KOLAR Document ID: 1509513

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 # 30606
Name: Murfin Drilling Co., Inc.
Address 1: 250 N WATER STE 300
Address 2:
City: WICHITA State: KS Zip: 67202 + 1216
Contact Person: Rob Kramer
Phone: (316) 267-3241
CONTRACTOR: License # 30606
Name: Murfin Drilling Co., Inc.
Wellsite Geologist: Robert Hendrix
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 #:

01/20/2020 Spud Date or Recompletion Date
01/30/2020 Date Reached TD
03/04/2020 Completion Date or Recompletion Date

API No.: 15-023-21531-00-00
Spot Description:
E2 - E2 - NW - SE Sec. 19 Twp. 2 S. R. 37 ☐ East ☑ West
1980 Feet from ☐ North / ☑ South Line of Section
1550 Feet from ☑ East / ☐ West Line of Section
Footages Calculated from Nearest Outside Section Corner:
☐ NE ☐ NW ☑ SE ☐ SW
GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Cheyenne
Lease Name: CULWELL 'H' Well #: 2-19
Field Name:
Producing Formation: LKC, Ft Scott, Celia
Elevation: Ground: 3396 Kelly Bushing: 3401
Total Vertical Depth: 4900 Plug Back Total Depth: 4870
Amount of Surface Pipe Set and Cemented at: 345 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: 1200 ppm Fluid volume: 300 bbls
Dewatering method used: Evaporated
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: 04/27/2020
☐ **Confidential Release Date:** 04/27/2022
☑ **Wireline Log Received** ☑ **Drill Stem Tests Received**
☑ **Geologist Report / Mud Logs Received**
☐ **UIC Distribution**
ALT ☑ **I** ☐ **II** ☐ **III** **Approved by:** Rene Stucky **Date:** 04/28/2020

Operator Name: Murfin Drilling Co., Inc. Lease Name: CULWELL 'H' Well #: 2-19

Sec. 19 Twp. 2 S. R. 37 ☐ East ☑ West County: Cheyenne

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 *(Attach Additional Sheets)*	☑ Yes	☐ No
Samples Sent to Geological Survey	☑ Yes	☐ No
Cores Taken	☐ Yes	☑ No
Electric Log Run	☑ Yes	☐ No
Geologist Report / Mud Logs	☑ Yes	☐ No

List All E. Logs Run:
Attached

☑ Log Formation (Top), Depth and Datum ☐ Sample

Name	Top	Datum
see attached	see attached	see attached

CASING RECORD ☑ New ☐ 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
Surface	12.250	8.625	23	345	Class A	300	3% cc, 2% gel
Production	7.875	5.500	15.5	4895	H-Con, H-Long	525	1/2 # flo-cel,10% salt, 5% cal-seal, 1/2#f

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
☐ Perforate ☐ Protect Casing ☐ Plug Back TD ☐ 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: 03/10/2020

Producing Method: ☐ Flowing ☑ Pumping ☐ Gas Lift ☐ Other *(Explain)*

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
	50		1.30		

DISPOSITION OF GAS:
☐ Vented ☐ Sold ☐ Used on Lease
(If vented, Submit ACO-18.)

METHOD OF COMPLETION:
☐ Open Hole ☑ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)*

PRODUCTION INTERVAL:

Top	Bottom
4302	4808

Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record *(Amount and Kind of Material Used)*
Attached	Attached	Attached	Attached	Attached	Attached

TUBING RECORD: Size: 2.375 Set At: 4830 Packer At:

Mail to: KCC - Conservation Division, 266 N. Main, Suite 220, Wichita, Kansas 67202

Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	CULWELL 'H' 2-19
Doc ID	1509513

All Electric Logs Run

DIL
DUCP
MEL
BHCS

Form	ACO1 - Well Completion
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Well Name	CULWELL 'H' 2-19
Doc ID	1509513

Perforations

Shots Per Foot	Perforation Top	Perforation Bottom	BridgePlugType	BridgePlugSetAt	Material Record
4	4302	4306			300 gals 20% MCA, 300 gals 20% MCA
4	4368	4376			300 gals 20% MCA, 300 gals 20% MCA
4	4716	4719			150 gals 20% MCA, 350 gals 20% MCA
4	4727	4732			150 gals 20% MCA, 350 gals 20% MCA
3	4794	4798			500 gals 20% MCA,
3	4802	4808			500 gals 20% MCA,

Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	CULWELL 'H' 2-19
Doc ID	1509513

Casing

Purpose Of String	Size Hole Drilled	Size Casing Set	Weight	Setting Depth	Type Of Cement	Number of Sacks Used	Type and Percent Additives
Surface	12.250	8.625	23	345	Class A	300	3% cc, 2% gel
Production	7.875	5.500	15.5	4895	H-Con, H-Long	525	1/2 # flo-cel,10% salt, 5% cal-seal, 1/2#per sx flo-cel, 1/4 % D-AIR, 3/4% CFR-1

CEMENT TREATMENT REPORT

Customer:	Murfin Drilling Company	Well:	Culwell 'H' #2-19	Ticket:	ICT3140
City, State:		County:	KS	Date:	1/20/2020
Field Rep:		S-T-R:	SEC 19-2 South-37 West	Service:	Surface

Downhole Information	
Hole Size:	12.25 in
Hole Depth:	345 ft
Casing Size:	8 5/8 in
Casing Depth:	325 ft
Tubing / Liner:	in
Depth:	ft
Tool / Packer:	
Depth:	ft
Displacement:	20.5 bbls

Calculated Slurry	
Weight:	14.8 # / sx
Water / Sx:	6.89 gal / sx
Yield:	1.42 ft^3 / sx
Bbls / Ft.:	
Depth:	345 ft
Annular Volume:	0 bbls
Excess:	
Total Slurry:	75.8 bbls
Total Sacks:	300 sx

Product	% / #	#
Class A		
Poz		
Gel		
CaCl		
Gypsum		
Metso		
Kol Seal		
Flo Seal		
Salt (bww)		
Total		-

TIME	RATE	PSI	BBLs	REMARKS
715P				Got to location
720P				Saftey meeting
725P				Rig up
905P	3.5	300.0	5.0	H2O Ahead
907P	5.0	350.0	75.8	Cement 300 sks H325
925P	3.5	400.0	20.5	Displaced H2O 10 BBLS To Pit
930P				Shut In
940P				Rig Down
950P				Left Location

CREW		UNIT
Cementer:	Josh Mosier	67
Pump Operator:	Jesse Jones	208
Bulk #1:	John Polly	194/254
Bulk #2:		

SUMMARY		
Average Rate	Average Pressure	Total Fluid
4 bpm	350 psi	101 bbls

Hurricane Services, Inc.
250 N. Water
Wichita, KS 67202

CEMENT TREATMENT REPORT

Customer:	Murfin Drilling	Well:	Culwell H 2-19	Ticket:	ICT 3174
City, State:		County:	Cheyenne KS	Date:	1/31/2019
Field Rep:		S-T-R:	19-2S-37W	Service:	Longstring

Downhole Information	
Hole Size:	7 7/8 in
Hole Depth:	4900 ft
Casing Size:	5 1/2 in
Casing Depth:	4895 ft
Tubing / Liner:	in
Depth:	ft
Tool / Packer:	
Depth:	ft
Displacement:	115.5 bbls

Calculated Slurry	
Weight:	12 # / sx
Water / Sx:	gal / sx
Yield:	2.56 ft^3 / sx
Bbls / Ft.:	
Depth:	ft
Annular Volume:	0 bbls
Excess:	
Total Slurry:	148.2 bbls
Total Sacks:	325 sx

Product	% / #	#
Class A		
Poz		
Gel		
CaCl		
Gypsum		
Metso		
Kol Seal		
Flo Seal		
Salt (bww)		
	Total	-

TIME	RATE	PSI	BBLs	REMARKS
615A				ON LOCATION
620A				GET FOLLOWINGFROM CO MAN 7 7/8 OPEN HOLE, 4900 FT TD, 4895 TOTAL PIPE, 40.98 FT SHOE JOINT, TURBOLIZERS ON
				JOINTS 1-13, 34, 44 BASKETS ON JOINTS 11, 35, 45
815A				CASING ON BOTTOM
830A				CIRCULATE
900A				EQUIPMENT ON LOCATION
905A				SAFETY MEETING
910A				RIG UP
950A	3.1	210.0	5.0	H2O AHEAD
954A	3.1	240.0	12.0	MUDFLUSH
958A	3.2	260.0	5.0	H2O SPACER
1001A	7.0	390.0	148.2	LEAD CEMENT 325 SKS H-CON MIXED AT 12 PPG MUD SCALE VERIFIED
1030A	5.5	220.0	51.6	TAIL CEMENT 200 SKS HSC MIXED AT 14.6 MUD SCALE VERIFIED
1048A				SHUT DOWN
1050A				DROP PLUG/WASH PUMP & LINES
1054A	7.0	220.0	25.0	DISPLACE H2O
1100A	6.0	420.0	25.0	DISPLACE H2O
1105A	6.0	1,010.0	25.0	DISPLACE H2O
1111A	6.0	1,350.0	25.0	DISPLACE H2O
1113A	4.0	1,430.0	10.0	DISPLACE H2O
1114A	4.0	1,510.0	5.5	DISPLACE H2O
1115A		2,500.0		PLUG LANDED
				CHECK FLOATS/THEY HELD
				RIG DOWN
				LEFT LOCATION
				CEMENT TO SURFDACE CIRCULATE 10 BBLS TO PIT

CREW		UNIT
Cementer:	Jimmie Cottrell	73
Pump Operator:	Jesse Jones	231
Bulk #1:	Jeff Jackson	242
Bulk #2:	John Polley	194/254

SUMMARY		
Average Rate	Average Pressure	Total Fluid
4.99182 bpm	813 psi	337 bbls

Hurricane Services, Inc.
250 N. Water
Wichita, KS 67202

	MDCI Culwell 'H' #2-19 1980FSL 1550FEL Sec. 19-T2S-R37W 3401' KB					
Formation	Sample top	Datum	Ref	Log Top	Datum	Ref
Anhydrite	3272	+129	+10	3271	+130	+11
B/Anhydrite	3303	+98	+12	3306	+95	+9
Topeka	4081	-680	+8	4083	-682	+6
Oread	4228	-827	+12	4229	-828	+11
Lansing	4303	-902	+15	4302	-901	+16
Stark	4533	-1132	+10	4534	-1133	+9
Mound City	4584	-1183	+10	4584	-1183	+10
Ft Scott	4710	-1309	+14	4715	-1314	+9
Oakley	4791	-1390	+8	4788	-1387	+11
RTD	4900					
LTD				4900		

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY Murfin Drilling Company Inc.
LEASE Culwell 'H' #2-19
FIELD Wildcat
LOCATION 1980'fsl & 1550'fel
SEC 19 TWSP 2s RGE 37w
COUNTY Cheyenne STATE Kansas
CONTRACTOR Murfin Drilling Co. Inc. Rig #3
SPUD 1/20/2020 COMP 1/30/2020
RTD 4900' LTD 4900'
MUD UP 3600' TYPE MUD Chemical

SAMPLES SAVED FROM 3990' TO 4900'
DRILLING TIME KEPT FROM 3990' TO 4900'
SAMPLES EXAMINED FROM 3990' TO 4900'
GEOLOGICAL SUPERVISION FROM 3990'
GEOLOGIST ON WELL Robert D. Hendrix

ELEVATIONS

KB 3401'
DF
GL 3396'
Measurements Are All From Kelly Bushing

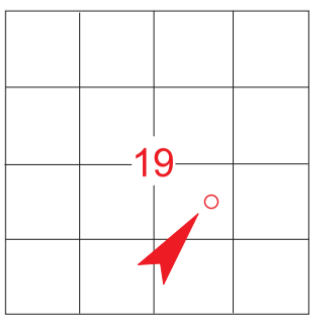
CASING

CONDUCTOR
SURFACE 8-5/8" @ 345'
PRODUCTION 5-1/2" @ 4895'

ELECTRICAL SURVEYS

Dual comp porosity /Dual Induction
Microlog / Sonic
Pioneer Wireline Services

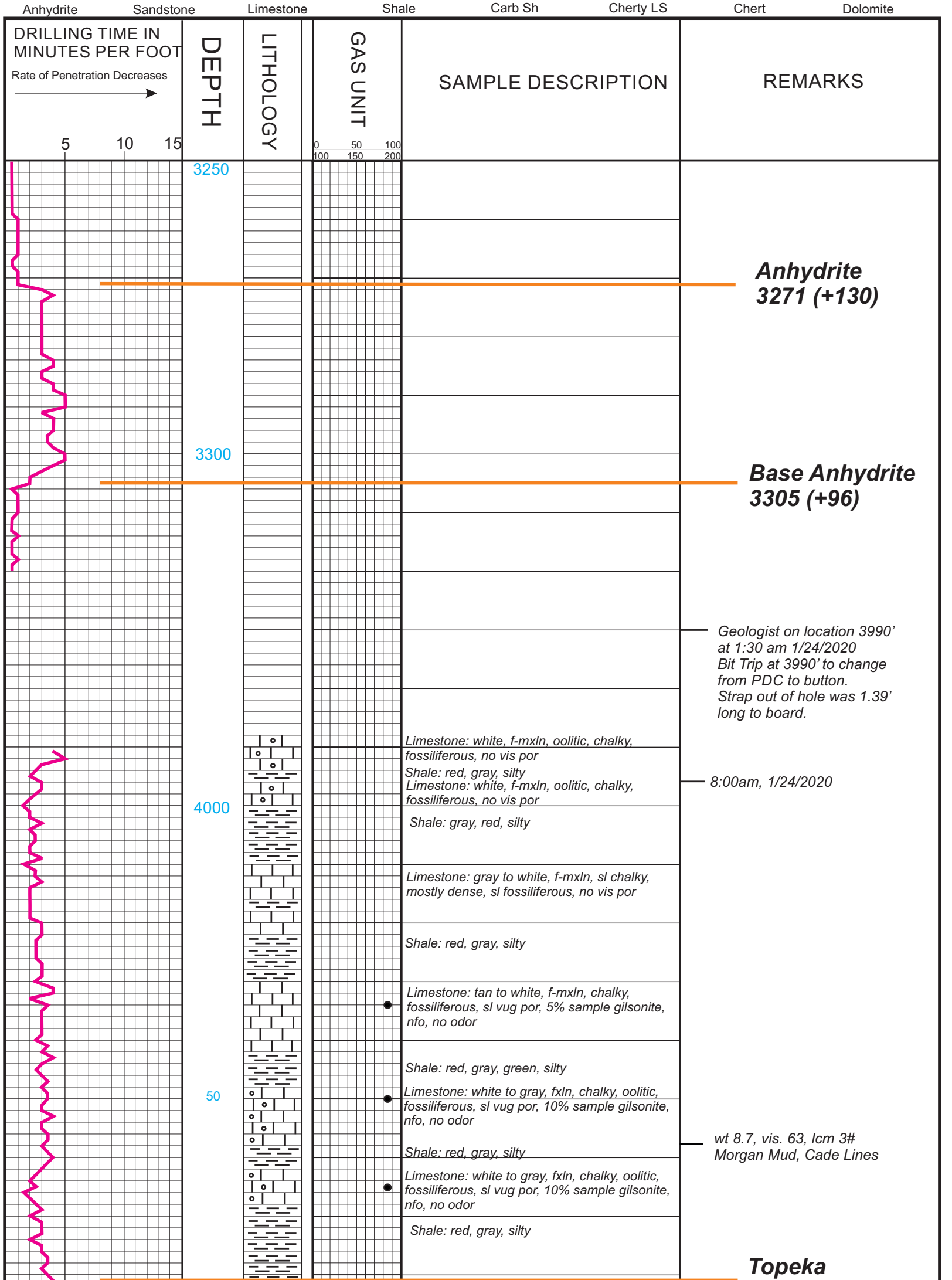
FORMATION TOPS	ELECTRIC LOG	SAMPLE
Anhydrite	3271 (+131)	3271 (+130)
Topeka	4083 (-682)	4081 (-680)
Lansing	4302 (-901)	4303 (-902)
Stark Shale	4533 (-1132)	4533 (-1132)
Mound City	4584 (-1183)	4584 (-1183)
Ft Scott	4715 (-1314)	4710 (-1309)
Oakley	4788 (-1387)	4791 (-1390)

