



## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Jeff Christian

### **AFT #1-5**

### **5-1s-36w Rawlins,KS**

Start Date: 2013.03.11 @ 07:50:00

End Date: 2013.03.11 @ 17:30:30

Job Ticket #: 51211                      DST #: 1

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2013.03.20 @ 10:20:54

Murfin Drilling, Co. 5-1s-36w Rawlins,KS AFT #1-5 DST # 1 LKC "A-D" 2013.03.11



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling, Co.  
 250 N Water STE #300  
 Wichita, KS 67202  
 ATTN: Jeff Christian

**5-1s-36w Rawlins,KS**  
**AFT #1-5**  
 Job Ticket: 51211 **DST#: 1**  
 Test Start: 2013.03.11 @ 07:50:00

## GENERAL INFORMATION:

Formation: **LKC "A-D"**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 10:26:00  
 Time Test Ended: 17:30:30  
 Interval: **4270.00 ft (KB) To 4376.00 ft (KB) (TVD)**  
 Total Depth: 4376.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Kevin Mack  
 Unit No: 43  
 Reference Elevations: 3369.00 ft (KB)  
 3359.00 ft (CF)  
 KB to GR/CF: 10.00 ft

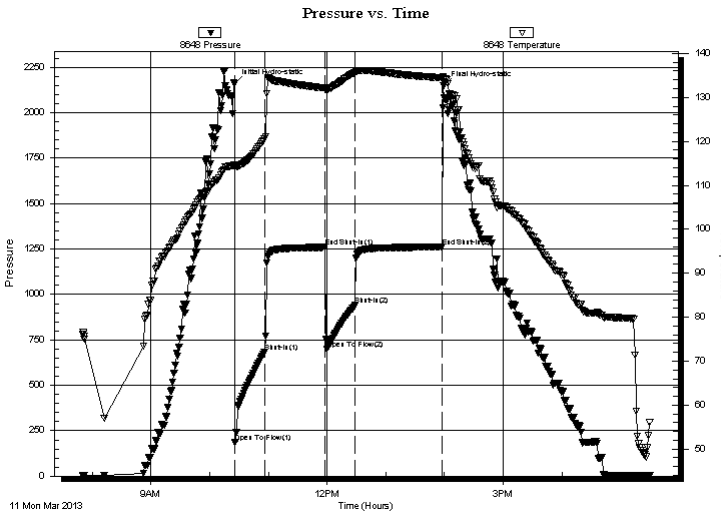
## Serial #: 8648

Inside

Press @ RunDepth: 939.49 psig @ 4271.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2013.03.11 End Date: 2013.03.11 Last Calib.: 2013.03.11  
 Start Time: 07:50:05 End Time: 17:30:30 Time On Btm: 2013.03.11 @ 10:25:15  
 Time Off Btm: 2013.03.11 @ 13:59:00

**TEST COMMENT:** 30 - IF- BoB in 1 1/2 Min.  
 60 - IS- Weak Surface Return started at 2 min. Died at 15 min.  
 30 - FF- BoB in 3 min  
 90 - FS- No Return

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2160.19	114.58	Initial Hydro-static
1	188.08	114.27	Open To Flow (1)
31	683.95	120.58	Shut-In(1)
92	1260.05	132.12	End Shut-In(1)
95	697.60	131.89	Open To Flow (2)
124	939.49	135.70	Shut-In(2)
212	1262.01	134.46	End Shut-In(2)
214	2151.58	134.29	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
360.00	OSMW 90W 10M (oil spots)	1.77
360.00	OCMW 50W 30M 20o	3.47
658.00	GWOCM 20G 20W 40M 20o	9.23
564.00	GMCWO 30G 10W 10M 50o	7.91
380.00	MCO 40M 60o	5.33

## Gas Rates

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



# TRILOBITE TESTING, INC.

## DRILL STEM TEST REPORT

Murfin Drilling, Co.  
250 N Water STE #300  
Wichita, KS 67202  
ATTN: Jeff Christian

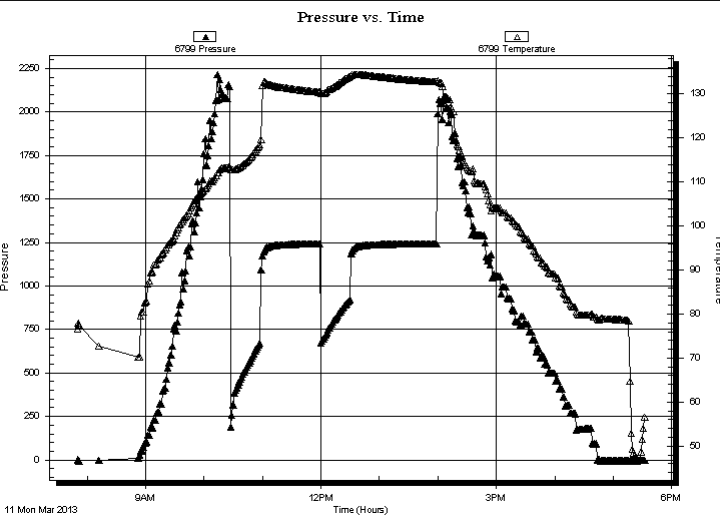
**5-1s-36w Rawlins,KS**  
**AFT #1-5**  
Job Ticket: 51211      **DST#: 1**  
Test Start: 2013.03.11 @ 07:50:00

### GENERAL INFORMATION:

Formation: **LKC "A-D"**  
Deviated: **No** Whipstock:                      ft (KB)  
Time Tool Opened: 10:26:00  
Time Test Ended: 17:30:30  
**Interval: 4270.00 ft (KB) To 4376.00 ft (KB) (TVD)**  
Total Depth: 4376.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Good  
Test Type: Conventional Bottom Hole (Initial)  
Tester: Kevin Mack  
Unit No: 43  
Reference Elevations: 3369.00 ft (KB)  
3359.00 ft (CF)  
KB to GR/CF: 10.00 ft

**Serial #: 6799**      **Inside**  
Press @ Run Depth:                      psig @      4271.00 ft (KB)      Capacity:                      8000.00 psig  
Start Date:                      2013.03.11      End Date:                      2013.03.11      Last Calib.:                      2013.03.11  
Start Time:                      07:50:05      End Time:                      17:32:15      Time On Btm:  
Time Off Btm:

**TEST COMMENT:** 30 - IF- BoB in 1 1/2 Min.  
60 - IS- Weak Surface Return started at 2 min. Died at 15 min.  
30 - FF- BoB in 3 min  
90 - FS- No Return



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

Recovery		
Length (ft)	Description	Volume (bbl)
360.00	OSMW 90W 10M (oil spots)	1.77
360.00	OCMW 50W 30M 20o	3.47
658.00	GWOCM 20G 20W 40M 20o	9.23
564.00	GMCWO 30G 10W 10M 50o	7.91
380.00	MCO 40M 60o	5.33

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling, Co.

**5-1s-36w Rawlins,KS**

250 N Water STE #300  
Wichita, KS 67202

**AFT #1-5**

Job Ticket: 51211

**DST#: 1**

ATTN: Jeff Christian

Test Start: 2013.03.11 @ 07:50:00

## Tool Information

Drill Pipe:	Length: 3740.00 ft	Diameter: 3.80 inches	Volume: 52.46 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 533.00 ft	Diameter: 2.25 inches	Volume: 2.62 bbl	Weight to Pull Loose: 75000.00 lb
			<u>Total Volume: 55.08 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	32.00 ft			String Weight: Initial 68000.00 lb
Depth to Top Packer:	4270.00 ft			Final 74000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	106.00 ft			
Tool Length:	135.00 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			4242.00	
Shut In Tool	5.00			4247.00	
Hydraulic tool	5.00			4252.00	
Jars	5.00			4257.00	
Safety Joint	3.00			4260.00	
Packer	5.00			4265.00	29.00 Bottom Of Top Packer
Packer	5.00			4270.00	
Stubb	1.00			4271.00	
Recorder	0.00	6799	Inside	4271.00	
Recorder	0.00	8648	Inside	4271.00	
Perforations	5.00			4276.00	
Change Over Sub	1.00			4277.00	
Drill Pipe	95.00			4372.00	
Change Over Sub	1.00			4373.00	
Bullnose	3.00			4376.00	106.00 Bottom Packers & Anchor

**Total Tool Length: 135.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling, Co.

**5-1s-36w Rawlins,KS**

250 N Water STE #300  
Wichita, KS 67202

**AFT #1-5**

Job Ticket: 51211

**DST#: 1**

ATTN: Jeff Christian

Test Start: 2013.03.11 @ 07:50:00

## 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: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.19 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 1000.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
360.00	OSMW 90W 10M (oil spots)	1.770
360.00	OCMW 50W 30M 20o	3.474
658.00	GWOCM 20G 20W 40M 20o	9.230
564.00	GMCWO 30G 10W 10M 50o	7.911
380.00	MCO 40M 60o	5.330

