



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita KS 67202

ATTN: Andy White

### **Hagen #2-12**

#### **12-12s-20w Ellis KS**

Start Date: 2014.04.02 @ 02:56:00

End Date: 2014.04.02 @ 10:08:30

Job Ticket #: 56097                      DST #: 1

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

Printed: 2014.04.04 @ 10:36:55



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56097

**DST#: 1**

ATTN: Andy White

Test Start: 2014.04.02 @ 02:56:00

## GENERAL INFORMATION:

Formation: **Oread**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 05:25:00

Time Test Ended: 10:08:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Cody Bloedorn

Unit No: 73

**Interval: 3374.00 ft (KB) To 3496.00 ft (KB) (TVD)**

Reference Elevations: 2156.00 ft (KB)

Total Depth: 3496.00 ft (KB) (TVD)

2151.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

**Serial #: 8648**

**Inside**

Press@RunDepth: 88.73 psig @ 3473.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.04.02

End Date:

2014.04.02

Last Calib.:

2014.04.02

Start Time: 02:56:05

End Time:

10:08:29

Time On Btm:

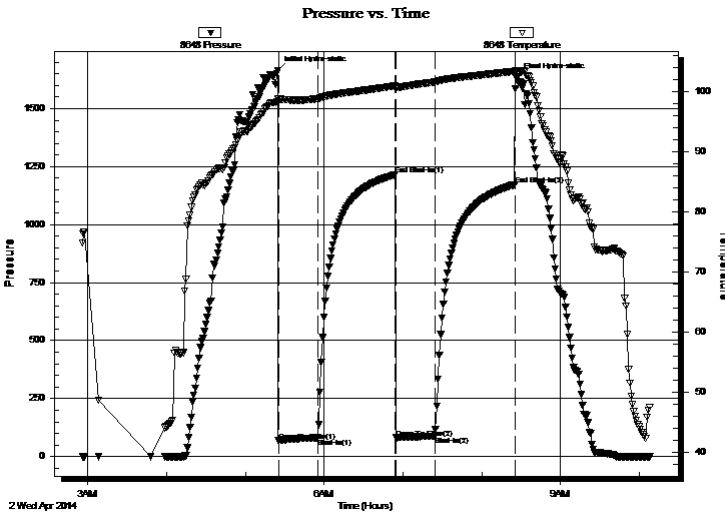
2014.04.02 @ 05:24:45

Time Off Btm:

2014.04.02 @ 08:26:30

TEST COMMENT: 30 - IF- 1 1/2" blow  
60 - IS- No return  
30 - FF- 1/2" blow  
60 - FS- No reutr

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1664.95	98.73	Initial Hydro-static
1	67.71	98.17	Open To Flow (1)
31	80.54	98.76	Shut-In(1)
90	1214.71	100.87	End Shut-In(1)
90	80.88	100.35	Open To Flow (2)
120	88.73	101.53	Shut-In(2)
181	1172.75	103.30	End Shut-In(2)
182	1634.37	102.76	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
50.00	Mud - w ith oil spots, 100%M	0.43

## Gas Rates

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





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co Inc

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56097

**DST#: 1**

ATTN: Andy White

Test Start: 2014.04.02 @ 02:56:00

## Tool Information

Drill Pipe:	Length: 3325.00 ft	Diameter: 3.80 inches	Volume: 46.64 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: 30000.00 lb
Drill Collar:	Length: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 54000.00 lb
			<u>Total Volume: 46.79 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	10.00 ft			String Weight: Initial 50000.00 lb
Depth to Top Packer:	3374.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	122.00 ft			
Tool Length:	151.00 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			3346.00	
Shut In Tool	5.00			3351.00	
Hydraulic tool	5.00			3356.00	
Jars	5.00			3361.00	
Safety Joint	3.00			3364.00	
Packer	5.00			3369.00	29.00 Bottom Of Top Packer
Packer	5.00			3374.00	
Stubb	1.00			3375.00	
Perforations	3.00			3378.00	
Change Over Sub	1.00			3379.00	
Drill Pipe	93.00			3472.00	
Change Over Sub	1.00			3473.00	
Recorder	0.00	8648	Inside	3473.00	
Recorder	0.00	8940	Outside	3473.00	
Perforations	20.00			3493.00	
Bullnose	3.00			3496.00	122.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>151.00</b>				