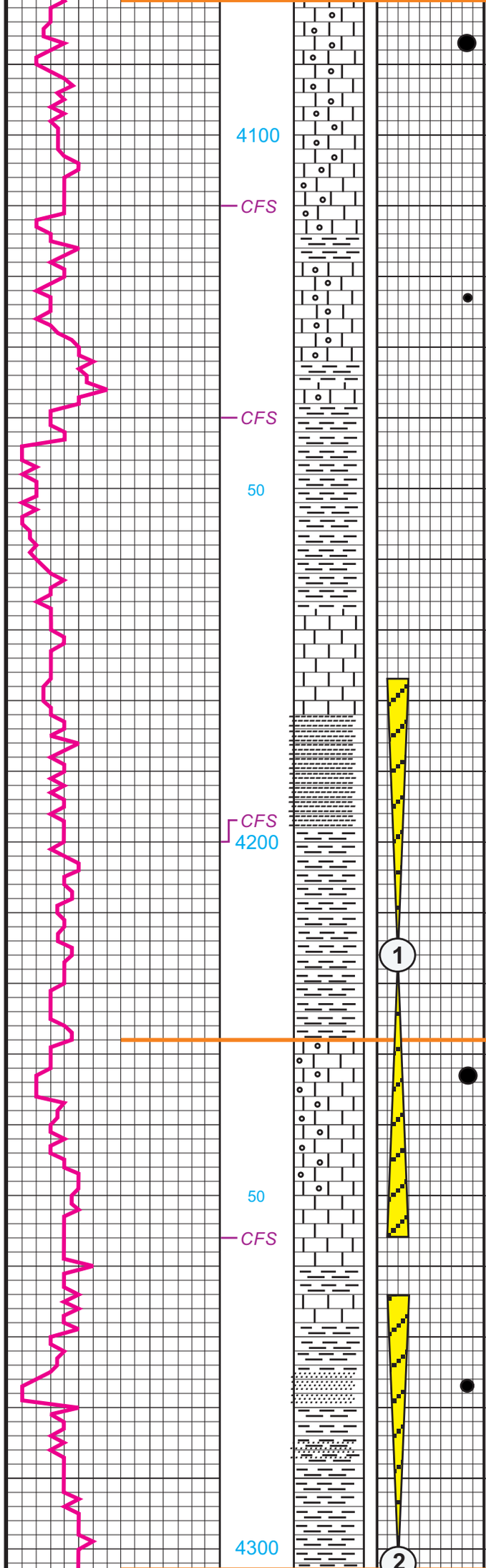


API# 15-023-21531

REMARKS:

LEGEND


Anhydrite
Sandstone
Limestone
Shale
Carb Sh
Cherty LS
Chert
Dolomite
DRILLING TIME IN MINUTES PER FOOT
Rate of Penetration Decreases
5
10
15
DEPTH
LITHOLOGY
GAS UNIT
0
50
100
100
150
200
SAMPLE DESCRIPTION
REMARKS
3250
3300
4000
50
Anhydrite
3271 (+130)
Base Anhydrite
3305 (+96)
Geologist on location 3990'
at 1:30 am 1/24/2020
Bit Trip at 3990' to change
from PDC to button.
Strap out of hole was 1.39'
long to board.
Limestone: white, f-mxln, oolitic, chalky,
fossiliferous, no vis por
Shale: red, gray, silty
Limestone: white, f-mxln, oolitic, chalky,
fossiliferous, no vis por
8:00am, 1/24/2020
Shale: gray, red, silty
Limestone: gray to white, f-mxln, sl chalky,
mostly dense, sl fossiliferous, no vis por
Shale: red, gray, silty
Limestone: tan to white, f-mxln, chalky,
fossiliferous, sl vug por, 5% sample gilsonite,
nfo, no odor
Shale: red, gray, green, silty
Limestone: white to gray, fxln, chalky, oolitic,
fossiliferous, sl vug por, 10% sample gilsonite,
nfo, no odor
wt 8.7, vis. 63, lcm 3#
Morgan Mud, Cade Lines
Shale: red, gray, silty
Limestone: white to gray, fxln, chalky, oolitic,
fossiliferous, sl vug por, 10% sample gilsonite,
nfo, no odor
Shale: red, gray, silty
Topeka



4081 (-680)

Limestone: white to lt gray, f-mxln, chalky, oolitic, fossiliferous, 25% sample fr interxln por, heavy amt of gilsonite, black sat stain, pr show of tarry free oil (mostly on break), faint odor

Limestone: white to lt gray, fxln, oolitic, chalky, sl pyritic, sl intexln por, ns

Shale: red, gray, green, silty

Limestone: white, f-mxln, oolitic, fossiliferous, sl pyritic, 3% sample pr interxln por, dark sat stain, slsfo on break only, no odor

Shale: red, gray, silty

Limestone: white, fxln, chalk, oolitic, fossiliferous, sl pyritic, 1% sample pr interxln por, dark sat stain, slsfo on break only, no odor

Shale: red, gray, sandy, silty (carrying show from above)

Shale: red, gray, green, black, silty, sandy

Limestone: tan to gray, fxln, sl chalky, dense, fossiliferous, no vis por

Siltstone: gray to brown, v-fxln, silty, dense, no vis por

Shale: gray, blocky, silty

Shale: gray, green, silty

DST #1
4177-4256
30-60-60-90
1st open: blow built to 4"
2nd open: blow built to 4 1/2"
no returns
Rec:
100' go 5/95
60' mco 40/60
hydro: 2040-1849 psi
If: 18-41 psi
ff: 47-69 psi
sip: 953-848 psi
bht: 133° F
gravity: 28°

Oread
4228 (-827)

Limestone: white, fxln, chalky, oolitic, fossiliferous, granular, 50% sample fr interxln to pr vug por, black sat stain, ex-sfo some bleeding, strong odor

Limestone: white to lt gray, f-mxln, sl chalky, dense in part, fossiliferous, 5% sample sl interxln por, scattered black sat stain, prsfo, fair odor

Limestone: tan, v-fxln, dense, no vis por

8:00am, 1/25/2020
wt 8.8, vis. 57, lcm 3#
Morgan Mud, Cade Lines

Shale: black, gray, red, green, blocky, silty

Limestone: tan, lt brown, v-fxln, dense, no vis por

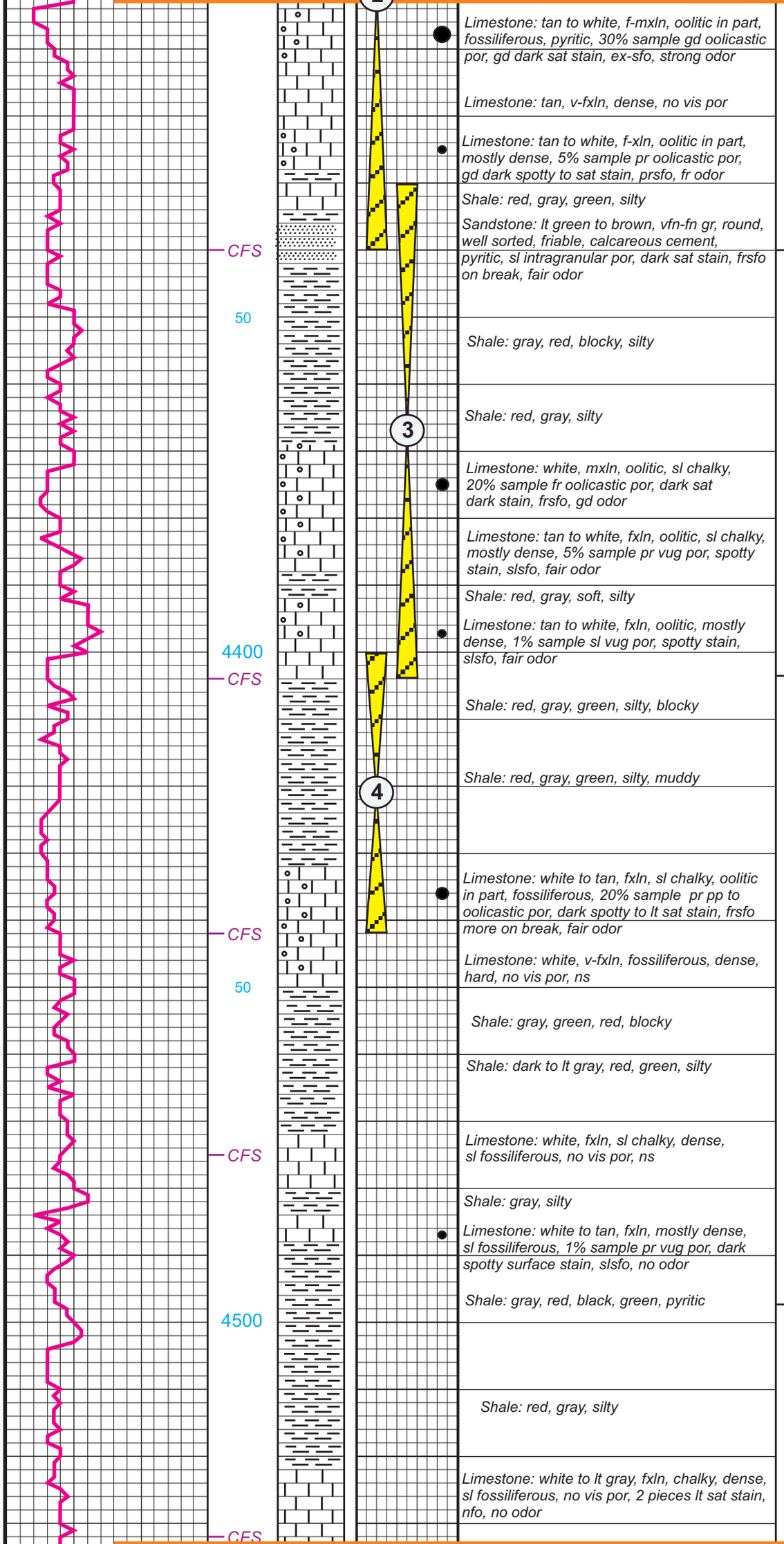
Shale: dark to lt gray, red, green, blocky, silty

Sandstone: white to lt gray, vfn-fn gr, round, well sorted, calcareous cement, pyritic, 10% sample pr vug por, scattered sat stain, prsfo on break, fair odor

Shale: gray, silty, sandy

Shale: gray, silty

DST #2
4264-4340
30-60-60-90
1st open: bob 18 min
2nd open: bob 26 min
no returns
Rec:
10' oil
63' owcm 10/35/55
126' mcw 40/60
371' mcw 5/95
hydro: 2092-2079 psi
If: 28-139 psi



Limestone: tan to white, f-mxln, oolitic in part, fossiliferous, pyritic, 30% sample gd oolicastic por, gd dark sat stain, ex-sfo, strong odor

Limestone: tan, v-fxln, dense, no vis por

Limestone: tan to white, f-xln, oolitic in part, mostly dense, 5% sample pr oolicastic por, gd dark spotty to sat stain, prsfo, fr odor

Shale: red, gray, green, silty

Sandstone: lt green to brown, vfn-fn gr, round, well sorted, friable, calcareous cement, pyritic, sl intragranular por, dark sat stain, frsfo on break, fair odor

Shale: gray, red, blocky, silty

Shale: red, gray, silty

Limestone: white, mxln, oolitic, sl chalky, 20% sample fr oolicastic por, dark sat dark stain, frsfo, gd odor

Limestone: tan to white, fxln, oolitic, sl chalky, mostly dense, 5% sample pr vug por, spotty stain, slsfo, fair odor

Shale: red, gray, soft, silty

Limestone: tan to white, fxln, oolitic, mostly dense, 1% sample sl vug por, spotty stain, slsfo, fair odor

Shale: red, gray, green, silty, blocky

Shale: red, gray, green, silty, muddy

Limestone: white to tan, fxln, sl chalky, oolitic in part, fossiliferous, 20% sample pr pp to oolicastic por, dark spotty to lt sat stain, frsfo more on break, fair odor

Limestone: white, v-fxln, fossiliferous, dense, hard, no vis por, ns

Shale: gray, green, red, blocky

Shale: dark to lt gray, red, green, silty

Limestone: white, fxln, sl chalky, dense, sl fossiliferous, no vis por, ns

Shale: gray, silty

Limestone: white to tan, fxln, mostly dense, sl fossiliferous, 1% sample pr vug por, dark spotty surface stain, slsfo, no odor

Shale: gray, red, black, green, pyritic

Shale: red, gray, silty

Limestone: white to lt gray, fxln, chalky, dense, sl fossiliferous, no vis por, 2 pieces lt sat stain, nfo, no odor

ff: 140-264 psi
sip: 1177-1075 psi
bht: 146° F
gravity: 28°
chl: 19,000 ppm

Lansing
4303 (-902)

8:00am, 1/26/2020
wt 9.1, vis. 52, lcm 2#
Morgan Mud, Cade Lines

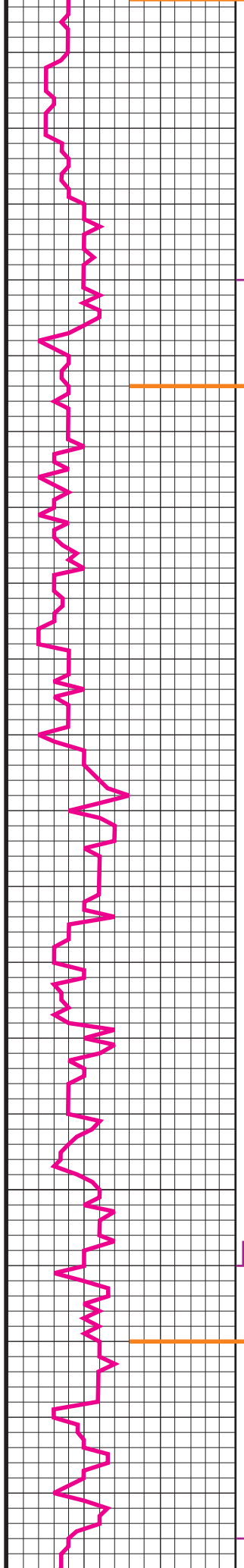
DST #3
4330-4404
30-60-60-90
1st open: blow built to 4"
2nd open: blow built to 2"
no returns
Rec:
5' mco 10/90
60' 20/80
60' 10/90
hydro: 2176-2155 psi
If: 29-43 psi
ff: 48-73 psi
sip: 1302-1297 psi
bht:137° F

8:00am, 1/27/2020
wt 9.1, vis. 62, lcm 2#
Morgan Mud, Cade Lines

DST #4
4400-4442
30-60-30-60
1st open: blow built to 1" died back to 1/4"
2nd open: no blow
no returns
Rec:
5' mud
hydro: 2113-2067 psi
If: 15-17 psi
ff: 17-18 psi
sip: 34-27 psi
bht:133° F

8:00am, 1/28/2020
wt 9.3, vis. 57, lcm 2#
Morgan Mud, Dave Lines

Stark Shale



4533 (-1132)