Total Length: 2322.00 ft      Total Volume: 27.715 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW .23 @ 70 = 30,000

Serial #: 8648

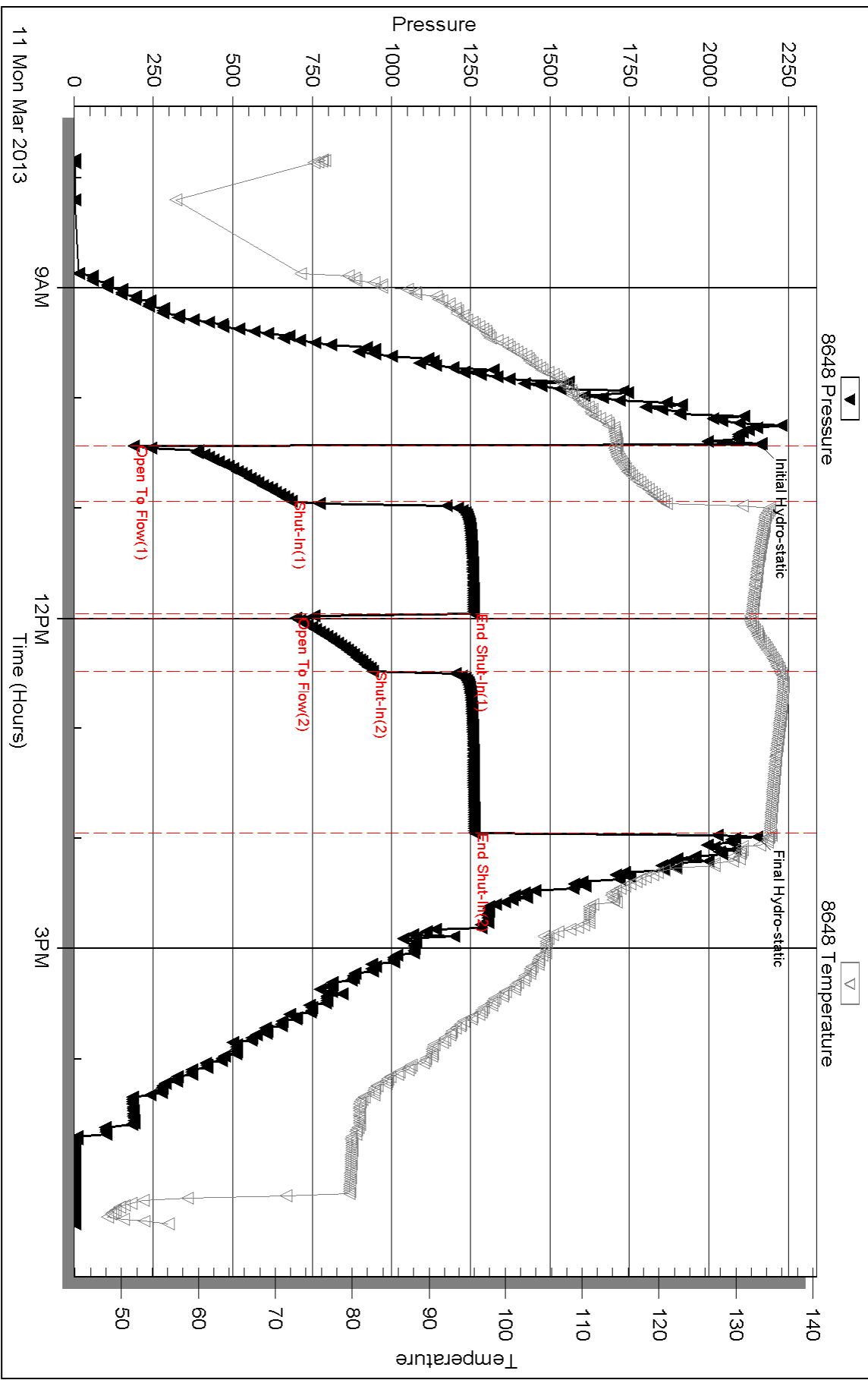
Inside

Murfin Drilling, Co.

AFT #1-5

DST Test Number: 1

### Pressure vs. Time



Triobite Testing, Inc

Ref. No: 51211

Printed: 2013.03.20 @ 10:20:56

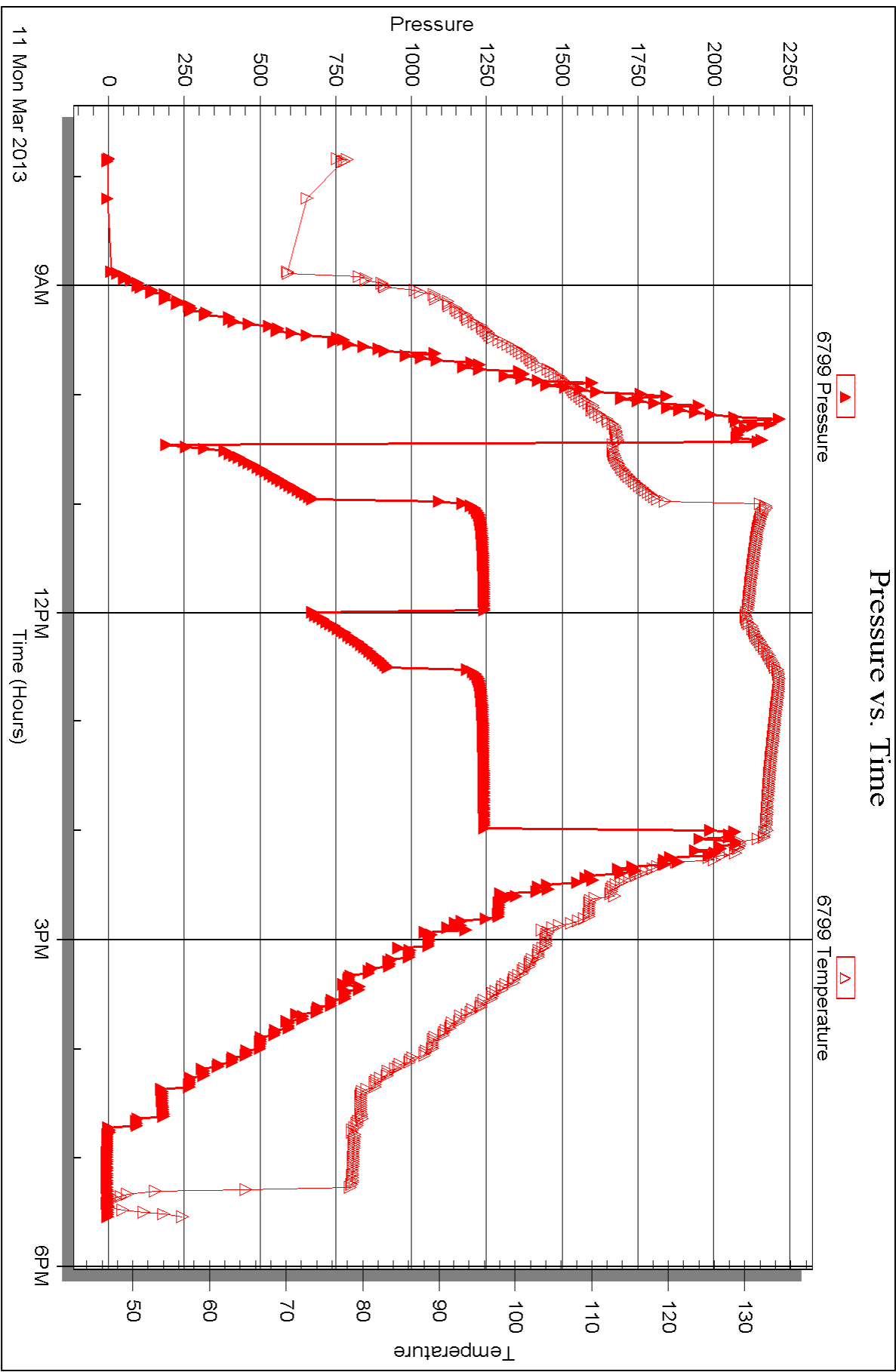
Serial #: 6799

Inside

Murfin Drilling, Co.

