

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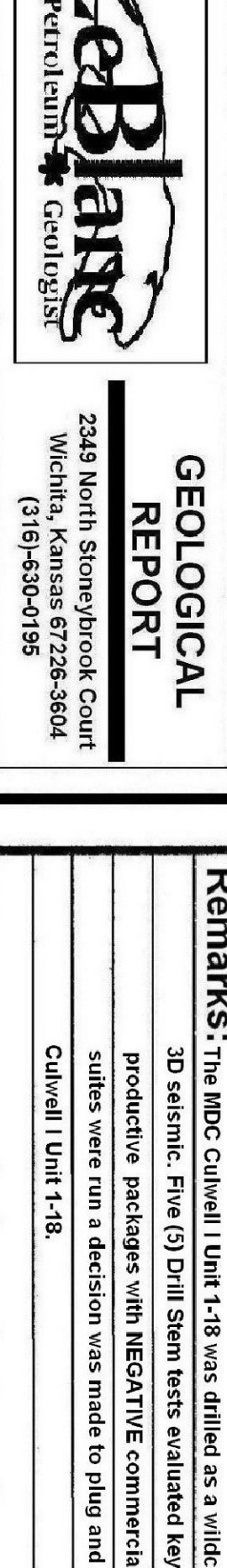
Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	CULWELL 'I' UNIT 1-18
Doc ID	1416790

All Electric Logs Run

DIL
DUCP
MEL
BHCS



GEOLOGICAL REPORT

2348 North Stonybrook Court Wichita, Kansas 67226-9564

Murfin Drilling Company (30606)
Lease: Culwell Unit 1-18
Location: 2640 FSL & 2570 FEL

CONTRACTOR: Murfin Drilling Co., Rig 3 (30606)
COMMERCIAL DRILLING: Wed. May 23, 2018

RTD: 5100 FEET LTO. 5099 FEET
MUD UP AT: 3600 FEET MUD TYPE: CHEMICAL

NOTES: Mud system - Morgan Mud, Surf. Churn, CMT - Allied Chem.
Mud - Hulsol Fluid - Behrman Fluid, Gas Detector - NONG.

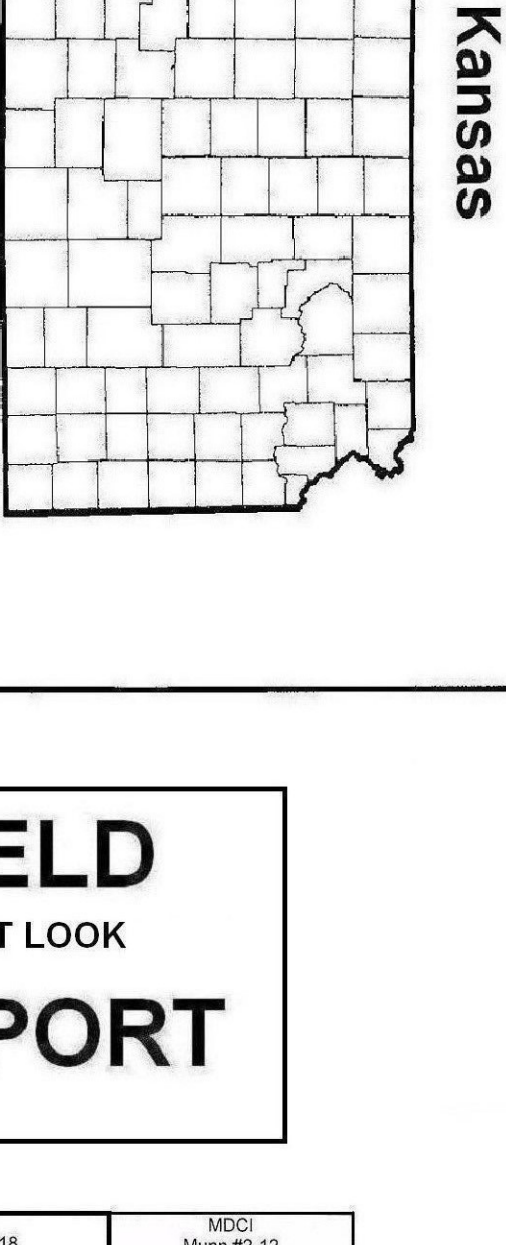
Remarks: The MDC Culwell Unit 1-18 was drilled as a wildcat test well based on 3D seismic. Five (5) Drill Stem tests evaluated key local productive intervals...

Table with 2 columns: Date, Depth, and Bit Record. Shows drilling progress from 3160 to 5100 feet.

Table with 2 columns: Formation, Name, Type, Depth, Feet, Hours. Lists geological formations like Mound City, Maroon, etc.

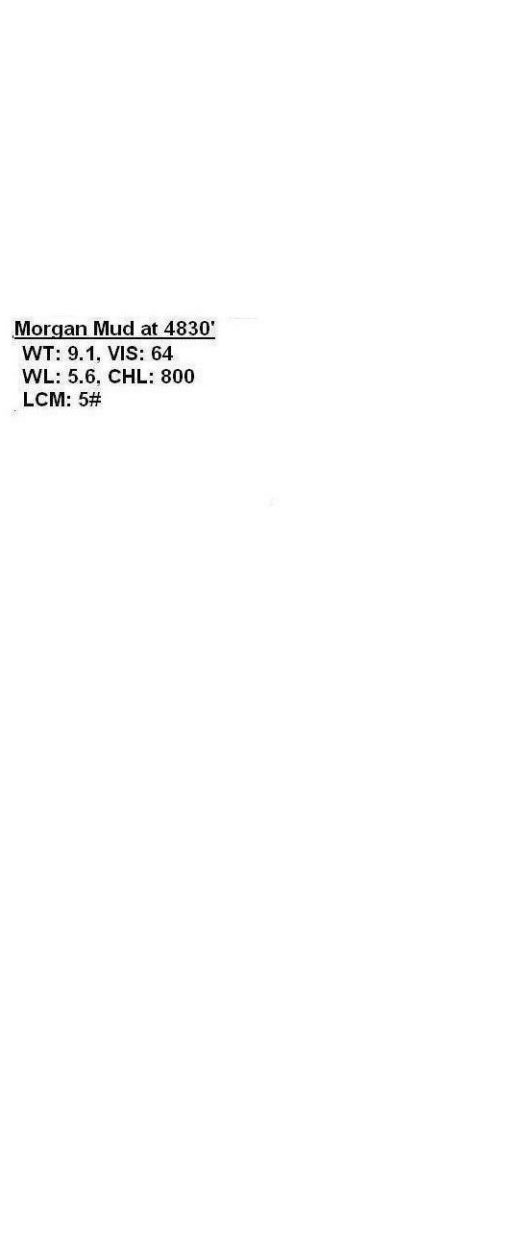
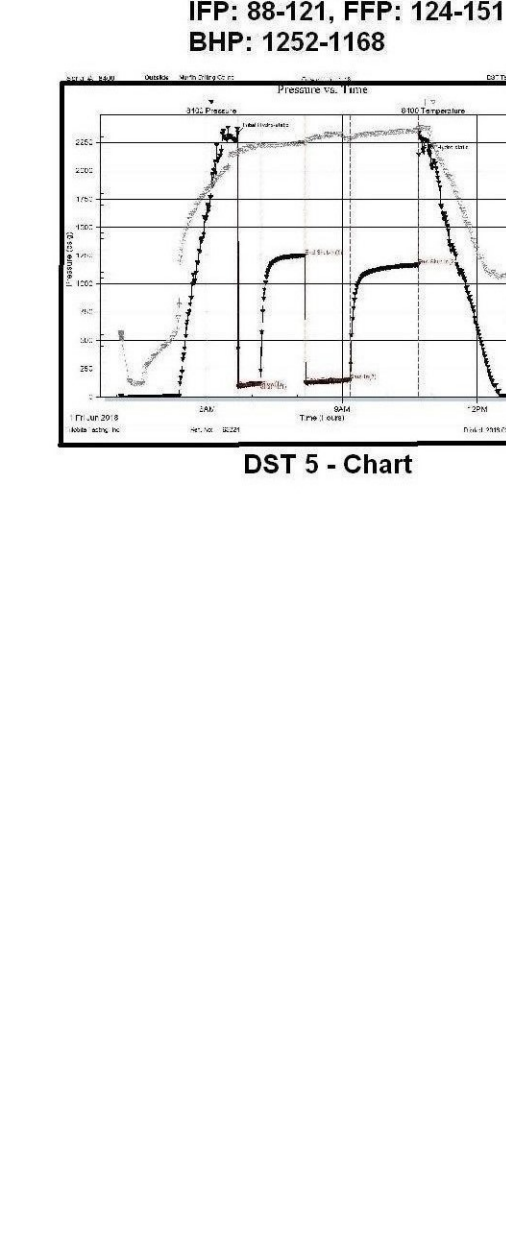
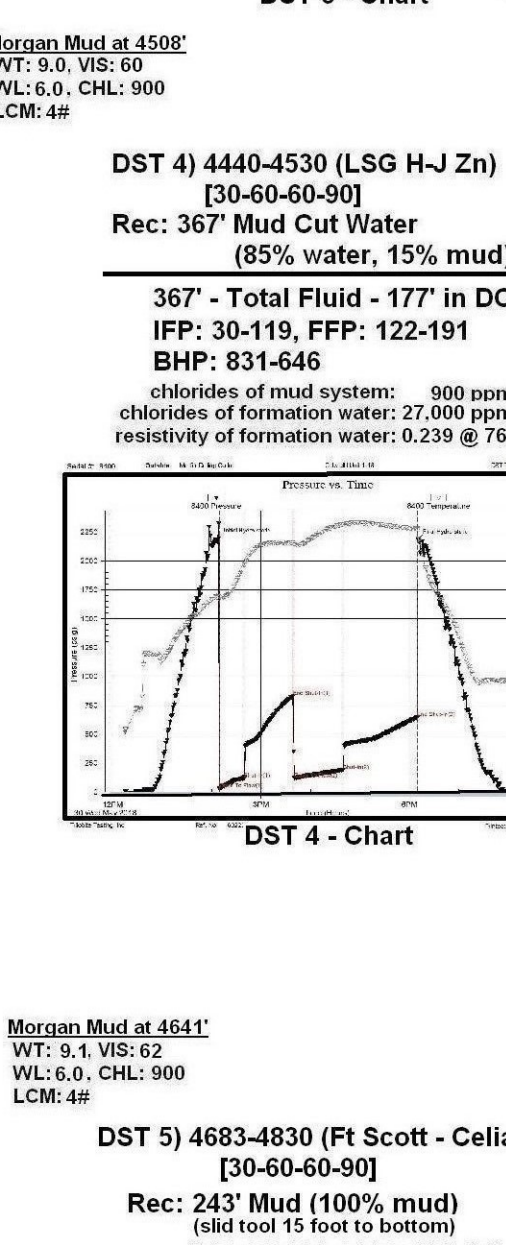
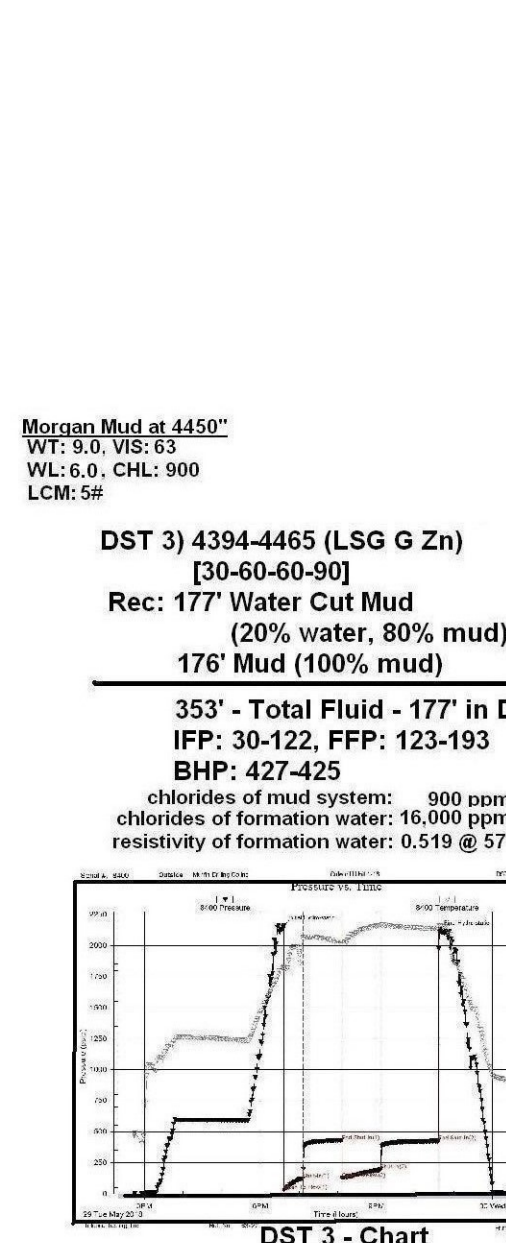
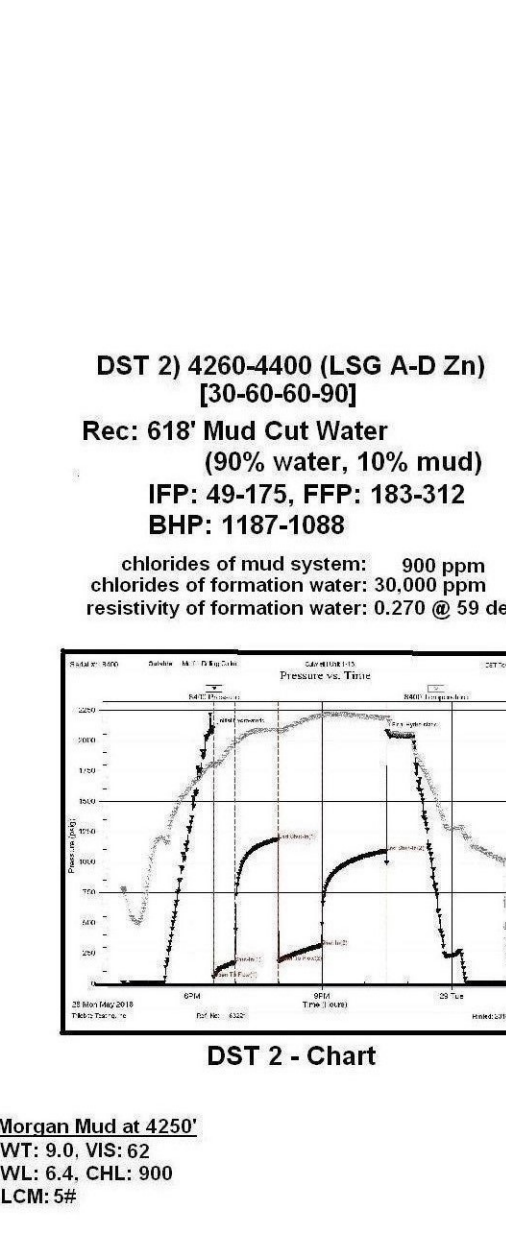
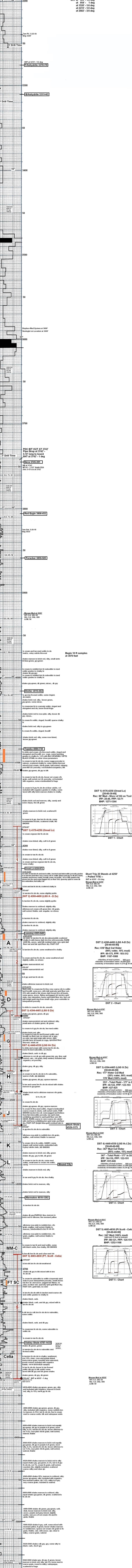
Table with 2 columns: Sample, Sample Top, Sample Bottom, Subsea Datum. Lists sample locations and depths.

