



## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Saman Sharifaie

### **Brown-Engle Unit 1-6**

### **6-5s-30w Decatur,KS**

Start Date: 2014.10.03 @ 00:25:00

End Date: 2014.10.03 @ 09:13:30

Job Ticket #: 60187                      DST #: 1

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

Printed: 2014.10.15 @ 16:30:28



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60187

**DST#: 1**

ATTN: Saman Sharifaie

Test Start: 2014.10.03 @ 00:25:00

## GENERAL INFORMATION:

Formation: **Toronto**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 03:43:30

Time Test Ended: 09:13:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Kevin Mack

Unit No: 66

**Interval: 3870.00 ft (KB) To 3920.00 ft (KB) (TVD)**

Reference Elevations: 2874.00 ft (KB)

Total Depth: 3920.00 ft (KB) (TVD)

2869.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

**Serial #: 8653 Outside**

Press@RunDepth: 32.50 psig @ 3871.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.10.03

End Date:

2014.10.03

Last Calib.: 2014.10.03

Start Time: 00:26:00

End Time:

09:13:30

Time On Btm: 2014.10.03 @ 03:42:30

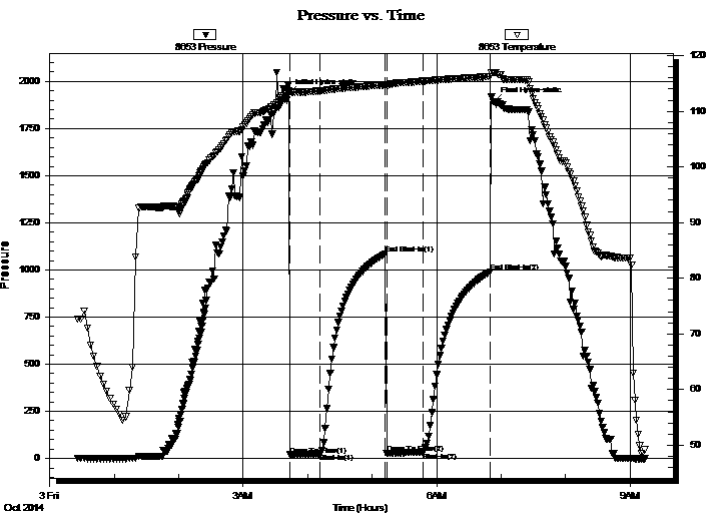
Time Off Btm: 2014.10.03 @ 06:53:30

TEST COMMENT: 30 - 1/8" Blow built to 3/4"

60 - ISI- No Return

30 - FF- No Blow

60 - FSI- No Return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1936.59	113.66	Initial Hydro-static
1	19.48	113.51	Open To Flow (1)
29	25.77	113.69	Shut-In(1)
90	1084.84	114.76	End Shut-In(1)
91	27.59	114.62	Open To Flow (2)
125	32.50	115.43	Shut-In(2)
187	988.86	116.25	End Shut-In(2)
191	1891.47	117.00	Final Hydro-static

## Recovery

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

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60187

**DST#: 1**

ATTN: Saman Sharifaie

Test Start: 2014.10.03 @ 00:25:00

## Tool Information

Drill Pipe:	Length: 3675.00 ft	Diameter: 3.80 inches	Volume: 51.55 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: 187.00 ft	Diameter: 2.25 inches	Volume: 0.92 bbl	Weight to Pull Loose: 77000.00 lb
			<u>Total Volume: 52.47 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	20.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	3870.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	50.00 ft			
Tool Length:	78.00 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			3843.00	
Shut In Tool	5.00			3848.00	
Hydraulic tool	5.00			3853.00	
Jars	5.00			3858.00	
Safety Joint	3.00			3861.00	
Packer	5.00			3866.00	28.00 Bottom Of Top Packer
Packer	4.00			3870.00	
Stubb	1.00			3871.00	
Recorder	0.00	8653	Outside	3871.00	
Recorder	0.00	8874	Inside	3871.00	
Perforations	10.00			3881.00	
Change Over Sub	1.00			3882.00	
Drill Pipe	32.00			3914.00	
Change Over Sub	1.00			3915.00	
Bullnose	5.00			3920.00	50.00 Bottom Packers & Anchor

**Total Tool Length: 78.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60187

**DST#: 1**

ATTN: Saman Sharifaie

Test Start: 2014.10.03 @ 00:25:00

## 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: 7.58 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 1300.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
10.00	Mud 100M	0.049

Total Length: 10.00 ft      Total Volume: 0.049 bbl

Num Fluid Samples: 0

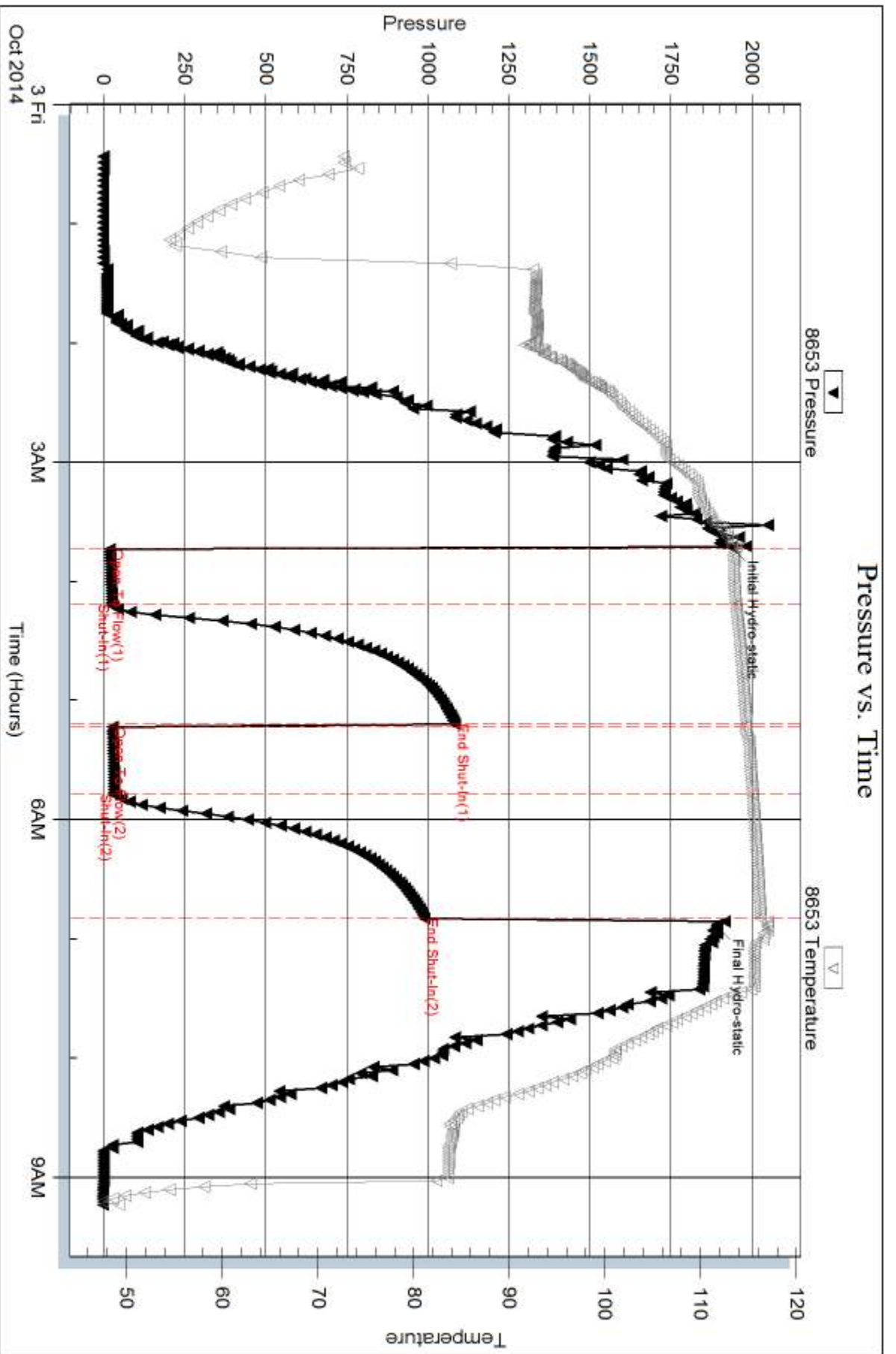
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