AFT #1-5

DST Test Number: 1





## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Jeff Christian

**AFT #1-5**

**5-1s-36w Rawlins,KS**

Start Date: 2013.03.12 @ 00:35:00

End Date: 2013.03.12 @ 09:17:15

Job Ticket #: 51212                      DST #: 2

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

ph: 785-625-4778 fax: 785-625-5620

Printed: 2013.03.20 @ 10:20:14

Murfin Drilling, Co. 5-1s-36w Rawlins,KS AFT #1-5 DST # 2 LKC "G" 2013.03.12





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling, Co.  
250 N Water STE #300  
Wichita, KS 67202  
ATTN: Jeff Christian

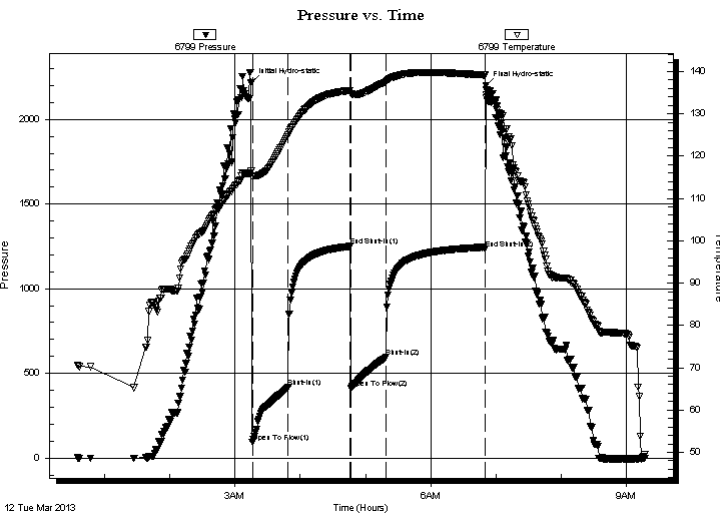
**5-1s-36w Rawlins,KS**  
**AFT #1-5**  
Job Ticket: 51212      **DST#: 2**  
Test Start: 2013.03.12 @ 00:35:00

## GENERAL INFORMATION:

Formation: **LKC "G"**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 03:15:45  
Time Test Ended: 09:17:15  
Interval: **4390.00 ft (KB) To 4430.00 ft (KB) (TVD)**  
Total Depth: 4430.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Good  
Test Type: Conventional Bottom Hole (Initial)  
Tester: Kevin Mack  
Unit No: 43  
Reference Elevations: 3369.00 ft (KB)  
3359.00 ft (CF)  
KB to GR/CF: 10.00 ft

**Serial #: 6799      Inside**  
Press @ RunDepth: 594.94 psig @ 4391.00 ft (KB)      Capacity: 8000.00 psig  
Start Date: 2013.03.12      End Date: 2013.03.12      Last Calib.: 2013.03.12  
Start Time: 00:35:05      End Time: 09:17:15      Time On Btm: 2013.03.12 @ 03:14:45  
Time Off Btm: 2013.03.12 @ 06:51:00

**TEST COMMENT:** 30 - IF- BoB in 5 min  
60 - IS- Surface Return started at 2 min. Died at 45 min  
30 - FF- BoB in 6 min  
90 - FS- No Return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2216.96	116.58	Initial Hydro-static
1	93.96	115.41	Open To Flow (1)
34	417.17	124.98	Shut-In(1)
91	1250.52	135.47	End Shut-In(1)
92	412.23	134.81	Open To Flow (2)
124	594.94	137.56	Shut-In(2)
215	1234.30	139.14	End Shut-In(2)
217	2199.36	133.87	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
533.00	MW 90W 10M	2.62
282.00	OCMW 80W 10M 10o	3.96
490.00	OCMW 70W 20M 10o	6.87
30.00	Free Oil 100o	0.42

## Gas Rates

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





**TRILOBITE  
TESTING, INC.**

## DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling, Co.

**5-1s-36w Rawlins,KS**

250 N Water STE #300  
Wichita, KS 67202

**AFT #1-5**

Job Ticket: 51212

**DST#: 2**

ATTN: Jeff Christian

Test Start: 2013.03.12 @ 00:35:00

### Tool Information

Drill Pipe:	Length: 3834.00 ft	Diameter: 3.80 inches	Volume: 53.78 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 533.00 ft	Diameter: 2.25 inches	Volume: 2.62 bbl	Weight to Pull Loose: 76000.00 lb
			<u>Total Volume: 56.40 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	6.00 ft			String Weight: Initial 68000.00 lb
Depth to Top Packer:	4390.00 ft			Final 74000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	40.00 ft			
Tool Length:	69.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

### Tool Description

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

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4362.00	
Shut In Tool	5.00			4367.00	
Hydraulic tool	5.00			4372.00	
Jars	5.00			4377.00	
Safety Joint	3.00			4380.00	
Packer	5.00			4385.00	29.00 Bottom Of Top Packer
Packer	5.00			4390.00	
Stubb	1.00			4391.00	
Recorder	0.00	6799	Inside	4391.00	
Recorder	0.00	8648	Inside	4391.00	
Perforations	2.00			4393.00	
Change Over Sub	1.00			4394.00	
Drill Pipe	32.00			4426.00	
Change Over Sub	1.00			4427.00	
Bullnose	3.00			4430.00	40.00 Bottom Packers & Anchor

**Total Tool Length: 69.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling, Co.

**5-1s-36w Rawlins,KS**

250 N Water STE #300  
Wichita, KS 67202

**AFT #1-5**

Job Ticket: 51212

**DST#: 2**

ATTN: Jeff Christian

Test Start: 2013.03.12 @ 00:35:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

36 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

23000 ppm

Viscosity: 51.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.59 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 1000.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
533.00	MW 90W 10M	2.621
282.00	OCMW 80W 10M 10o	3.956
490.00	OCMW 70W 20M 10o	6.873
30.00	Free Oil 100o	0.421

Total Length: 1335.00 ft      Total Volume: 13.871 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

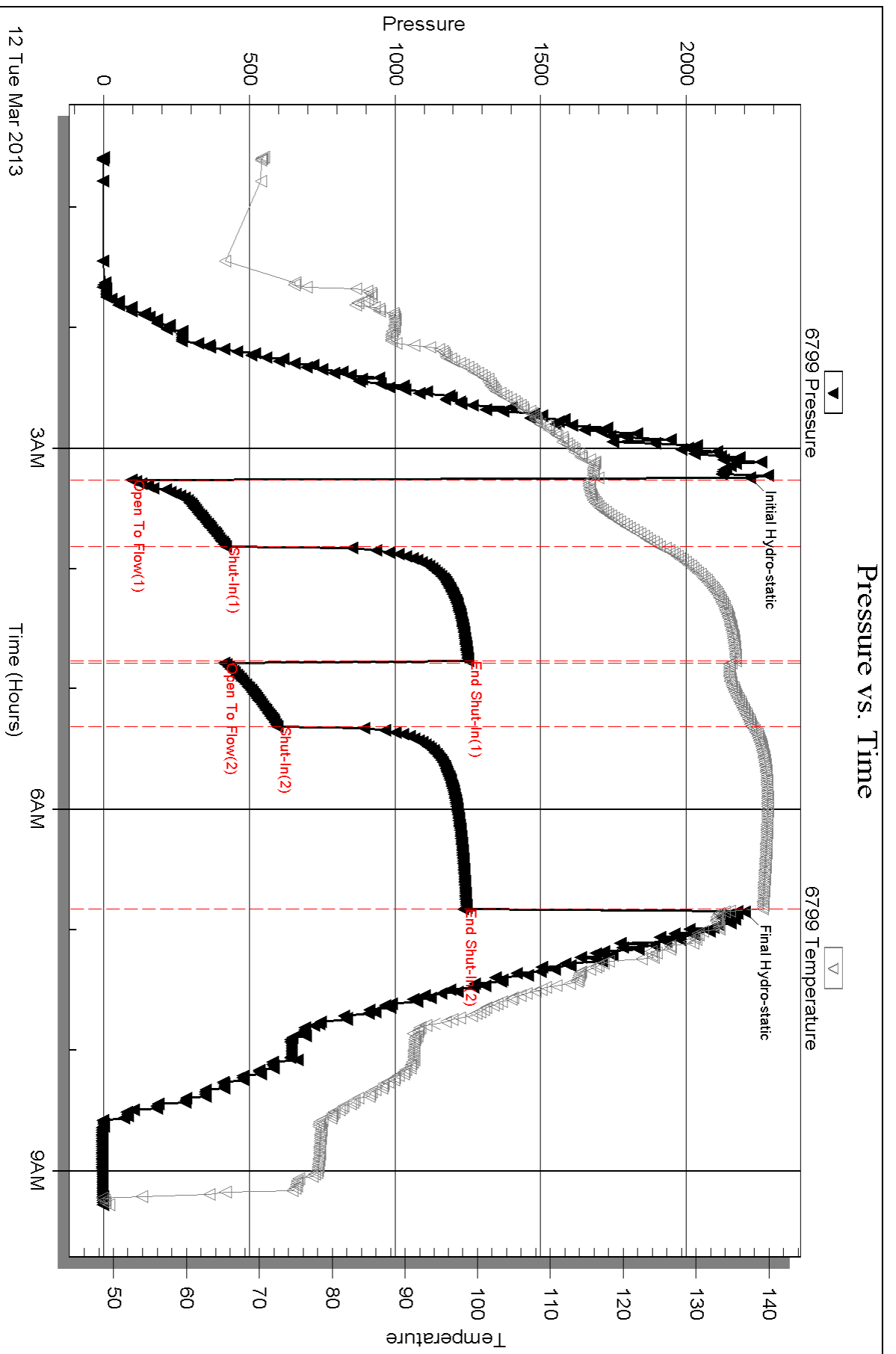
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Oil API 37 @ 70 deg = 36 cor.