Shale: gray, red, green, pyritic

Shale: red, gray, sandy

50

Limestone: tan, vf-xln, oolitic in part, dense, chalky, fossiliferous, no vis por

Shale: dark to lt gray, red, green, black

CFS

Limestone: white to tan, f-mxln, chalky, fossiliferous, argillaceous, no vis por

Mound City
4584 (-1183)

Shale: gray, red, silty

4600

Limestone: white, mxln, chalky, oolitic, fossiliferous, gd oolicastic to vug por

Shale: gray, red, green, blocky, silty

Shale: gray, red, green, blocky, silty

Limestone: white, fxln, sl chalky, dense, oolitic, no vis por

siltstone: gray, v-fxln, dense, silty, blocky, no vis por

Shale: gray, brown, red, green, soft, silty

50

Shale: red, gray, sandy, silty

Limestone: tan to white, m-lxln, chalky, v-fossiliferous, fr fossiliferous por, ns

Shale: red, gray, silty

Limestone: tan to white, m-lxln, chalky, v-fossiliferous, fr fossiliferous por, ns

siltstone: gray, v-fxln, dense, silty, blocky, no vis por

CFS
4700

Shale: black, dark to lt gray, blocky

Shale: red, gray, silty

Ft Scott
4710 (-1309)

Limestone: white, fxln, oolitic, chalky, fossiliferous, 1% sample sl interxln por, pr scattered spotted lt stain, slsfo on break, no odor

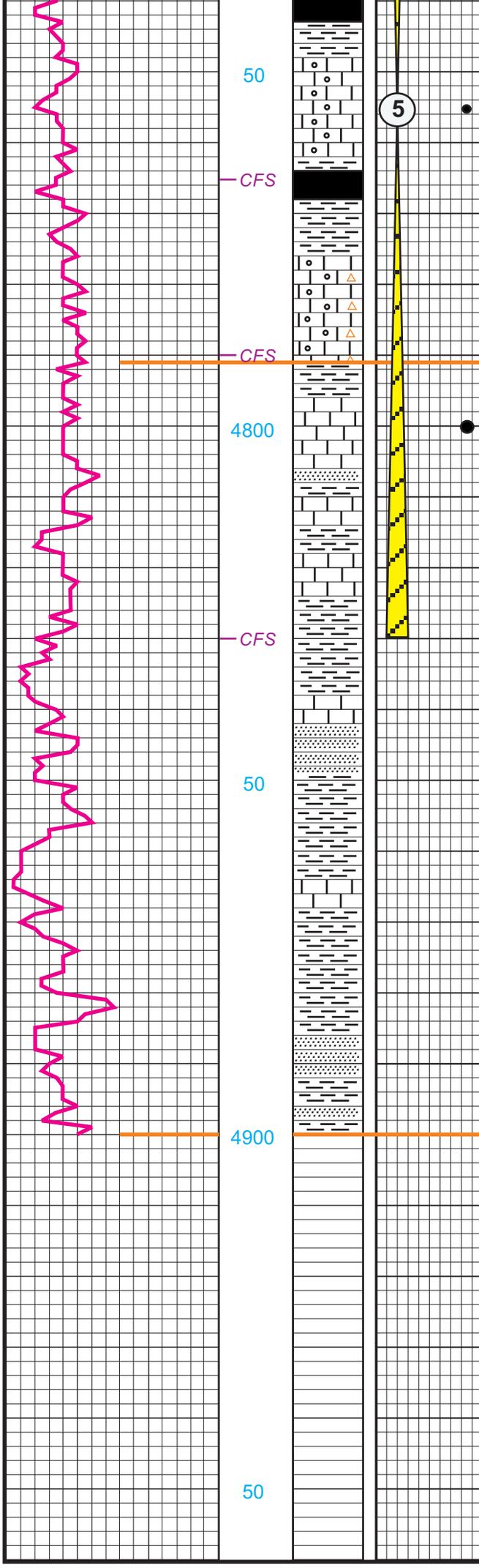
Shale: red, brown, gray, silty

Limestone: white, f-mxln, chalky, oolitic, fossiliferous, 5% sample pr pp por, spotty to lt sat stain, prsfo more on break, fair odor

CFS

Shale: black, carbonaceous

8:00am, 1/29/2020
wt 9.1, vis. 64, lcm 3#
Morgan Mud, Dave Lines



Shale: black, dark to lt gray, blocky

Limestone: white to gray, fxln, chalky, oolitic, dense, fossiliferous, 2 pieces no vis por, lt sat stain, nfo, no odor

Shale: black carbonaceous, gray, red, silty

Shale: black, gray, blocky, silty

Limestone: tan to white, fxln, chalky, cherty, oolitic, sl fossiliferous, no vis por

Shale: gray lt to dark, red, black

Limestone: tan to white, f-mxln, chalky, sucrosic in part, fossiliferous, 10% sample fr pp to vug por, dark sat stain, prsfo more on break, good odor

Sandstone: white, t/t, md-fn gr, sub-ang, mod sorted, calcareous cement, friable, no vis por

Shale: gray, green, red, silty, blocky

Limestone: tan to white, fxln, chalky, glauconitic, granular, fossiliferous, pyritic, no vis por, ns

Shale: dark to lt gray, black, red, green, pyrite

Shale: lt gray, green, red, silty

Limestone: tan to white, fxln, chalky, granular, fossiliferous, no vis por, ns

Sandstone: white, t/t, md gr, sub-ang, mod sorted, calcareous cement, friable, fr intergranular por, ns

Shale: black, gray, red, green

Limestone: tan, v-fxln, dense, fossiliferous, no vis por

Shale: black, gray, red, green

Shale: red, gray, muddy, sandy

Sandstone: tan to red, md-fn gr, sub-round, mod sorted, calcareous cement, argillaceous, pr intergranular por

Shale: red, gray, v-sandy

Sandstone: tan, fn-md gr, sub-round, mod sorted, calcareous cement, pr intergranular por

Shale: red, gray, green, silty

DST #5
4681-4830
30-60-60-90
1st open: bob 20 min
1st shut-in: surface return
2nd open: bob 16 min
2nd shut-in: return built to 2 1/2"
Rec:
65' ocm 50/50
245' ocm 35/65
378' gip
hydro: 2367-2234 psi
If: 35-88 psi
ff: 88-131 psi
sip: 1332-1315 psi
bht:144° F

Oakley
4791 (-1390)

8:00am, 1/30/2020

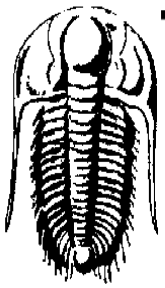
wt 9.1, vis. 62, lcm 3#
Morgan Mud, Cade Lines

RTD
4900 (-1499)

Geologist off location
at 11:00 pm, 1/30/2020

Murfin Drilling Co Inc
Culwell 'H' #2-19
1980'fsl & 1550'fel

19-2-37w, Cheyenne County, Kansas
KB=3401', GL=3396'
API: 15-023-21531



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell H #2-19

19-2s-37w Cheyenne,KS

Start Date: 2020.01.25 @ 07:57:00
End Date: 2020.01.25 @ 15:51:00
Job Ticket #: 66467 DST #: 1

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

Printed: 2020.01.30 @ 12:11:53

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66467 **DST#: 1**

Test Start: 2020.01.25 @ 07:57:00

GENERAL INFORMATION:

Formation: **Oread**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 10:06:00
Time Test Ended: 15:51:00

Test Type: Conventional Bottom Hole (Initial)
Tester: Ryan Nichols
Unit No: 71

Interval: 4177.00 ft (KB) To 4256.00 ft (KB) (TVD)
Total Depth: 4256.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

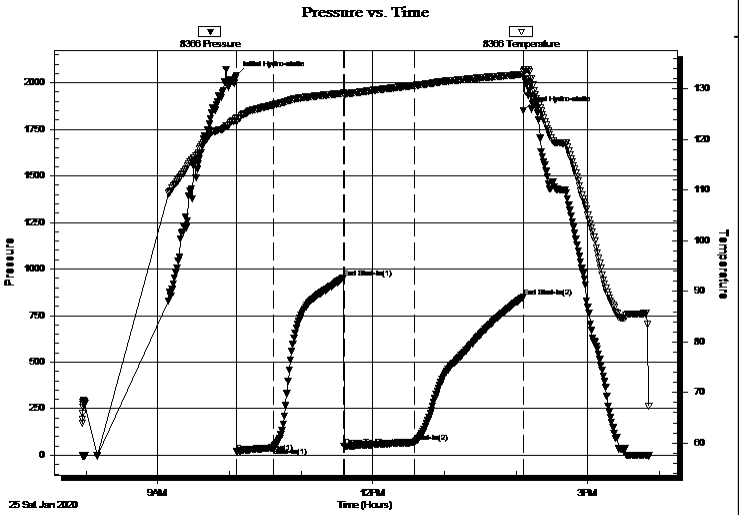
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8366 **Outside**

Press@RunDepth: 68.96 psig @ 4178.00 ft (KB)
Start Date: 2020.01.25 End Date: 2020.01.25
Start Time: 07:57:01 End Time: 15:51:00

Capacity: 8000.00 psig
Last Calib.: 2020.01.25
Time On Btm: 2020.01.25 @ 10:05:50
Time Off Btm: 2020.01.25 @ 14:06:20

TEST COMMENT: 30 IF - Blow built to 4"
60 ISI - No return
60 FF - Blow built to 4 1/2"
90 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2040.05	124.35	Initial Hydro-static
1	18.16	123.41	Open To Flow (1)
31	40.55	126.82	Shut-In(1)
90	953.26	129.16	End Shut-In(1)
91	47.07	128.90	Open To Flow (2)
150	68.96	130.69	Shut-In(2)
241	848.38	132.89	End Shut-In(2)
241	1848.98	133.33	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
60.00	MCO - 40%M - 60%o	0.30
100.00	GO - 5%G - 95%o	0.60

Gas Rates

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

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66467 **DST#: 1**

Test Start: 2020.01.25 @ 07:57:00

GENERAL INFORMATION:

Formation: **Oread**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 10:06:00
Time Test Ended: 15:51:00

Test Type: Conventional Bottom Hole (Initial)
Tester: Ryan Nichols
Unit No: 71

Interval: 4177.00 ft (KB) To 4256.00 ft (KB) (TVD)
Total Depth: 4256.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

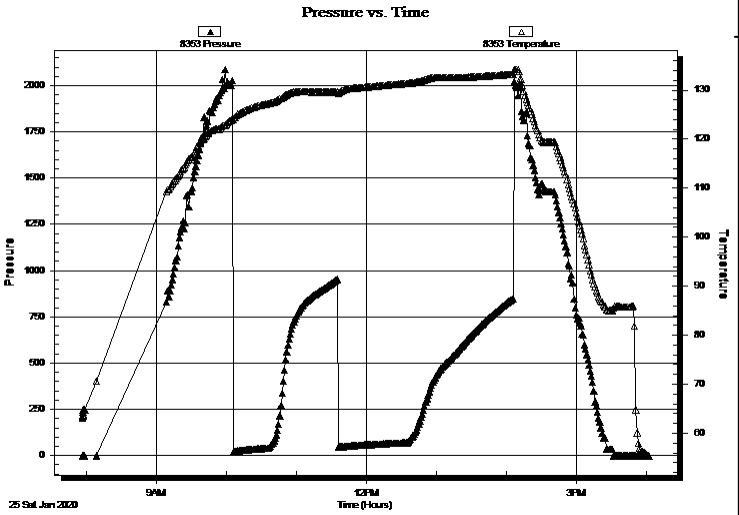
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8353 **Inside**

Press@RunDepth: psig @ 4178.00 ft (KB)
Start Date: 2020.01.25 End Date: 2020.01.25
Start Time: 07:57:01 End Time: 16:02:50

Capacity: 8000.00 psig
Last Calib.: 2020.01.25
Time On Btm:
Time Off Btm:

TEST COMMENT: 30 IF - Blow built to 4"
60 ISI - No return
60 FF - Blow built to 4 1/2"
90 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
60.00	MCO - 40%M - 60%o	0.30
100.00	GO - 5%G - 95%o	0.60

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66467 **DST#: 1**

Test Start: 2020.01.25 @ 07:57:00

Tool Information

Drill Pipe:	Length:	4011.00 ft	Diameter:	3.80 inches	Volume:	56.26 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	0.00 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	148.00 ft	Diameter:	2.25 inches	Volume:	0.73 bbl	
					Total Volume:	56.99 bbl	

Drill Pipe Above KB:	10.00 ft
Depth to Top Packer:	4177.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	79.00 ft
Tool Length:	107.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		20000.00 lb
Weight to Pull Loose:		80000.00 lb
Tool Chased		0.00 ft
String Weight:	Initial	68000.00 lb
	Final	68000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Shut In Tool	5.00			4154.00		
Hydraulic tool	5.00			4159.00		
Jars	5.00			4164.00		
Safety Joint	3.00			4167.00		
Packer	5.00			4172.00	28.00	Bottom Of Top Packer
Packer	5.00			4177.00		
Stubb	1.00			4178.00		
Recorder	0.00	8353	Inside	4178.00		
Recorder	0.00	8366	Outside	4178.00		
Perforations	11.00			4189.00		
Blank Spacing	64.00			4253.00		
Bullnose	3.00			4256.00	79.00	Bottom Packers & Anchor
Total Tool Length:	**107.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66467 **DST#: 1**

Test Start: 2020.01.25 @ 07:57:00

Mud and Cushion Information

Mud Type:	Gel Chem	Cushion Type:		Oil API:	28 deg API
Mud Weight:	9.00 lb/gal	Cushion Length:	ft	Water Salinity:	ppm
Viscosity:	57.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	5.98 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	800.00 ppm				
Filter Cake:	2.00 inches				

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
60.00	MCO - 40%M - 60%o	0.295
100.00	GO - 5%G - 95%o	0.601