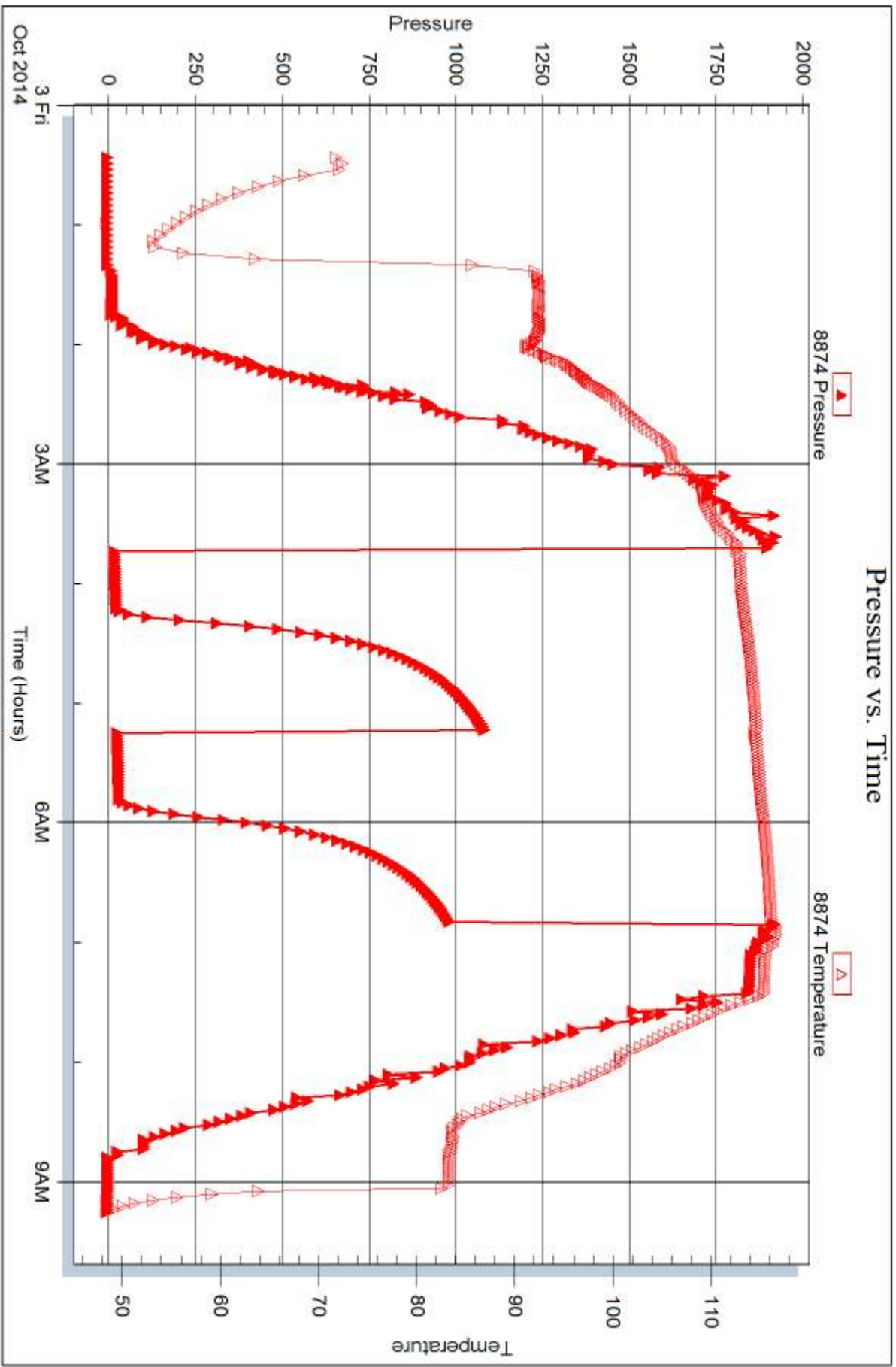
Serial #: 8874

Inside

Murfin Drilling Co., Inc.

Brown-Engle Unit 1-6

DST Test Number: 1



Trilobite Testing, Inc

Ref. No: 60187

Printed: 2014, 10, 15 @ 16:30:30



## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Saman Sharifaie

### **Brown-Engle Unit 1-6**

### **6-5s-30w Decatur,KS**

Start Date: 2014.10.03 @ 16:30:00

End Date: 2014.10.04 @ 02:52:00

Job Ticket #: 60188                      DST #: 2

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

Printed: 2014.10.15 @ 16:30:06





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

ATTN: Saman Sharifaie

Job Ticket: 60188

**DST#: 2**

Test Start: 2014.10.03 @ 16:30:00

## GENERAL INFORMATION:

Formation: **LKC "A-B"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 21:14:00

Time Test Ended: 02:52:00

Test Type: Conventional Bottom Hole (Initial)

Tester: Kevin Mack

Unit No: 66

**Interval: 3911.00 ft (KB) To 3950.00 ft (KB) (TVD)**

Reference Elevations: 2874.00 ft (KB)

Total Depth: 950.00 ft (KB) (TVD)

2869.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

**Serial #: 8874**

**Inside**

Press@RunDepth: 47.88 psig @ 3912.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.10.03

End Date:

2014.10.04

Last Calib.: 2014.10.03

Start Time: 16:31:00

End Time:

02:52:00

Time On Btm: 2014.10.03 @ 21:13:00

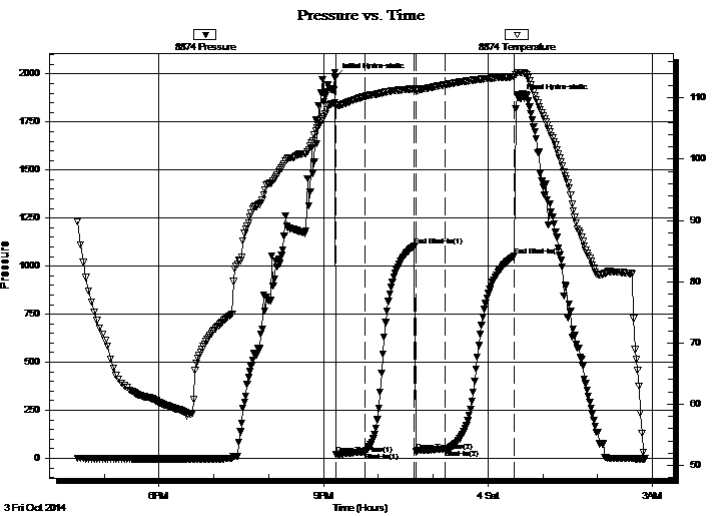
Time Off Btm: 2014.10.04 @ 00:35:00

TEST COMMENT: 30 - IF- 1/4" Blow built to 1" then died back to 3/4"

60 - IS- No Return

30 - FF- Surface Blow started at 2 min. Built to 3/4"

60 - FS- No Return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1982.52	109.27	Initial Hydro-static
1	19.56	108.71	Open To Flow (1)
32	33.36	110.24	Shut-In(1)
87	1107.07	111.51	End Shut-In(1)
88	37.43	111.20	Open To Flow (2)
120	47.88	112.15	Shut-In(2)
196	1053.32	113.48	End Shut-In(2)
202	1873.88	114.16	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
63.00	OCWM 10o 5W 85M	0.31

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60188

**DST#: 2**

ATTN: Saman Sharifaie

Test Start: 2014.10.03 @ 16:30:00

## Tool Information

Drill Pipe:	Length: 3706.00 ft	Diameter: 3.80 inches	Volume: 51.99 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: 187.00 ft	Diameter: 2.25 inches	Volume: 0.92 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 52.91 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	10.00 ft			String Weight: Initial 65000.00 lb
Depth to Top Packer:	3911.00 ft			Final 65000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	39.00 ft			
Tool Length:	67.00 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			3884.00	
Shut In Tool	5.00			3889.00	
Hydraulic tool	5.00			3894.00	
Jars	5.00			3899.00	
Safety Joint	3.00			3902.00	
Packer	5.00			3907.00	28.00 Bottom Of Top Packer
Packer	4.00			3911.00	
Stubb	1.00			3912.00	
Recorder	0.00	8653	Outside	3912.00	
Recorder	0.00	8874	Inside	3912.00	
Perforations	2.00			3914.00	
Change Over Sub	1.00			3915.00	
Drill Pipe	31.00			3946.00	
Change Over Sub	1.00			3947.00	
Bullnose	3.00			3950.00	39.00 Bottom Packers & Anchor