RW = .41 @ 54 deg = 23000 ppm



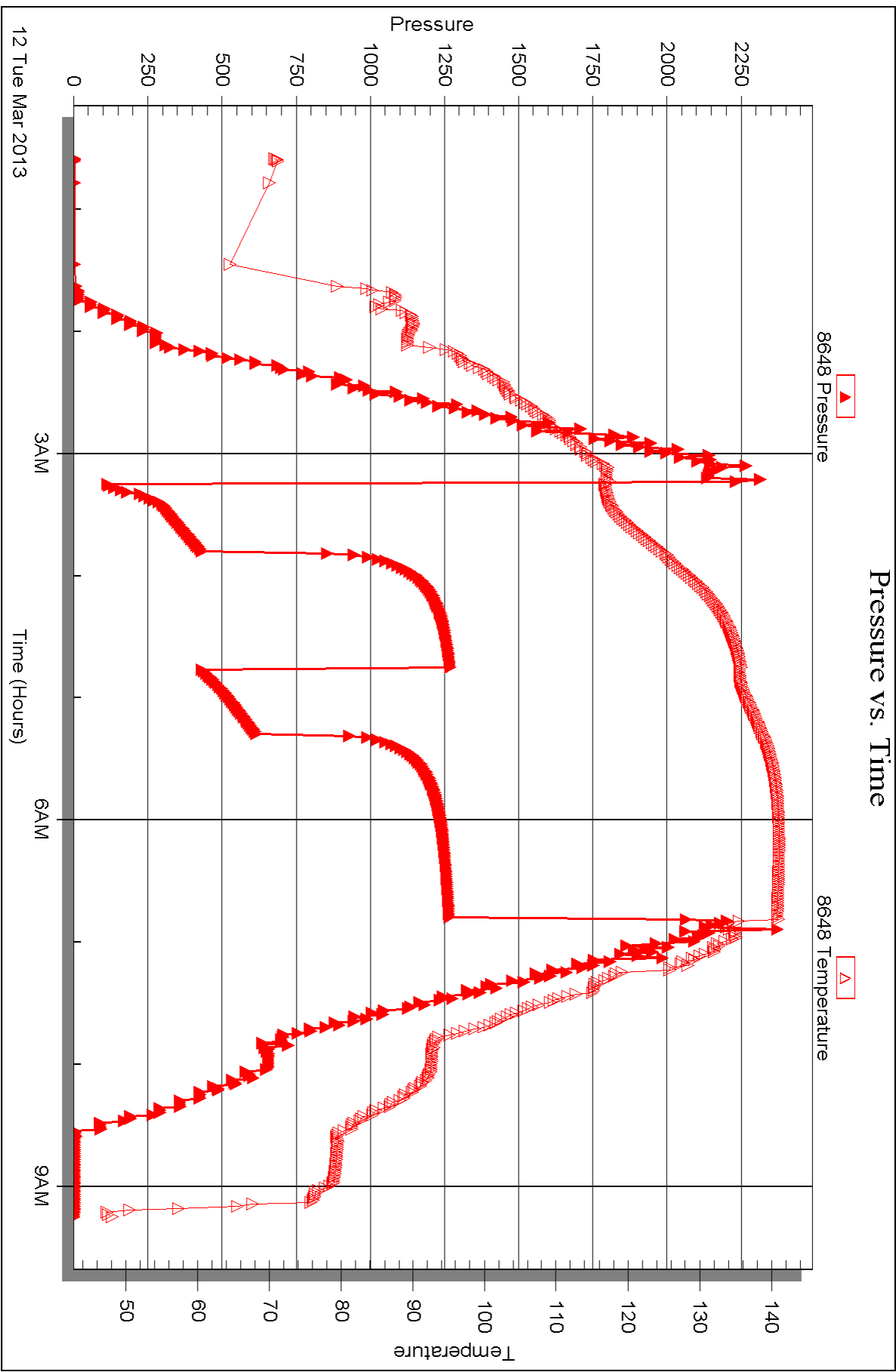
Serial #: 8648

Inside

Murfin Drilling, Co.

AFT #1-5

DST Test Number: 2





## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Jeff Christian

**AFT #1-5**

**5-1s-36w Rawlins,KS**

Start Date: 2013.03.12 @ 20:30:00

End Date: 2013.03.13 @ 05:05:15

Job Ticket #: 51213                      DST #: 3

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2013.03.20 @ 10:19:39

Murfin Drilling, Co. 5-1s-36w Rawlins,KS AFT #1-5 DST # 3 LKC "J" 2013.03.12



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling, Co.  
 250 N Water STE #300  
 Wichita, KS 67202  
 ATTN: Jeff Christian

**5-1s-36w Rawlins,KS**  
**AFT #1-5**  
 Job Ticket: 51213      **DST#: 3**  
 Test Start: 2013.03.12 @ 20:30:00

## GENERAL INFORMATION:

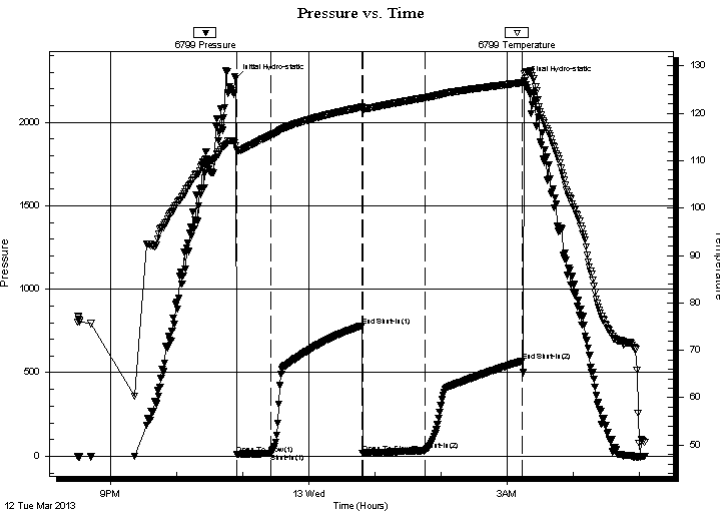
Formation: **LKC "J"**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 22:54:45  
 Time Test Ended: 05:05:15  
 Interval: **4479.00 ft (KB) To 4522.00 ft (KB) (TVD)**  
 Total Depth: 4522.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Kevin Mack  
 Unit No: 43  
 Reference Elevations: 3369.00 ft (KB)  
 3359.00 ft (CF)  
 KB to GR/CF: 10.00 ft

## Serial #: 6799

Inside

Press @ RunDepth: 33.66 psig @ 4480.00 ft (KB)      Capacity: 8000.00 psig  
 Start Date: 2013.03.12      End Date: 2013.03.13      Last Calib.: 2013.03.13  
 Start Time: 20:30:05      End Time: 05:05:15      Time On Btm: 2013.03.12 @ 22:53:45  
 Time Off Btm: 2013.03.13 @ 03:15:45

TEST COMMENT: 30 - IF- 3/4" Blow built to 4"  
 60 - IS- No Return  
 60 - FF- Weak Surface Blow built to 1"  
 90 - FS- No Return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2262.00	113.21	Initial Hydro-static
1	12.69	112.33	Open To Flow (1)
32	18.29	115.36	Shut-In(1)
114	779.64	121.29	End Shut-In(1)
115	18.28	120.91	Open To Flow (2)
172	33.66	123.27	Shut-In(2)
260	570.30	126.46	End Shut-In(2)
262	2250.83	128.43	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
20.00	MCO 40M 60o	0.10
40.00	Free Oil 100o	0.20

## Gas Rates

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







**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling, Co.

**5-1s-36w Rawlins,KS**

250 N Water STE #300  
Wichita, KS 67202

**AFT #1-5**

Job Ticket: 51213

**DST#: 3**

ATTN: Jeff Christian

Test Start: 2013.03.12 @ 20:30:00

## Tool Information

Drill Pipe:	Length: 3932.00 ft	Diameter: 3.80 inches	Volume: 55.16 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 533.00 ft	Diameter: 2.25 inches	Volume: 2.62 bbl	Weight to Pull Loose:	82000.00 lb
			<u>Total Volume: 57.78 bbl</u>	Tool Chased	ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial	70000.00 lb
Depth to Top Packer:	4479.00 ft			Final	70000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	43.00 ft				
Tool Length:	72.00 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			4451.00	
Shut In Tool	5.00			4456.00	
Hydraulic tool	5.00			4461.00	
Jars	5.00			4466.00	
Safety Joint	3.00			4469.00	
Packer	5.00			4474.00	29.00 Bottom Of Top Packer
Packer	5.00			4479.00	
Stubb	1.00			4480.00	
Recorder	0.00	6799	Inside	4480.00	
Recorder	0.00	8648	Inside	4480.00	
Perforations	5.00			4485.00	
Change Over Sub	1.00			4486.00	
Drill Pipe	32.00			4518.00	
Change Over Sub	1.00			4519.00	
Bullnose	3.00			4522.00	43.00 Bottom Packers & Anchor