Formation Tops: 303, 3276, 3311, 3316, 3388, 3808, 4084, 4226, 4529, 4708, 4792, 4836, 4919, 5099



FIELD FIRST LOOK REPORT

API: 15-023-21485-0000
Murfin Drilling Company
Culwell Unit 1-18
2640 FSL & 2570 FEL
Sec. 18-T2S-R37W
Cheyenne Co., KS
KB 3354



RTD 5100-1746 at 12:05 AM on Saturday June 2, 2018
Short Trip 15 stands
Drop Survey
Plugging Orders: 1st plug at 3330 feet - 50 sxs, 2nd plug at 2500 feet - 100 sxs, 3rd plug at 2500 feet - 50 sxs, 4th plug at 40 feet - 10 sxs, ratihole - 30 sxs, mousehole - 15 sxs, 255 sxs 60/40 poz 4% gel + 14# per sack fofoal



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N Water Ste 300
Wichita KS 67202-1216

ATTN: Ken LeBlanc

Culwell I Unit #1-18

18 2s 37w Cheyenne,KS

Start Date: 2018.05.27 @ 13:11:00

End Date: 2018.05.27 @ 21:21:00

Job Ticket #: 63220 DST #: 1

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

Printed: 2018.06.04 @ 14:58:48



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
 250 N Water Ste 300
 Wichita KS 67202-1216
 ATTN: Ken LeBlanc

18 2s 37w Cheyenne, KS
Culwell I Unit #1-18
 Job Ticket: 63220 **DST#: 1**
 Test Start: 2018.05.27 @ 13:11:00

GENERAL INFORMATION:

Formation: **Oread**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 15:18:16
 Time Test Ended: 21:21:00
 Interval: **4176.00 ft (KB) To 4250.00 ft (KB) (TVD)**
 Total Depth: 4250.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Jim Svaty
 Unit No: 76
 Reference Elevations: 3354.00 ft (KB)
 3349.00 ft (CF)
 KB to GR/CF: 5.00 ft

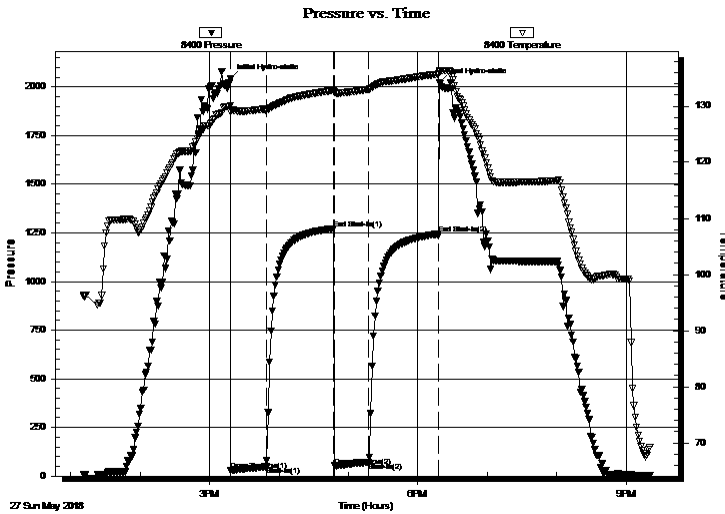
Serial #: 8400

Outside

Press@RunDepth: 71.00 psig @ 4182.00 ft (KB)
 Start Date: 2018.05.27 End Date: 2018.05.27
 Start Time: 13:11:01 End Time: 21:20:46
 Capacity: 8000.00 psig
 Last Calib.: 2018.05.27
 Time On Btm: 2018.05.27 @ 15:18:01
 Time Off Btm: 2018.05.27 @ 18:18:46

TEST COMMENT: 30-IFP- Surface Blow Building to 1 1/2"
 60-ISIP- No Blow
 30-FFP- Surface Blow Building to 1 1/4"
 60-FSIP- No Blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2039.95	130.05	Initial Hydro-static
1	29.32	129.01	Open To Flow (1)
31	48.77	129.27	Shut-In(1)
89	1271.95	132.80	End Shut-In(1)
90	52.34	132.38	Open To Flow (2)
120	71.00	133.00	Shut-In(2)
180	1244.29	135.69	End Shut-In(2)
181	2020.18	136.11	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
80.00	Mud 100% Show of Oil in Tool...	0.39

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne, KS

Culwell I Unit #1-18

Job Ticket: 63220 **DST#: 1**

Test Start: 2018.05.27 @ 13:11:00

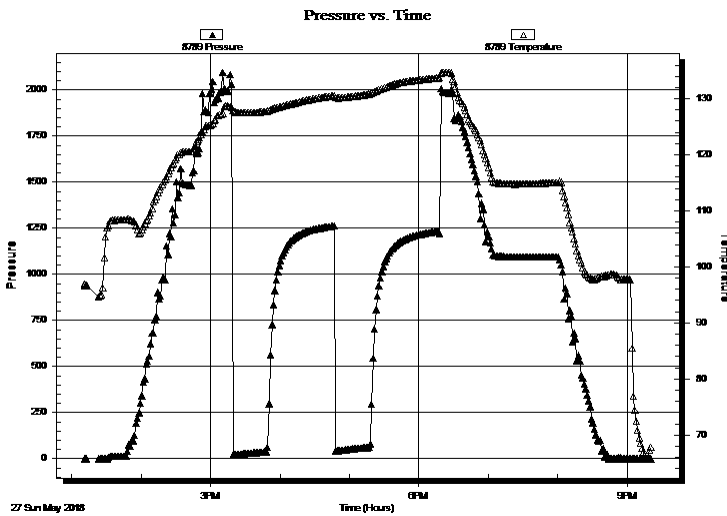
GENERAL INFORMATION:

Formation: Oread	Deviated: No Whipstock:	ft (KB)	Test Type: Conventional Bottom Hole (Initial)
Time Tool Opened: 15:18:16	Time Test Ended: 21:21:00		Tester: Jim Svaty
			Unit No: 76
Interval: 4176.00 ft (KB) To 4250.00 ft (KB) (TVD)			Reference Elevations: 3354.00 ft (KB)
Total Depth: 4250.00 ft (KB) (TVD)			3349.00 ft (CF)
Hole Diameter: 7.88 inches	Hole Condition: Fair		KB to GR/CF: 5.00 ft

Serial #: 8789 Inside

Press@RunDepth: psig @ 4182.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2018.05.27 End Date: 2018.05.27	Last Calib.: 2018.05.27
Start Time: 13:11:01 End Time: 21:21:01	Time On Btm:
	Time Off Btm:

TEST COMMENT: 30-IFP- Surface Blow Building to 1 1/2"
60-ISIP- No Blow
30-FFP- Surface Blow Building to 1 1/4"
60-FSIP- No Blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
80.00	Mud 100% Show of Oil in Tool...	0.39

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63220 **DST#: 1**
Test Start: 2018.05.27 @ 13:11:00

Tool Information

Drill Pipe:	Length: 3979.00 ft	Diameter: 3.80 inches	Volume: 55.81 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 56.68 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	7.00 ft			String Weight: Initial 66000.00 lb
Depth to Top Packer:	4176.00 ft			Final 66000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	74.00 ft			
Tool Length:	101.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Length (ft) Serial No. Position Depth (ft) Accum. Lengths

Change Over Sub	1.00			4150.00	
Shut In Tool	5.00			4155.00	
Hydraulic tool	5.00			4160.00	
Jars	5.00			4165.00	
Safety Joint	2.00			4167.00	
Packer	5.00			4172.00	27.00 Bottom Of Top Packer
Packer	4.00			4176.00	
Stubb	1.00			4177.00	
Perforations	4.00			4181.00	
Change Over Sub	1.00			4182.00	
Recorder	0.00	8400	Outside	4182.00	
Recorder	0.00	8789	Inside	4182.00	
Drill Pipe	31.00			4213.00	
Change Over Sub	1.00			4214.00	
Perforations	33.00			4247.00	
Bullnose	3.00			4250.00	74.00 Bottom Packers & Anchor
Total Tool Length:	101.00				



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63220 **DST#: 1**
Test Start: 2018.05.27 @ 13:11:00

Mud and Cushion Information

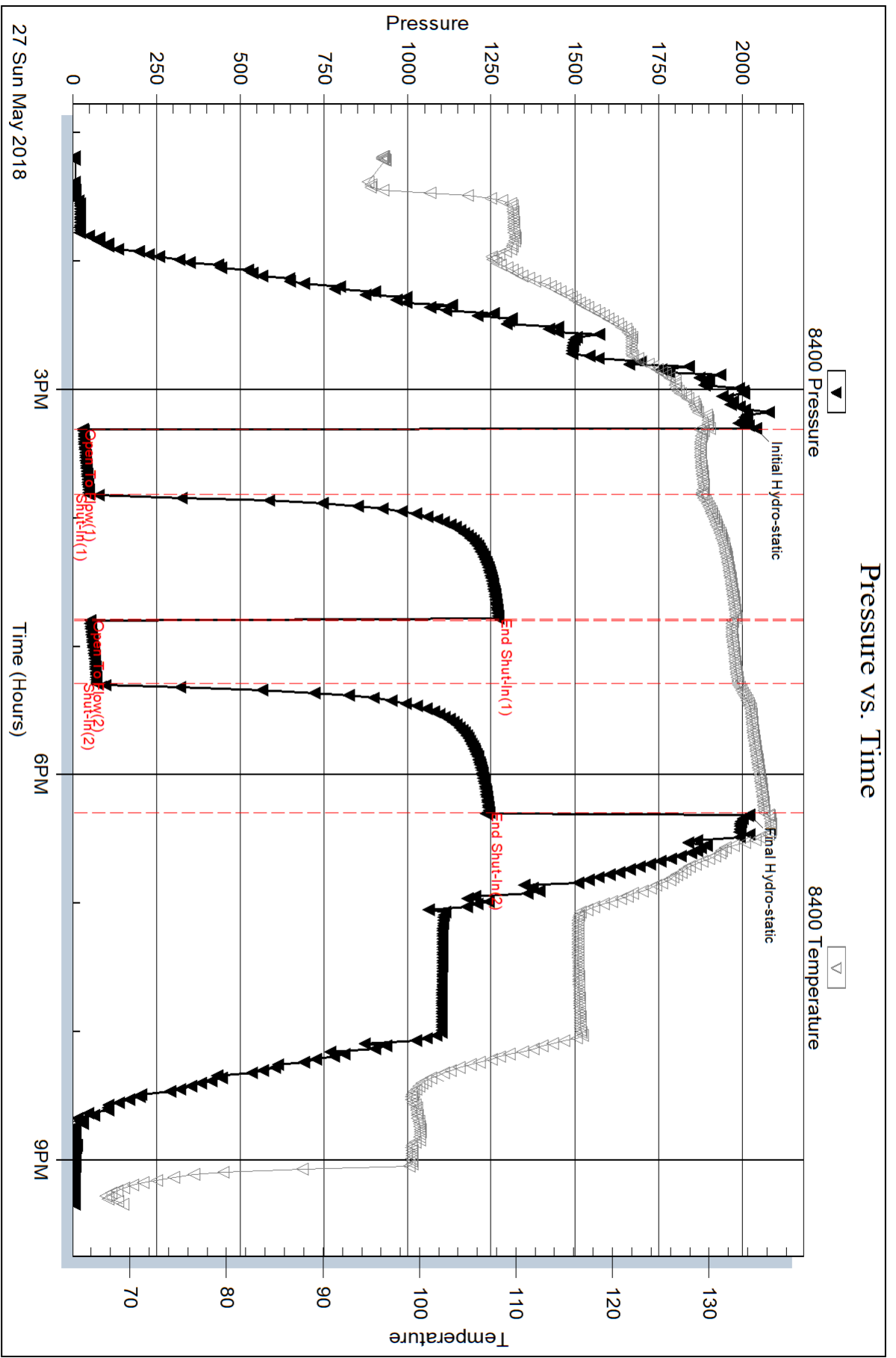
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 65.00 sec/qt	Cushion Volume: bbl		
Water Loss: 6.36 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 900.00 ppm			
Filter Cake: 4.00 inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
80.00	Mud 100% Show of Oil in Tool...	0.393