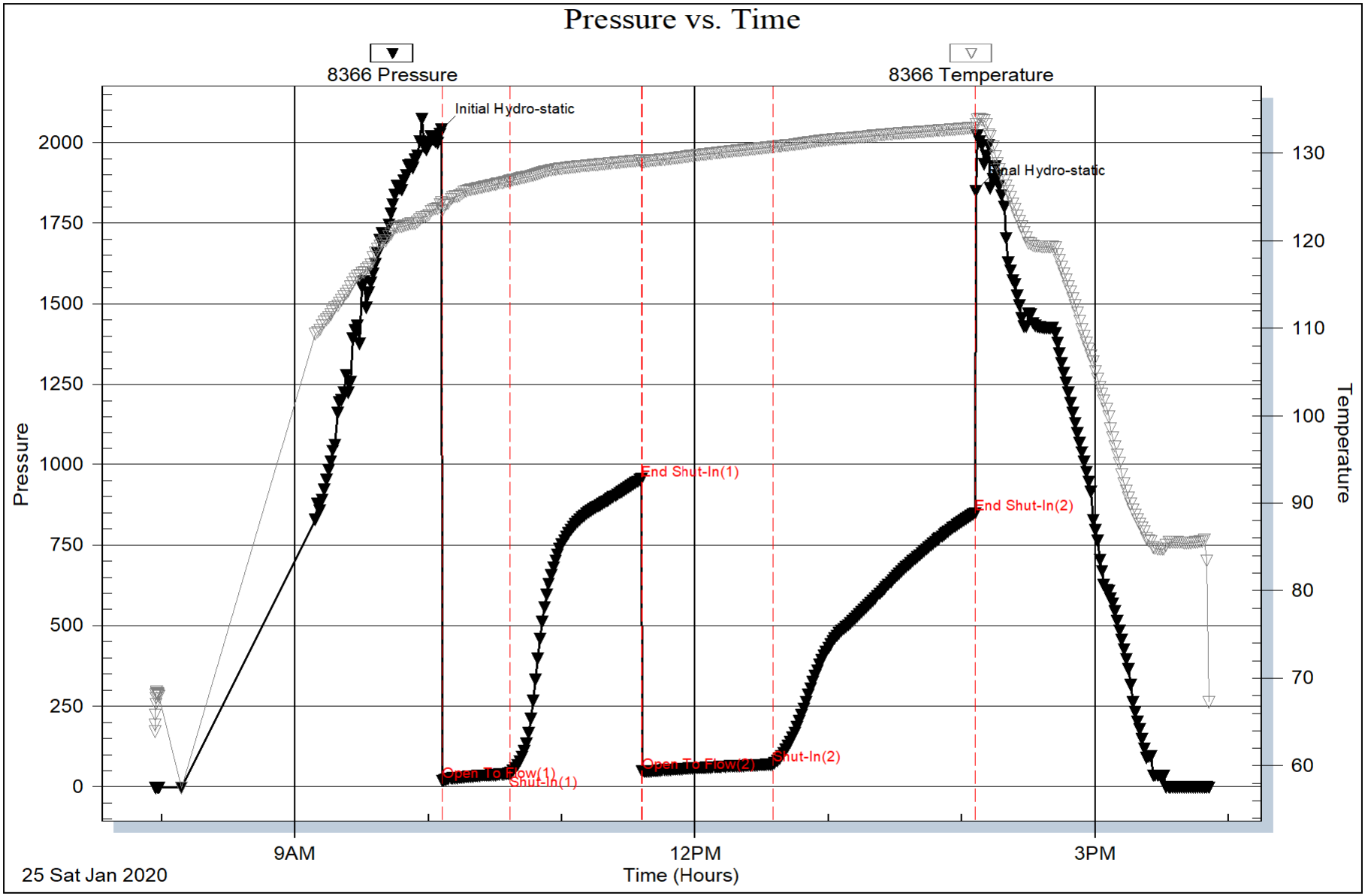
Total Length: 160.00 ft Total Volume: 0.896 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

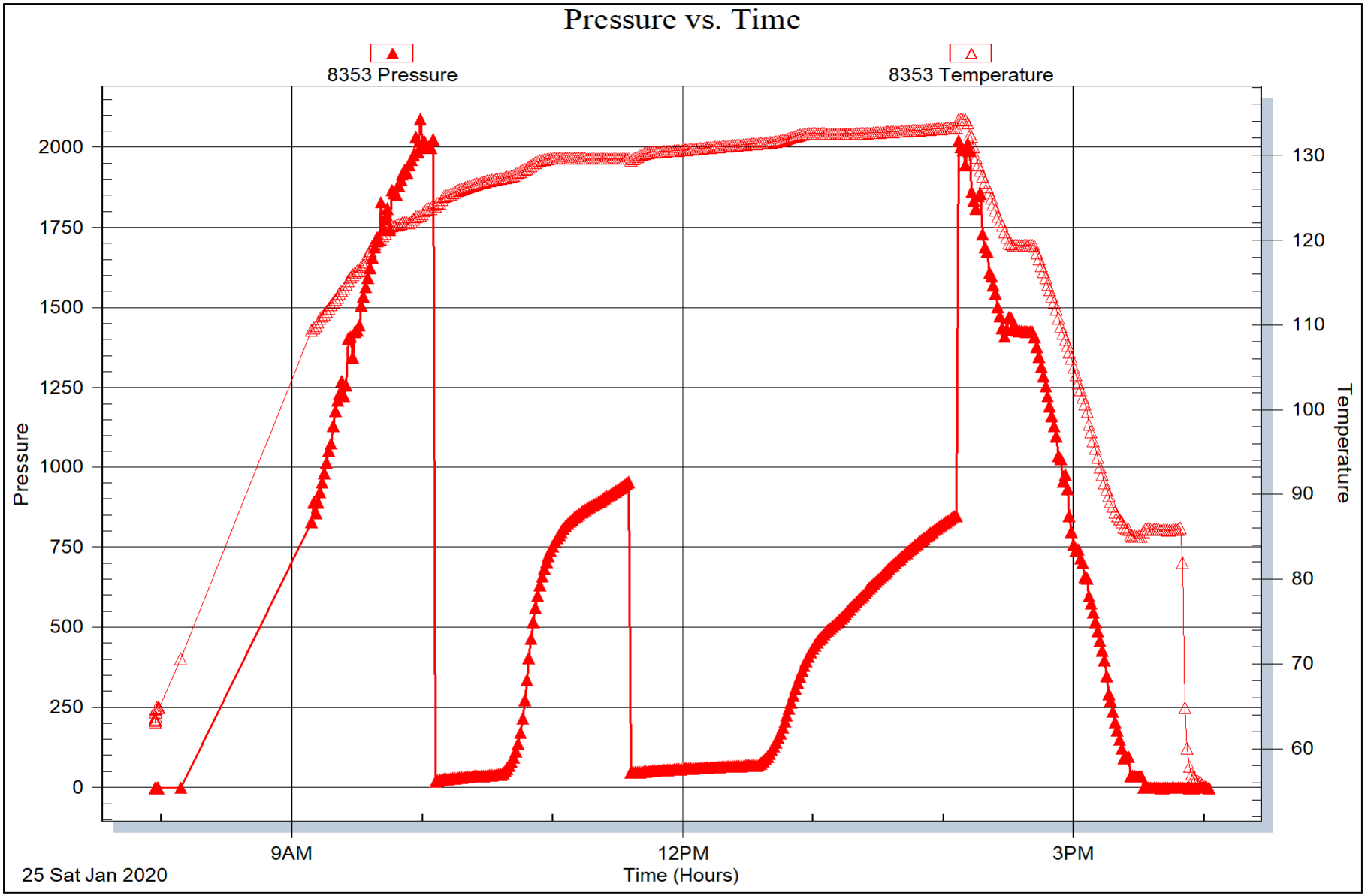
Recovery Comments: Gravity = 28 @ 60 DEG F

Serial #: 8366 **Outside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 1



Trilobite Testing, Inc Ref. No: 66467 Printed: 2020.01.30 @ 12:11:54

Serial #: 8353 **Inside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 1



Trilobite Testing, Inc Ref. No: 66467 Printed: 2020.01.30 @ 12:11:54

DRILL STEM TEST REPORT

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

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell H #2-19

19-2s-37w Cheyenne,KS

Start Date: 2020.01.26 @ 04:08:00
End Date: 2020.01.26 @ 12:18:20
Job Ticket #: 66468 DST #: 2

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

Printed: 2020.01.30 @ 12:03:57

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66468 **DST#: 2**

Test Start: 2020.01.26 @ 04:08:00

GENERAL INFORMATION:

Formation: **LKC " A "**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 06:12:30
Time Test Ended: 12:18:20

Test Type: Conventional Bottom Hole (Reset)
Tester: Ryan Nichols
Unit No: 71

Interval: 4264.00 ft (KB) To 4340.00 ft (KB) (TVD)
Total Depth: 4340.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

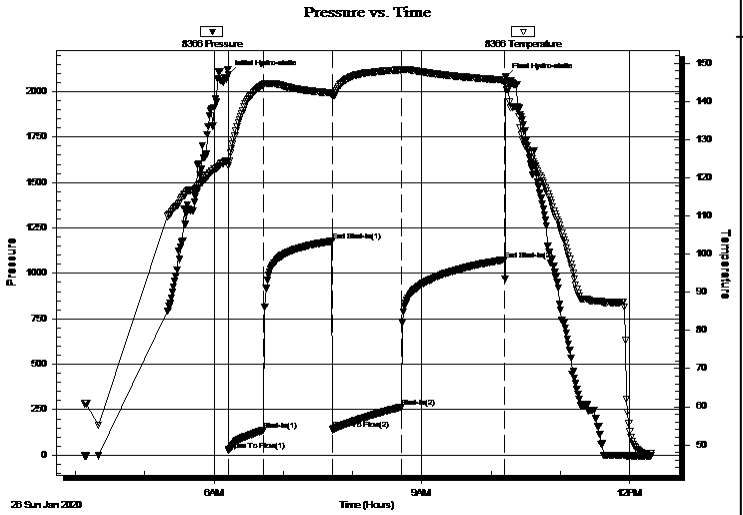
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8366 **Outside**

Press@RunDepth: 263.91 psig @ 4265.00 ft (KB)
Start Date: 2020.01.26 End Date: 2020.01.26
Start Time: 04:08:01 End Time: 12:18:20

Capacity: 8000.00 psig
Last Calib.: 2020.01.26
Time On Btm: 2020.01.26 @ 06:12:20
Time Off Btm: 2020.01.26 @ 10:12:39

TEST COMMENT: 30 IF - BoB @ 18 mins
60 ISI - No return
60 FF - BoB @ 26 mins
90 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2092.15	124.48	Initial Hydro-static
1	27.54	123.21	Open To Flow (1)
31	138.51	144.46	Shut-In(1)
90	1177.45	142.18	End Shut-In(1)
91	140.23	141.53	Open To Flow (2)
150	263.91	148.27	Shut-In(2)
240	1075.13	145.58	End Shut-In(2)
241	2079.42	144.33	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
371.00	MCW - 5%M - 95%W	3.86
126.00	MCW - 40%M - 60%W	1.77
63.00	OWCM - 10%o - 35%W - 55%M	0.88
10.00	Oil - 100%o	0.14

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66468 **DST#: 2**

Test Start: 2020.01.26 @ 04:08:00

GENERAL INFORMATION:

Formation: **LKC " A "**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 06:12:30
Time Test Ended: 12:18:20

Test Type: Conventional Bottom Hole (Reset)
Tester: Ryan Nichols
Unit No: 71

Interval: 4264.00 ft (KB) To 4340.00 ft (KB) (TVD)
Total Depth: 4340.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

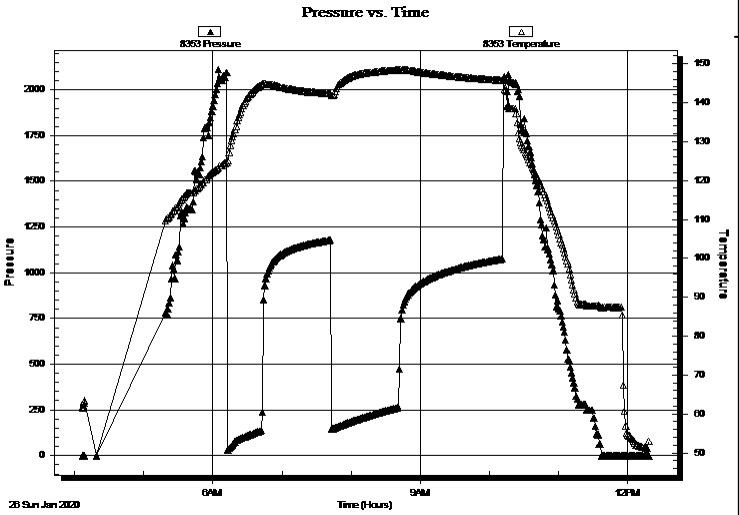
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8353 **Inside**

Press@RunDepth: psig @ 4265.00 ft (KB)
Start Date: 2020.01.26 End Date: 2020.01.26
Start Time: 04:07:01 End Time: 12:18:00

Capacity: 8000.00 psig
Last Calib.: 2020.01.26
Time On Btm:
Time Off Btm:

TEST COMMENT: 30 IF - BoB @ 18 mins
60 ISI - No return
60 FF - BoB @ 26 mins
90 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
371.00	MCW - 5%M - 95%W	3.86
126.00	MCW - 40%M - 60%W	1.77
63.00	OWCM - 10%o - 35%W - 55%M	0.88
10.00	Oil - 100%o	0.14

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66468 **DST#: 2**

Test Start: 2020.01.26 @ 04:08:00

Tool Information

Drill Pipe:	Length:	4104.00 ft	Diameter:	3.80 inches	Volume:	57.57 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	0.00 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	148.00 ft	Diameter:	2.25 inches	Volume:	0.73 bbl	
					Total Volume:	58.30 bbl	

Drill Pipe Above KB:	16.00 ft
Depth to Top Packer:	4264.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	76.00 ft
Tool Length:	104.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		20000.00 lb
Weight to Pull Loose:		80000.00 lb
Tool Chased		4.00 ft
String Weight:	Initial	68000.00 lb
	Final	68000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Shut In Tool	5.00			4241.00		
Hydraulic tool	5.00			4246.00		
Jars	5.00			4251.00		
Safety Joint	3.00			4254.00		
Packer	5.00			4259.00	28.00	Bottom Of Top Packer
Packer	5.00			4264.00		
Stubb	1.00			4265.00		
Recorder	0.00	8353	Inside	4265.00		
Recorder	0.00	8366	Outside	4265.00		
Perforations	8.00			4273.00		
Blank Spacing	64.00			4337.00		
Bullnose	3.00			4340.00	76.00	Bottom Packers & Anchor
Total Tool Length:	**104.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66468 **DST#: 2**

Test Start: 2020.01.26 @ 04:08:00

Mud and Cushion Information

Mud Type:	Gel Chem	Cushion Type:		Oil API:	28 deg API
Mud Weight:	9.00 lb/gal	Cushion Length:	ft	Water Salinity:	19000 ppm
Viscosity:	59.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	5.98 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	800.00 ppm				
Filter Cake:	2.00 inches				

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
371.00	MCW - 5%M - 95%W	3.856
126.00	MCW - 40%M - 60%W	1.767
63.00	OWCM - 10%o - 35%W - 55%M	0.884
10.00	Oil - 100%o	0.140

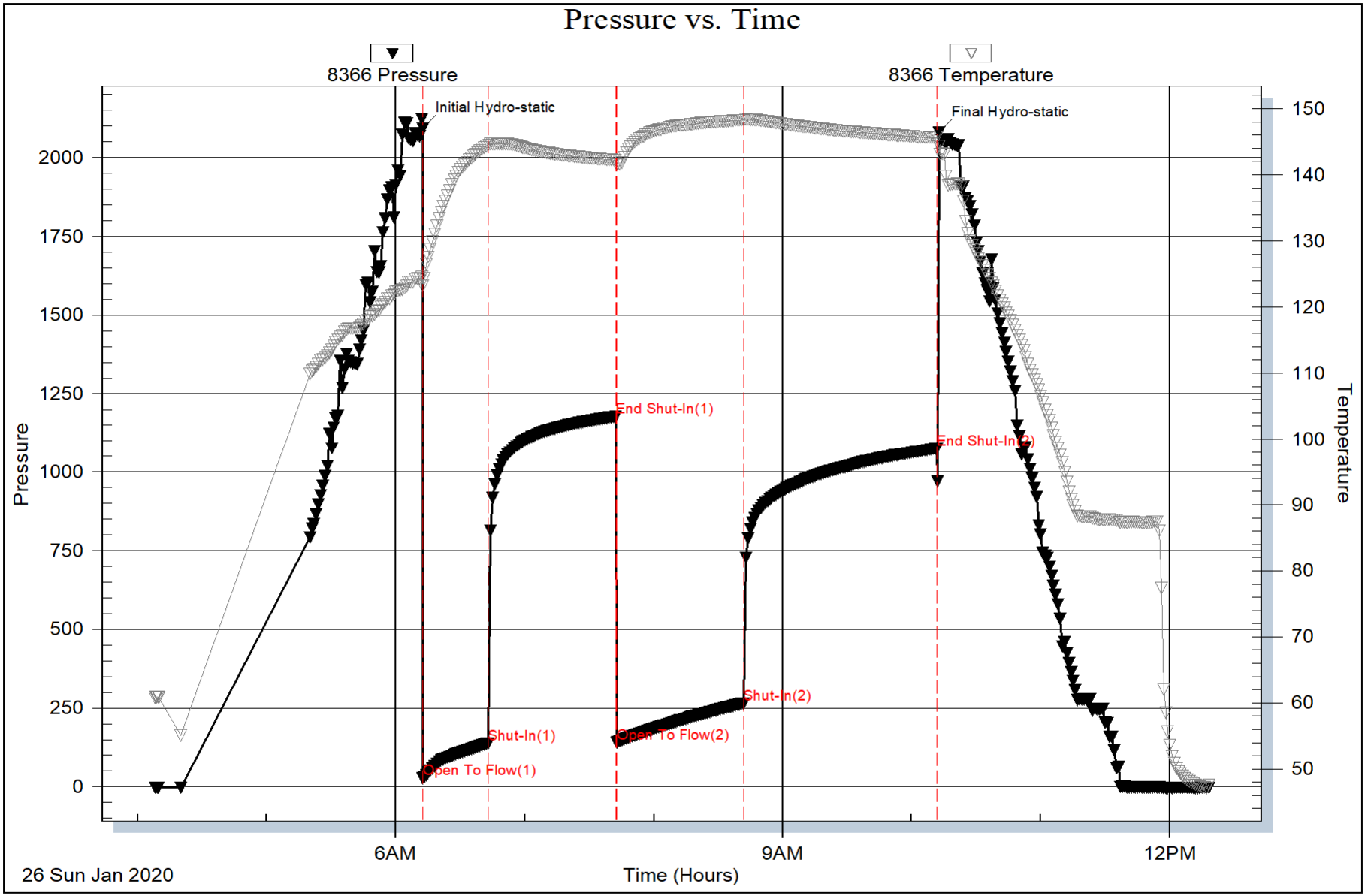
Total Length: 570.00 ft Total Volume: 6.647 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