**Total Tool Length: 72.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling, Co.

**5-1s-36w Rawlins,KS**

250 N Water STE #300  
Wichita, KS 67202

**AFT #1-5**

Job Ticket: 51213

**DST#: 3**

ATTN: Jeff Christian

Test Start: 2013.03.12 @ 20:30:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

38 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.59 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 1500.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
20.00	MCO 40M 60o	0.098
40.00	Free Oil 100o	0.197

Total Length: 60.00 ft      Total Volume: 0.295 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

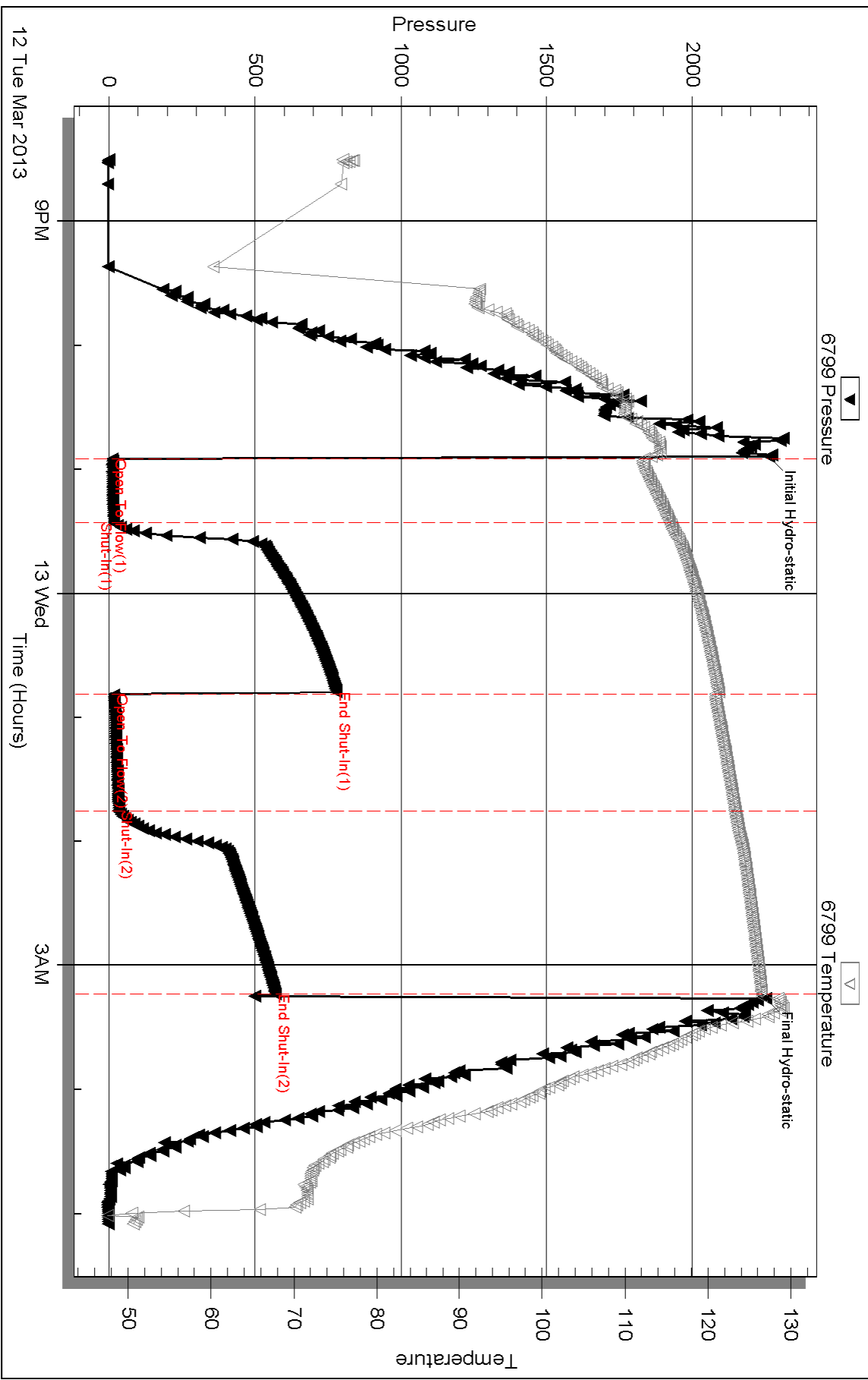
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Oil API = 39 @ 70 deg = 38 cor

# Pressure vs. Time



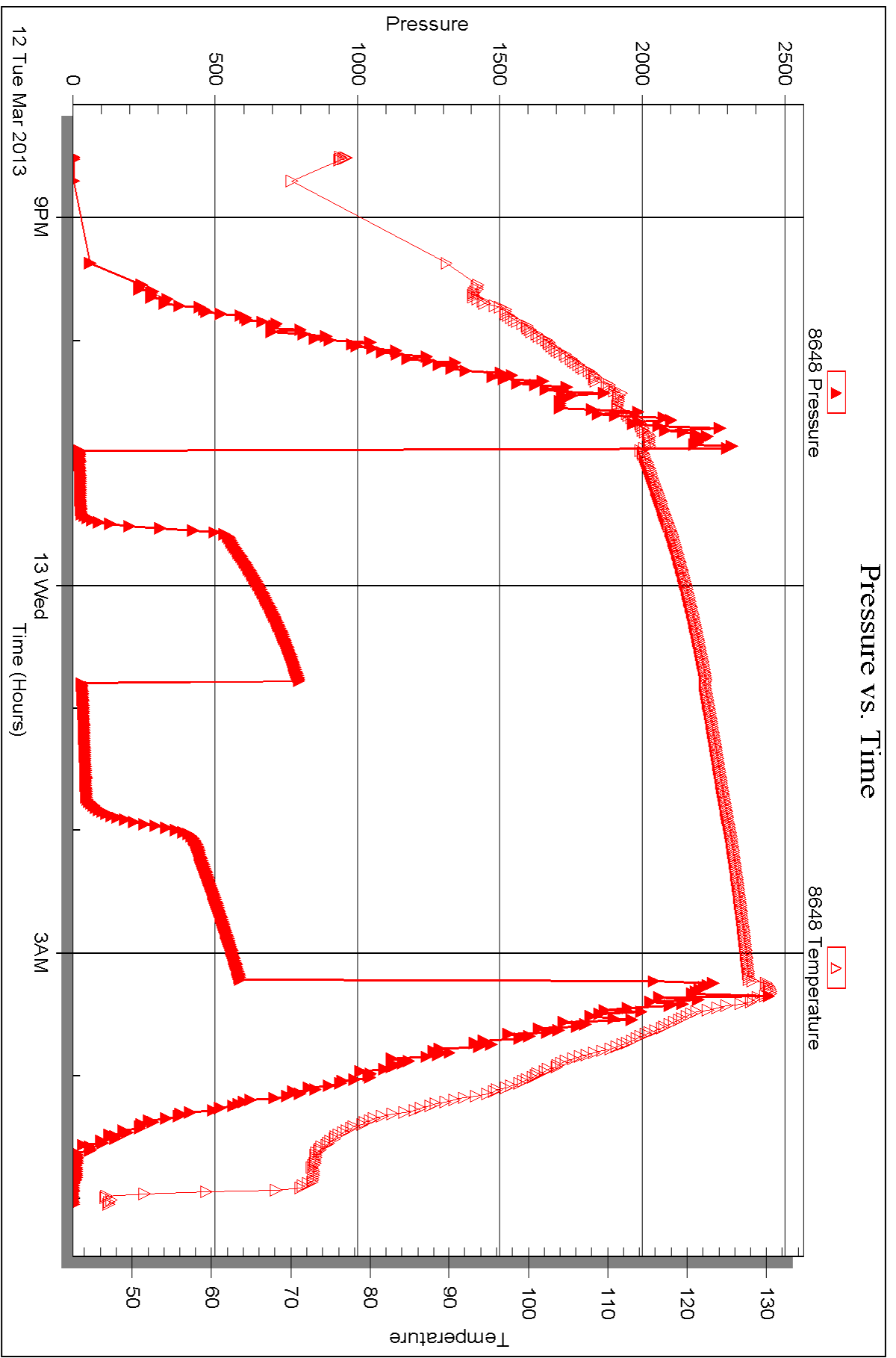
Serial #: 8648

Inside

Murfin Drilling, Co.

