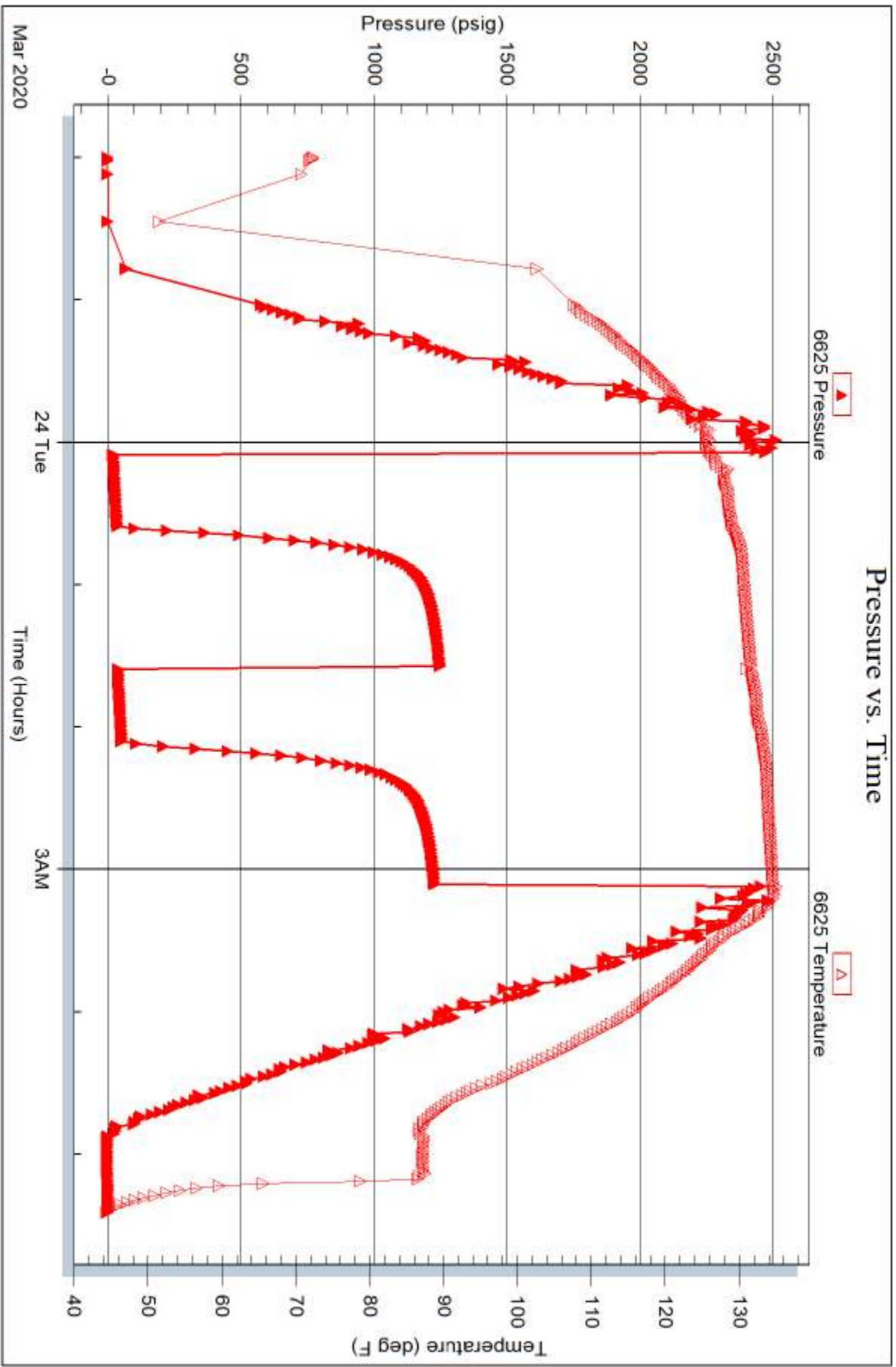
Serial #: 6625

Inside

Marfin Drilling Co., Inc.