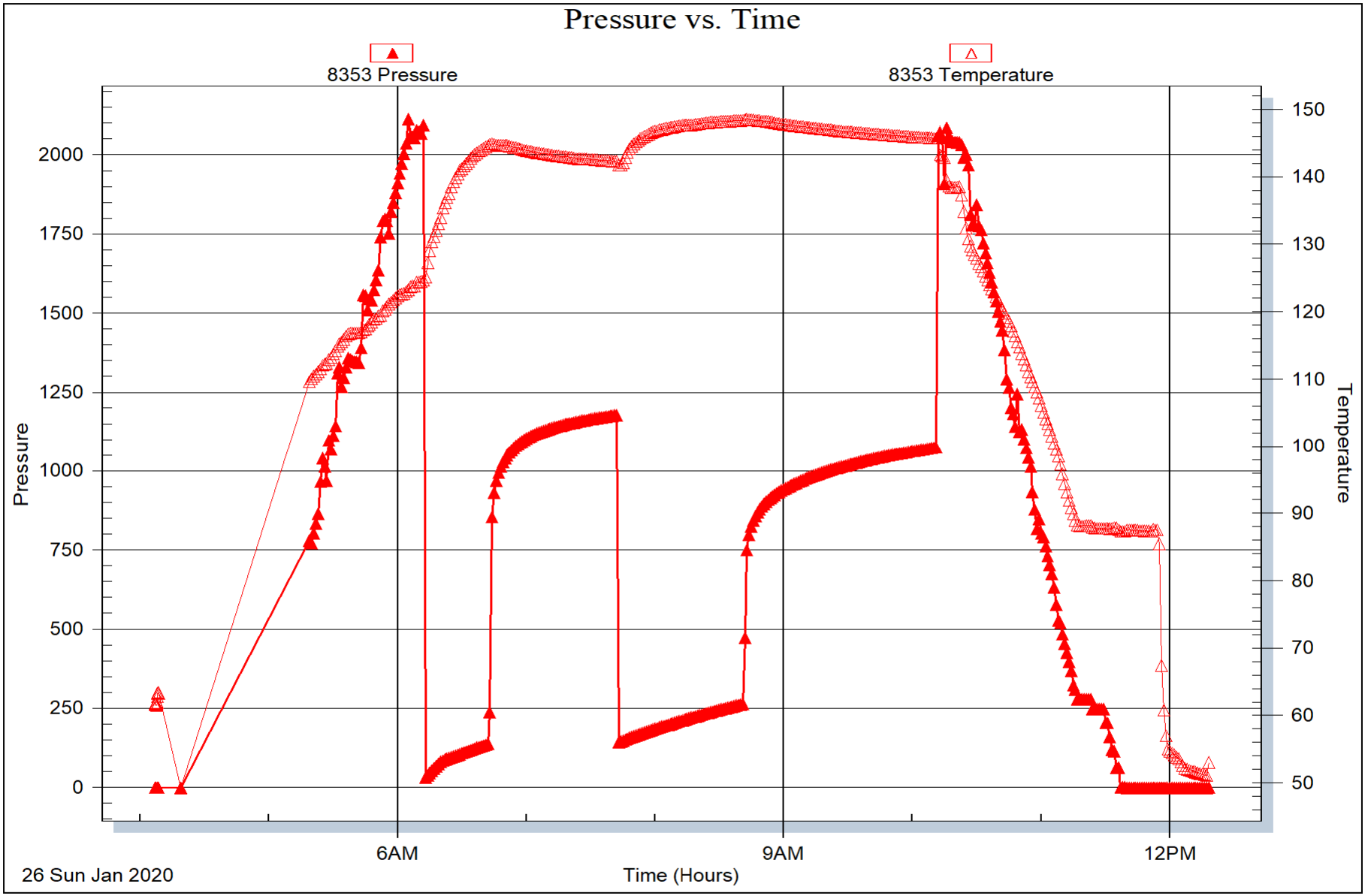
Recovery Comments: Gravity = 29 @ 70 DEG F = 28 COR 60 DEG F
RW = .443 @ 54 DEG F
Chlorides = 19,000 ppm

Serial #: 8366 **Outside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 2



Trilobite Testing, Inc Ref. No: 66468 Printed: 2020.01.30 @ 12:03:58

Serial #: 8353 **Inside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 2



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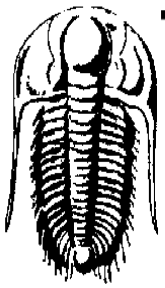


TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell H #2-19

19-2s-37w Cheyenne,KS

Start Date: 2020.01.26 @ 23:02:00
End Date: 2020.01.27 @ 06:55:39
Job Ticket #: 66469 DST #: 3

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

Printed: 2020.01.30 @ 12:03:33

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66469 **DST#: 3**

Test Start: 2020.01.26 @ 23:02:00

GENERAL INFORMATION:

Formation: **LKC " D "**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 00:59:10
Time Test Ended: 06:55:39

Test Type: Conventional Bottom Hole (Reset)
Tester: Ryan Nichols
Unit No: 71

Interval: 4330.00 ft (KB) To 4404.00 ft (KB) (TVD)
Total Depth: 4404.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

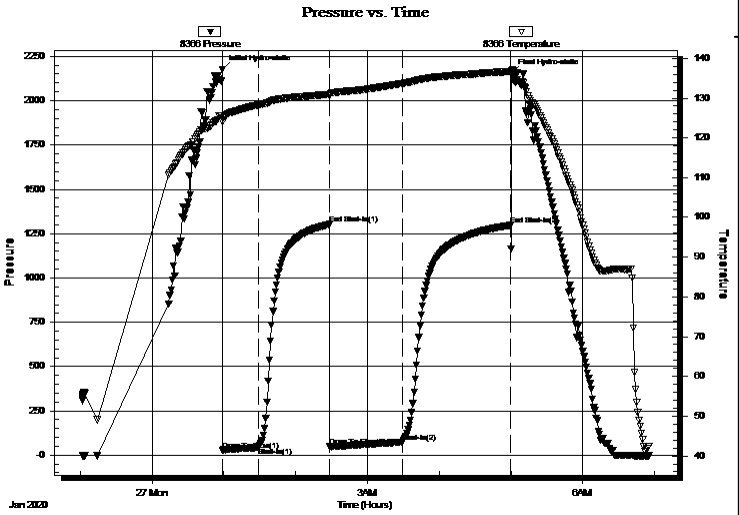
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8366 **Outside**

Press@RunDepth: 73.32 psig @ 4331.00 ft (KB)
Start Date: 2020.01.26 End Date: 2020.01.27
Start Time: 23:02:01 End Time: 06:55:40

Capacity: 8000.00 psig
Last Calib.: 2020.01.27
Time On Btm: 2020.01.27 @ 00:59:00
Time Off Btm: 2020.01.27 @ 05:00:30

TEST COMMENT: 30 IF - Slide 5', 1 1/2" blow built to 4"
60 ISI - No return
60 FF - Surface blow built to 2"
90 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2176.42	125.01	Initial Hydro-static
1	28.91	124.16	Open To Flow (1)
30	43.29	128.32	Shut-In(1)
90	1302.49	130.95	End Shut-In(1)
90	47.70	130.74	Open To Flow (2)
150	73.32	133.68	Shut-In(2)
241	1296.63	136.68	End Shut-In(2)
242	2154.51	137.02	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
60.00	OCM - 10%o - 90%M	0.30
60.00	OCM - 20%o - 80%M	0.30
5.00	MCO - 90%o - 10%M	0.02

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66469 **DST#: 3**

Test Start: 2020.01.26 @ 23:02:00

GENERAL INFORMATION:

Formation: **LKC " D "**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 00:59:10
Time Test Ended: 06:55:39

Test Type: Conventional Bottom Hole (Reset)
Tester: Ryan Nichols
Unit No: 71

Interval: 4330.00 ft (KB) To 4404.00 ft (KB) (TVD)
Total Depth: 4404.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

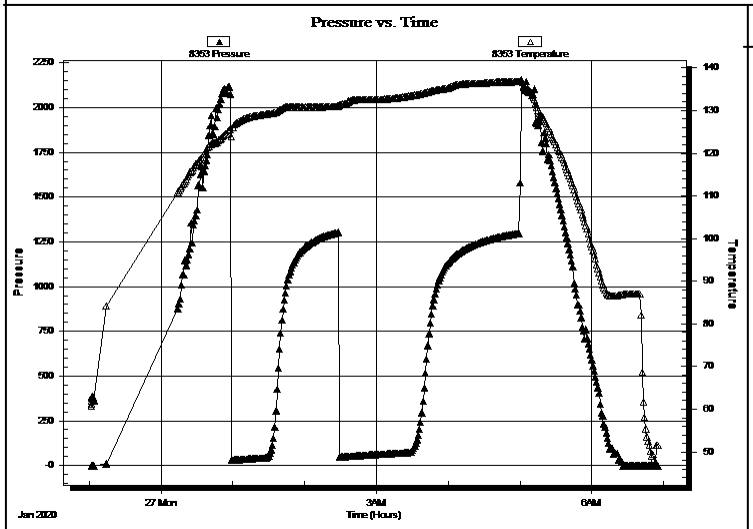
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8353 **Inside**

Press@RunDepth: psig @ 4331.00 ft (KB)
Start Date: 2020.01.26 End Date: 2020.01.27
Start Time: 23:02:01 End Time: 06:55:40

Capacity: 8000.00 psig
Last Calib.: 2020.01.27
Time On Btm:
Time Off Btm:

TEST COMMENT: 30 IF - Slide 5', 1 1/2" blow built to 4"
60 ISI - No return
60 FF - Surface blow built to 2"
90 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
60.00	OCM - 10%o - 90%M	0.30
60.00	OCM - 20%o - 80%M	0.30
5.00	MCO - 90%o - 10%M	0.02

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66469 **DST#: 3**

Test Start: 2020.01.26 @ 23:02:00

Tool Information

Drill Pipe:	Length:	4169.00 ft	Diameter:	3.80 inches	Volume:	58.48 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	0.00 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	148.00 ft	Diameter:	2.25 inches	Volume:	0.73 bbl	
					Total Volume:	59.21 bbl	

Drill Pipe Above KB:	15.00 ft
Depth to Top Packer:	4330.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	72.00 ft
Tool Length:	100.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		20000.00 lb
Weight to Pull Loose:		85000.00 lb
Tool Chased		5.00 ft
String Weight:	Initial	68000.00 lb
	Final	68000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Shut In Tool	5.00			4307.00		
Hydraulic tool	5.00			4312.00		
Jars	5.00			4317.00		
Safety Joint	3.00			4320.00		
Packer	5.00			4325.00	28.00	Bottom Of Top Packer
Packer	5.00			4330.00		
Stubb	1.00			4331.00		
Recorder	0.00	8353	Inside	4331.00		
Recorder	0.00	8366	Outside	4331.00		
Perforations	4.00			4335.00		
Blank Spacing	64.00			4399.00		
Bullnose	3.00			4402.00	72.00	Bottom Packers & Anchor
Total Tool Length:	**100.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66469 **DST#: 3**

Test Start: 2020.01.26 @ 23:02:00

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:	56.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	6.39 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	1000.00 ppm				
Filter Cake:	2.00 inches				

Recovery Information

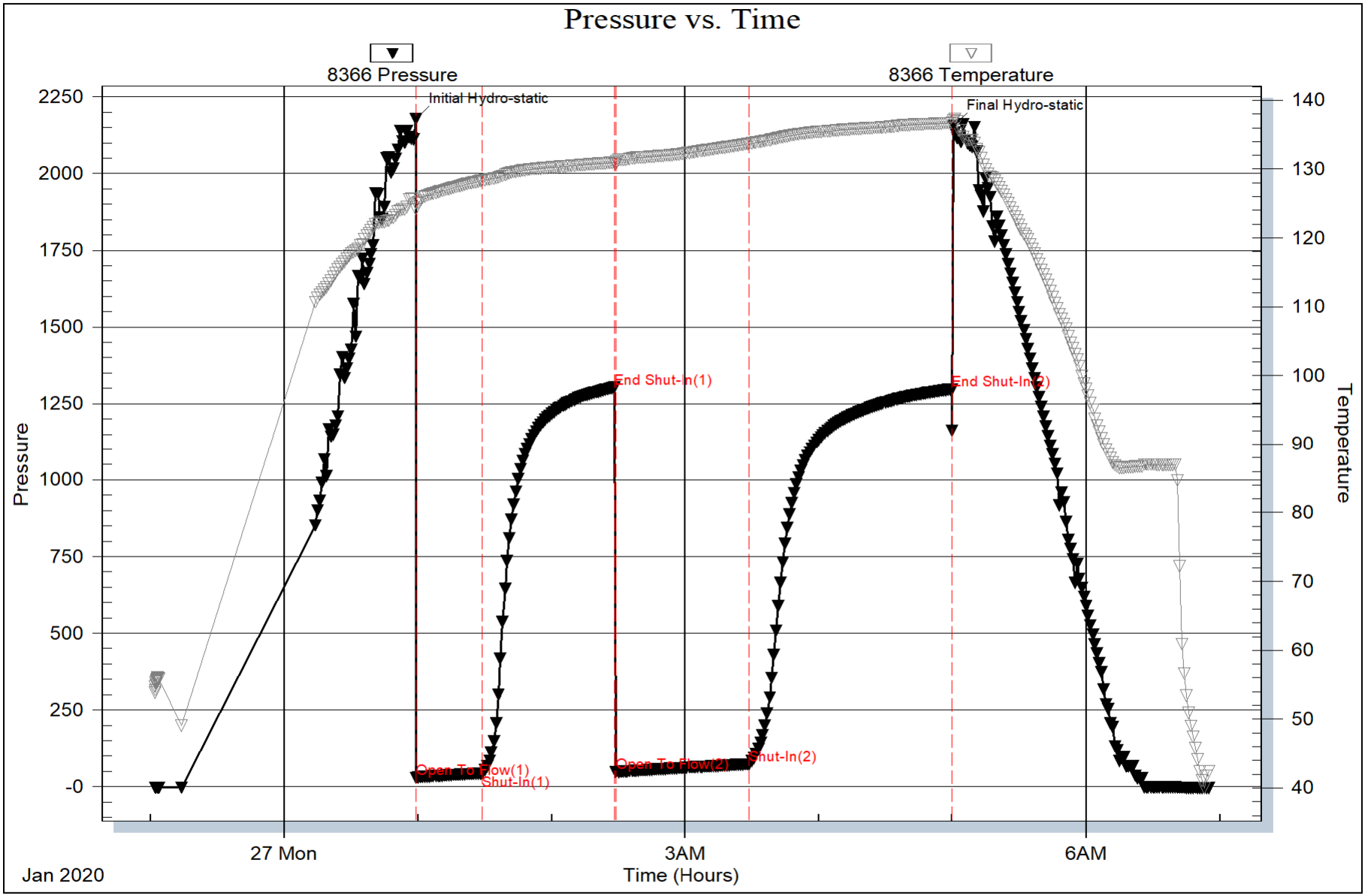
Recovery Table

Length ft	Description	Volume bbl
60.00	OCM - 10%o - 90%M	0.295
60.00	OCM - 20%o - 80%M	0.295
5.00	MCO - 90%o - 10%M	0.025