Total Length: 80.00 ft Total Volume: 0.393 bbl
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:



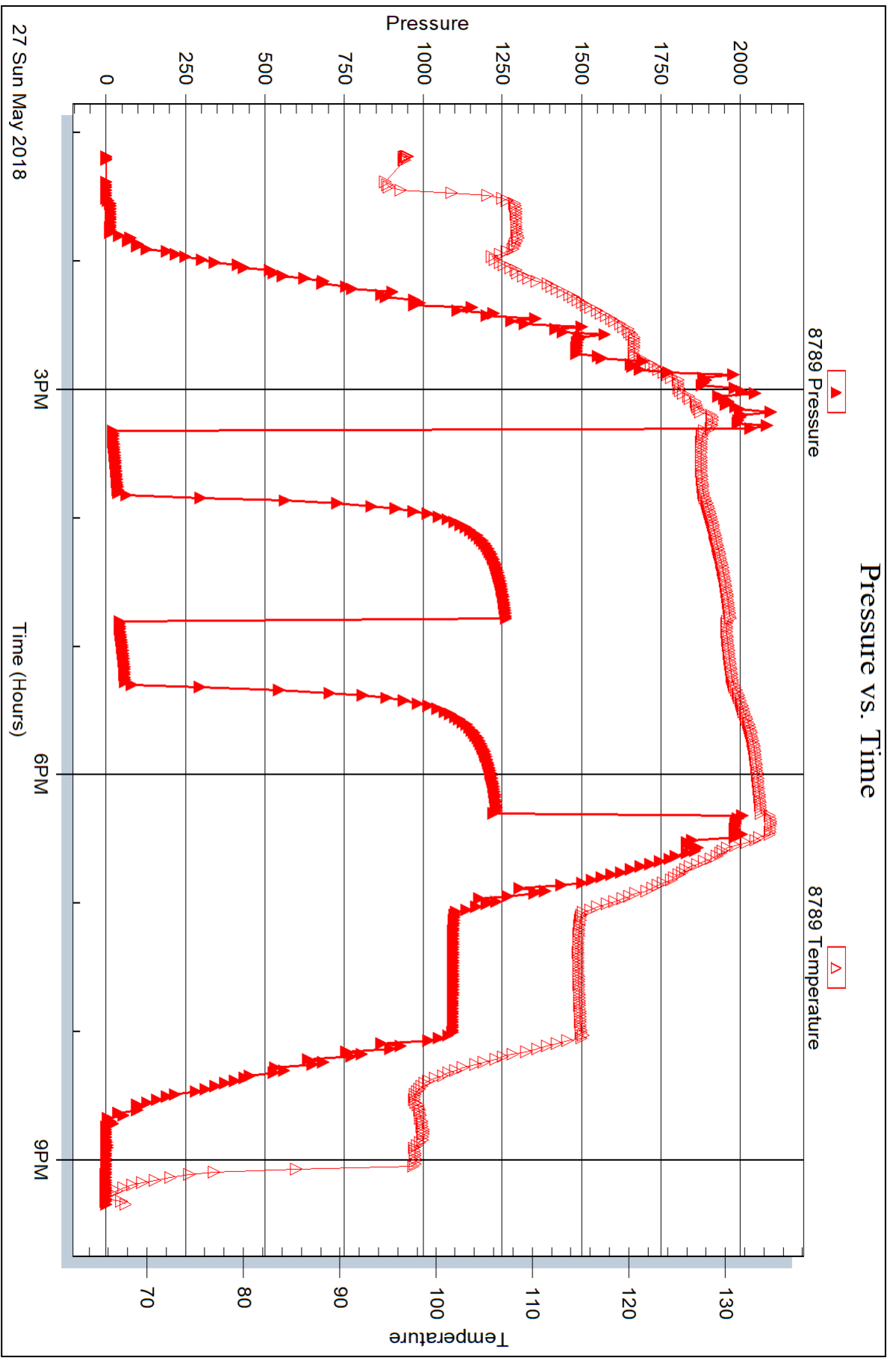
Serial #: 8789

Inside

Murfin Drilling Co Inc

Culwell Unit #1-18

DST Test Number: 1



Trilobite Testing, Inc

Ref. No: 63220

Printed: 2018.06.04 @ 14:58:50



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N Water Ste 300
Wichita KS 67202-1216

ATTN: Ken LeBlanc

Culwell I Unit #1-18

18 2s 37w Cheyenne,KS

Start Date: 2018.05.28 @ 16:24:00

End Date: 2018.05.29 @ 01:46:00

Job Ticket #: 63221 DST #: 2

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

Printed: 2018.06.04 @ 14:58:12



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne, KS
Culwell I Unit #1-18
Job Ticket: 63221 **DST#: 2**
Test Start: 2018.05.28 @ 16:24:00

GENERAL INFORMATION:

Formation: **LKC " A - D "**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 18:29:31
Time Test Ended: 01:46:00
Interval: **4260.00 ft (KB) To 4400.00 ft (KB) (TVD)**
Total Depth: 4400.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Test Type: Conventional Bottom Hole (Reset)
Tester: Jim Svaty
Unit No: 76
Reference Elevations: 3354.00 ft (KB)
3349.00 ft (CF)
KB to GR/CF: 5.00 ft

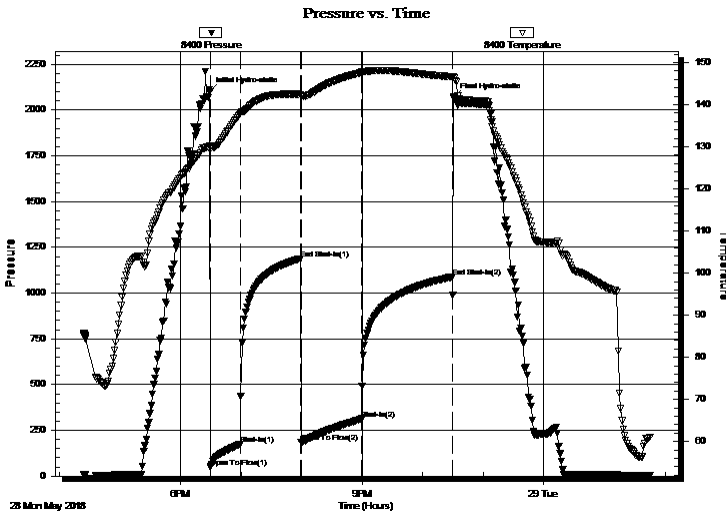
Serial #: 8400

Outside

Press@RunDepth: 312.74 psig @ 4269.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2018.05.28 End Date: 2018.05.29 Last Calib.: 2018.05.29
Start Time: 16:24:01 End Time: 01:45:46 Time On Btm: 2018.05.28 @ 18:29:01
Time Off Btm: 2018.05.28 @ 22:30:31

TEST COMMENT: 30-IFP- BOB in 12 1/2 min. IPRO - 19.56"
60-ISIP- No Blow IPRO - 16.50"
60-FFP- BOB in 20 min. IPRO 24.17"
90-FSIP- No Blow IPRO - 17.45"

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2098.80	130.25	Initial Hydro-static
1	49.00	129.82	Open To Flow (1)
31	175.32	137.89	Shut-In(1)
90	1187.71	142.46	End Shut-In(1)
91	183.69	141.88	Open To Flow (2)
151	312.74	147.62	Shut-In(2)
241	1088.50	146.59	End Shut-In(2)
242	2065.55	146.71	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
618.00	MCW 10% m 90% w	7.06

* Recovery from multiple tests

Gas Rates

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



TRILOBITE
TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne, KS
Culwell I Unit #1-18
Job Ticket: 63221 **DST#: 2**
Test Start: 2018.05.28 @ 16:24:00

GENERAL INFORMATION:

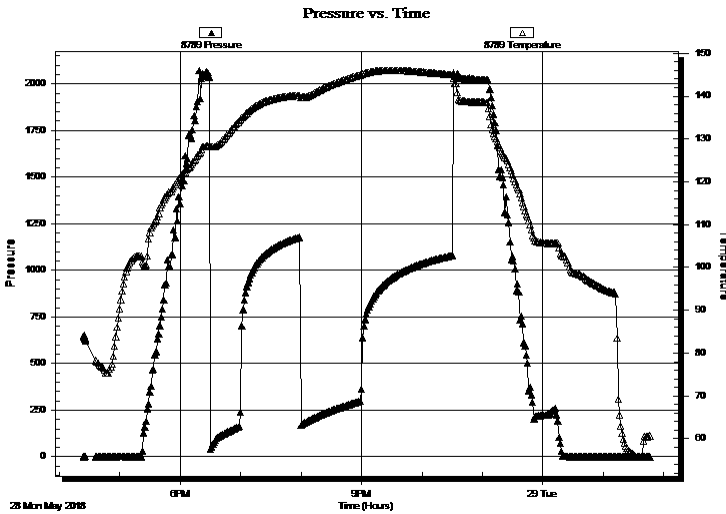
Formation: LKC " A - D "	Test Type: Conventional Bottom Hole (Reset)
Deviated: No Whipstock: ft (KB)	Tester: Jim Svaty
Time Tool Opened: 18:29:31	Unit No: 76
Time Test Ended: 01:46:00	Reference Elevations: 3354.00 ft (KB)
Interval: 4260.00 ft (KB) To 4400.00 ft (KB) (TVD)	3349.00 ft (CF)
Total Depth: 4400.00 ft (KB) (TVD)	KB to GR/CF: 5.00 ft
Hole Diameter: 7.88 inches	Hole Condition: Fair

Serial #: 8789 Inside

Press@RunDepth: psig @ 4269.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2018.05.28	End Date: 2018.05.29
Start Time: 16:24:01	End Time: 01:46:01
	Last Calib.: 2018.05.29
	Time On Btm:
	Time Off Btm:

TEST COMMENT: 30-IFP- BOB in 12 1/2 min. IPRO - 19.56"
60-ISIP- No Blow IPRO - 16.50"
60-FFP- BOB in 20 min. IPRO 24.17"
90-FSIP- No Blow IPRO - 17.45"

PRESSURE SUMMARY



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

Recovery

Length (ft)	Description	Volume (bbl)
618.00	MCW 10% m 90% w	7.06

* 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
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63221 **DST#: 2**
Test Start: 2018.05.28 @ 16:24:00

Tool Information

Drill Pipe:	Length: 4072.00 ft	Diameter: 3.80 inches	Volume: 57.12 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 57.99 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial 65000.00 lb
Depth to Top Packer:	4260.00 ft			Final 68000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	140.00 ft			
Tool Length:	167.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4234.00	
Shut In Tool	5.00			4239.00	
Hydraulic tool	5.00			4244.00	
Jars	5.00			4249.00	
Safety Joint	2.00			4251.00	
Packer	5.00			4256.00	27.00 Bottom Of Top Packer
Packer	4.00			4260.00	
Stubb	1.00			4261.00	
Perforations	7.00			4268.00	
Change Over Sub	1.00			4269.00	
Recorder	0.00	8400	Outside	4269.00	
Recorder	0.00	8789	Inside	4269.00	
Drill Pipe	94.00			4363.00	
Change Over Sub	1.00			4364.00	
Perforations	33.00			4397.00	
Bullnose	3.00			4400.00	140.00 Bottom Packers & Anchor
Total Tool Length:	167.00				



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63221 **DST#: 2**
Test Start: 2018.05.28 @ 16:24:00

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:	30000 ppm
Viscosity: 62.00 sec/qt	Cushion Volume: bbl		
Water Loss: 6.37 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 900.00 ppm			
Filter Cake: 5.00 inches			

Recovery Information

Recovery Table

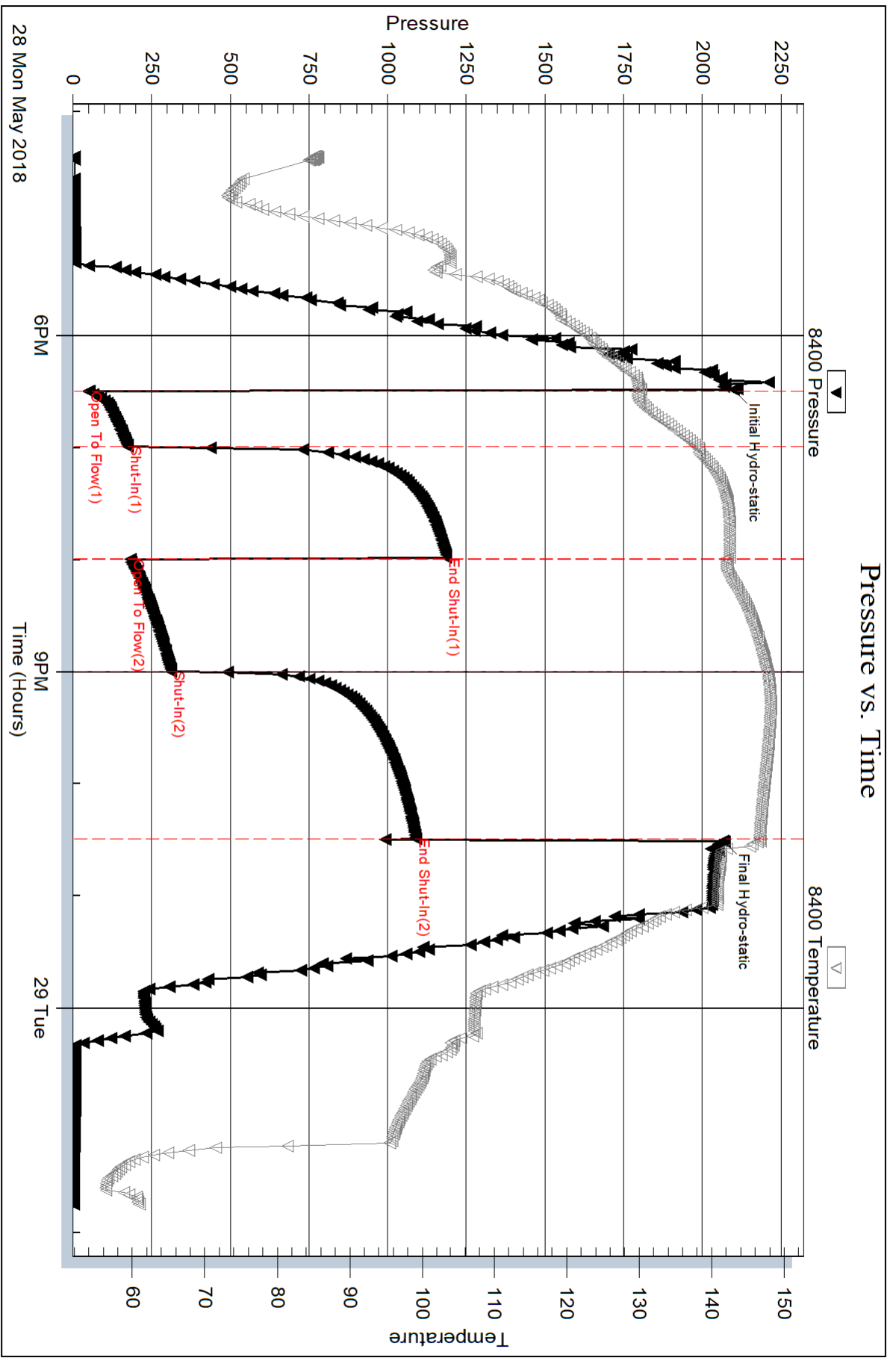
Length ft	Description	Volume bbl
618.00	MCW 10%m 90%w	7.057