**Total Tool Length: 67.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60188

**DST#: 2**

ATTN: Saman Sharifaie

Test Start: 2014.10.03 @ 16:30:00

### 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: 6.78 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure: psig

Salinity: 2000.00 ppm

Filter Cake: 2.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
63.00	OCWM 10o 5W 85M	0.310

Total Length: 63.00 ft      Total Volume: 0.310 bbl

Num Fluid Samples: 0

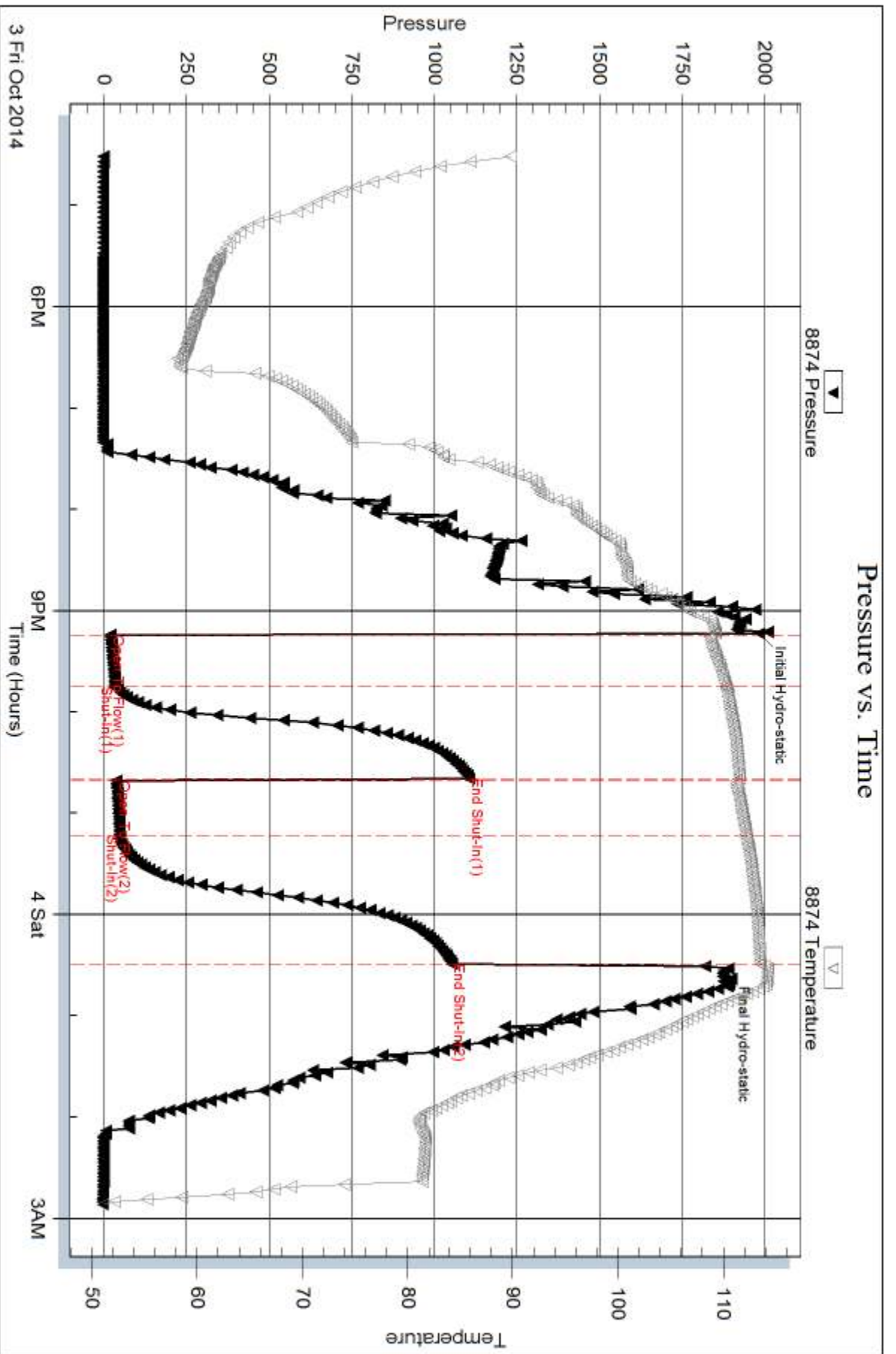
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

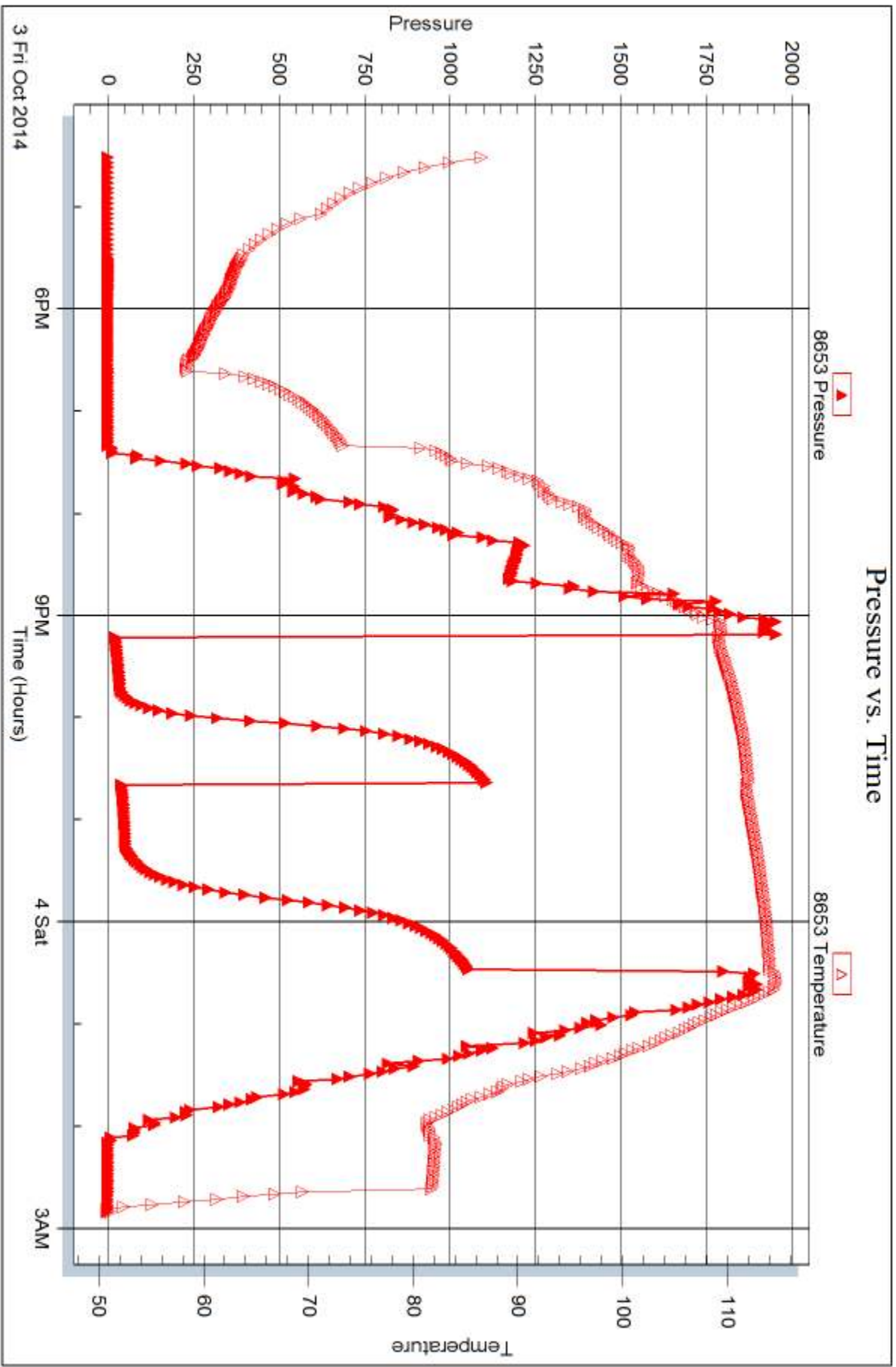


Serial #: 8653

Outside Murfin Drilling Co., Inc.