Keith #1-5

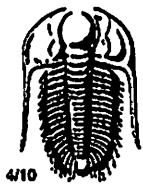
DST Test Number: 3



Tribble Testing, Inc

Ref. No: 66492

Printed: 2020.03.24 @ 08:24:36



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66490

NO.

Well Name & No. Keith #1-5 Test No. 1 Date 3-20-20
 Company Murfin Drilling Co. Inc Elevation 3437 KB 3432 GL
 Address 250 N. Water StE ~~6000~~ 300 Wichita, KS 67202
 Co. Rep / Geo. Robert Hendrix Rig Murfin #7
 Location: Sec. 5 Twp 3s Rge. 37w Co. Cheyenne State KS

Interval Tested 4395-4465 Zone Tested LKC "D"
 Anchor Length 70 Drill Pipe Run 4213 Mud Wt. 9.2
 Top Packer Depth 4390 Drill Collars Run 180 Vis 60
 Bottom Packer Depth 4395 Wt. Pipe Run - WL 6.0
 Total Depth 4465 Chlorides 600 ppm System LCM 4

Blow Description IF: 1/2" Blow at open, built to just over 1/4" (diesel in bucket)
ISI: No blowback
FF: No blow
FSI: No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>Mud</u>				<u>100</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

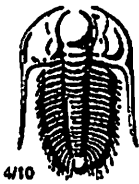
Rec Total 10 BHT 125 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 2225 Test 1300 T-On Location 17:05 3/20
 (B) First Initial Flow 19 Jars 250 T-Started 19:48
 (C) First Final Flow 22 Safety Joint 75 T-Open 22:09
 (D) Initial Shut-In 1196 Circ Sub _____ T-Pulled 1:10
 (E) Second Initial Flow 24 Hourly Standby _____ T-Out 3:15 3/21
 (F) Second Final Flow 26 Mileage 126 RT 126 Comments _____
 (G) Final Shut-In 1122 Sampler _____
 (H) Final Hydrostatic 2187 Straddle _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____

Initial Open 30 EM Tool _____
 Initial Shut-In 60 Ruined Shale Packer _____
 Final Flow 30 Ruined Packer _____
 Final Shut-In 60 Extra Copies _____
 Sub Total 0
 Total 1751
 Sub Total 1751 MP/DST Disc't _____

Approved By _____ Our Representative James Winder

TriLOBITE Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66491

NO.

Well Name & No. Keith #1-5 Test No. 2 Date 3-22-20
 Company Murfin Drilling Co. Inc Elevation 3437 KB 3432 GL
 Address 250 N. Water STE 300 Wichita, KS 67202
 Co. Rep / Geo. Robert Hendrix Rig Murfin #7
 Location: Sec. 5 Twp 3s Rge. 37w Co. Cheyenne State KS

Interval Tested 4507 - 4605 Zone Tested LKC "H-J"
 Anchor Length 98 Drill Pipe Run 4310 Mud Wt. 9.0
 Top Packer Depth ~~400~~ 4502 Drill Collars Run 180 Vis 70
 Bottom Packer Depth 4507 Wt. Pipe Run - WL 6.0
 Total Depth 4605 Chlorides 600 ppm System LCM 4
 Blow Description IF: Blow built to BOB (11") at 40 sec. (diesel in bucket) built to 146"
ISI: No blowback
FF: Blow built to 6 1/4"
FSI: No blowback

Rec	Feet of	%gas	%oil	%water	%mud
<u>50</u>	<u>wcm</u>		<u>28</u>	<u>72</u>	
<u>250</u>	<u>mcw</u>		<u>88</u>	<u>12</u>	
<u>1200</u>	<u>smcw</u>		<u>97</u>	<u>3</u>	