Total Length: 125.00 ft Total Volume: 0.615 bbl

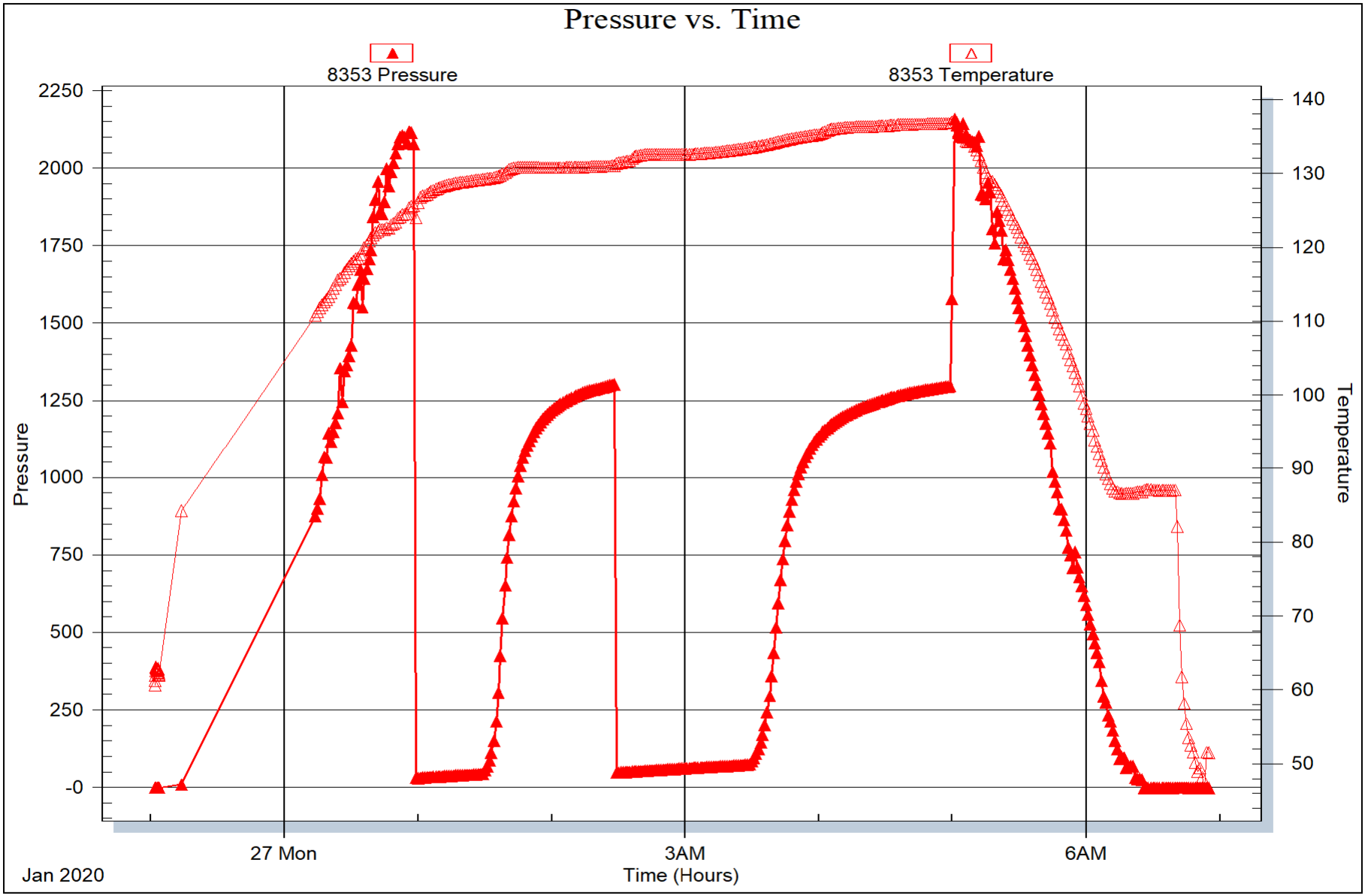
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8366 **Outside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 3



Trilobite Testing, Inc Ref. No: 66469 Printed: 2020.01.30 @ 12:03:34

Serial #: 8353 **Inside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 3



Trilobite Testing, Inc Ref. No: 66469 Printed: 2020.01.30 @ 12:03:34

DRILL STEM TEST REPORT

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

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell H #2-19

19-2s-37w Cheyenne,KS

Start Date: 2020.01.27 @ 15:16:00
End Date: 2020.01.27 @ 22:30:38
Job Ticket #: 66470 DST #: 4

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

Printed: 2020.01.30 @ 12:02:56

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66470 **DST#: 4**

Test Start: 2020.01.27 @ 15:16:00

GENERAL INFORMATION:

Formation: **LKC " G "**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 17:21:00
Time Test Ended: 22:30:38

Test Type: Conventional Bottom Hole (Reset)
Tester: Ryan Nichols
Unit No: 71

Interval: 4400.00 ft (KB) To 4442.00 ft (KB) (TVD)
Total Depth: 4442.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

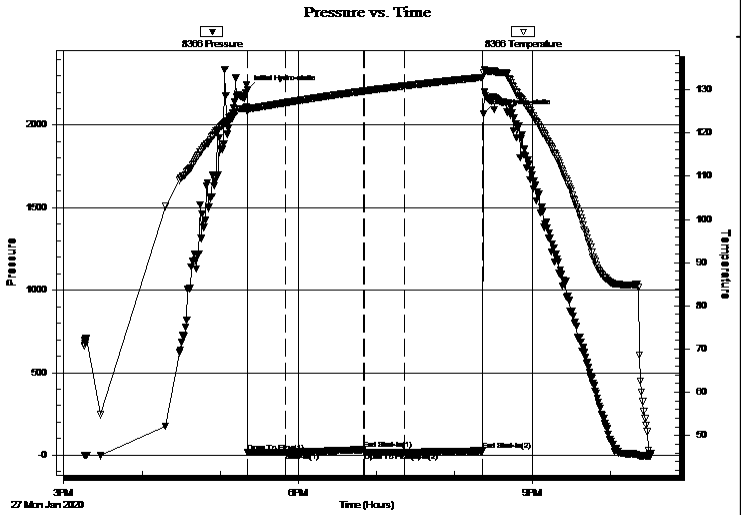
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8366 **Outside**

Press@RunDepth: 17.96 psig @ 4401.00 ft (KB)
Start Date: 2020.01.27 End Date: 2020.01.27
Start Time: 15:16:01 End Time: 22:30:38

Capacity: 8000.00 psig
Last Calib.: 2020.01.27
Time On Btm: 2020.01.27 @ 17:20:50
Time Off Btm: 2020.01.27 @ 20:22:00

TEST COMMENT: 30 IF - 1/4" blow built to 1" died back to 1/4"
60 ISI - No return
30 FF - No blow
60 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2213.15	125.78	Initial Hydro-static
1	15.37	124.99	Open To Flow (1)
30	17.03	127.00	Shut-In(1)
90	34.13	129.68	End Shut-In(1)
90	17.02	129.69	Open To Flow (2)
121	17.96	130.89	Shut-In(2)
181	26.80	132.87	End Shut-In(2)
182	2067.05	133.84	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud 100%M	0.02

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66470 **DST#: 4**

Test Start: 2020.01.27 @ 15:16:00

GENERAL INFORMATION:

Formation: **LKC " G "**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 17:21:00
Time Test Ended: 22:30:38

Test Type: Conventional Bottom Hole (Reset)
Tester: Ryan Nichols
Unit No: 71

Interval: 4400.00 ft (KB) To 4442.00 ft (KB) (TVD)
Total Depth: 4442.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

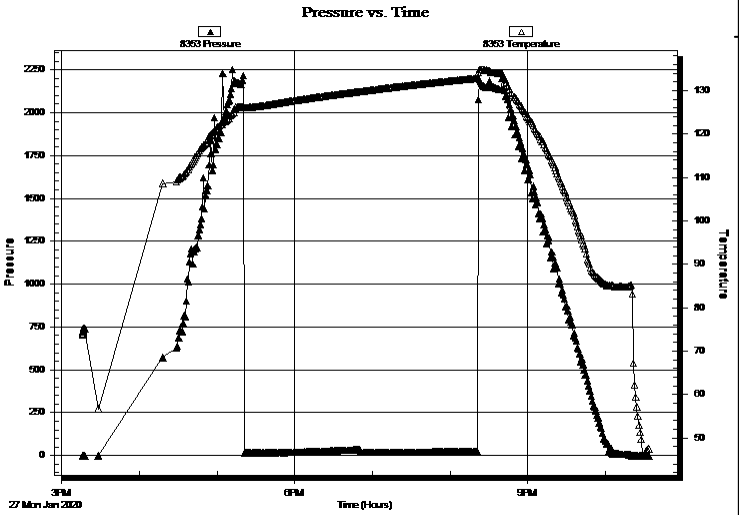
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8353 **Inside**

Press@RunDepth: psig @ 4401.00 ft (KB)
Start Date: 2020.01.27 End Date: 2020.01.27
Start Time: 15:16:01 End Time: 22:34:10

Capacity: 8000.00 psig
Last Calib.: 2020.01.27
Time On Btm:
Time Off Btm:

TEST COMMENT: 30 IF - 1/4" blow built to 1" died back to 1/4"
60 ISI - No return
30 FF - No blow
60 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud 100%M	0.02

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66470 **DST#: 4**

Test Start: 2020.01.27 @ 15:16:00

Tool Information

Drill Pipe:	Length:	4232.00 ft	Diameter:	3.80 inches	Volume:	59.36 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	0.00 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	148.00 ft	Diameter:	2.25 inches	Volume:	0.73 bbl	
					Total Volume:	60.09 bbl	

Drill Pipe Above KB:	8.00 ft
Depth to Top Packer:	4400.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	42.00 ft
Tool Length:	70.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		20000.00 lb
Weight to Pull Loose:		90000.00 lb
Tool Chased		0.00 ft
String Weight:	Initial	68000.00 lb
	Final	68000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Shut In Tool	5.00			4377.00		
Hydraulic tool	5.00			4382.00		
Jars	5.00			4387.00		
Safety Joint	3.00			4390.00		
Packer	5.00			4395.00	28.00	Bottom Of Top Packer
Packer	5.00			4400.00		
Stubb	1.00			4401.00		
Recorder	0.00	8353	Inside	4401.00		
Recorder	0.00	8366	Outside	4401.00		
Perforations	5.00			4406.00		
Blank Spacing	33.00			4439.00		
Bullnose	3.00			4442.00	42.00	Bottom Packers & Anchor
Total Tool Length:	**70.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66470 **DST#: 4**

Test Start: 2020.01.27 @ 15:16:00

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:	62.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	6.39 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	1000.00 ppm				
Filter Cake:	2.00 inches				

Recovery Information

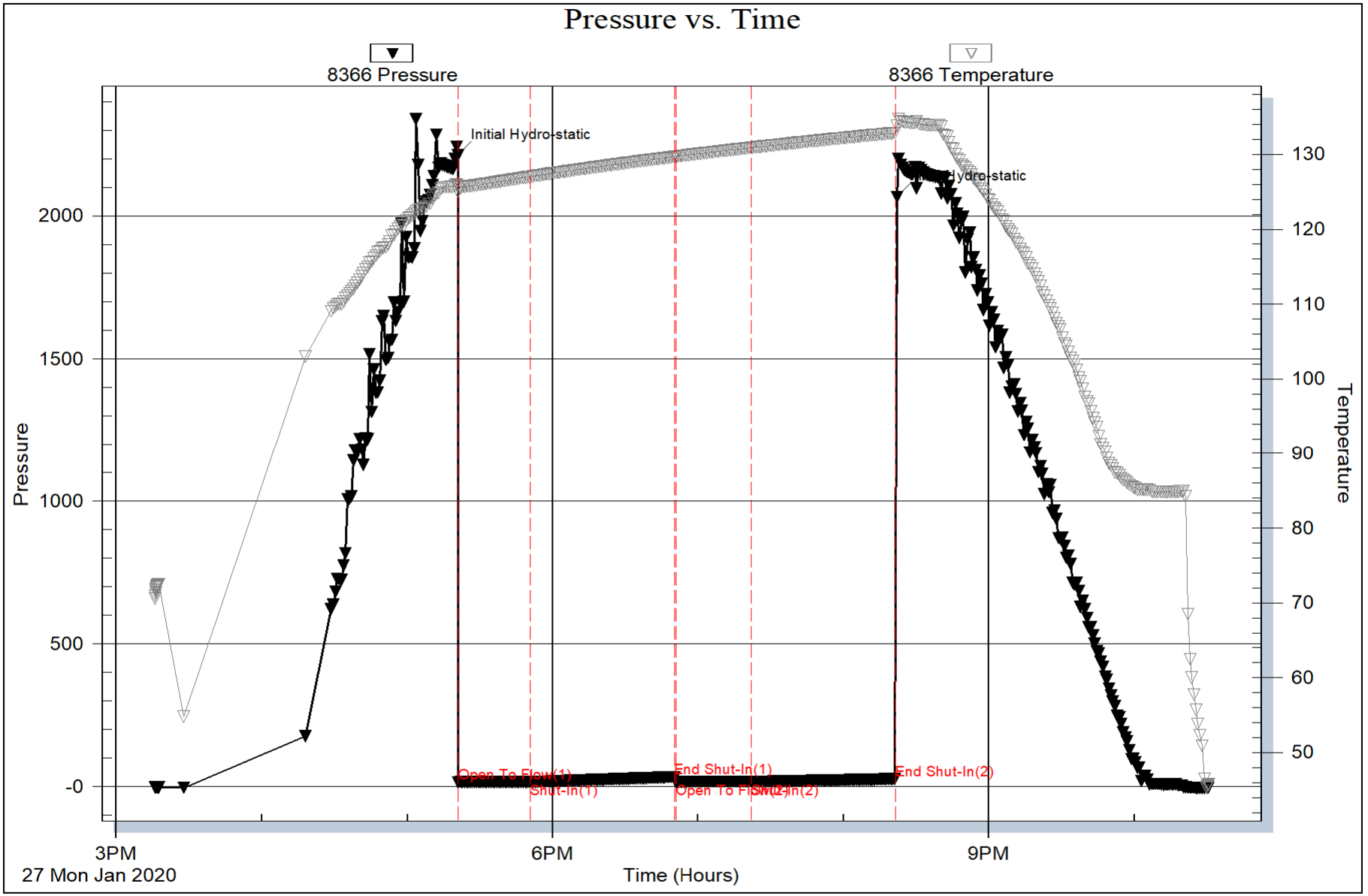
Recovery Table

Length ft	Description	Volume bbl
5.00	Mud 100%M	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