Brown-Engle Unit 1-6

DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 60188

Printed: 2014, 10, 15 @ 16:30:07



## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Saman Sharifaie

### **Brown-Engle Unit 1-6**

### **6-5s-30w Decatur,KS**

Start Date: 2014.10.04 @ 14:15:00

End Date: 2014.10.05 @ 00:52:30

Job Ticket #: 60189                      DST #: 3

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

Printed: 2014.10.15 @ 16:29:45



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

ATTN: Saman Sharifaie

Job Ticket: 60189

**DST#: 3**

Test Start: 2014.10.04 @ 14:15:00

## GENERAL INFORMATION:

Formation: **LKC "D-G**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 17:09:30  
 Time Test Ended: 00:52:30  
 Interval: **3948.00 ft (KB) To 4006.00 ft (KB) (TVD)**  
 Total Depth: 4006.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Kevin Mack  
 Unit No: 66  
 Reference Elevations: 2874.00 ft (KB)  
 2869.00 ft (CF)  
 KB to GR/CF: 5.00 ft

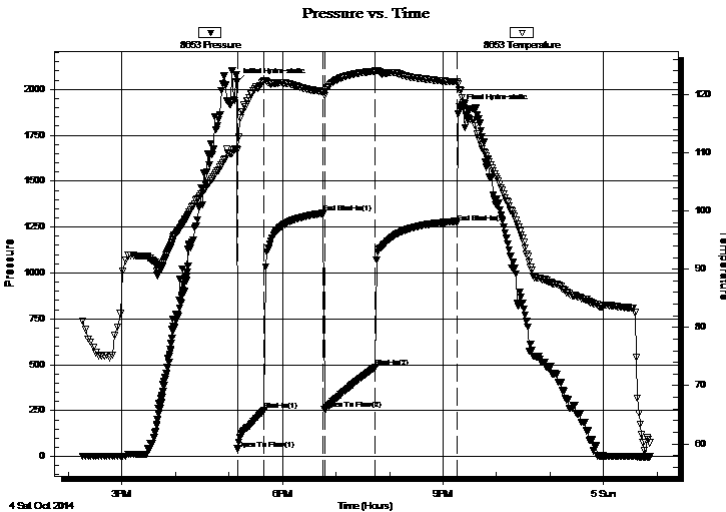
## Serial #: 8653

**Outside**

Press@RunDepth: 487.00 psig @ 3949.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2014.10.04 End Date: 2014.10.05 Last Calib.: 2014.10.05  
 Start Time: 14:16:00 End Time: 00:52:30 Time On Btm: 2014.10.04 @ 17:09:00  
 Time Off Btm: 2014.10.04 @ 21:19:00

**TEST COMMENT:** 30 - IF- BoB in 6 min.  
 60 - IS- Surface Return started at 2 min. Built to 4"  
 60 - FF- BoB in 7 min.  
 90 - FS- BoB in 48 min.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2039.09	110.70	Initial Hydro-static
1	42.01	110.48	Open To Flow (1)
31	253.00	122.39	Shut-In(1)
97	1325.27	120.45	End Shut-In(1)
98	256.83	119.77	Open To Flow (2)
155	487.00	123.96	Shut-In(2)
247	1274.22	122.11	End Shut-In(2)
250	1894.28	120.75	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
180.00	OSMW 95W 5M (oil spots)	0.89
252.00	OSMW 90W 10M (oil spots)	3.47
189.00	GOCM 30G 10o 60M	2.65
383.00	Clean Gassy Oil 30G 70o	5.37
0.00	819' GIP	0.00

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60189

**DST#: 3**

ATTN: Saman Sharifaie

Test Start: 2014.10.04 @ 14:15:00

## Tool Information

Drill Pipe:	Length: 3736.00 ft	Diameter: 3.80 inches	Volume: 52.41 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: 187.00 ft	Diameter: 2.25 inches	Volume: 0.92 bbl	Weight to Pull Loose: 75000.00 lb
			<u>Total Volume: 53.33 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	3.00 ft			String Weight: Initial 65000.00 lb
Depth to Top Packer:	3948.00 ft			Final 69000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	58.00 ft			
Tool Length:	86.00 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			3921.00	
Shut In Tool	5.00			3926.00	
Hydraulic tool	5.00			3931.00	
Jars	5.00			3936.00	
Safety Joint	3.00			3939.00	
Packer	5.00			3944.00	28.00 Bottom Of Top Packer
Packer	4.00			3948.00	
Stubb	1.00			3949.00	
Recorder	0.00	8653	Outside	3949.00	
Recorder	0.00	8874	Inside	3949.00	
Perforations	20.00			3969.00	
Change Over Sub	1.00			3970.00	
Drill Pipe	32.00			4002.00	
Change Over Sub	1.00			4003.00	
Bullnose	3.00			4006.00	58.00 Bottom Packers & Anchor

**Total Tool Length: 86.00**



**TRILOBITE  
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# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc.

**6-5s-30w Decatur,KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60189

**DST#: 3**

ATTN: Saman Sharifaie

Test Start: 2014.10.04 @ 14:15:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

27 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

72000 ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.98 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
180.00	OSMW 95W 5M (oil spots)	0.885
252.00	OSMW 90W 10M (oil spots)	3.471
189.00	GOCM 30G 10o 60M	2.651
383.00	Clean Gassy Oil 30G 70o	5.372
0.00	819' GIP	0.000

Total Length: 1004.00 ft      Total Volume: 12.379 bbl

Num Fluid Samples: 0

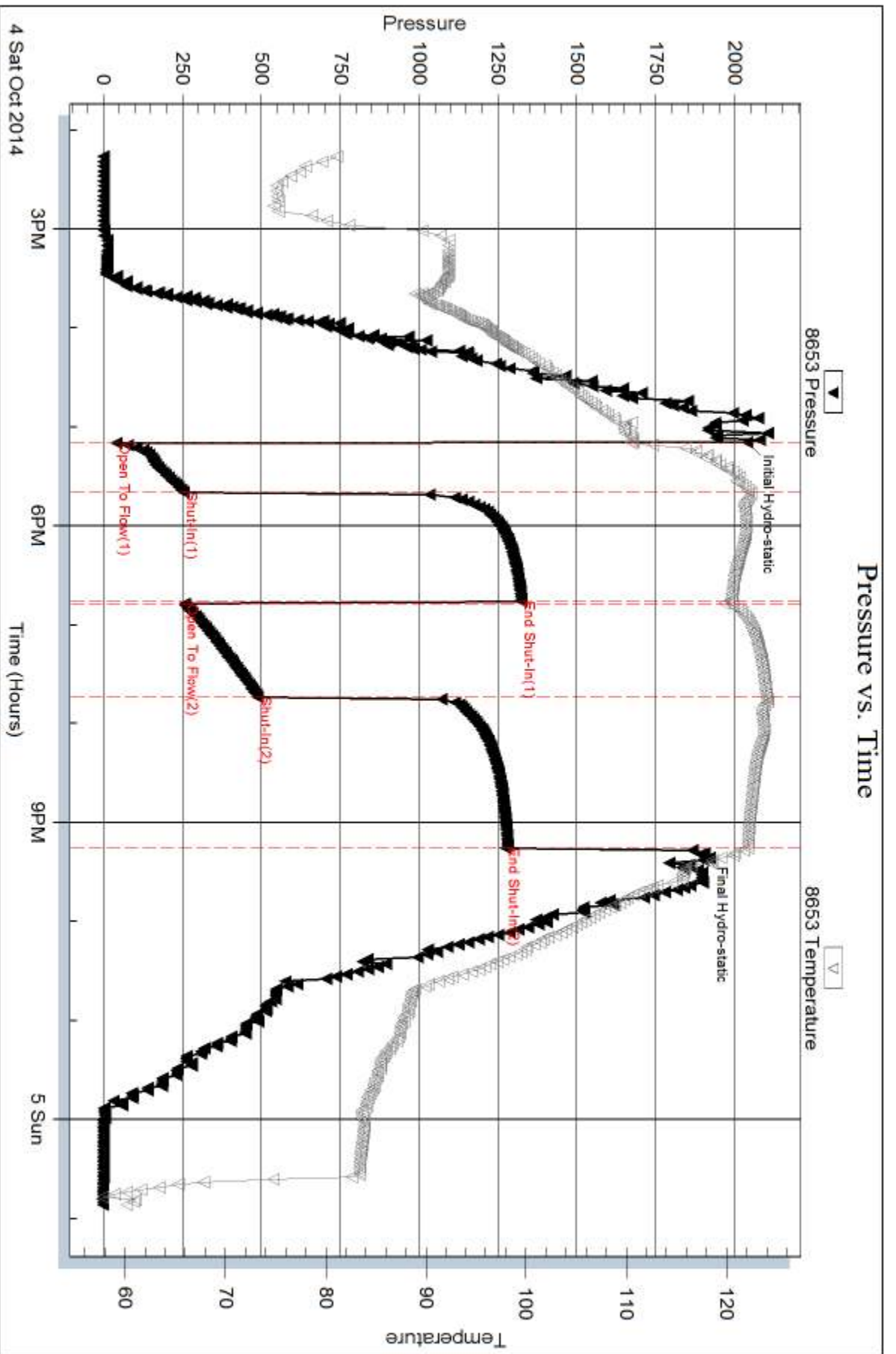
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Oil API 27 @ 60 deg = 27 corrected  
RW .14 @ 55 deg. = 72,000ppm





## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Saman Sharifaie

### **Brown-Engle Unit 1-6**

### **6-5s-30w Decatur,KS**

Start Date: 2014.10.05 @ 14:00:00

End Date: 2014.10.05 @ 23:47:30

Job Ticket #: 60190                      DST #: 4

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

Printed: 2014.10.15 @ 16:29:19



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60190

**DST#: 4**

ATTN: Saman Sharifaie

Test Start: 2014.10.05 @ 14:00:00

## GENERAL INFORMATION:

Formation: **LKC "H-K"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 16:31:30

Time Test Ended: 23:47:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Kevin Mack

Unit No: 66

**Interval: 4019.00 ft (KB) To 4110.00 ft (KB) (TVD)**

Reference Elevations: 2874.00 ft (KB)

Total Depth: 4110.00 ft (KB) (TVD)

2869.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

**Serial #: 8874**

**Inside**

Press@RunDepth: 281.73 psig @ 4020.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.10.05

End Date:

2014.10.05

Last Calib.: 2014.10.05

Start Time: 14:01:00

End Time:

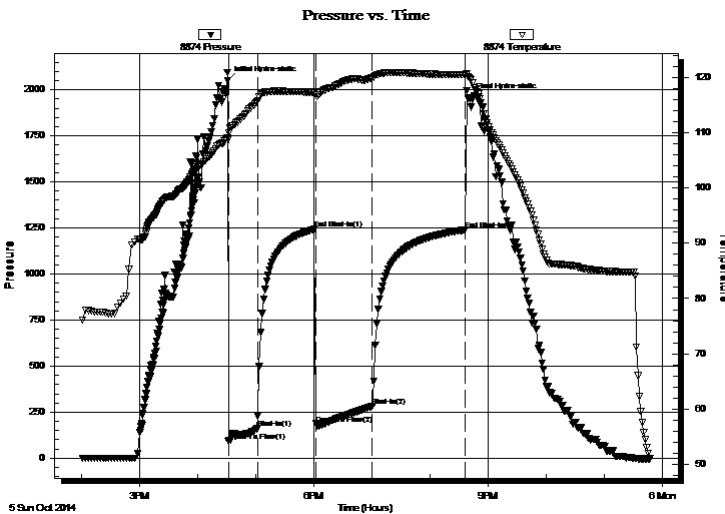
23:47:30

Time On Btm: 2014.10.05 @ 16:31:00

Time Off Btm: 2014.10.05 @ 20:40:30

**TEST COMMENT:** 30 - IF- BoB in 5 min.  
60 - IS- Surface Return built to BoB in 21 min.  
60 - FF- BoB in 6 min.  
90 - FS- Surface Return built to BoB in 28 min.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2048.80	109.01	Initial Hydro-static
1	89.88	108.85	Open To Flow (1)
31	161.04	115.60	Shut-In(1)
90	1242.46	117.31	End Shut-In(1)
91	187.09	116.82	Open To Flow (2)
150	281.73	119.93	Shut-In(2)
246	1239.76	120.43	End Shut-In(2)
250	1956.18	119.92	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
187.00	GOCM 20G 10o 70M	0.92
504.00	Clean Gassy Oil 20G 80o	7.07
0.00	2802' GIP	0.00

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60190

**DST#: 4**

ATTN: Saman Sharifaie

Test Start: 2014.10.05 @ 14:00:00

## Tool Information

Drill Pipe:	Length: 3832.00 ft	Diameter: 3.80 inches	Volume: 53.75 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: 187.00 ft	Diameter: 2.25 inches	Volume: 0.92 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 54.67 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	28.00 ft			String Weight: Initial 62000.00 lb
Depth to Top Packer:	4019.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	91.00 ft			
Tool Length:	119.00 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			3992.00	
Shut In Tool	5.00			3997.00	
Hydraulic tool	5.00			4002.00	
Jars	5.00			4007.00	
Safety Joint	3.00			4010.00	
Packer	5.00			4015.00	28.00 Bottom Of Top Packer
Packer	4.00			4019.00	
Stubb	1.00			4020.00	
Recorder	0.00	8653	Outside	4020.00	
Recorder	0.00	8874	Inside	4020.00	
Perforations	20.00			4040.00	
Change Over Sub	1.00			4041.00	
Drill Pipe	63.00			4104.00	
Change Over Sub	1.00			4105.00	
Bullnose	5.00			4110.00	91.00 Bottom Packers & Anchor

**Total Tool Length: 119.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60190

**DST#: 4**

ATTN: Saman Sharifaie

Test Start: 2014.10.05 @ 14:00:00

### Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

25 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 50.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.98 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 2000.00 ppm

Filter Cake: 2.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
187.00	GOCM 20G 10o 70M	0.920
504.00	Clean Gassy Oil 20G 80o	7.070
0.00	2802' GIP	0.000

Total Length: 691.00 ft      Total Volume: 7.990 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

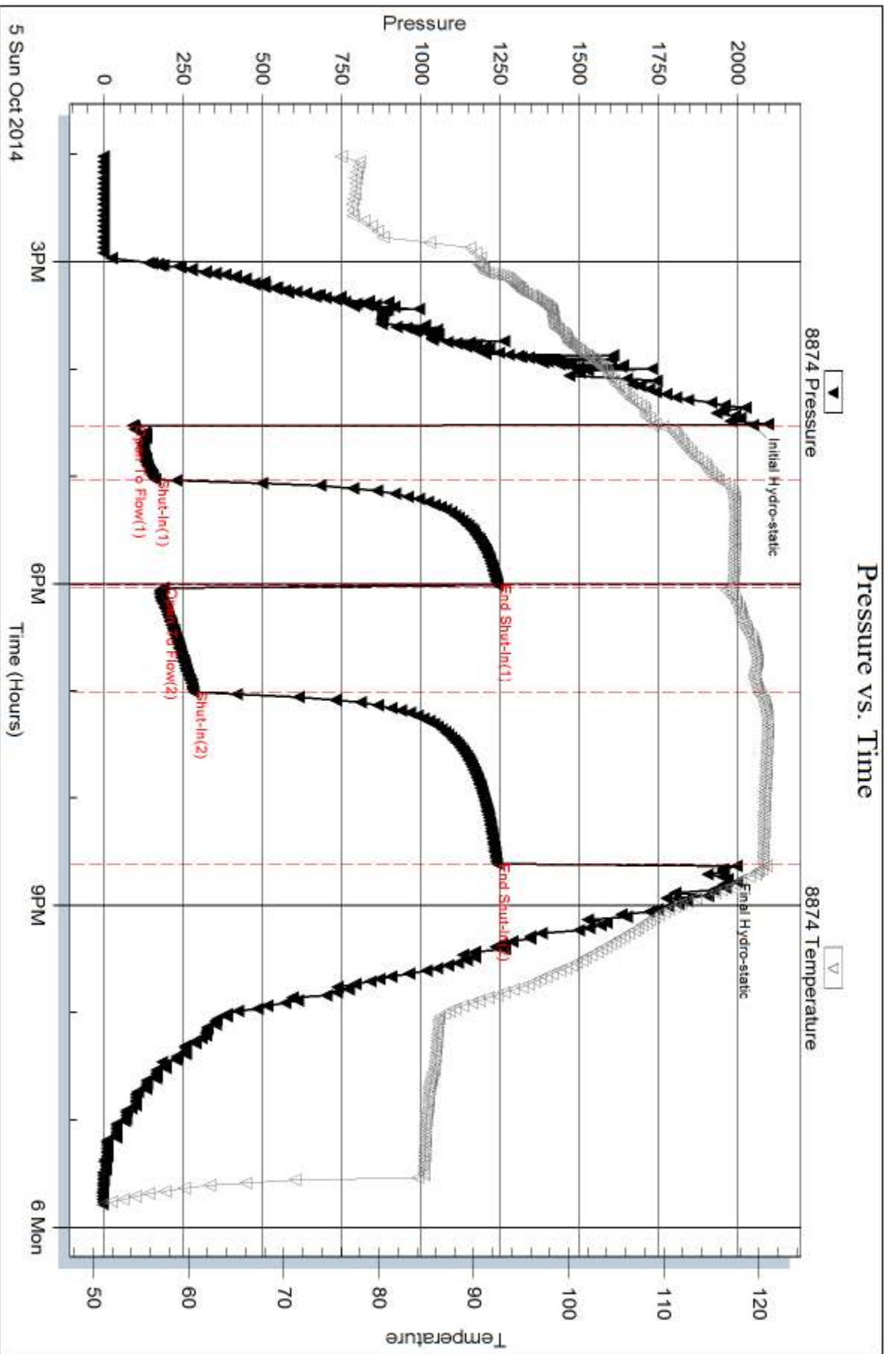
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Oil API 35 @ 60 deg = 25 corrected