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co Inc

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56097

**DST#: 1**

ATTN: Andy White

Test Start: 2014.04.02 @ 02:56:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.79 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1100.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
50.00	Mud - w with oil spots, 100%M	0.428

Total Length: 50.00 ft      Total Volume: 0.428 bbl

Num Fluid Samples: 0

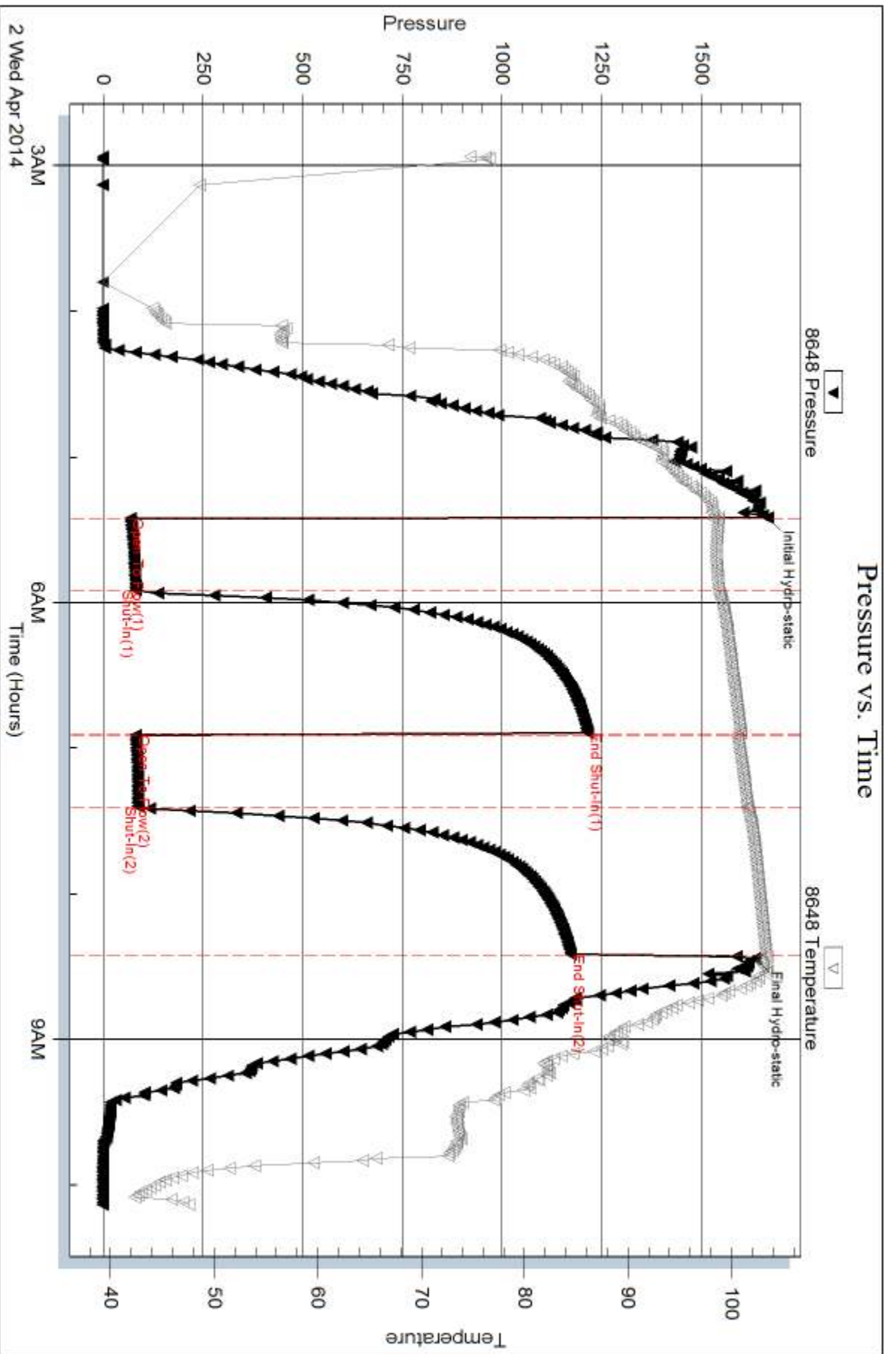
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