AFT #1-5

DST Test Number: 3





## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Jeff Christian

**AFT #1-5**

**5-1s-36w Rawlins,KS**

Start Date: 2013.03.13 @ 19:07:00

End Date: 2013.03.14 @ 02:18:00

Job Ticket #: 51214                      DST #: 4

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2013.03.20 @ 10:19:02



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling, Co.  
250 N Water STE #300  
Wichita, KS 67202  
ATTN: Jeff Christian

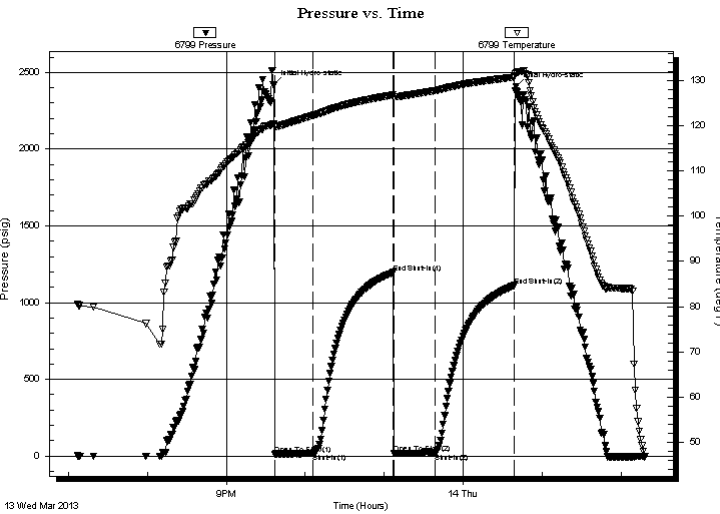
**5-1s-36w Rawlins,KS**  
**AFT #1-5**  
Job Ticket: 51214      **DST#: 4**  
Test Start: 2013.03.13 @ 19:07:00

## GENERAL INFORMATION:

Formation: **Pawnee**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 21:36:45  
Time Test Ended: 02:18:00  
Interval: **4669.00 ft (KB) To 4715.00 ft (KB) (TVD)**  
Total Depth: 4715.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Good  
Test Type: Conventional Bottom Hole (Initial)  
Tester: Kevin Mack  
Unit No: 43  
Reference Elevations: 3369.00 ft (KB)  
3359.00 ft (CF)  
KB to GR/CF: 10.00 ft

**Serial #: 6799      Inside**  
Press @ Run Depth: 16.61 psig @ 4670.00 ft (KB)      Capacity: 8000.00 psig  
Start Date: 2013.03.13      End Date: 2013.03.14      Last Calib.: 2013.03.14  
Start Time: 19:07:05      End Time: 02:17:59      Time On Btm: 2013.03.13 @ 21:35:45  
Time Off Btm: 2013.03.14 @ 00:40:00

**TEST COMMENT:** 30 - IF- 1/2" Blow built to 1"  
60 - IS- No Return  
30 - FF- No Blow  
60 - FS- No Return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2418.06	120.27	Initial Hydro-static
1	12.81	119.73	Open To Flow (1)
30	16.66	122.19	Shut-In(1)
91	1194.96	126.79	End Shut-In(1)
92	15.83	126.36	Open To Flow (2)
123	16.61	127.71	Shut-In(2)
183	1110.89	130.70	End Shut-In(2)
185	2408.94	131.59	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
10.00	OSM 100M (oil spots)	0.05

## Gas Rates

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



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling, Co.  
 250 N Water STE #300  
 Wichita, KS 67202  
 ATTN: Jeff Christian

**5-1s-36w Rawlins,KS**  
**AFT #1-5**  
 Job Ticket: 51214      **DST#: 4**  
 Test Start: 2013.03.13 @ 19:07:00

**GENERAL INFORMATION:**

Formation:	<b>Pawnee</b>	Test Type:	Conventional Bottom Hole (Initial)
Deviated:	No Whipstock:      ft (KB)	Tester:	Kevin Mack
Time Tool Opened:	21:36:45	Unit No:	43
Time Test Ended:	02:18:00	Reference Elevations:	3369.00 ft (KB) 3359.00 ft (CF)
<b>Interval:</b>	<b>4669.00 ft (KB) To 4715.00 ft (KB) (TVD)</b>	KB to GR/CF:	10.00 ft
Total Depth:	4715.00 ft (KB) (TVD)		
Hole Diameter:	7.88 inches Hole Condition: Good		

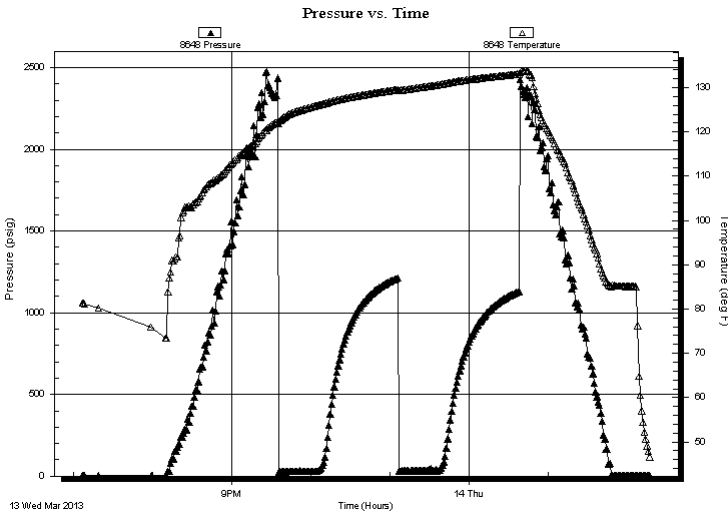
**Serial #: 8648**

**Inside**

Press @ Run Depth:	psig @ 4670.00 ft (KB)	Capacity:	8000.00 psig
Start Date:	2013.03.13	End Date:	2013.03.14
Start Time:	19:07:05	End Time:	02:16:59
		Time On Btm:	
		Time Off Btm:	

**TEST COMMENT:** 30 - IF- 1/2" Blow built to 1"  
 60 - IS- No Return  
 30 - FF- No Blow  
 60 - FS- No Return

**PRESSURE SUMMARY**



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

**Recovery**

**Gas Rates**

Length (ft)	Description	Volume (bbl)
10.00	OSM 100M (oil spots)	0.05

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





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling, Co.

**5-1s-36w Rawlins,KS**

250 N Water STE #300  
Wichita, KS 67202

**AFT #1-5**

Job Ticket: 51214

**DST#: 4**

ATTN: Jeff Christian

Test Start: 2013.03.13 @ 19:07:00

## Tool Information

Drill Pipe:	Length: 4122.00 ft	Diameter: 3.80 inches	Volume: 57.82 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 533.00 ft	Diameter: 2.25 inches	Volume: 2.62 bbl	Weight to Pull Loose:	80000.00 lb
			<u>Total Volume: 60.44 bbl</u>	Tool Chased	ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial	70000.00 lb
Depth to Top Packer:	4669.00 ft			Final	70000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	46.00 ft				
Tool Length:	75.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Change Over Sub	1.00			4641.00	
Shut In Tool	5.00			4646.00	
Hydraulic tool	5.00			4651.00	
Jars	5.00			4656.00	
Safety Joint	3.00			4659.00	
Packer	5.00			4664.00	29.00 Bottom Of Top Packer
Packer	5.00			4669.00	
Stubb	1.00			4670.00	
Recorder	0.00	6799	Inside	4670.00	
Recorder	0.00	8648	Inside	4670.00	
Perforations	6.00			4676.00	
Change Over Sub	1.00			4677.00	
Drill Pipe	32.00			4709.00	
Change Over Sub	1.00			4710.00	
Bullnose	5.00			4715.00	46.00 Bottom Packers & Anchor

**Total Tool Length: 75.00**



**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

**FLUID SUMMARY**

Murfin Drilling, Co.