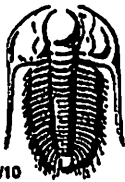
Rec Total 1500 BHT 133 Gravity API RW, 475 @ 36.7 °F Chlorides 28,000 ppm

(A) Initial Hydrostatic 2331 Test 1300 T-On Location 23:25 3/21
 (B) First Initial Flow 427 Jars 250 T-Started 00:23
 (C) First Final Flow 666 Safety Joint 75 T-Open 2:36
 (D) Initial Shut-In 1348 Circ Sub T-Pulled 5:39
 (E) Second Initial Flow 662 Hourly Standby T-Out 8:35 3/22
 (F) Second Final Flow 687 Mileage 126 RT 126 Comments _____
 (G) Final Shut-In 1344 Sampler _____
 (H) Final Hydrostatic 2297 Straddle _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____

Initial Open 30 EM Tool _____
 Initial Shut-In 60 Ruined Shale Packer _____
 Final Flow 30 Ruined Packer _____
 Final Shut-In 60 Extra Copies _____

Sub Total 1751 Sub Total 0
 Total 1751 MP/DST Disc't _____

Approved By [Signature] Our Representative James Winder
 Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66492

NO.

Well Name & No. Keith #1-5 Test No. 3 Date 3-23-20
 Company Murfin Drilling Co. Inc Elevation 3437 KB 3432 GL
 Address 250 N. Water STE 300 Wichita, KS 67202
 Co. Rep / Geo. Robert Hendrix Rig Murfin #7
 Location: Sec. 5 Twp 3s Rge. 37w Co. Cheyenne State KS

Interval Tested 4758-4897 Zone Tested Ft. Scott - Celia
 Anchor Length 139 Drill Pipe Run 4562 Mud Wt. 9.3
 Top Packer Depth 4753 Drill Collars Run 180 Vis 59
 Bottom Packer Depth 4758 Wt. Pipe Run - WL 6.4
 Total Depth 4897 Chlorides 700 ppm System LCM 4
 Blow Description IF: 1" Blow at open, built to 2 1/2" (diesel in bucket)
ISI: No blowback
FF: Blow built to 3/4"
FST: No blowback

Rec	Feet of	%gas	%oil	%water	%mud
<u>65</u>	<u>mud</u>			<u>100</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 65 BHT 132 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm
 (A) Initial Hydrostatic 2475 Test 1300 T-On Location 21:05 3/23
 (B) First Initial Flow 23 Jars 250 T-Started 22:00
 (C) First Final Flow 39 Safety Joint 75 T-Open 00:05
 (D) Initial Shut-In 1251 Circ Sub _____ T-Pulled 3:06
 (E) Second Initial Flow 42 Hourly Standby _____ T-Out 5:20 3/24
 (F) Second Final Flow 55 Mileage 126 RT 126 Comments _____
 (G) Final Shut-In 1230 Sampler _____
 (H) Final Hydrostatic 2461 Straddle _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____

Initial Open 30
 Initial Shut-In 60
 Final Flow 30
 Final Shut-In 60
 Sub Total 0
 Total 1751
 MP/DST Disc't _____

Approved By [Signature] Our Representative James [Signature]

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MDCI
Keith #1-5
499' FNL 1998'FWL
Sec. 5-3S-37W
3437' KB

Formation	Sample top	Datum	Ref	Log tops	Datum	Ref
Anhydrite	3323	+114	-21	3321	+116	-19
B/Anhydrite	3358	+79	-19	3357	+80	-18
Topeka	4160	-723	-15	4163	-726	-18
Oread	4299	-862	-17	4304	-867	-22
Lansing	4378	-941	-18	4381	-944	-21
Stark	4605	-1168	-17	4603	-1166	-15
Mound City	4659	-1222	-19	4653	-1216	-13
Ft Scott	4784	-1347	-20	4784	-1347	-20
Oakley	4860	-1423	-22	4861	-1424	-23
Mississippian	5084	-1647	-22	5082	-1645	-20
RTD	5100					
LTD				5102		