Total Length: 618.00 ft Total Volume: 7.057 bbl

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

Laboratory Name: Laboratory Location:

Recovery Comments: .270 @ 59



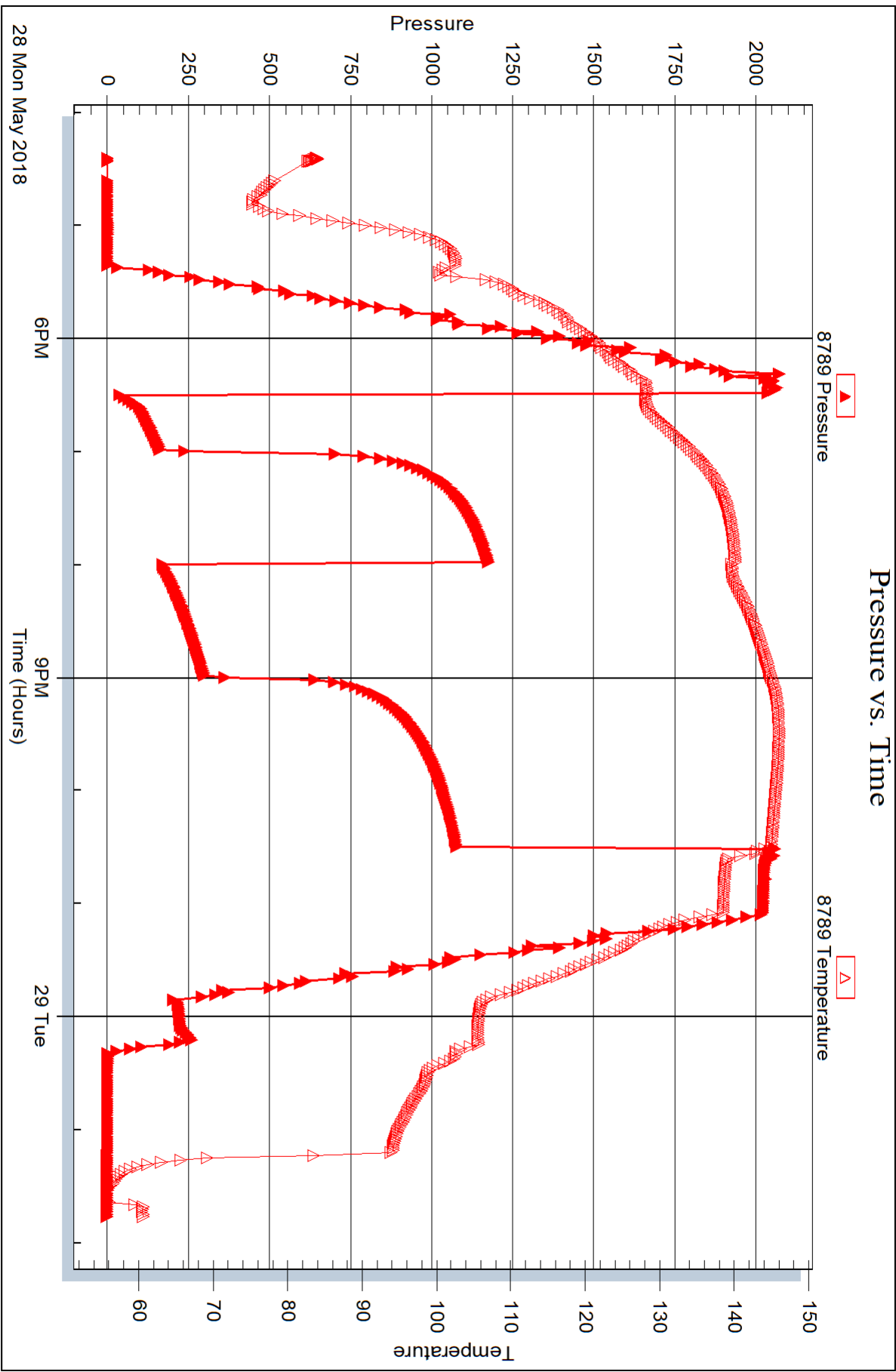
Serial #: 8789

Inside

Murfin Drilling Co Inc

Culwell Unit #1-18

DST Test Number: 2





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N Water Ste 300
Wichita KS 67202-1216

ATTN: Ken LeBlanc

Culwell I Unit #1-18

18 2s 37w Cheyenne,KS

Start Date: 2018.05.29 @ 14:44:00

End Date: 2018.05.30 @ 01:11:00

Job Ticket #: 63222 DST #: 3

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

Printed: 2018.06.04 @ 14:54:06



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63222 **DST#: 3**
Test Start: 2018.05.29 @ 14:44:00

GENERAL INFORMATION:

Formation: **LKC " G "**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 18:36:16
Time Test Ended: 01:11:00
Interval: **4394.00 ft (KB) To 4465.00 ft (KB) (TVD)**
Total Depth: 4465.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Test Type: Conventional Bottom Hole (Reset)
Tester: Jim Svaty
Unit No: 76
Reference Elevations: 3354.00 ft (KB)
3349.00 ft (CF)
KB to GR/CF: 5.00 ft

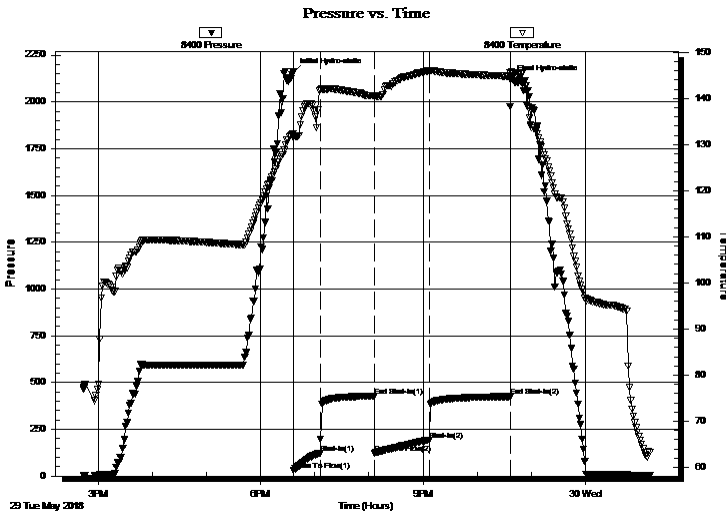
Serial #: 8400

Outside

Press@RunDepth: 193.29 psig @ 4397.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2018.05.29 End Date: 2018.05.30 Last Calib.: 2018.05.30
Start Time: 14:44:01 End Time: 01:11:01 Time On Btm: 2018.05.29 @ 18:36:01
Time Off Btm: 2018.05.29 @ 22:37:01

TEST COMMENT: 30-IFP- Surface Blow Building to 9" IPRO-- 9.15"
60-ISIP- No Blow IPRO-- 8.01"
60-FFP- BOB in 51 1/2 min. IPRO-- 12.76"
90-FSIP- No Blow IPRO---10.95"

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2158.22	132.40	Initial Hydro-static
1	30.02	131.41	Open To Flow (1)
31	122.49	141.93	Shut-In(1)
91	427.58	140.56	End Shut-In(1)
91	123.76	140.45	Open To Flow (2)
151	193.29	145.85	Shut-In(2)
241	425.23	144.80	End Shut-In(2)
241	2117.50	145.39	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
177.00	WCM 20%w 80%m	0.87
176.00	Mud 100%	2.47

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

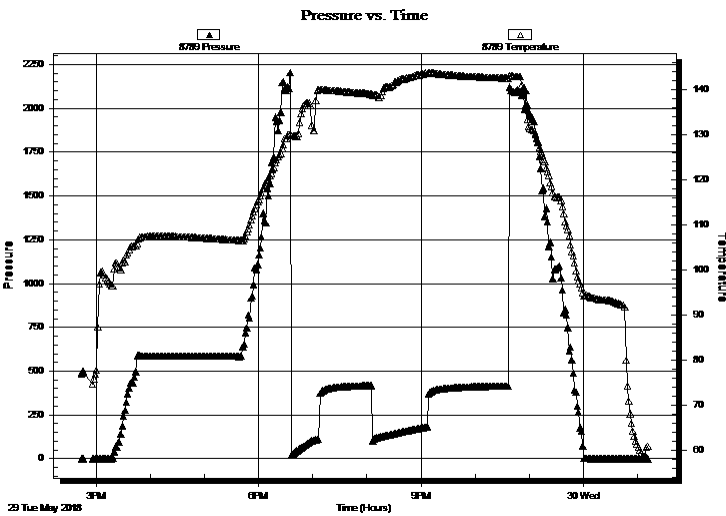
18 2s 37w Cheyenne, KS
Culwell I Unit #1-18
Job Ticket: 63222 **DST#: 3**
Test Start: 2018.05.29 @ 14:44:00

GENERAL INFORMATION:

Formation:	LKC " G "			Test Type:	Conventional Bottom Hole (Reset)
Deviated:	No Whipstock:	ft (KB)		Tester:	Jim Svaty
Time Tool Opened:	18:36:16			Unit No:	76
Time Test Ended:	01:11:00				
Interval:	4394.00 ft (KB) To 4465.00 ft (KB) (TVD)			Reference Elevations:	3354.00 ft (KB)
Total Depth:	4465.00 ft (KB) (TVD)				3349.00 ft (CF)
Hole Diameter:	7.88 inches	Hole Condition:	Fair	KB to GR/CF:	5.00 ft

Serial #: 8789	Inside			Capacity:	8000.00 psig
Press@RunDepth:	psig @ 4397.00 ft (KB)			Last Calib.:	2018.05.30
Start Date:	2018.05.29	End Date:	2018.05.30	Time On Btm:	
Start Time:	14:44:01	End Time:	01:11:01	Time Off Btm:	

TEST COMMENT: 30-IFP- Surface Blow Building to 9" IPRO-- 9.15"
60-ISIP- No Blow IPRO-- 8.01"
60-FFP- BOB in 51 1/2 min. IPRO-- 12.76"
90-FSIP- No Blow IPRO---10.95"



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
177.00	WCM 20%w 80%m	0.87
176.00	Mud 100%	2.47

* 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
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63222 **DST#: 3**
Test Start: 2018.05.29 @ 14:44:00

Tool Information

Drill Pipe:	Length: 4197.00 ft	Diameter: 3.80 inches	Volume: 58.87 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 75000.00 lb
			<u>Total Volume: 59.74 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	7.00 ft			String Weight: Initial 68000.00 lb
Depth to Top Packer:	4394.00 ft			Final 69000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	71.00 ft			
Tool Length:	98.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Change Over Sub	1.00			4368.00	
Shut In Tool	5.00			4373.00	
Hydraulic tool	5.00			4378.00	
Jars	5.00			4383.00	
Safety Joint	2.00			4385.00	
Packer	5.00			4390.00	27.00 Bottom Of Top Packer
Packer	4.00			4394.00	
Stubb	1.00			4395.00	
Perforations	1.00			4396.00	
Change Over Sub	1.00			4397.00	
Recorder	0.00	8400	Outside	4397.00	
Recorder	0.00	8789	Inside	4397.00	
Drill Pipe	31.00			4428.00	
Change Over Sub	1.00			4429.00	
Perforations	33.00			4462.00	
Bullnose	3.00			4465.00	71.00 Bottom Packers & Anchor
Total Tool Length:	98.00				



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63222 **DST#: 3**
Test Start: 2018.05.29 @ 14:44:00

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:	16000 ppm
Viscosity: 63.00 sec/qt	Cushion Volume: bbl		
Water Loss: 5.98 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 900.00 ppm			
Filter Cake: 5.00 inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
177.00	WCM 20%w 80%m	0.870
176.00	Mud 100%	2.469