**5-1s-36w Rawlins,KS**

250 N Water STE #300  
Wichita, KS 67202

**AFT #1-5**

Job Ticket: 51214

**DST#: 4**

ATTN: Jeff Christian

Test Start: 2013.03.13 @ 19:07:00

**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:

bbbl

Water Loss: 5.99 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 1500.00 ppm

Filter Cake: 2.00 inches

**Recovery Information**

Recovery Table

Length ft	Description	Volume bbl
10.00	OSM 100M (oil spots)	0.049

Total Length: 10.00 ft      Total Volume: 0.049 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

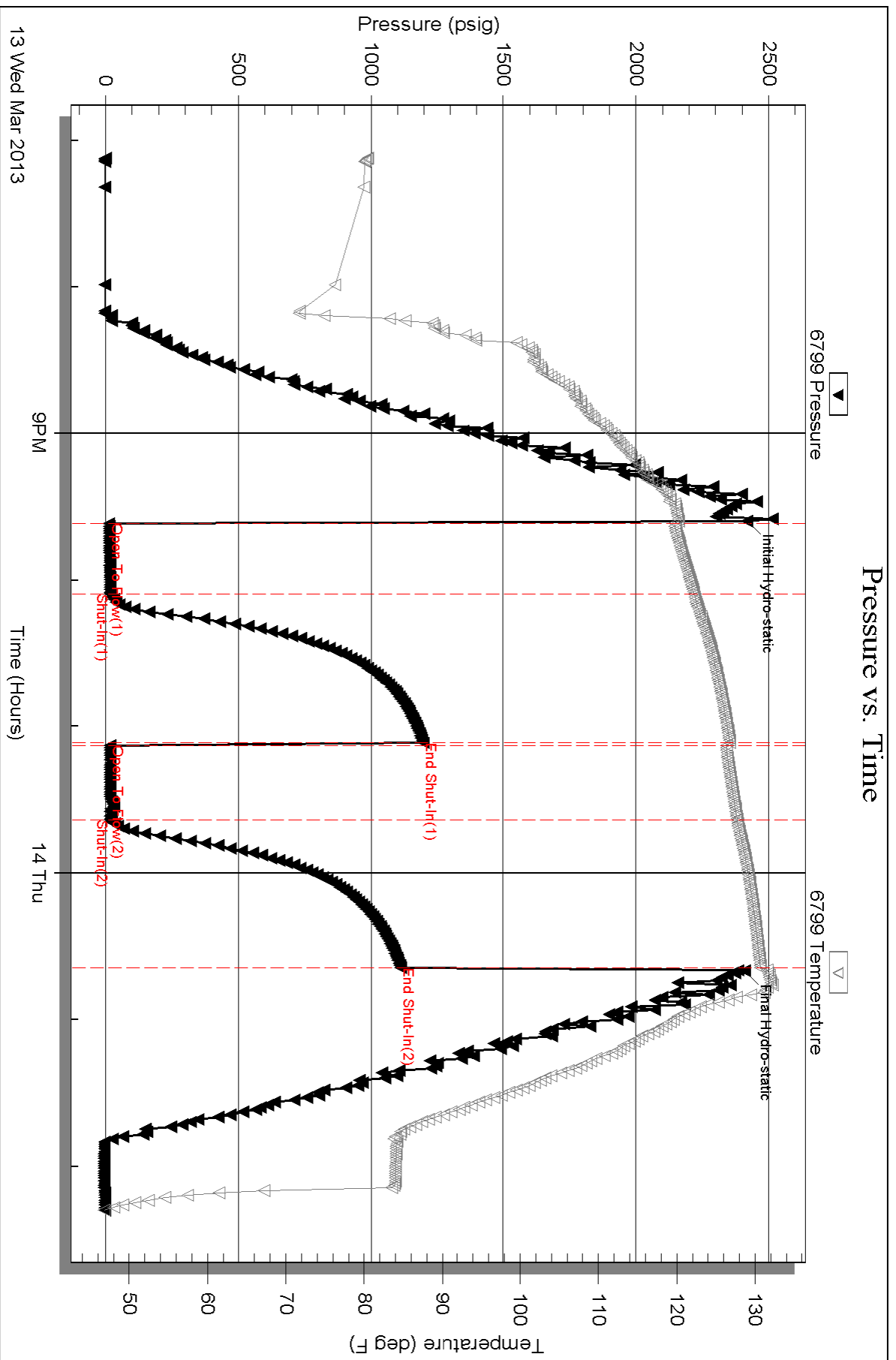
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

# Pressure vs. Time



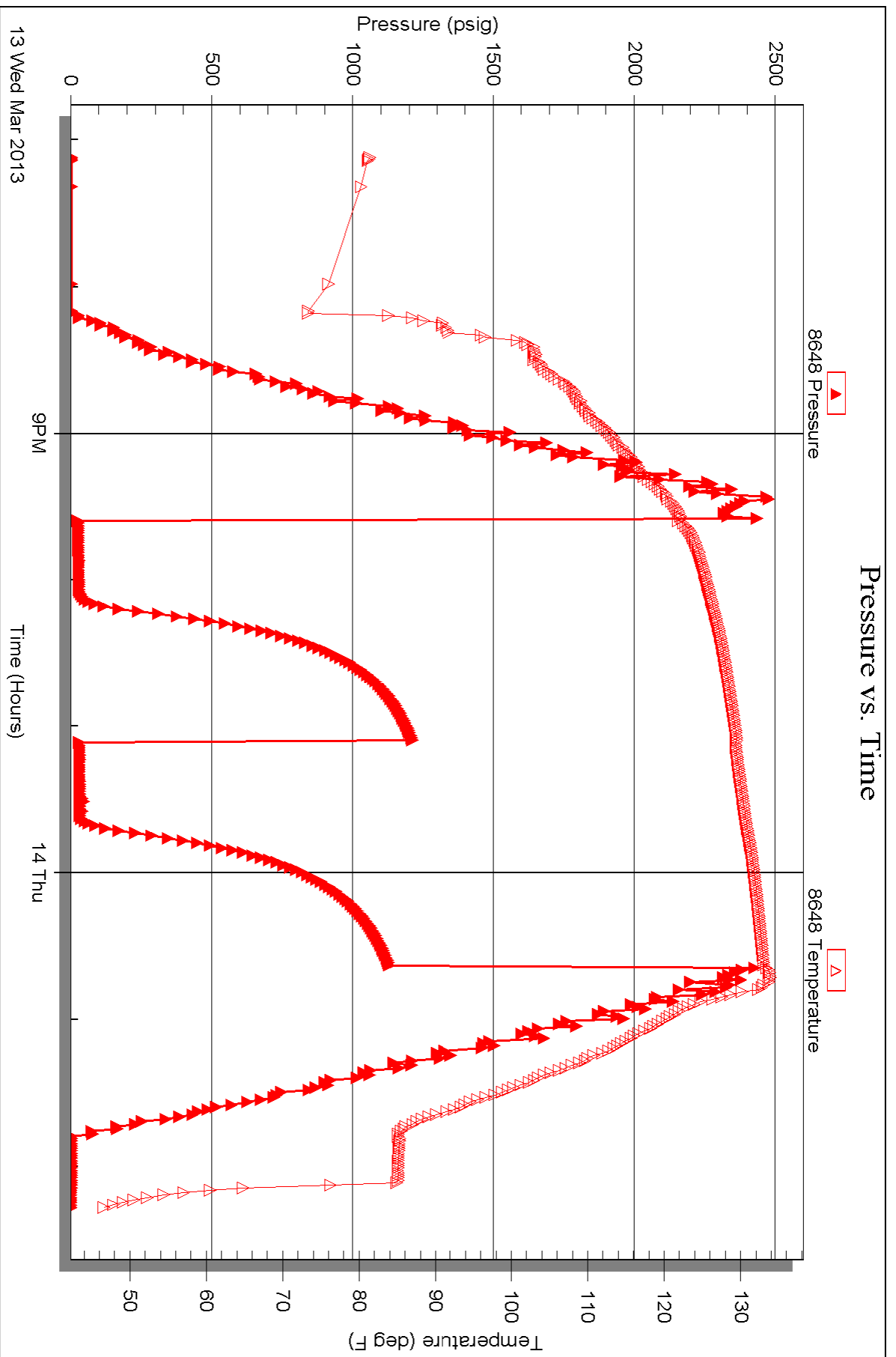
Serial #: 8648

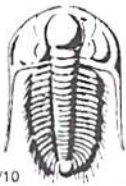
Inside

Murfin Drilling, Co.