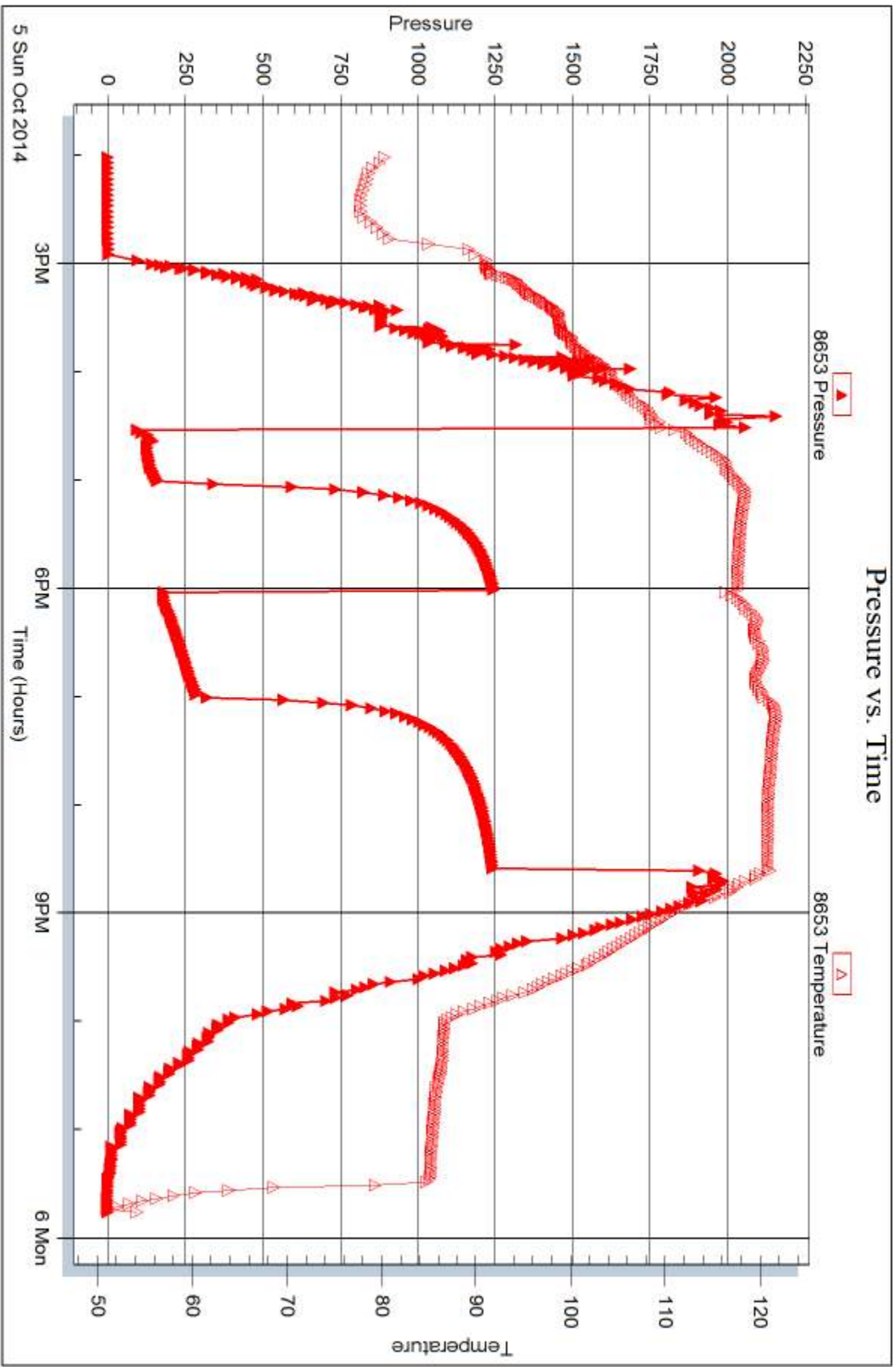


Serial #: 8653

Outside Murfin Drilling Co., Inc.

Brown-Engle Unit 1-6

DST Test Number: 4



Trilobite Testing, Inc

Ref. No: 60190

Printed: 2014, 10, 15 @ 16:29:21



## DRILL STEM TEST REPORT

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

250 N Water STE #300  
Wichita, KS 67202

ATTN: Saman Sharifaie

### **Brown-Engle Unit 1-6**

### **6-5s-30w Decatur,KS**

Start Date: 2014.10.06 @ 23:25:00

End Date: 2014.10.07 @ 07:50:30

Job Ticket #: 60191                      DST #: 5

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

Printed: 2014.10.15 @ 16:28:32

Murfin Drilling Co., Inc.

6-5s-30w Decatur,KS

Brown-Engle Unit 1-6

DST # 5

Verdigis

2014.10.06



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

ATTN: Saman Sharifaie

Job Ticket: 60191

**DST#: 5**

Test Start: 2014.10.06 @ 23:25:00

## GENERAL INFORMATION:

Formation: **Verdigis**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 02:15:00

Time Test Ended: 07:50:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Kevin Mack

Unit No: 66

**Interval: 4322.00 ft (KB) To 4358.00 ft (KB) (TVD)**

Reference Elevations: 2874.00 ft (KB)

Total Depth: 4358.00 ft (KB) (TVD)

2869.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

**Serial #: 8653 Outside**

Press@RunDepth: 35.43 psig @ 4323.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.10.06

End Date:

2014.10.07

Last Calib.:

2014.10.07

Start Time: 23:26:00

End Time:

07:50:30

Time On Btm:

2014.10.07 @ 02:14:30

Time Off Btm:

2014.10.07 @ 05:19:00

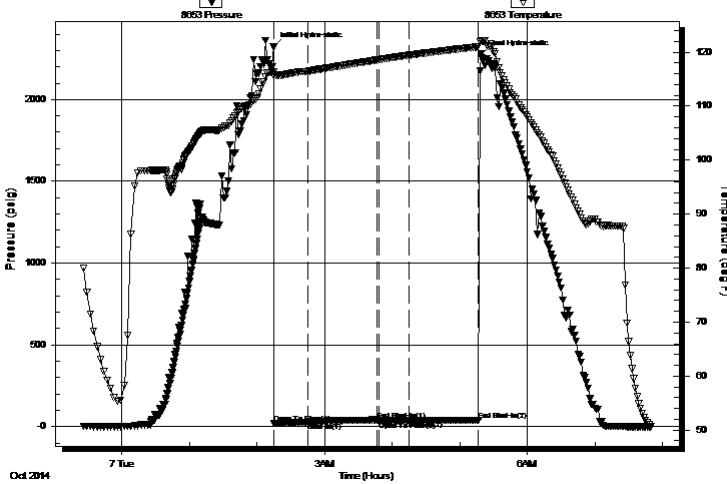
TEST COMMENT: 30 - IF- 1/8" Blow died in 5 min.