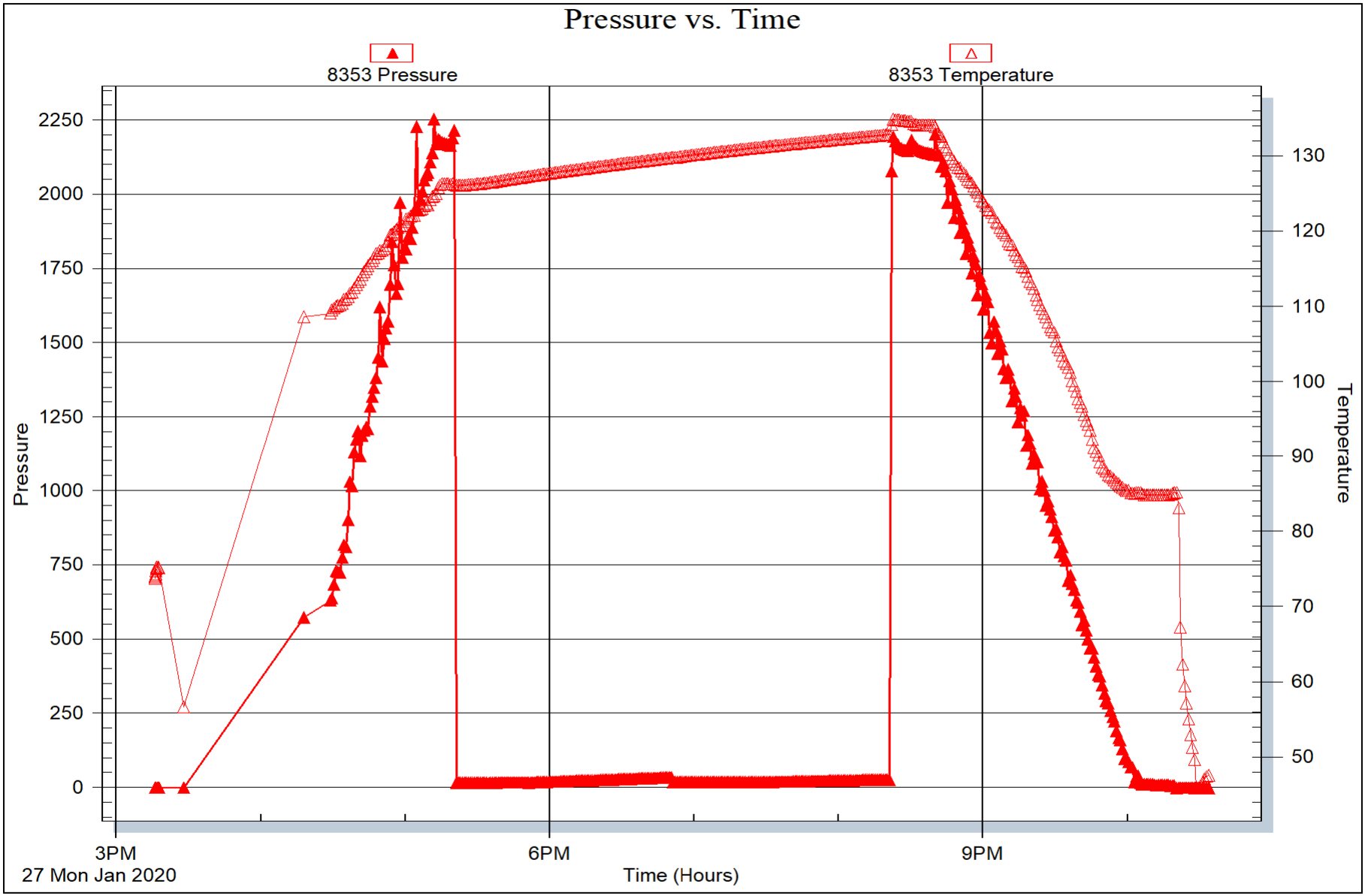
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8366 **Outside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 4



Trilobite Testing, Inc Ref. No: 66470 Printed: 2020.01.30 @ 12:02:57

Serial #: 8353 **Inside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 4



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DRILL STEM TEST REPORT

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

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell H #2-19

19-2s-37w Cheyenne,KS

Start Date: 2020.01.29 @ 23:33:00
End Date: 2020.01.30 @ 08:29:10
Job Ticket #: 66471 DST #: 5

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

Printed: 2020.01.30 @ 12:02:30

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66471 **DST#: 5**

Test Start: 2020.01.29 @ 23:33:00

GENERAL INFORMATION:

Formation: **Ft. Scott - Celia**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 02:00:50
Time Test Ended: 08:29:10

Test Type: Conventional Bottom Hole (Reset)
Tester: Ryan Nichols
Unit No: 71

Interval: 4681.00 ft (KB) To 4630.00 ft (KB) (TVD)
Total Depth: 4830.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

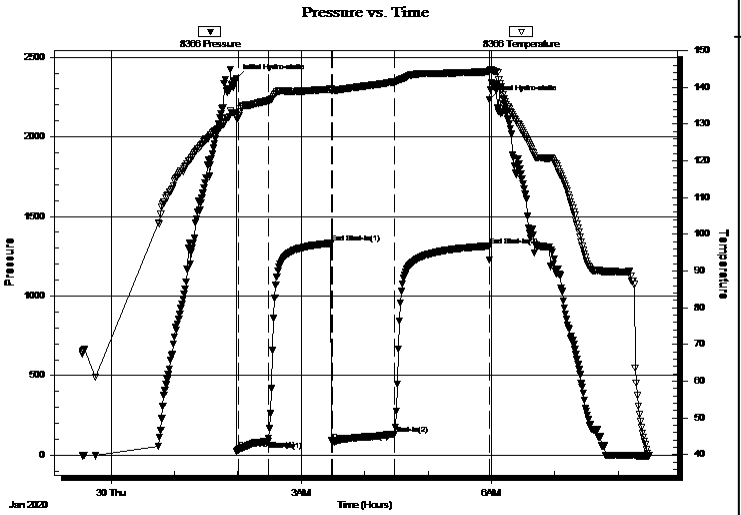
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8366 **Outside**

Press@RunDepth: 131.47 psig @ 4682.00 ft (KB)
Start Date: 2020.01.29 End Date: 2020.01.30
Start Time: 23:33:01 End Time: 08:29:10

Capacity: 8000.00 psig
Last Calib.: 2020.01.30
Time On Btm: 2020.01.30 @ 01:58:30
Time Off Btm: 2020.01.30 @ 05:58:10

TEST COMMENT: 30 IF - BoB @ 20 mins
60 ISI - Surface return
60 FF - BoB @ 16 mins
90 FSI - Surface return built to 2 1/2"



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2366.96	132.23	Initial Hydro-static
3	34.63	132.13	Open To Flow (1)
30	87.75	136.32	Shut-In(1)
90	1331.94	139.46	End Shut-In(1)
91	88.17	139.12	Open To Flow (2)
150	131.47	141.45	Shut-In(2)
240	1314.52	144.19	End Shut-In(2)
240	2234.47	144.58	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
245.00	OCM - 35%o - 65%M	2.09
65.00	OCM - 50%o - 50%M	0.91
0.00	378' GIP	0.00

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66471 **DST#: 5**

Test Start: 2020.01.29 @ 23:33:00

GENERAL INFORMATION:

Formation: **Ft. Scott - Celia**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 02:00:50
Time Test Ended: 08:29:10

Test Type: Conventional Bottom Hole (Reset)
Tester: Ryan Nichols
Unit No: 71

Interval: 4681.00 ft (KB) To 4630.00 ft (KB) (TVD)
Total Depth: 4830.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

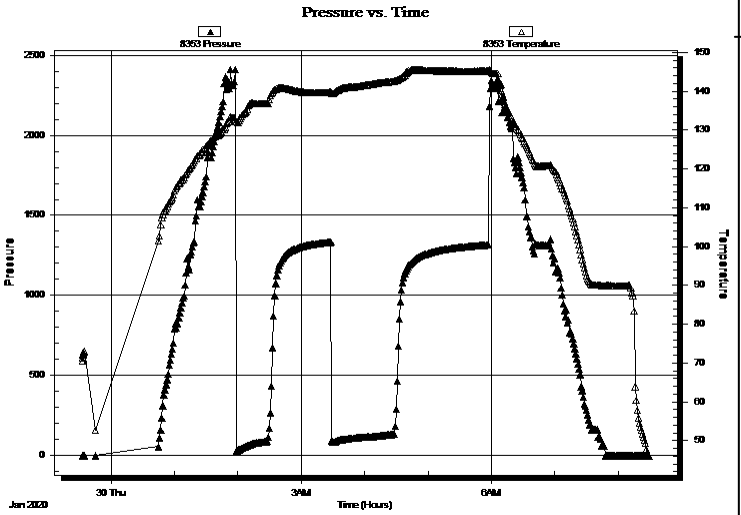
Reference Elevations: 3401.00 ft (KB)
3396.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 8353 **Inside**

Press@RunDepth: psig @ 4682.00 ft (KB)
Start Date: 2020.01.29 End Date: 2020.01.30
Start Time: 23:33:01 End Time: 08:29:10

Capacity: 8000.00 psig
Last Calib.: 2020.01.30
Time On Btm:
Time Off Btm:

TEST COMMENT: 30 IF - BoB @ 20 mins
60 ISI - Surface return
60 FF - BoB @ 16 mins
90 FSI - Surface return built to 2 1/2"



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
245.00	OCM - 35%o - 65%M	2.09
65.00	OCM - 50%o - 50%M	0.91
0.00	378' GIP	0.00

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66471 **DST#: 5**

Test Start: 2020.01.29 @ 23:33:00

Tool Information

Drill Pipe:	Length:	4513.00 ft	Diameter:	3.80 inches	Volume:	63.31 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	0.00 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	148.00 ft	Diameter:	2.25 inches	Volume:	0.73 bbl	
					Total Volume:	64.04 bbl	

Drill Pipe Above KB:	8.00 ft
Depth to Top Packer:	4681.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	149.00 ft
Tool Length:	177.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		20000.00 lb
Weight to Pull Loose:		95000.00 lb
Tool Chased		0.00 ft
String Weight:	Initial	68000.00 lb
	Final	70000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Shut In Tool	5.00			4658.00		
Hydraulic tool	5.00			4663.00		
Jars	5.00			4668.00		
Safety Joint	3.00			4671.00		
Packer	5.00			4676.00	28.00	Bottom Of Top Packer
Packer	5.00			4681.00		
Stubb	1.00			4682.00		
Recorder	0.00	8353	Inside	4682.00		
Recorder	0.00	8366	Outside	4682.00		
Perforations	18.00			4700.00		
Blank Spacing	127.00			4827.00		
Bullnose	3.00			4830.00	149.00	Bottom Packers & Anchor
Total Tool Length:	**177.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

19-2s-37w Cheyenne,KS

Culwell H #2-19

Job Ticket: 66471 **DST#: 5**

Test Start: 2020.01.29 @ 23:33:00

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:	64.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	5.99 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	800.00 ppm				
Filter Cake:	2.00 inches				

Recovery Information

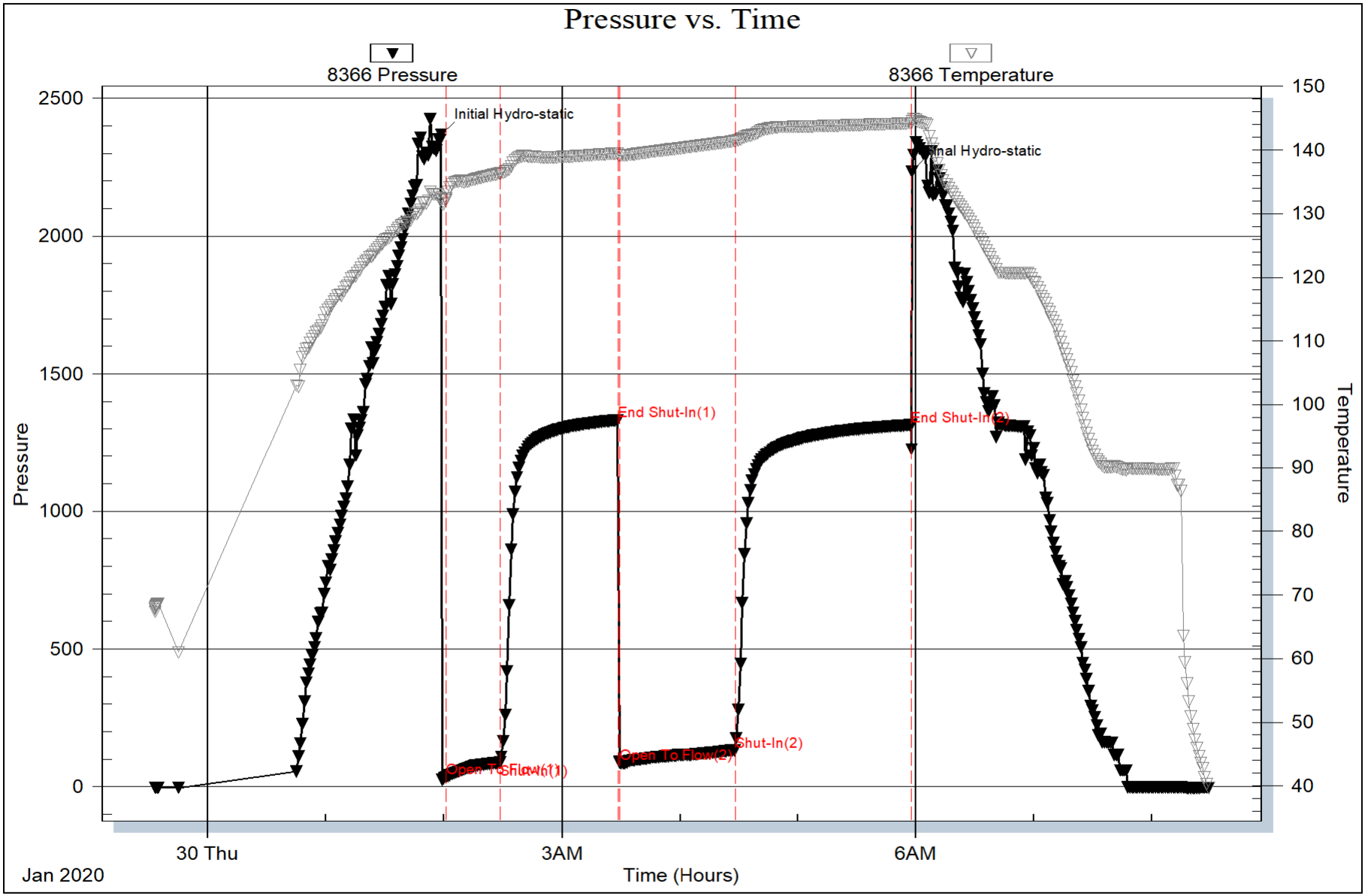
Recovery Table

Length ft	Description	Volume bbl
245.00	OCM - 35%o - 65%M	2.088
65.00	OCM - 50%o - 50%M	0.912
0.00	378' GIP	0.000