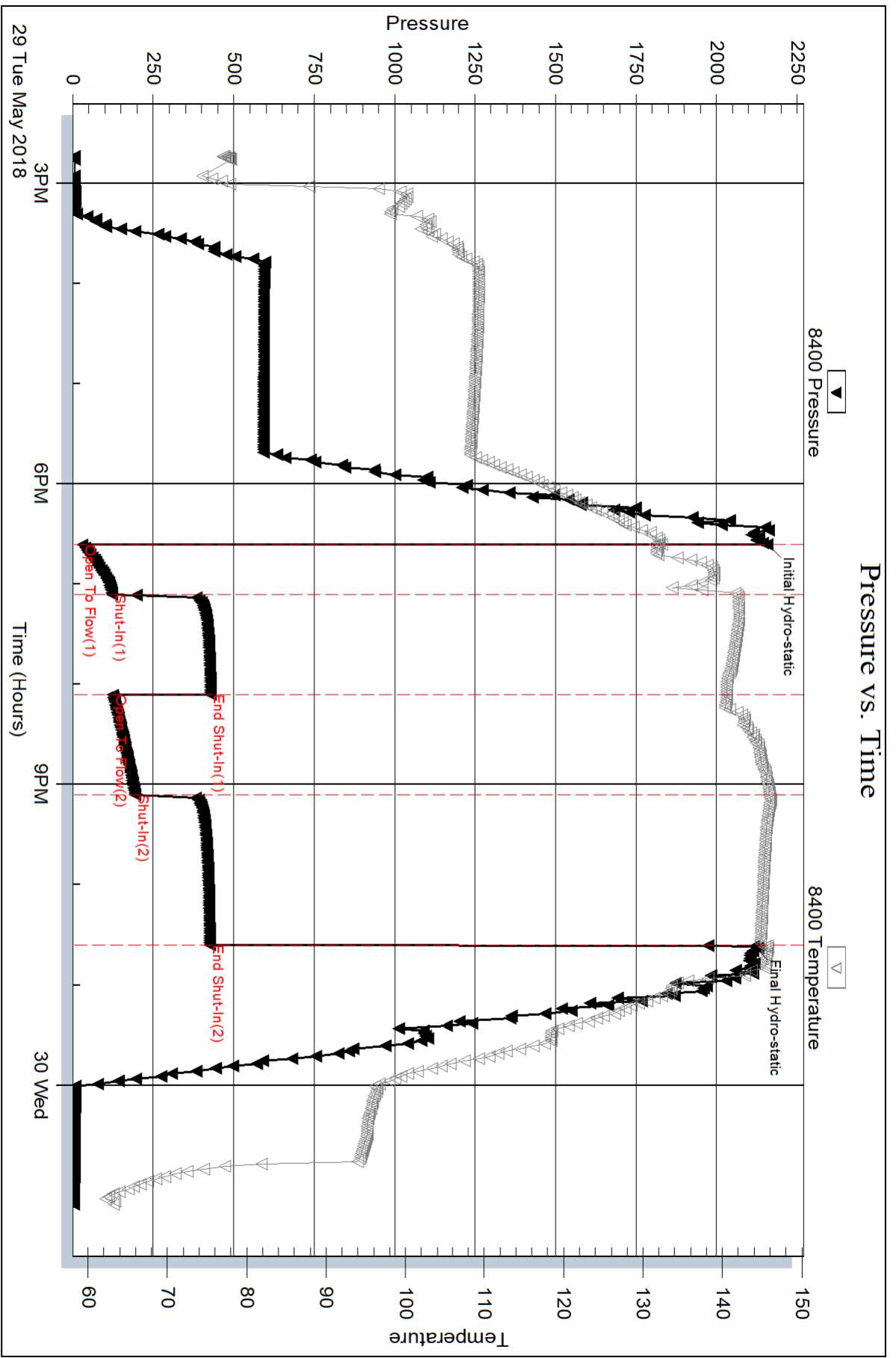
Total Length: 353.00 ft Total Volume: 3.339 bbl
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments: .519 @ 57

Serial #: 8400

Outside Murfin Drilling Co Inc

Culwell Unit #1-18

DST Test Number: 3



Trilobite Testing, Inc

Ref. No: 63222

Printed: 2018.06.04 @ 14:54:07

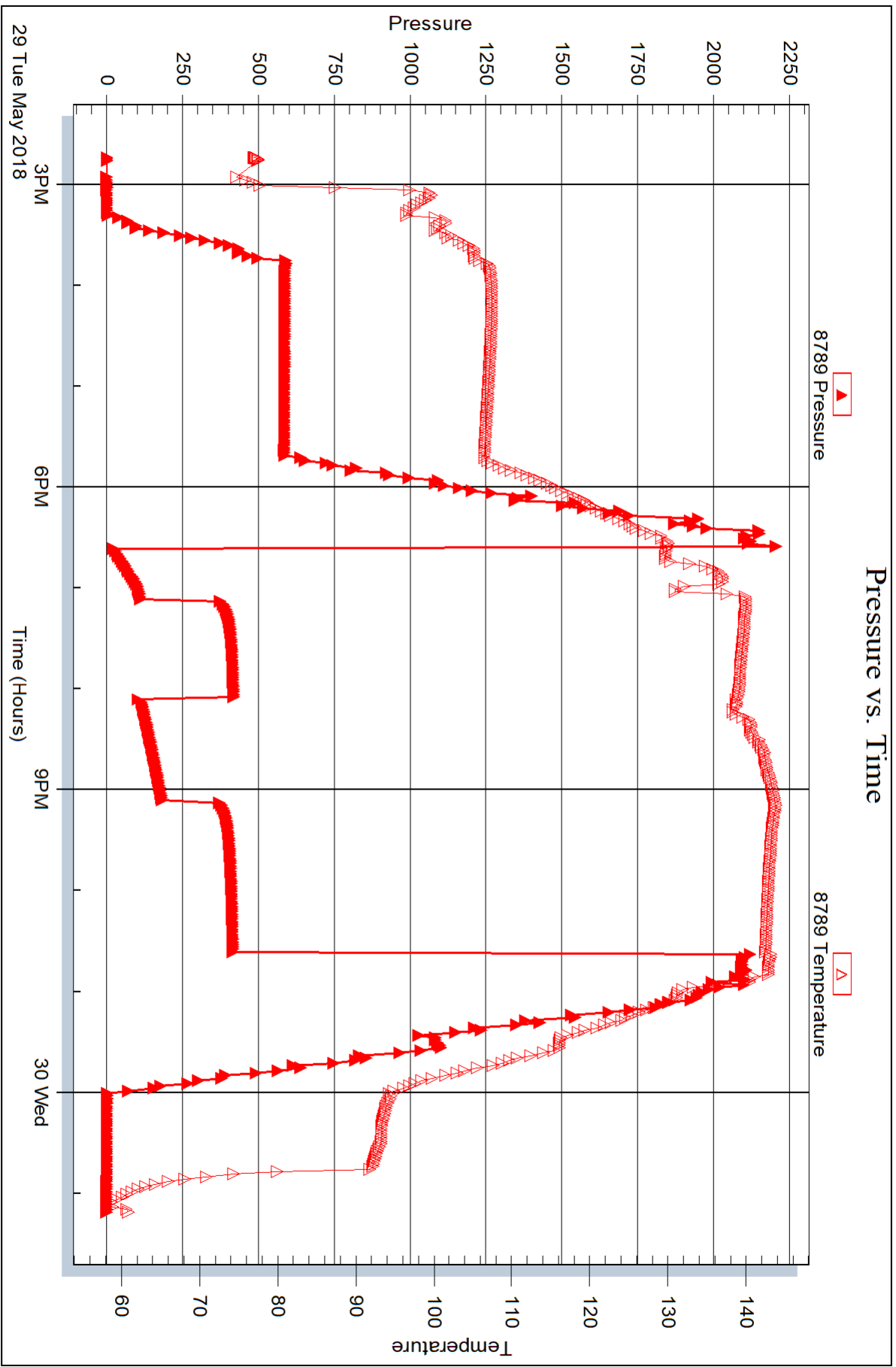
Serial #: 8789

Inside

Murfin Drilling Co Inc

Culwell Unit #1-18

DST Test Number: 3





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N Water Ste 300
Wichita KS 67202-1216

ATTN: Ken LeBlanc

Culwell I Unit #1-18

18 2s 37w Cheyenne,KS

Start Date: 2018.05.30 @ 12:15:00

End Date: 2018.05.30 @ 20:27:00

Job Ticket #: 63223 DST #: 4

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

Printed: 2018.06.04 @ 14:53:44



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne, KS
Culwell I Unit #1-18
Job Ticket: 63223 **DST#: 4**
Test Start: 2018.05.30 @ 12:15:00

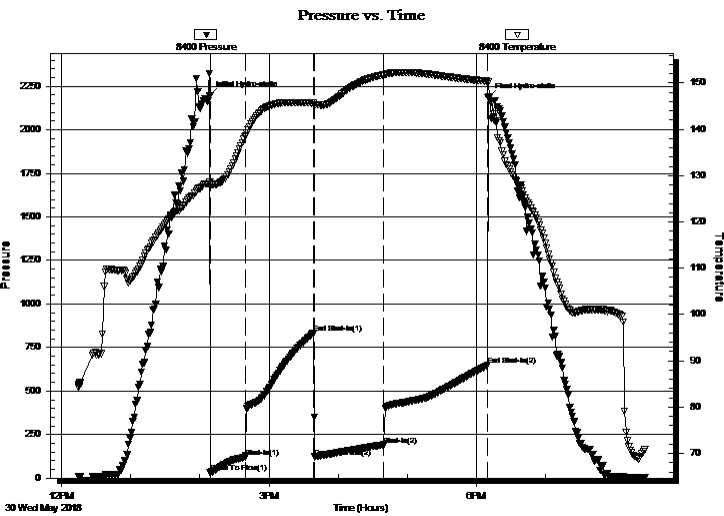
GENERAL INFORMATION:

Formation: **LKC "H - J"**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 14:09:01
Time Test Ended: 20:27:00
Interval: **4440.00 ft (KB) To 4530.00 ft (KB) (TVD)**
Total Depth: 4530.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Reference Elevations: 3354.00 ft (KB)
3349.00 ft (CF)
KB to GR/CF: 5.00 ft
Test Type: Conventional Bottom Hole (Reset)
Tester: Jim Svaty
Unit No: 76

Serial #: 8400 Outside

Press@RunDepth: 191.69 psig @ 4442.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2018.05.30 End Date: 2018.05.30 Last Calib.: 2018.05.30
Start Time: 12:15:01 End Time: 20:26:46 Time On Btm: 2018.05.30 @ 14:08:46
Time Off Btm: 2018.05.30 @ 18:10:01

TEST COMMENT: 30-IFP- Surface Blow Building to 7 1/2" IPRO -- 7.67"
60-ISIP- No Blow IPRO -- 7.30"
60-FFP- BOB in 51min. IPRO -- 12.04"
90-FSIP- No Blow IPRO -- 11.29"



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2196.14	128.67	Initial Hydro-static
1	30.87	127.57	Open To Flow (1)
31	119.70	138.38	Shut-In(1)
90	831.69	145.64	End Shut-In(1)
91	122.62	145.43	Open To Flow (2)
151	191.69	151.75	Shut-In(2)
241	646.72	150.37	End Shut-In(2)
242	2186.25	150.18	Final Hydro-static

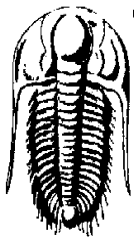
Recovery

Length (ft)	Description	Volume (bbl)
367.00	MCW 15% m 85% w	3.54

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
 250 N Water Ste 300
 Wichita KS 67202-1216
 ATTN: Ken LeBlanc

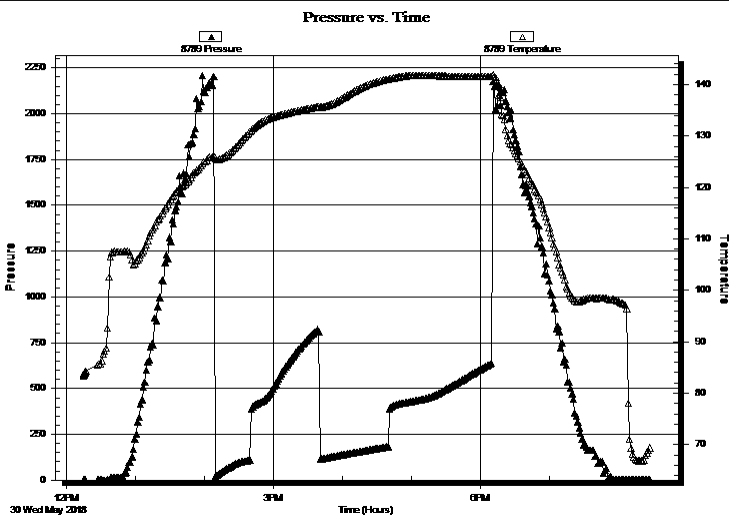
18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
 Job Ticket: 63223 **DST#: 4**
 Test Start: 2018.05.30 @ 12:15:00

GENERAL INFORMATION:

Formation: **LKC " H - J "**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 14:09:01
 Time Test Ended: 20:27:00
 Interval: **4440.00 ft (KB) To 4530.00 ft (KB) (TVD)**
 Total Depth: 4530.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Jim Svaty
 Unit No: 76
 Reference Elevations: 3354.00 ft (KB)
 3349.00 ft (CF)
 KB to GR/CF: 5.00 ft

Serial #: 8789 **Inside**
 Press@RunDepth: psig @ 4442.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2018.05.30 End Date: 2018.05.30 Last Calib.: 2018.05.30
 Start Time: 12:15:01 End Time: 20:27:01 Time On Btm:
 Time Off Btm:

TEST COMMENT: 30-IFP- Surface Blow Building to 7 1/2" IPRO -- 7.67"
 60-ISIP- No Blow IPRO -- 7.30"
 60-FFP- BOB in 51min. IPRO -- 12.04"
 90-FSIP- No Blow IPRO -- 11.29"



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
367.00	MCW 15% m 85% w	3.54

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63223 **DST#: 4**
Test Start: 2018.05.30 @ 12:15:00

Tool Information

Drill Pipe:	Length: 4259.00 ft	Diameter: 3.80 inches	Volume: 59.74 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 75000.00 lb
			<u>Total Volume: 60.61 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	23.00 ft			String Weight: Initial 69000.00 lb
Depth to Top Packer:	4440.00 ft			Final 70000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	90.00 ft			
Tool Length:	117.00 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			4414.00	
Shut In Tool	5.00			4419.00	
Hydraulic tool	5.00			4424.00	
Jars	5.00			4429.00	
Safety Joint	2.00			4431.00	
Packer	5.00			4436.00	27.00 Bottom Of Top Packer
Packer	4.00			4440.00	
Stubb	1.00			4441.00	
Perforations	1.00			4442.00	
Recorder	0.00	8400	Outside	4442.00	
Recorder	0.00	8789	Inside	4442.00	
Perforations	20.00			4462.00	
Change Over Sub	1.00			4463.00	
Drill Pipe	63.00			4526.00	
Change Over Sub	1.00			4527.00	
Bullnose	3.00			4530.00	90.00 Bottom Packers & Anchor
Total Tool Length:	117.00				