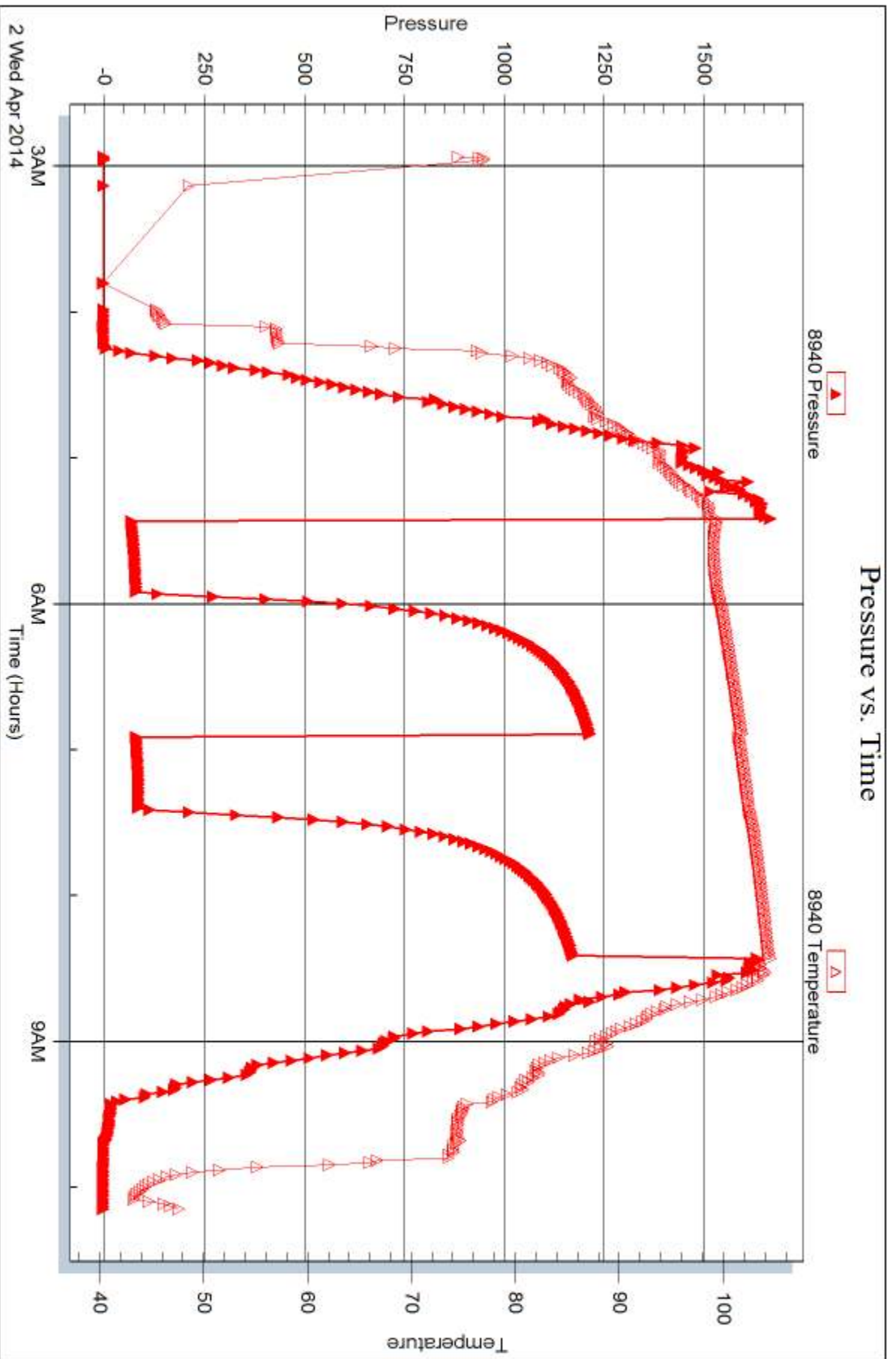


Serial #: 8940

Outside Murfin Drilling Co Inc

Hagen #2-12

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 56097

Printed: 2014.04.04 @ 10:36:57



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita KS 67202

ATTN: Andy White

### **Hagen #2-12**

#### **12-12s-20w Ellis KS**

Start Date: 2014.04.02 @ 19:31:00

End Date: 2014.04.03 @ 02:00:15

Job Ticket #: 56098                      DST #: 2

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

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

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**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
250 N. Water STE 300  
Wichita KS 67202  
ATTN: Andy White

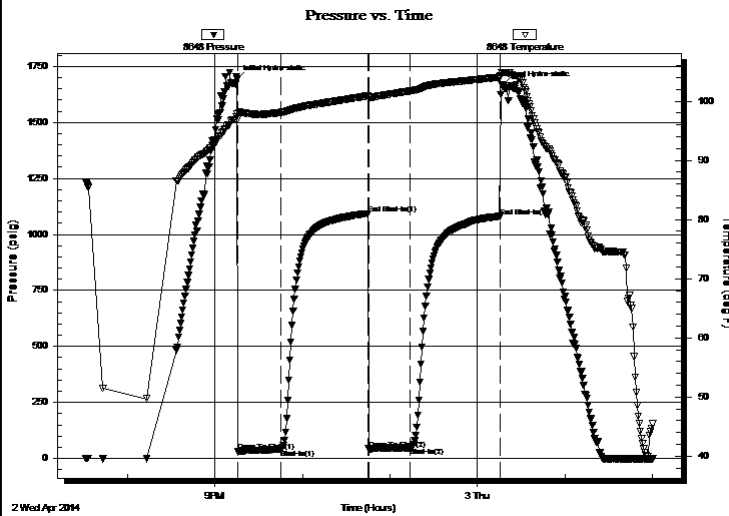
**12-12s-20w Ellis KS**  
**Hagen #2-12**  
Job Ticket: 56098 **DST#: 2**  
Test Start: 2014.04.02 @ 19:31:00

## GENERAL INFORMATION:

Formation: **LKC "B-F"**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 21:15:15  