AFT #1-5

DST Test Number: 4





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 51211

Well Name & No. ~~Murphy~~ Art # 1-5 Test No. 1 Date 3-11-13  
 Company Murphy Drilling Co Elevation 3369 KB 3359 GL  
 Address 250 N Water STE # 3008 Wichita, KS 67202  
 Co. Rep / Geo. Jeff Christian Rig Murphy #14  
 Location: Sec. 5 Twp. 1S Rge. 36W Co. Rawlins State KS

Interval Tested 4270-4376 Zone Tested LKC "A-D"  
 Anchor Length 106 Drill Pipe Run 3740 Mud Wt. 9.0  
 Top Packer Depth 4266 Drill Collars Run 533' Vis 60  
 Bottom Packer Depth 4270 Wt. Pipe Run 0 WL 5.2  
 Total Depth 4376 Chlorides 1,000 ppm System LCM 5#

Blow Description IF-BOB in 1 1/2 min.  
DST-Weak surface Return started at 2 min. Died in 15 min.  
FF-BOB in 3 min.  
FSD-NO Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>380</u>	<u>MCO</u>	<u>60</u>		<u>40</u>	
<u>564</u>	<u>GMWCO</u>	<u>30</u>	<u>50</u>	<u>10</u>	<u>10</u>
<u>658</u>	<u>GWOCOM</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>40</u>
<u>360</u>	<u>OCMW</u>	<u>20</u>	<u>50</u>	<u>30</u>	
<u>360</u>	<u>OSMW</u>	<u>spots</u>	<u>90</u>	<u>10</u>	
Rec Total	<u>2322</u>	BHT	<u>134</u>	Gravity	<u>-</u>
		API RW	<u>23 @ 90</u>	F Chlorides	<u>30,000</u> ppm

(A) Initial Hydrostatic 2160  Test 1250 T-On Location 6:40 AM  
 (B) First Initial Flow 188  Jars 250 T-Started 7:50 AM  
 (C) First Final Flow 683  Safety Joint 75 T-Open 10:30 AM  
 (D) Initial Shut-In 1260  Circ Sub NIC T-Pulled 2:00 PM  
 (E) Second Initial Flow 697  Hourly Standby T-Out 5:33 PM  
 (F) Second Final Flow 939  Mileage 102 RT 158.10  
 (G) Final Shut-In 1262  Sampler  
 (H) Final Hydrostatic 2151  Straddle

Ruined Shale Packer  
 Ruined Packer  
 Extra Packer  
 Extra Copies  
 Sub Total 0  
 Total 1733.10  
 MP/DST Disc't  
 Sub Total 1733.10

Approved By \_\_\_\_\_ Our Representative [Signature]

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

NO. 51212

Well Name & No. Art #1-5 Test No. 2 Date 3-12-13  
 Company Murfin Drilling Co. Elevation 3369 KB 3359 GL  
 Address 250 N Water STE # 300 Wichita, KS 67202  
 Co. Rep / Geo. Jeff Christian Rig Murfin #14  
 Location: Sec. 5 Twp. 1s Rge. 36w Co. Rawlins State KS

Interval Tested 4390-4430 Zone Tested LKC "G"  
 Anchor Length 40 Drill Pipe Run 3834' Mud Wt. 9.1  
 Top Packer Depth 4386 Drill Collars Run 533' Vis SI  
 Bottom Packer Depth 4390 Wt. Pipe Run Ø WL 5.6  
 Total Depth 4430 Chlorides 1,000 ppm System LCM 4#

Blow Description IF- Bob in 5 min.  
ISE- Surface Return Started at 2 min. Died at 45 min  
FF- Bob in 6 min.  
FSE- No Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>30</u>	<u>Free Oil</u>	<u>100</u>			
<u>490</u>	<u>OC MW</u>	<u>10</u>	<u>70</u>	<u>20</u>	
<u>282</u>	<u>OC MW</u>	<u>10</u>	<u>80</u>	<u>10</u>	
<u>533</u>	<u>MW</u>		<u>90</u>	<u>10</u>	

Rec Total 1335 BHT 139 Gravity 36 API RW 041 @ 54 °F Chlorides 23000 ppm

(A) Initial Hydrostatic <u>2216</u>	<input checked="" type="checkbox"/> Test <u>1250</u>	T-On Location <u>12:00 AM</u>
(B) First Initial Flow <u>93</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>12:35 AM</u>
(C) First Final Flow <u>417</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>3:15 AM</u>
(D) Initial Shut-In <u>1250</u>	<input checked="" type="checkbox"/> Circ Sub <u>N/C</u>	T-Pulled <u>6:45 AM</u>
(E) Second Initial Flow <u>412</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>9:20 AM</u>

(F) Second Final Flow 594  Mileage 102 RT 158.10

(G) Final Shut-In 1234  Sampler

(H) Final Hydrostatic 2199  Straddle

Initial Open 30  Shale Packer

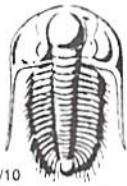
Initial Shut-In 60  Shale Packer

Final Flow 30  Extra Packer

Final Shut-In 90  Extra Recorder

Approved By \_\_\_\_\_ Our Representative [Signature]

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 51213

Well Name & No. Aft #15 Test No. 3 Date 3-12-13  
 Company Murfin Drilling Co. Elevation 3364 KB 3359 GL  
 Address 250 N West STE # 3000 Wichita, KS 67202  
 Co. Rep / Geo. Jeff Christian Rig Murfin #14  
 Location: Sec. 5 Twp. 15 Rge. 36w Co. Rawlins State KS

Interval Tested 4479-4522 Zone Tested LKC "J"  
 Anchor Length 43' Drill Pipe Run 3932 Mud Wt. 9.2  
 Top Packer Depth 4475 Drill Collars Run 533 Vis 52  
 Bottom Packer Depth 4479 Wt. Pipe Run 0 WL 5.6  
 Total Depth 4522 Chlorides 1,500 ppm System LCM 4#

Blow Description IF - 3/4" Blow built to 4"  
ISE - NO Return  
FF - Surface Blow built to 1"  
FSE - NO Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>40</u>	<u>Free Oil</u>	<u>100</u>			
<u>20</u>	<u>MCU</u>	<u>60</u>		<u>40</u>	

Rec Total 60 BHT 126 Gravity 38 API RW - @ - °F Chlorides - ppm

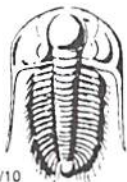
(A) Initial Hydrostatic 2262  Test 1250 T-On Location 7:30 PM  
 (B) First Initial Flow 12  Jars 250 T-Started 8:30 PM  
 (C) First Final Flow 18  Safety Joint 75 T-Open 10:55 PM  
 (D) Initial Shut-In 779  Circ Sub N/C T-Pulled 2:55 AM  
 (E) Second Initial Flow 18  Hourly Standby T-Out 5:05 AM  
 (F) Second Final Flow 33  Mileage 102 RT 158.10 Comments \_\_\_\_\_  
 (G) Final Shut-In 570  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 22.50  Straddle \_\_\_\_\_

Ruined Shale Packer  
 Shale Packer  
 Ruined Packer  
 Extra Packer  
 Extra Copies  
 Extra Recorder  
 Day Standby  
 Accessibility  
 Sub Total 1733.10 Total 1733.10 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 51214

Well Name & No. APT #1-5 Test No. 4 Date 3-13-13  
 Company Muffin Drilling Co. Elevation 3369 KB 3359 GL  
 Address 2500 N Webster STE #3000 Wichita, KS 67202  
 Co. Rep / Geo. JEFF Christian Rig Muffin #14  
 Location: Sec. 5 Twp. 1S Rge. 36W Co. Rawlins State KS

Interval Tested 4664-4715 Zone Tested Pawnee  
 Anchor Length 46' Drill Pipe Run 4122 Mud Wt. 9.2  
 Top Packer Depth 4665 Drill Collars Run 533' Vis 62  
 Bottom Packer Depth 4664 Wt. Pipe Run Ø WL 60  
 Total Depth 4715 Chlorides 1,500 ppm System LCM 4#

Blow Description IE - 1/2" Blow built to 1"  
ISI - NO Return  
FE - NO Blow  
FSL - NO Return

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

Rec Total 10 BHT 131 Gravity - API RW - @ - °F Chlorides - ppm

(A) Initial Hydrostatic	<u>2418</u>	<input checked="" type="checkbox"/> Test	<u>1250</u>	T-On Location	<u>6:40 PM</u>
(B) First Initial Flow	<u>12</u>	<input checked="" type="checkbox"/> Jars	<u>250</u>	T-Started	<u>7:07 PM</u>
(C) First Final Flow	<u>16</u>	<input checked="" type="checkbox"/> Safety Joint	<u>75</u>	T-Open	<u>9:36 PM</u>
(D) Initial Shut-In	<u>1194</u>	<input checked="" type="checkbox"/> Circ Sub	<u>W/C</u>	T-Pulled	<u>12:36 AM</u>
(E) Second Initial Flow	<u>15</u>	<input type="checkbox"/> Hourly Standby		T-Out	<u>2:25 AM</u>
(F) Second Final Flow	<u>16</u>	<input checked="" type="checkbox"/> Mileage	<u>102 RT</u> 158.10	Comments	
(G) Final Shut-In	<u>1110</u>	<input type="checkbox"/> Sampler			
(H) Final Hydrostatic	<u>2408</u>	<input type="checkbox"/> Straddle		<input type="checkbox"/> Ruined Shale Packer	
Initial Open	<u>30</u>	<input type="checkbox"/> Shale Packer		<input type="checkbox"/> Ruined Packer	
Initial Shut-In	<u>60</u>	<input type="checkbox"/> Extra Packer		<input type="checkbox"/> Extra Copies	
Final Flow	<u>30</u>	<input type="checkbox"/> Extra Recorder		Sub Total	<u>0</u>
Final Shut-In	<u>60</u>	<input type="checkbox"/> Day Standby		Total	<u>1733.10</u>
		<input type="checkbox"/> Accessibility		MP/DST Disc't	
		Sub Total	<u>1733.10</u>		

Approved By \_\_\_\_\_ Our Representative 

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