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63223 **DST#: 4**
Test Start: 2018.05.30 @ 12:15:00

Mud and Cushion Information

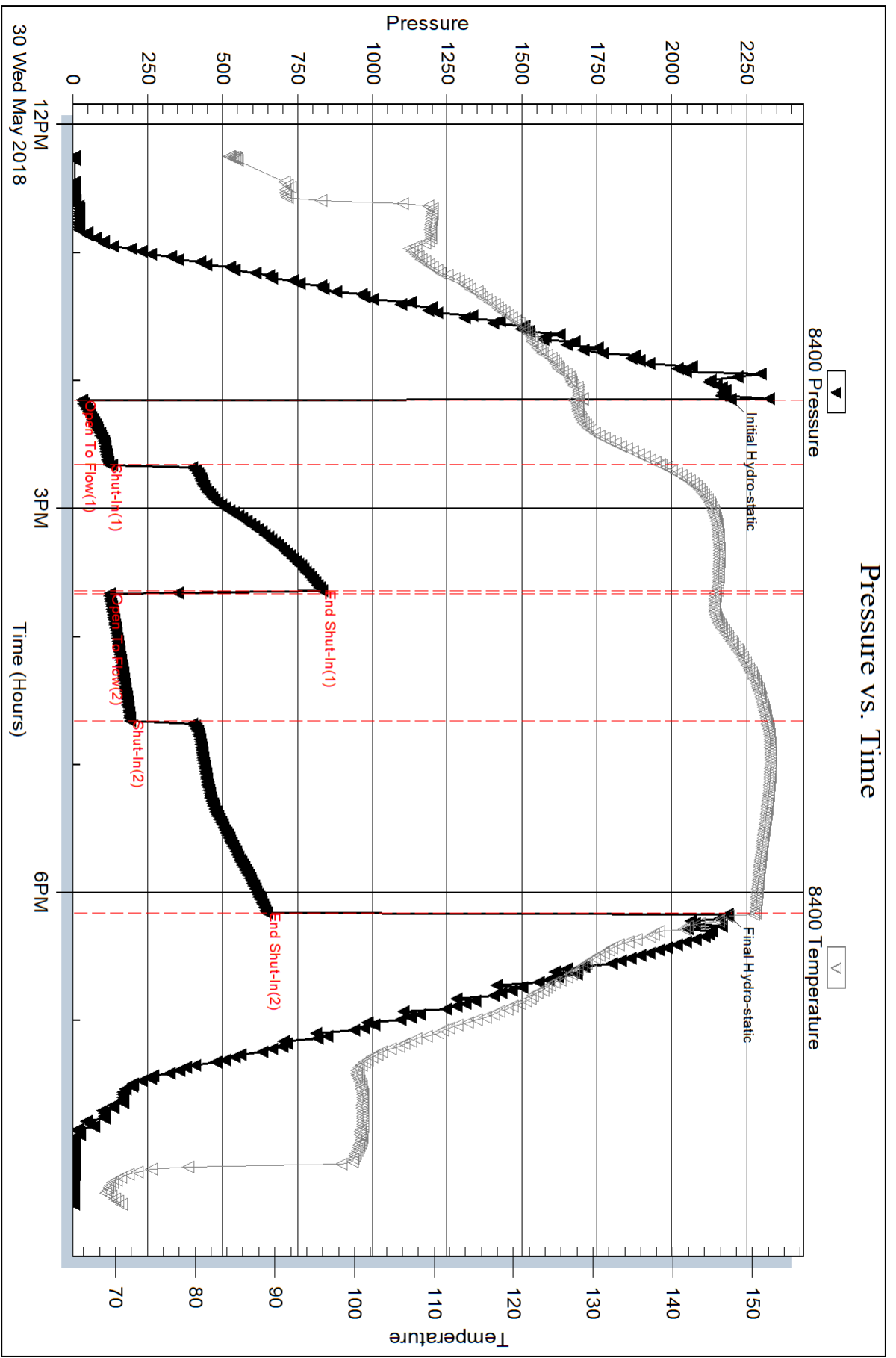
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	27000 ppm
Viscosity: 60.00 sec/qt	Cushion Volume: bbl		
Water Loss: 5.99 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 900.00 ppm			
Filter Cake: 4.00 inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
367.00	MCW 15% _m 85% _w	3.536

Total Length: 367.00 ft Total Volume: 3.536 bbl
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments: .239 @ 76



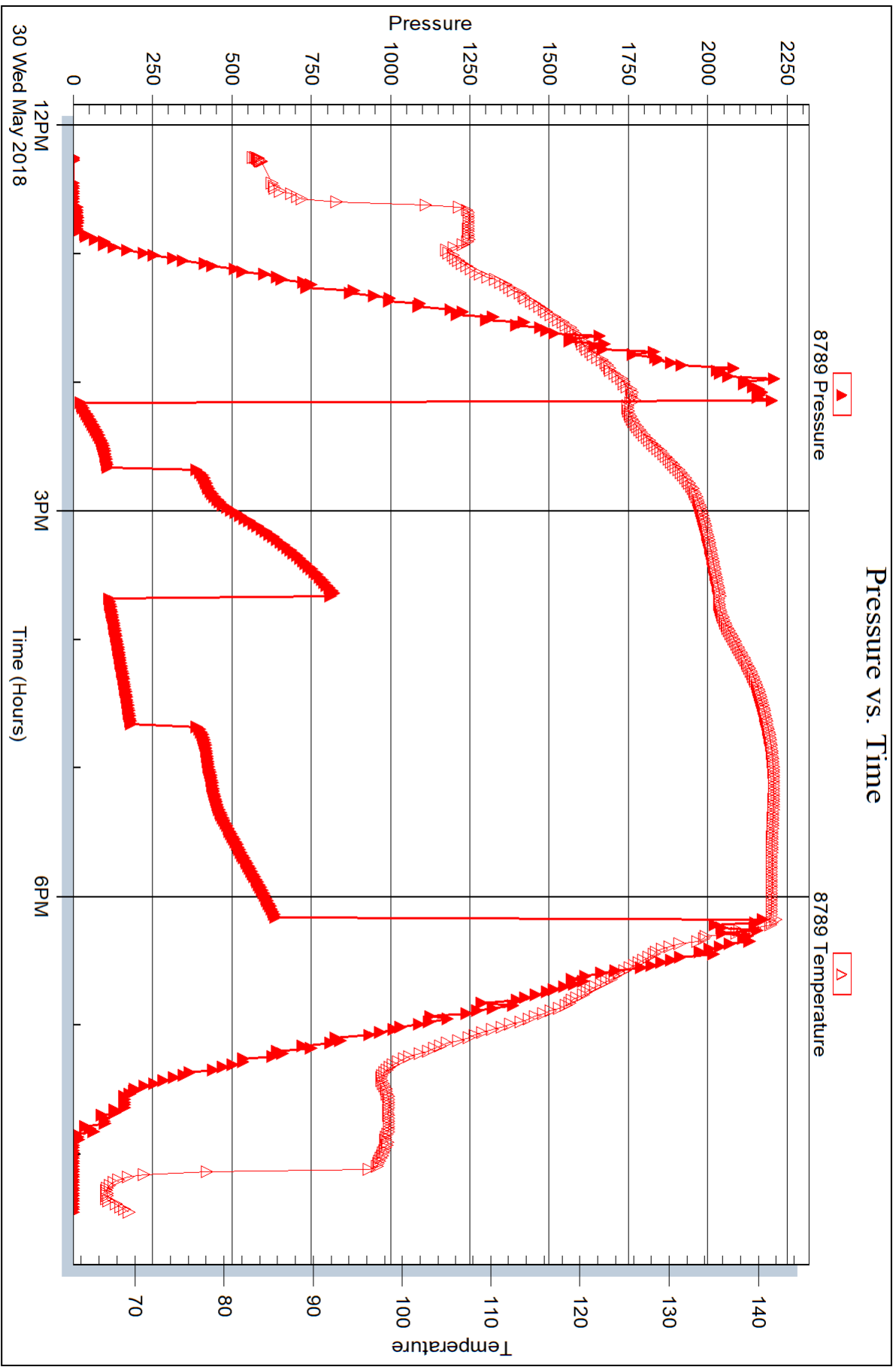
Serial #: 8789

Inside

Murfin Drilling Co Inc

Culwell Unit #1-18

DST Test Number: 4





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N Water Ste 300
Wichita KS 67202-1216

ATTN: Ken LeBlanc

Culwell I Unit #1-18

18 2s 37w Cheyenne,KS

Start Date: 2018.06.01 @ 04:04:00

End Date: 2018.06.01 @ 13:03:00

Job Ticket #: 63224 DST #: 5

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

Printed: 2018.06.04 @ 14:53:18

Murfin Drilling Co Inc

18 2s 37w Cheyenne,KS

Culwell I Unit #1-18

DST # 5

Ft Scott & Cella

2018.06.01



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
 250 N Water Ste 300
 Wichita KS 67202-1216
 ATTN: Ken LeBlanc

18 2s 37w Cheyenne, KS
Culwell I Unit #1-18
 Job Ticket: 63224 **DST#: 5**
 Test Start: 2018.06.01 @ 04:04:00

GENERAL INFORMATION:

Formation: **Ft Scott & Celia**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 06:41:16
 Time Test Ended: 13:03:00
 Interval: **4683.00 ft (KB) To 4830.00 ft (KB) (TVD)**
 Total Depth: 4830.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Jim Svaty
 Unit No: 76
 Reference Elevations: 3354.00 ft (KB)
 3349.00 ft (CF)
 KB to GR/CF: 5.00 ft

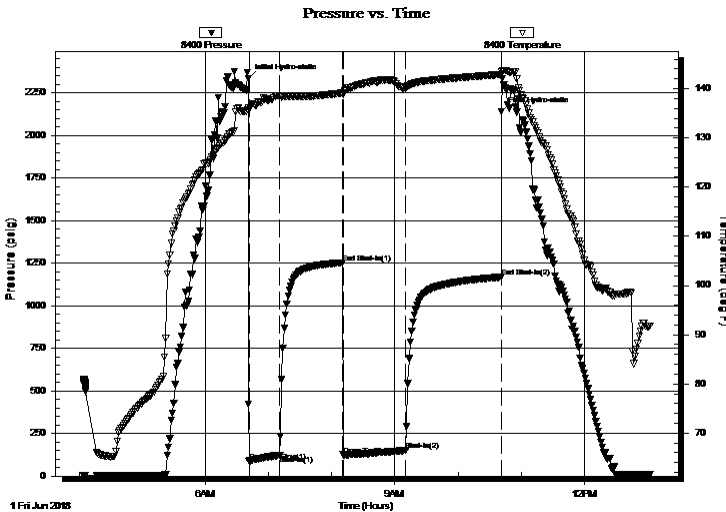
Serial #: 8400

Outside

Press@RunDepth: 151.35 psig @ 4684.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2018.06.01 End Date: 2018.06.01 Last Calib.: 2018.06.01
 Start Time: 04:04:01 End Time: 13:02:46 Time On Btm: 2018.06.01 @ 06:40:31
 Time Off Btm: 2018.06.01 @ 10:41:31

TEST COMMENT: 30-IFP- Hit Bridge 15ft. Up... 6" Blow. IPRO -- 6.30"
 60-ISIP- No Blow IPRO -- 5.40"
 60-FFP- Surface Blow Building to 4" IPRO -- 4.03"
 90-FSIP- No Blow IPRO -- 3.10"

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2333.65	136.17	Initial Hydro-static
1	88.66	135.72	Open To Flow (1)
30	121.45	138.36	Shut-In(1)
90	1252.62	139.10	End Shut-In(1)
91	124.36	138.85	Open To Flow (2)
150	151.35	140.19	Shut-In(2)
241	1168.02	142.90	End Shut-In(2)
241	2137.56	143.35	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
243.00	Mud 100%	1.80

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63224 **DST#: 5**
Test Start: 2018.06.01 @ 04:04:00

GENERAL INFORMATION:

Formation: **Ft Scott & Celia**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 06:41:16
Time Test Ended: 13:03:00
Test Type: Conventional Bottom Hole (Reset)
Tester: Jim Svaty
Unit No: 76
Interval: **4683.00 ft (KB) To 4830.00 ft (KB) (TVD)**
Reference Elevations: 3354.00 ft (KB)
3349.00 ft (CF)
Total Depth: 4830.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
KB to GR/CF: 5.00 ft

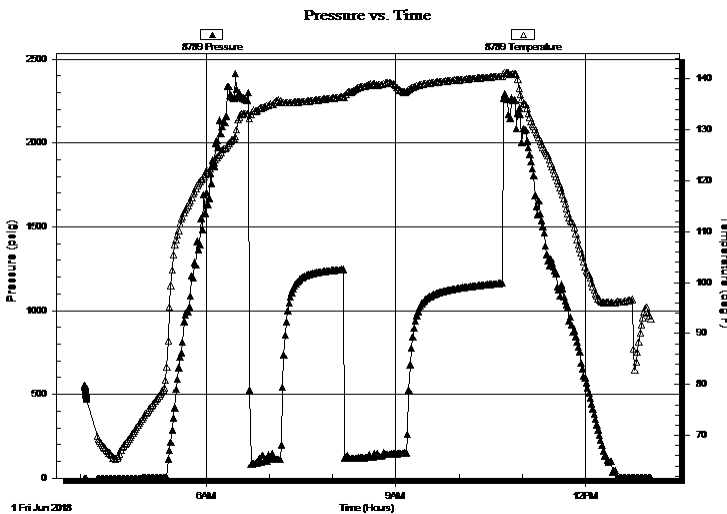
Serial #: 8789

Inside

Press@RunDepth: psig @ 4684.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2018.06.01 End Date: 2018.06.01 Last Calib.: 2018.06.01
Start Time: 04:04:01 End Time: 13:03:01 Time On Btm:
Time Off Btm:

TEST COMMENT: 30-IFP- Hit Bridge 15ft. Up... 6" Blow . IPRO -- 6.30"
60-ISIP- No Blow IPRO -- 5.40"
60-FFP- Surface Blow Building to 4" IPRO -- 4.03"
90-FSIP- No Blow IPRO -- 3.10"

PRESSURE SUMMARY



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

Recovery

Length (ft)	Description	Volume (bbl)
243.00	Mud 100%	1.80

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63224 **DST#: 5**
Test Start: 2018.06.01 @ 04:04:00

Tool Information

Drill Pipe:	Length: 4506.00 ft	Diameter: 3.80 inches	Volume: 63.21 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: 177.00 ft	Diameter: 2.25 inches	Volume: 0.87 bbl	Weight to Pull Loose: 85000.00 lb
			<u>Total Volume: 64.08 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	27.00 ft			String Weight: Initial 70000.00 lb
Depth to Top Packer:	4683.00 ft			Final 70000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	147.00 ft			
Tool Length:	174.00 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			4657.00	
Shut In Tool	5.00			4662.00	
Hydraulic tool	5.00			4667.00	
Jars	5.00			4672.00	
Safety Joint	2.00			4674.00	
Packer	5.00			4679.00	27.00 Bottom Of Top Packer
Packer	4.00			4683.00	
Stubb	1.00			4684.00	
Recorder	0.00	8400	Outside	4684.00	
Recorder	0.00	8789	Inside	4684.00	
Perforations	15.00			4699.00	
Change Over Sub	1.00			4700.00	
Perforations	126.00			4826.00	
Change Over Sub	1.00			4827.00	
Bullnose	3.00			4830.00	147.00 Bottom Packers & Anchor

Total Tool Length: 174.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc
250 N Water Ste 300
Wichita KS 67202-1216
ATTN: Ken LeBlanc

18 2s 37w Cheyenne,KS
Culwell I Unit #1-18
Job Ticket: 63224 **DST#: 5**
Test Start: 2018.06.01 @ 04:04:00

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: 5.99 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 900.00 ppm			
Filter Cake: 4.00 inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
243.00	Mud 100%	1.796

Total Length: 243.00 ft Total Volume: 1.796 bbl

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

Laboratory Name: Laboratory Location:

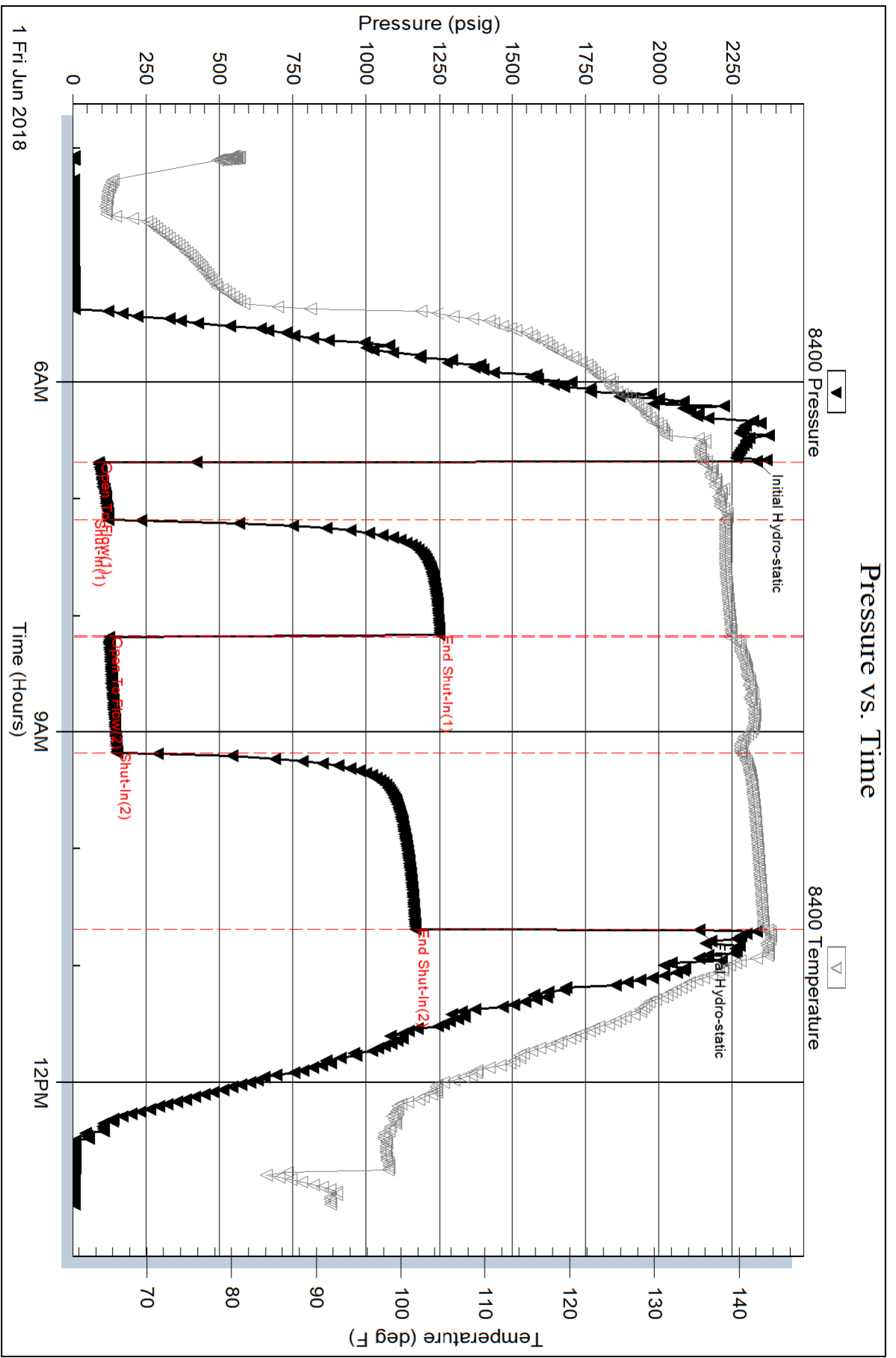
Recovery Comments:

Serial #: 8400

Outside Murfin Drilling Co Inc

Culwell I Unit #1-18

DST Test Number: 5



Trilobite Testing, Inc

Ref. No: 63224

Printed: 2018.06.04 @ 14:53:19

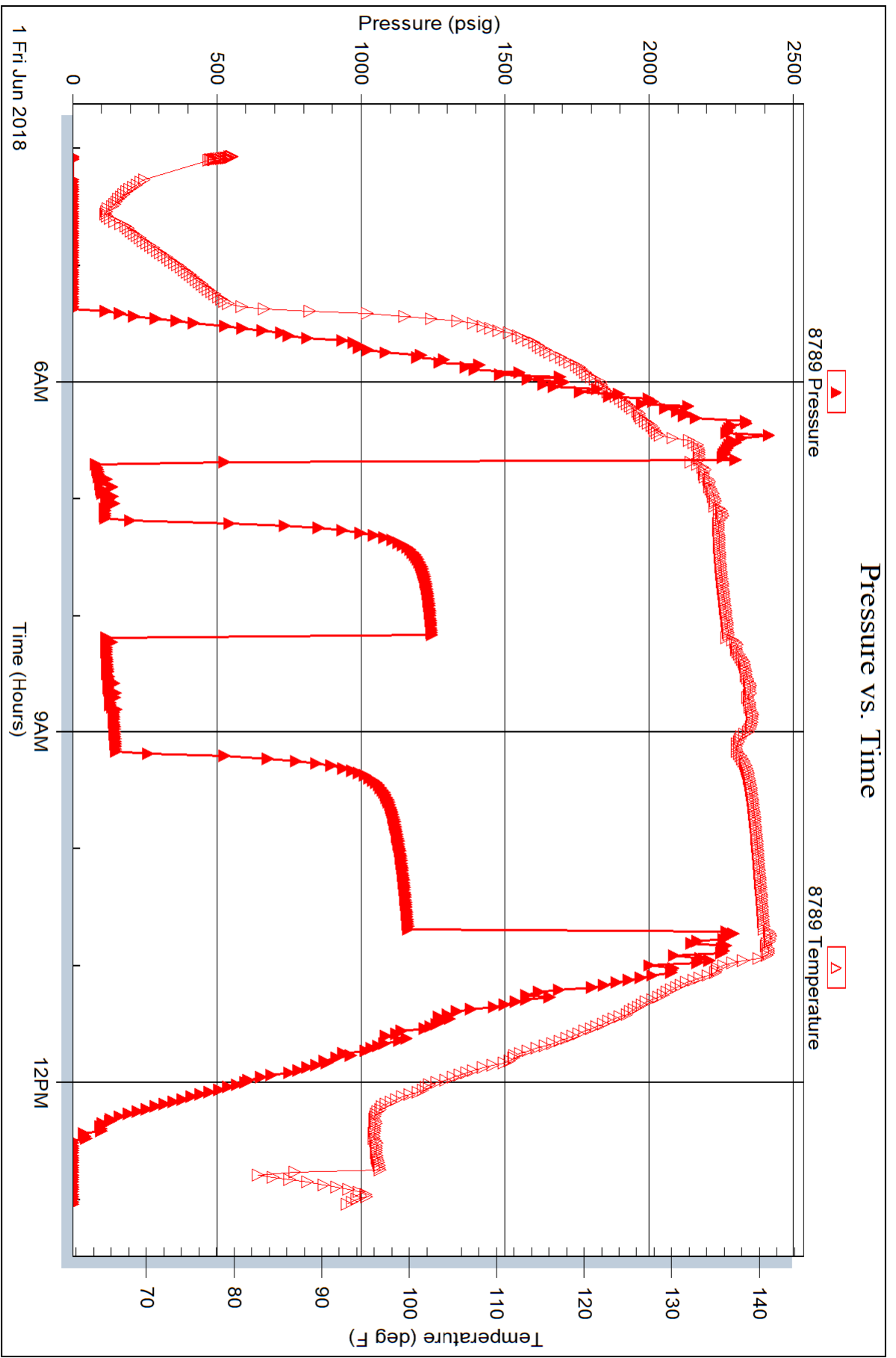
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Inside

Murfin Drilling Co Inc

Culwell Unit #1-18

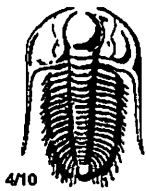
DST Test Number: 5



Trilobite Testing, Inc

Ref. No: 63224

Printed: 2018.06.04 @ 14:53:19



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63220

Well Name & No. Culwell "I" Unit 1-18 Test No. 1 Date 5-27-18
 Company Murfin Drilling Co. Inc. Elevation 3954 KB 3349 GL
 Address 250 N. Water St. Ste 300 Wichita, KS 67202-1216
 Co. Rep / Geo. Ken LeBlanc Rig Murfin 3
 Location: Sec. 18 Twp. 25 Rge. 37W Co. Cheyenne State KS

Interval Tested 4176 - 4250 Zone Tested Oread
 Anchor Length 74 Drill Pipe Run 3979 Mud Wt. 8.8
 Top Packer Depth 4171 Drill Collars Run 177 Vis 65
 Bottom Packer Depth 4176 Wt. Pipe Run 0 WL 6.4
 Total Depth 4250 Chlorides 900 ppm System LCM 4

Blow Description I FP - Surface Blow Built to 1 1/2 in.
I SIP - No Blow
F FP - Surface Blow Building to 1 1/4 in.
F SIP - No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>80</u>	<u>Mud</u>			<u>100</u>	
	<u>Show of Oil in Tool</u>				

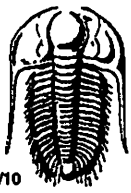
Rec Total 80 BHT 136 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 2039 Test 1150 T-On Location 11:15
 (B) First Initial Flow 29 Jars 250 T-Started 13:11
 (C) First Final Flow 48 Safety Joint 75 T-Open 15:18
 (D) Initial Shut-In 1271 Circ Sub _____ T-Pulled 18:18
 (E) Second Initial Flow 52 Hourly Standby _____ T-Out 21:21
 (F) Second Final Flow 71 Mileage 133 133 RT Comments _____
 (G) Final Shut-In 1244 Sampler _____
 (H) Final Hydrostatic 2020 Straddle _____

Initial Open 30 Shale Packer 250 Ruined Shale Packer _____
 Initial Shut-In 60 Extra Packer _____ Ruined Packer _____
 Final Flow 30 Extra Recorder _____ Sub Total 0
 Final Shut-In 60 Day Standby _____ Total 1858
 Accessibility _____ MP/DST Disc't _____
 Sub Total 1858

Approved By

Our Representative
7856395864



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63221

Well Name & No. Culwell "I" Unit 1-18 Test No. 2 Date 5-28-18
 Company Murfin Drilling Co. Inc. Elevation 3354 KB 3349 GL
 Address 250 N. Water St # 300 Wichita, KS 67202-1216
 Co. Rep / Geo. Ken LeBlanc Rig Murfin 3
 Location: Sec. 18 Twp. 25 Rge. 37W Co. Cherokee State KS

Interval Tested 4260-4400 Zone Tested LKC "A-D"
 Anchor Length 140 Drill Pipe Run 4072 Mud Wt. 9
 Top Packer Depth 4255 Drill Collars Run 177 Vis 62
 Bottom Packer Depth 4260 Wt. Pipe Run 0 WL 6.4
 Total Depth 4400 Chlorides 900 ppm System LCM 5

Blow Description IFP - BOB in 12 1/2 min. IPRO - 19.56 in.
ISIP - No Blow IPRO - 16.50 in.
FFP - BOB in 20 min. IPRO - 24.17 in.
FSIP - No Blow IPRO - 17.45 in.