60 - IS- No Return

30 - FF- No Blow

60 - FS- No Return

Pressure vs. Time



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2321.32	116.29	Initial Hydro-static
1	20.83	115.65	Open To Flow (1)
31	25.19	116.46	Shut-In(1)
92	40.77	118.57	End Shut-In(1)
94	29.13	118.61	Open To Flow (2)
121	35.43	119.45	Shut-In(2)
182	39.38	121.01	End Shut-In(2)
185	2277.48	122.20	Final Hydro-static

Recovery

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

Gas Rates

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



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60191

**DST#: 5**

ATTN: Saman Sharifaie

Test Start: 2014.10.06 @ 23:25:00

## Tool Information

Drill Pipe:	Length: 4114.00 ft	Diameter: 3.80 inches	Volume: 57.71 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: 187.00 ft	Diameter: 2.25 inches	Volume: 0.92 bbl	Weight to Pull Loose: 75000.00 lb
			<u>Total Volume: 58.63 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	7.00 ft			String Weight: Initial 68000.00 lb
Depth to Top Packer:	4322.00 ft			Final 68000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	35.00 ft			
Tool Length:	63.00 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			4295.00	
Shut In Tool	5.00			4300.00	
Hydraulic tool	5.00			4305.00	
Jars	5.00			4310.00	
Safety Joint	3.00			4313.00	
Packer	5.00			4318.00	28.00 Bottom Of Top Packer
Packer	4.00			4322.00	
Stubb	1.00			4323.00	
Recorder	0.00	8653	Outside	4323.00	
Recorder	0.00	8874	Inside	4323.00	
Perforations	29.00			4352.00	
Bullnose	5.00			4357.00	35.00 Bottom Packers & Anchor

**Total Tool Length: 63.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc.

**6-5s-30w Decatur, KS**

250 N Water STE #300  
Wichita, KS 67202

**Brown-Engle Unit 1-6**

Job Ticket: 60191

**DST#: 5**

ATTN: Saman Sharifaie

Test Start: 2014.10.06 @ 23:25:00

## 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: 67.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.59 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 2500.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
5.00	Mud 100M	0.025

Total Length: 5.00 ft      Total Volume:                      bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

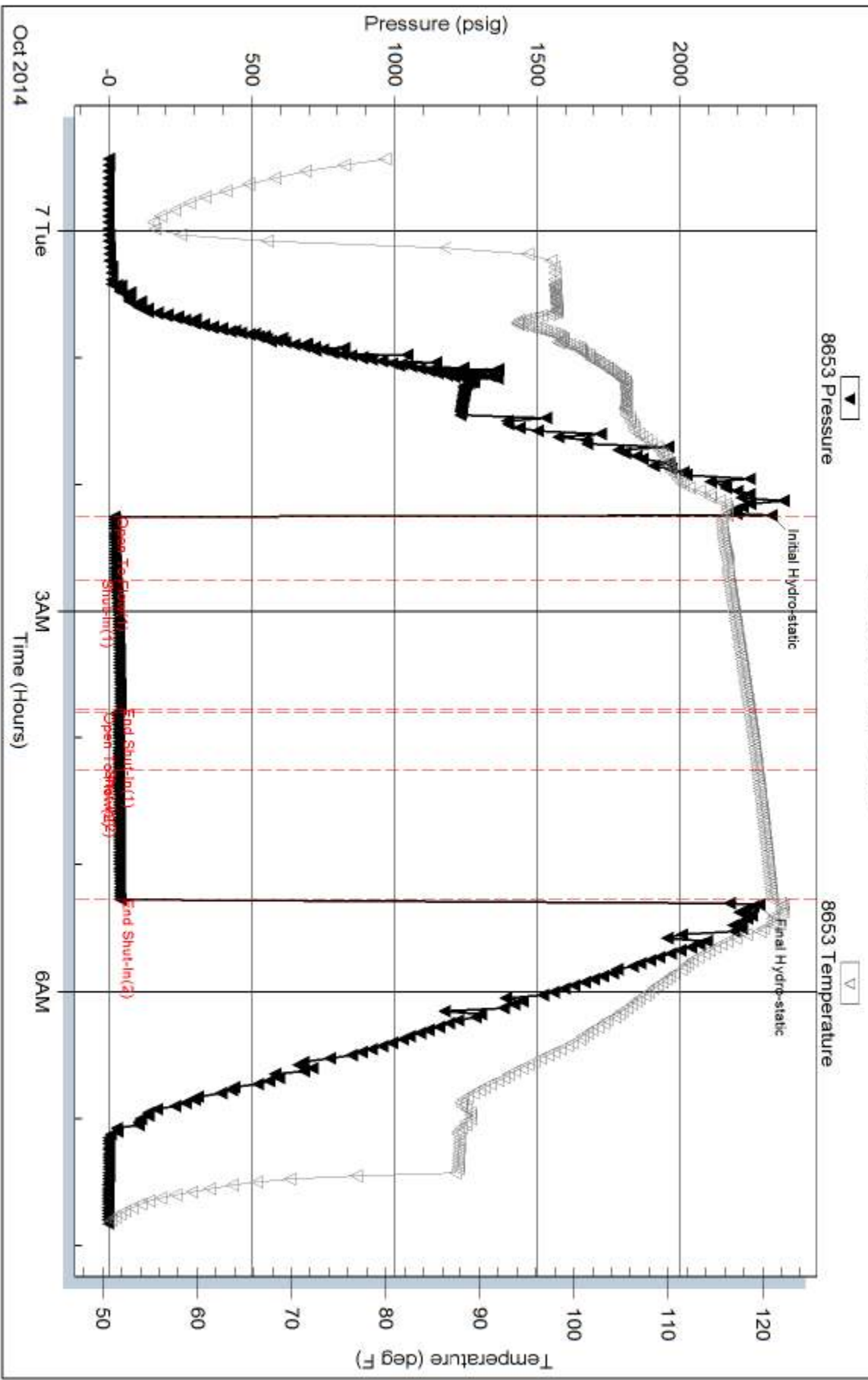
Serial #: 8653

Outside Murfin Drilling Co., Inc.

Brown-Engle Unit 1-6

DST Test Number: 5

### Pressure vs. Time



Trilobite Testing, Inc

Ref. No: 60191

Printed: 2014, 10, 15 @ 16:28:33





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 60187

Well Name & No. Brown-Engle Unit #1-6 Test No. 1 Date 10-2-14  
 Company Murfin Drilling Co., Inc Elevation 2874 KB 2869 GL  
 Address 250 N Water STE #300 Wichita, KS 67202  
 Co. Rep / Geo. Saman Sharifaie Rig Murfin #7  
 Location: Sec. 6 Twp. 5S Rge. 30W Co. Decatur State KS

Interval Tested 3870-3920 Zone Tested Turonto  
 Anchor Length 50' Drill Pipe Run 3675' Mud Wt. 8.9  
 Top Packer Depth 3866 Drill Collars Run 187' Vis 62  
 Bottom Packer Depth 3870 Wt. Pipe Run 0 WL 7.6  
 Total Depth 3920 Chlorides 1,300 ppm System LCM 2#  
 Blow Description IF - 1/8" Blow built to 3/4"  
ISI - No Return  
FF - No Blow  
FSD - No Return

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

BHT 116 Gravity — API RW — @ — ° F Chlorides — ppm

(A) Initial Hydrostatic 1936  Test 1150 T-On Location 11:15 pm  
 (B) First Initial Flow 19  Jars 250 T-Started 12:25 AM  
 (C) First Final Flow 25  Safety Joint 75 T-Open 3:40 AM  
 (D) Initial Shut-In 1084  Circ Sub — T-Pulled 6:40 AM  
 (E) Second Initial Flow 27  Hourly Standby — T-Out 9:15 AM  
 (F) Second Final Flow 32  Mileage 48 RT 74.40 Comments —  
 (G) Final Shut-In 988  Sampler —  
 (H) Final Hydrostatic 1891  Straddle —  Ruined Shale Packer —  
 Shale Packer —  Ruined Packer —  
 Extra Packer —  Extra Copies —  
 Extra Recorder — Sub Total 0  
 Day Standby — Total 1549.40  
 Accessibility — MP/DST Disc't —  
 Sub Total 1549.40

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. 60188

Well Name & No. Brown-Engle Unit #1-6 Test No. 2 Date 10-3-14  
 Company Murfin Drilling Co., Inc. Elevation 2874 KB 2869 GL  
 Address 250 N Water STE #300 Wichita, KS 67202  
 Co. Rep / Geo. Saman Sharifaie Rig Murfin #7  
 Location: Sec. 6 Twp. 5S Rge. 30 W Co. Decatur State KS