Total Length: 310.00 ft Total Volume: 3.000 bbl

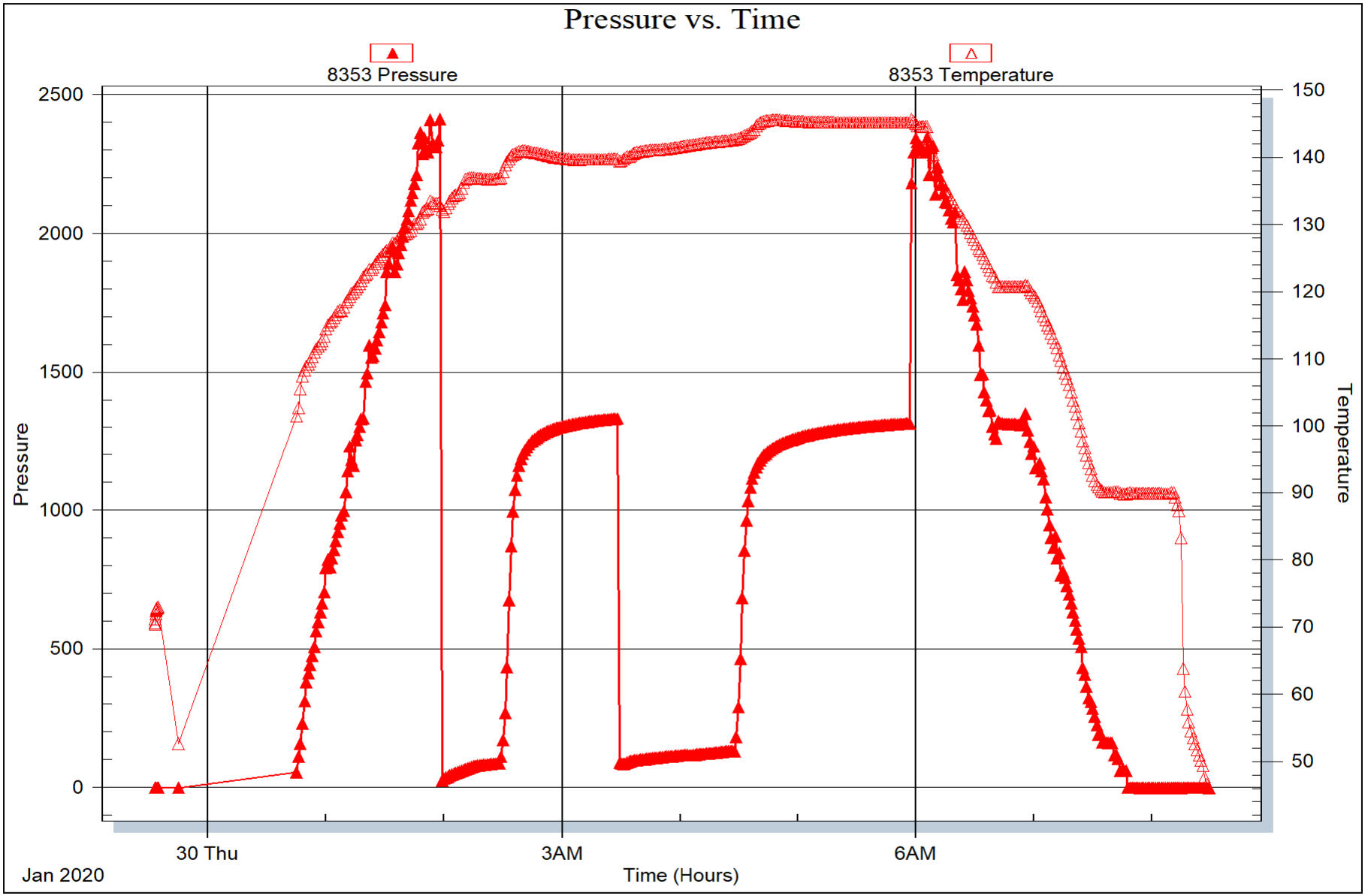
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8366 **Outside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 5



Trilobite Testing, Inc Ref. No: 66471 Printed: 2020.01.30 @ 12:02:31

Serial #: 8353 **Inside** Murfin Drilling Co. Inc. Culw ell H #2-19 DST Test Number: 5



Trilobite Testing, Inc Ref. No: 66471 Printed: 2020.01.30 @ 12:02:31

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket 66467

NO.

Well Name & No. Culwell # #2-19 Test No. 1 Date 1/25/20

Company Murfin Drilling Co. Inc. Elevation 3401 KB 3396 GL

Address 250 N. Water STE 300 Wichita KS 67202

Co. Rep / Geo. Robert Hendrix Rig Murfin #3

Location: Sec. 19 Twp 2S Rge. 37W Co. Cheyenne State KS

Interval Tested 4177 - 4256 Zone Tested Oread

Anchor Length 79' Drill Pipe Run 4011' Mud Wt. 8.8

Top Packer Depth 4172 Drill Collars Run 148' Vis 57

Bottom Packer Depth 4177 Wt. Pipe Run 0' WL 6.0

Total Depth 4256 Chlorides 800 ppm System LCM 3

Blow Description 30 IF - Blow built to 4"

60 ISI - No return

60 FF - Blow built to 4 1/2"

90 FSI - No return

Rec 100'	Feet of GO	5 %gas	95 %oil	%water	%mud	
Rec 60'	Feet of MCO	%gas	60 %oil	%water 40	%mud	
Rec	Feet of	%gas	%oil	%water	%mud	
Rec	Feet of	%gas	%oil	%water	%mud	
Rec	Feet of	%gas	%oil	%water	%mud	

Rec Total 160' BHT 133° Gravity 28 @ 60°F API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2040

(B) First Initial Flow 18

(C) First Final Flow 41

(D) Initial Shut-In 953

(E) Second Initial Flow 47

(F) Second Final Flow 69

(G) Final Shut-In 848

(H) Final Hydrostatic 1849

Initial Open 30

Initial Shut-In 60

Final Flow 60

Final Shut-In 90

- ☑ Test 1300
- ☑ Jars 250
- ☑ Safety Joint 75
- ☐ Circ Sub
- ☐ Hourly Standby
- ☑ Mileage 130 RT 130
- ☐ Sampler
- ☐ Straddle
- ☐ Shale Packer
- ☐ Extra Packer
- ☐ Extra Recorder
- ☐ Day Standby
- ☐ Accessibility

Sub Total 1755

T-On Location 07:00

T-Started 07:57

T-Open 10:06

T-Pulled 14:06

T-Out 16:00

Comments

- ☐ EM Tool
- ☐ Ruined Shale Packer
- ☐ Ruined Packer
- ☐ Extra Copies

Sub Total 0

Total 1755

MP/DST Disc't

Approved By Our Representative Ryan Nicholas

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket 66468

NO.

Well Name & No. Culwell # #2-19 Test No. 2 Date 1/26/20

Company Murfin Drilling Co. Inc. Elevation 3401 KB 3396 GL

Address 250 N. Water STE 300 Wichita KS 67202

Co. Rep / Geo. Robert Hendrix Rig Murfin #3

Location: Sec. 19 Twp 25 Rge. 37 W Co. Cheyenne State KS

Interval Tested 4264 - 4340 Zone Tested LKC "A"

Anchor Length 76' Drill Pipe Run 4104' Mud Wt. 8.8

Top Packer Depth 4259 Drill Collars Run 148' Vis 59

Bottom Packer Depth 4264 Wt. Pipe Run 0 WL 6.0

Total Depth 4340 Chlorides 600 ppm System LCM 2

Blow Description 30 IF - BoB @ 18 mins

60 ISI - No return

60 FF - BoB @ 26 mins

90 FSI -

Rec 10'	Feet of Oil	%gas 100	%oil	%water	%mud
Rec 63'	Feet of OWCM	%gas 10	%oil 35	%water 55	%mud
Rec 126'	Feet of [redacted] MCW	%gas	%oil 60	%water 40	%mud
Rec 371'	Feet of MCW	%gas	%oil 95	%water 5	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 570' BHT 146° Gravity 28 CAL 60 °API RW .443 @ 54 °F Chlorides 19,000 ppm

(A) Initial Hydrostatic	2092	☑ Test	1300	T-On Location	03:35
(B) First Initial Flow	28	☑ Jars	250	T-Started	04:08
(C) First Final Flow	139	☑ Safety Joint	75	T-Open	06:12
(D) Initial Shut-In	1177	☐ Circ Sub		T-Pulled	10:12
(E) Second Initial Flow	140	☐ Hourly Standby		T-Out	12:15
(F) Second Final Flow	264	☑ Mileage	130 RT 130	Comments	[redacted]
(G) Final Shut-In	1075	☐ Sampler			
(H) Final Hydrostatic	2079	☐ Straddle			
		☐ Shale Packer		☐ EM Tool	
Initial Open	30	☐ Extra Packer		☐ Ruined Shale Packer	
Initial Shut-In	60	☐ Extra Recorder		☐ Ruined Packer	
Final Flow	60	☐ Day Standby		☐ Extra Copies	
Final Shut-In	90	☐ Accessibility		Sub Total	0
		Sub Total	1755	Total	1755
				MP/DST Disc't	

Approved By _____ Our Representative Ryan Nichols

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket 66469

NO.

Well Name & No. Calwell H #2-19 Test No. 3 Date 01/26/20

Company Murfin Drilling Co. Inc. Elevation 3401 KB 3396 GL

Address 250 N. Water STE 300 Wichita KS 67202

Co. Rep / Geo. Robert Hendrix Rig Murfin #3

Location: Sec. 19 Twp 2S Rge. 37W Co. Cheyenne State KS

Interval Tested 4330 - 4404 Zone Tested LKC "D"

Anchor Length 74' Drill Pipe Run 4169' Mud Wt. 9.1

Top Packer Depth 4325 Drill Collars Run 148' Vis 56

Bottom Packer Depth 4330 Wt. Pipe Run 0' WL 6.4

Total Depth 4404 Chlorides 1000 ppm System LCM 2

Blow Description 30 IF - Slide 5", 1½" blow built to 4"

60 ISI - No return

60 FF - Surface blow built to 2"

90 FSI - No return

Rec	5'	Feet of	MCO	%gas	90	%oil	%water	10	%mud
Rec	60'	Feet of	OCM	%gas	20	%oil	%water	80	%mud
Rec	60'	Feet of	OCM	%gas	10	%oil	%water	90	%mud
Rec		Feet of		%gas		%oil	%water		%mud
Rec		Feet of		%gas		%oil	%water		%mud

Rec Total 125' BHT 137° Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic	2176	☑ Test 1300	T-On Location [redacted] 22:45
(B) First Initial Flow	29	☑ Jars 250	T-Started 23:02
(C) First Final Flow	43	☑ Safety Joint 75	T-Open 00:59
(D) Initial Shut-In	1302	☐ Circ Sub	T-Pulled 04:59
(E) Second Initial Flow	48	☐ Hourly Standby	T-Out 06:45
(F) Second Final Flow	73	☑ Mileage 130 RT 130	Comments
(G) Final Shut-In	1297	☐ Sampler	
(H) Final Hydrostatic	2155	☐ Straddle	☐ EM Tool
		☐ Shale Packer	☐ Ruined Shale Packer
Initial Open	30	☐ Extra Packer	☐ Ruined Packer
Initial Shut-In	60	☐ Extra Recorder	☐ Extra Copies
Final Flow	60	☐ Day Standby	Sub Total 0
Final Shut-In	90	☐ Accessibility	Total 1755
		Sub Total 1755	MP/DST Disc't

Approved By _____ Our Representative Ryan Nichols

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 66470

NO.

Well Name & No. Culwell H #2-19 Test No. 4 Date 1/27/20

Company Murfin Drilling Co. Inc. Elevation 3401 KB 3396 GL

Address 250 N. Water STE 300 Wichita KS 67202

Co. Rep / Geo. Robert Hendrix Rig Murfin #3

Location: Sec. 19 Twp 25 Rge. 37W Co. Cheyenne State KS

Interval Tested 4400 - 4442 Zone Tested LKC "G"

Anchor Length 42' Drill Pipe Run 4232' Mud Wt. 9.1

Top Packer Depth 4395 Drill Collars Run 148' Vis 62

Bottom Packer Depth 4400 Wt. Pipe Run 0' WL 6.4

Total Depth 4442 Chlorides 1000 ppm System LCM 2

Blow Description 30 IF - 1/4" blow built to 1" died back 1/4"

60 ISI - No return

30 FF - No blow

60 FSI - No return

Rec 5'	Feet of Mud	%gas	%oil	%water 100	%mud
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 5' BHT 133° Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2113	☑ Test 1300	T-On Location 14:30
(B) First Initial Flow 15	☑ Jars 250	T-Started 15:16
(C) First Final Flow 17	☑ Safety Joint 75	T-Open 17:21
(D) Initial Shut-In 34	☐ Circ Sub	T-Pulled 20:21
(E) Second Initial Flow 17	☐ Hourly Standby	T-Out 22:30
(F) Second Final Flow 18	☑ Mileage 130 RT 130	Comments
(G) Final Shut-In 27	☐ Sampler	
(H) Final Hydrostatic 2067	☐ Straddle	☐ EM Tool
	☐ Shale Packer	☐ Ruined Shale Packer
Initial Open 30	☐ Extra Packer	☐ Ruined Packer
Initial Shut-In 60	☐ Extra Recorder	☐ Extra Copies
Final Flow 30	☐ Day Standby	Sub Total 0
Final Shut-In 60	☐ Accessibility	Total 1755
	Sub Total 1755	MP/DST Disc't

Approved By _____ Our Representative Ryan Nichols

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket NO. 66471

Well Name & No. Culwell H #2-19 Test No. 5 Date 1/29/20

Company Murfin Drilling Co. Inc. Elevation 3401 KB 3396 GL

Address 250 N. Water STE 300 Wichita KS 67202

Co. Rep / Geo. Robert Hendrix Rig Murfin #3

Location: Sec. 19 Twp 25 Rge. 37 W Co. Cheyenne State KS

Interval Tested 4681 - 4830 Zone Tested Ft. Scott - Cherokee

Anchor Length 149' Drill Pipe Run 4513' Mud Wt. 9.1

Top Packer Depth 4676 Drill Collars Run 148' Vis 64

Bottom Packer Depth 4681 Wt. Pipe Run 0' WL 6.0

Total Depth 4830 Chlorides 800 ppm System LCM 3

Blow Description 30 IF - BoB @ 20 mins

60 ISI - Surface return

60 FF - BoB @ 16 mins

90 FSI - @ Surface return built to 2½"

Rec 65'	Feet of OCM	%gas 50	%oil	%water 50	%mud		
Rec 245'	Feet of OCM	%gas 35	%oil	%water 65	%mud		
Rec	Feet of	%gas	%oil	%water	%mud		
Rec	Feet of	%gas	%oil	%water	%mud		
Rec	Feet of	%gas	%oil	%water	%mud		

Rec Total 310 BHT 144° Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2367	☑ Test 1300	T-On Location 22:30	
(B) First Initial Flow 35	☑ Jars 250	T-Started 23:33	
(C) First Final Flow 88	☑ Safety Joint 75	T-Open 02:00	
(D) Initial Shut-In 1332	☐ Circ Sub	T-Pulled 06:00	
(E) Second Initial Flow 88	☐ Hourly Standby	T-Out 09:00	
(F) Second Final Flow 131	☑ Mileage 130 RT 130	Comments 378' GIP	
(G) Final Shut-In 1315	☐ Sampler		
(H) Final Hydrostatic 2234	☐ Straddle	☐ EM Tool	
	☐ Shale Packer	☐ Ruined Shale Packer	
Initial Open 30	☐ Extra Packer	☐ Ruined Packer	
Initial Shut-In 60	☐ Extra Recorder	☐ Extra Copies	
Final Flow 60	☐ Day Standby	Sub Total 0	
Final Shut-In 90	☐ Accessibility	Total 1755	
	Sub Total 1755	MP/DST Disc't	

Approved By _____ Our Representative Ryan Nichols