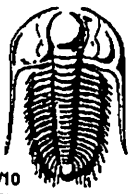
Rec	Feet of	%gas	%oil	%water	%mud
<u>618</u>	<u>MCW</u>		<u>90</u>	<u>10</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 618 BHT 146 Gravity API RW, 270 @ 59 °F Chlorides 30000 ppm
 (A) Initial Hydrostatic 2098 Test 1150 T-On Location 15:40
 (B) First Initial Flow 49 Jars 250 T-Started 16:24
 (C) First Final Flow 175 Safety Joint 75 T-Open 18:30
 (D) Initial Shut-In 1187 Circ Sub T-Pulled 22:30
 (E) Second Initial Flow 183 Hourly Standby T-Out 01:46
 (F) Second Final Flow 312 Mileage 133 Comments _____
 (G) Final Shut-In 1088 Sampler _____
 (H) Final Hydrostatic 2065 Straddle _____
 Shale Packer 250 Ruined Shale Packer _____
 Extra Packer _____ Ruined Packer _____
 Extra Recorder _____ Extra Copies _____

Initial Open 30
 Initial Shut-In 60
 Final Flow 60
 Final Shut-In 90

Approved By [Signature] Sub Total 1858 Our Representative

Sub Total 0
 Total 1858
 MP/DST Disc't _____



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63222

Well Name & No. Culwell "I" Unit 1-18 Test No. 3 Date 5-29-18
 Company Martin Drilling Co. Inc. Elevation 3354 KB 3349 GL
 Address 250 N. Water Ste 300 Wichita KS 67202-1216
 Co. Rep / Geo. Ken LeBlanc Rig Martin 3
 Location: Sec. 18 Twp. 25 Rge. 37W Co. Cheyenne State KS

Interval Tested 4394-4465 Zone Tested LKC "H"
 Anchor Length 71 Drill Pipe Run 4197 Mud Wt. 9
 Top Packer Depth 4389 Drill Collars Run 177 Vis 63
 Bottom Packer Depth 4394 Wt. Pipe Run 0 WL 6
 Total Depth 4465 Chlorides 900 ppm System LCM 5

Blow Description FFP - Surface Blow Building to 9 in. IPRD - 9.15 in.
ISIP - No Blow Back IPRD - 8.01 in.
FFP - BOB in 5 1/2 min. IPRD - 12.76 in.
FSIP - No Blow IPRD - 10.95

Rec	Feet of	%gas	%oil	%water	%mud
<u>177</u>	<u>WCM</u>		<u>20</u>	<u>80</u>	
<u>176</u>	<u>Mud</u>			<u>100</u>	

Rec Total 353 BHT 146 Gravity API RW 519 @ 57 °F Chlorides 16000 ppm

- (A) Initial Hydrostatic 2158
- (B) First Initial Flow 30
- (C) First Final Flow 122
- (D) Initial Shut-In 427
- (E) Second Initial Flow 123
- (F) Second Final Flow 193
- (G) Final Shut-In 425
- (H) Final Hydrostatic 2117

- Initial Open 30
- Initial Shut-In 60
- Final Flow 60
- Final Shut-In 90

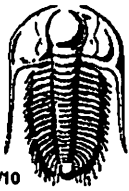
- Test 1150
- Jars 250
- Safety Joint 75
- Circ Sub
- Hourly Standby
- Mileage 133
- Sampler
- Straddle
- Shale Packer 250
- Extra Packer
- Extra Recorder
- Day Standby
- Accessibility
- Sub Total 1858

- T-On Location 14:10
- T-Started 14:44
- T-Open 18:37
- T-Pulled 22:37
- T-Out 01:11

- Comments
- Ruined Shale Packer
- Ruined Packer
- Extra Copies
- Sub Total 0
- Total 1858
- MP/DST Disc't

Approved By

Our Representative



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63223

Well Name & No. Culwell "I" Unit 1-18 Test No. 4 Date 5-30-18
 Company Murfin Drilling Co. Inc. Elevation 3354 KB 3349 GL
 Address 250 N. Water Ste 300 Wichita KS 67202-1216
 Co. Rep / Geo. Ken LeBlanc Rig Murfin 3
 Location: Sec. 18 Twp. 25 Rge. 37W Co. Cheyenne State KS

Interval Tested 4440-4530 Zone Tested LKC-H-J
 Anchor Length 90 Drill Pipe Run 4259 Mud Wt. 9
 Top Packer Depth 4435 Drill Collars Run 177 Vis 60
 Bottom Packer Depth 4440 Wt. Pipe Run 0 WL 6
 Total Depth 4530 Chlorides 900 ppm System LCM 4

Blow Description I/P - Surface Blow Building to 7 1/2 in. IPRO 7.67 in.
I/SIP - No Blow IPRO 7.30 in.
I/P - Bob in 5 min IPRO 12.04 in.
I/SIP - No Blow IPRO 11.29 in.

Rec	Feet of	%gas	%oil	%water	%mud
<u>367</u>	<u>MCW</u>		<u>85</u>	<u>15</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 367 BHT 151 Gravity API RW 239 @ 76 °F Chlorides 27000 ppm

- (A) Initial Hydrostatic 2196
- (B) First Initial Flow 30
- (C) First Final Flow 119
- (D) Initial Shut-In 831
- (E) Second Initial Flow 122
- (F) Second Final Flow 191
- (G) Final Shut-In 646
- (H) Final Hydrostatic 2186

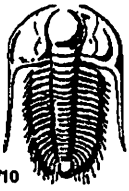
- Test 1150
- Jars 250
- Safety Joint 75
- Circ Sub
- Hourly Standby
- Mileage 133
- Sampler
- Straddle
- Shale Packer 250
- Extra Packer
- Extra Recorder
- Day Standby
- Accessibility
- Sub Total 1858

- T-On Location 11:36
- T-Started 12:15
- T-Open 14:10
- T-Pulled 18:10
- T-Out 20:27

- Comments
- Ruined Shale Packer
- Ruined Packer
- Extra Copies
- Sub Total 0
- Total 1858
- MP/DST Disc't

Initial Open 30
 Initial Shut-In 60
 Final Flow 60
 Final Shut-In 90

Approved By [Signature] Our Representative



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63224

Well Name & No. Culwell "I" Unit 1-18 Test No. 5 Date 6-1-18
 Company Marfin Drilling Co. Inc. Elevation 3354 KB 3349 GL
 Address 250 N. Water St. 300 Wichita KS 67202-1216
 Co. Rep / Geo. Ken LeBlanc Rig Marfin 3
 Location: Sec. 18 Twp. 25 Rge. 37W Co. Cheyenne State KS

Interval Tested 4683-4830 Zone Tested Ft Scott + Celia
 Anchor Length 147 Drill Pipe Run 4506 Mud Wt. 9.1
 Top Packer Depth 4678 Drill Collars Run 177 Vis 62
 Bottom Packer Depth 4683 Wt. Pipe Run 0 WL 6
 Total Depth 4830 Chlorides 900 ppm System LCM 4

Blow Description I-FP - Hit Bridge 15ft. up. 6in Blow I-PRO - 6.30 in.
I-SIP - No Blow I-PRO - 5.40 in.
F-FP - Surface Blow Building to 4in. I-PRO - 4.03 in.
F-SIP - No Blow I-PRO - 3.10 in.

Rec	Feet of	%gas	%oil	%water	%mud
<u>243</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 243 BHT 143 Gravity API RW @ °F Chlorides ppm
 (A) Initial Hydrostatic 2333 Test 1150 T-On Location 03:10
 (B) First Initial Flow 88 Jars 250 T-Started 04:04
 (C) First Final Flow 121 Safety Joint 75 T-Open 06:41
 (D) Initial Shut-In 1252 Circ Sub _____ T-Pulled 10:41
 (E) Second Initial Flow 124 Hourly Standby _____ T-Out 13:03
 (F) Second Final Flow 151 Mileage 133 Comments _____
 (G) Final Shut-In 1168 Sampler _____
 (H) Final Hydrostatic 2137 Straddle _____
 Shale Packer 250 Ruined Shale Packer 350
 Extra Packer _____ Ruined Packer _____
 Extra Recorder _____ Extra Copies _____

Initial Open 30
 Initial Shut-In 60
 Final Flow 60
 Final Shut-In 90

Approved By [Signature] Our Representative

Sub Total 350
 Total 2208
 MP/DST Disc't _____

MDCI
 Culwell 'I' Unit #1-18
 2640' FSL 2570' FEL
 Sec. 18-T2S-R37W
 3354' KB

Formation	Sample top	Datum	Ref	Log Top	Datum	Ref
Anhydrite	3276	+78	-14	3276	+78	-14
B/Anhydrite	3311	+43	-14	3310	+44	-13
Neva	3745	-391	-18	3745	-391	-18
Red Eagle	3806	-452	-14	3810	-456	-18
Foraker	3859	-505	-15	3859	-505	-15
Topeka	4084	-730	-15	4086	-732	-17
Oread	4226	-872	-12	4230	-876	-18
Lansing	4303	-949	-22	4302	-948	-21
Stark	4529	-1175	-17	4532	-1178	-20
Mound City	4575	-1221	-11	4583	-1229	-19
Ft Scott	4708	-1354	-16	4712	-1358	-20
Oakley	4787	-1433	-19	4792	-1438	-24
Mississippian	5061	-1707		5016	-1662	
RTD	5100	-1746				
LTD				5100	-1746	

TREATMENT REPORT



HURRICANE SERVICES INC

Customer:	Murfin Drilling	Date:	5/22/2018	Ticket No.:	100929
Field Rep:	Greg Condren				
Address:	PO Box 661				
City, State:	Colby, KS				
County, Zip:	Thomas	67701			

Field Order No.:	
Well Name:	Cutwell "I" #1-18
Location:	Cheyenne
Formation:	
Type of Service:	Cement
Well Type:	oil
Age of Well:	New
Packer Type:	
Packer Depth:	
Treatment Via:	Cement

Open Hole:	303
Casing Depth:	302.71
Casing Size:	8 5/8"
Tubing Depth:	
Tubing Size:	
Liner Depth:	
Liner Size:	
Liner Top:	
Liner Bottom:	
Total Depth:	

Perf Depths (ft)	Perfs
Total Perfs	0

TIME	INJECTION RATE		PRESSURE		REMARKS	PROP (lbs)	HCL (gls)	FLUID (bbis)
	FLUID	N2/CO2	STP	ANNULUS				
9:30 PM					Depart Oakley yard			
11:00 PM					Arrive on location			
11:15 PM					Safety meeting			
11:30 PM					Spot and rig up equipment			
12:00 AM					Rig starts coming out of hole			
12:30 AM					Rig starts running casing			
1:30 AM					Casing on bottom, rig circulates 15 minutes			
1:45 AM					HSI rig up to well head			
1:58 AM	4.0		40.0		Pump water ahead			15.00
2:04 AM	3.8		70.0		Pump 300 sks of class A, 2% gel, 3% CC, 1/4#phno at 14.8			75.30
2:42 AM	4.0		100.0		Start displacement with fresh water			
2:47 AM			50.0		End displacement, shut in well			18.00
3:15 AM					Rig down and wash up equipment			
3:30 AM					Depart location			
					100% circulation through out job			
					15 bbis cement returned to surface			
					Thank you for calling Hurricane services			
					Glen, Fennis, Nate and Daryl			
TOTAL:								108.30

SUMMARY

Max Fl. Rate	Avg Fl. Rate	Max PSI	Avg PSI
4.0	3.9	100.0	65.0

PRODUCTS USED

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Treater: Glen Fisher

Customer: _____

TREATMENT REPORT



HURRICANE SERVICES INC

Customer:	Murfin Drilling Inc.	Date:	6/2/2018	Ticket No.:	100930
Field Rep:	Greg Condren				
Address:					
City, State:					
County, Zip:					

Field Order No.:	100930
Well Name:	Cullwell "I" 1-18
Location:	
Formation:	
Type of Service:	PTA
Well Type:	OIL
Age of Well:	New
Packer Type:	
Packer Depth:	
Treatment Via:	

Open Hole:	7.875"
Casing Depth:	
Casing Size:	8 5/8
Tubing Depth:	
Tubing Size:	
Liner Depth:	
Liner Size:	
Liner Top:	
Liner Bottom:	
Total Depth:	

Perf Depths (ft)	Perfs
Total Perfs	0

TIME	INJECTION RATE		PRESSURE		REMARKS	PROP (lbs)	HCL (gls)	FLUID (bbls)
	FLUID	N2/CO2	STP	ANNULUS				
2:05 PM					Arrived on location			
2:10 PM					Held Safety meeting			
2:15 PM					Spot in equipment			
2:20 PM					Rig up equipment			
2:50 PM	4.0		200.0		Pump 20 bbls H2O ahead			20.00
2:57 PM	4.0		200.0		Pump 50 sx cement at 13.8 ppg			12.70
3:05 PM	3.6		140.0		Pump 7 bbls H2O behind			7.00
3:08 PM					Turn over to rig pump 38.62 mud displacement			
3:12 PM					Rig pull drill pipe to 2500'			
3:42 PM	4.0		180.0		Pump 20 bbls H2O ahead			20.00
3:51 PM	3.0		150.0		Pump 100 sx cement at 13.8 ppg hand scaled at 13.9 ppg			25.50
4:00 PM	4.0		100.0		Pump 7 bbls H2O behind			7.00
4:05 PM					Turn over to rig pump 22 bbls mud displacement			
4:08 PM					Rig pull to 350'			
5:15 PM	4.0		100.0		Pump 10 bbls ahead			10.00
5:19 PM	4.0		130.0		Mix 50 sx cement at 13.8 ppg, scaled at 13.8 ppg			12.70
5:22 PM	4.0		110.0		Pump 2 bbls H2O behind			2.00
5:24 PM					Shut down turn to rig to pull drill pipe			
TOTAL:						-	-	133.90

SUMMARY

Max Fl. Rate	Avg Fl. Rate	Max PSI	Avg PSI
4.0	3.6	200.0	118.3

PRODUCTS USED

--

Treater: Dave Retzlaff

Customer: _____