Interval Tested 3911-3950 Zone Tested LKC "A-B"  
 Anchor Length 39' Drill Pipe Run 3706' Mud Wt. 91  
 Top Packer Depth 3907 Drill Collars Run 187' Vis 65  
 Bottom Packer Depth 3911 Wt. Pipe Run 0 WL 6-8  
 Total Depth 3950 Chlorides 2,000 ppm System LCM 4#  
 Blow Description IF - 1/4" Blow built to 1" then died back to 3/4"  
ISI - No Return  
FF - Surface Blow started at 2 min. Built to 3/4"  
FSI - No Return

Rec	Feet of	%gas	%oil	%water	%mud
63	OCWM	10	5	85	

Rec Total 63' BHT 114° Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 1982  Test 1150 T-On Location 3:55 PM  
 (B) First Initial Flow 19  Jars 250 T-Started 4:30 PM  
 (C) First Final Flow 33  Safety Joint 75 T-Open 9:10 PM  
 (D) Initial Shut-In 1107  Circ Sub — T-Pulled 12:10 AM  
 (E) Second Initial Flow 37  Hourly Standby 3.25h 325 T-Out 2:50 AM  
 (F) Second Final Flow 47  Mileage 48 RT 74.40 Comments Rigs Rusty chain broke when crew got to collars  
 (G) Final Shut-In 1053  Sampler —  Ruined Shale Packer —  
 (H) Final Hydrostatic 1873  Straddle —  Ruined Packer —

Initial Open 30  Shale Packer —  Extra Copies —  
 Initial Shut-In 60  Extra Packer — Sub Total 0  
 Final Flow 30  Extra Recorder — Total 1874.40  
 Final Shut-In 60  Day Standby — MP/DST Disc't —  
 Sub Total 1874.40

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

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. **60189**

4/10

Well Name & No. Brown-Engle Unit #1-6 Test No. 3 Date 10-4-14  
 Company Murphy Drilling Co., Inc Elevation 2874 KB 2869 GL  
 Address 250 N Water STE #300 Wichita, KS 67202  
 Co. Rep / Geo. Samir Sharifuie Rig Murphy #7  
 Location: Sec. 6 Twp. 5S Rge. 300 W Co. Decatur State KS

Interval Tested 3948-4006 Zone Tested LKC "D-5"  
 Anchor Length 58' Drill Pipe Run 3736' Mud Wt. 9.0  
 Top Packer Depth 3944 Drill Collars Run 187' Vis 52  
 Bottom Packer Depth 3948 Wt. Pipe Run 0 WL 8.0  
 Total Depth 4006 Chlorides 4,500 ppm System LCM 4#

Blow Description IF - BoB in 6 min.  
ISI - Surface Return started at 2 min built to 4"  
PF - BoB in 7 min.  
FSI - BoB in 48 min.

Rec	Feet of	%gas	%oil	%water	%mud
<u>383</u>	<u>Clean Gassy Oil</u>	<u>30</u>	<u>70</u>		
<u>189</u>	<u>GOCM</u>	<u>30</u>	<u>10</u>		<u>60</u>
<u>252</u>	<u>OSMW</u>		<u>Spots</u>	<u>90</u>	<u>10</u>
<u>180</u>	<u>OSMW</u>		<u>Spots</u>	<u>95</u>	<u>5</u>

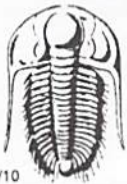
Rec Total 1004 BHT 122 Gravity 27 API RW 14 @ 55 ° F Chlorides 72,000 ppm  
 (A) Initial Hydrostatic 2039  Test 1250 T-On Location 1:15 PM  
 (B) First Initial Flow 42  Jars 250 T-Started 2:15 PM  
 (C) First Final Flow 253  Safety Joint 75 T-Open 5:10 PM  
 (D) Initial Shut-In 1325  Circ Sub \_\_\_\_\_ T-Pulled 9:10 PM  
 (E) Second Initial Flow 256  Hourly Standby .5h 50 T-Out 12:53 AM  
 (F) Second Final Flow 487  Mileage 48 RT 74.40 Comments 819' GIP  
 (G) Final Shut-In 1274  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 1894  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_ Sub Total 0  
 Day Standby \_\_\_\_\_ Total 1699.40  
 Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_

Initial Open 30  
 Initial Shut-In 60  
 Final Flow 60  
 Final Shut-In 90  
 Sub Total 1699.40

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

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **60190**

4/10

Well Name & No. Brown-Engle #1-6 Test No. 4 Date 10-5-14  
 Company Murfin Drilling Co, Inc Elevation 2874 KB 2869 GL  
 Address 2508 N Water STE #300 Wichita, KS 67202  
 Co. Rep / Geo. Suman SharifAie Rig Murfin #7  
 Location: Sec. 6 Twp. 5S Rge. 30 W Co. Decatur State KS

Interval Tested 4019-4110 Zone Tested LKC "H-K"  
 Anchor Length 91' Drill Pipe Run 3832' Mud Wt. 9.0  
 Top Packer Depth 4015 Drill Collars Run 187 Vis 50  
 Bottom Packer Depth 4019 Wt. Pipe Run 0 WL 8.0  
 Total Depth 4110 Chlorides 2,000 ppm System LCM 2#

Blow Description IF - BoB in 5 min.  
ISI - Surface Return built to BoB in 21 min.  
PF - BoB in 6 min.  
FST - BoB in 28 min.

Rec	Feet of	%gas	%oil	%water	%mud
<u>504</u>	<u>Clean Gassy Oil</u>	<u>20</u>	<u>80</u>		
<u>187</u>	<u>60cm</u>	<u>20</u>	<u>10</u>		<u>70</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 691 BHT 120 Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 2048  Test 1250 T-On Location 1:45 PM  
 (B) First Initial Flow 89  Jars 250 T-Started 2:00 PM  
 (C) First Final Flow 161  Safety Joint 75 T-Open 4:32 PM  
 (D) Initial Shut-In 1242  Circ Sub \_\_\_\_\_ T-Pulled 8:32 PM  
 (E) Second Initial Flow 187  Hourly Standby \_\_\_\_\_ T-Out 11:50 PM  
 (F) Second Final Flow 281  Mileage 48 RT 74.40 Comments 2802' GEP  
 (G) Final Shut-In 1239  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 1956  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_

Initial Open 30 Sub Total 0  
 Initial Shut-In 60 Total 1649.40  
 Final Flow 60 MP/DST Disc't \_\_\_\_\_  
 Final Shut-In 90 Sub Total 1649.40

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

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 60191

4/10

Well Name & No. Brown-Engle Unit #1-6 Test No. 5 Date 10-16-10-6-14  
 Company Murphy Drilling Co., Inc. Elevation 2874 KB 2869 GL  
 Address 2508 N Water STE # 3008 Wichita, KS 67202  
 Co. Rep / Geo. Saman Sharifaie Rig Murphy #7  
 Location: Sec. 6 Twp. 5S Rge. 30W Co. Decatur State KS

Interval Tested 4322-4358 Zone Tested Vendigic  
 Anchor Length 36' Drill Pipe Run 4114' Mud Wt. 9.1  
 Top Packer Depth 4318 Drill Collars Run 187' Vis 67  
 Bottom Packer Depth 4322 Wt. Pipe Run 0 WL 7.6  
 Total Depth 4358 Chlorides 2,500 ppm System LCM 3#

Blow Description IP - 1/8" Blow ditch in 5 min.  
ISI - NO Return  
PF - NO Blow  
FSD - NO Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>5</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 \_\_\_\_\_ BHT 121 Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 2321  Test 1250 T-On Location 11:00pm  
 (B) First Initial Flow 200  Jars 250 T-Started 11:25pm  
 (C) First Final Flow 25  Safety Joint 75 T-Open 2:15 Am  
 (D) Initial Shut-In 40  Circ Sub \_\_\_\_\_ T-Pulled 5:15 Am  
 (E) Second Initial Flow 29  Hourly Standby \_\_\_\_\_ T-Out 7:53 Am  
 (F) Second Final Flow 35  Mileage 48 RT X2 Comments Loaded tools  
 (G) Final Shut-In 39  Sampler 74.40+74.40 12:00 Am 10-7-14  
 (H) Final Hydrostatic 2277  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_ Sub Total 0  
 Day Standby \_\_\_\_\_ Total 1723.80  
 Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_

Initial Open 300  
 Initial Shut-In 600  
 Final Flow 300  
 Final Shut-In 600

Sub Total 1723.80

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

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