Time Test Ended: 02:00:15  
Interval: **3494.00 ft (KB) To 3565.00 ft (KB) (TVD)**  
Total Depth: 3565.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Fair  
Test Type: Conventional Bottom Hole (Reset)  
Tester: Cody Bloedorn  
Unit No: 73  
Reference Elevations: 2156.00 ft (KB)  
2151.00 ft (CF)  
KB to GR/CF: 5.00 ft

**Serial #: 8648 Inside**  
Press@RunDepth: 47.75 psig @ 3533.00 ft (KB) Capacity: 8000.00 psig  
Start Date: 2014.04.02 End Date: 2014.04.03 Last Calib.: 2014.04.03  
Start Time: 19:31:05 End Time: 02:00:14 Time On Btm: 2014.04.02 @ 21:15:00  
Time Off Btm: 2014.04.03 @ 00:16:45

TEST COMMENT: 30 - IF- 1" blow  
60 - ISI- No return  
30 - FF- Surface blow  
60 - FSI- No return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1692.65	97.91	Initial Hydro-static
1	30.83	96.96	Open To Flow (1)
31	40.84	98.10	Shut-In(1)
90	1093.50	100.88	End Shut-In(1)
91	42.93	100.53	Open To Flow (2)
119	47.75	101.71	Shut-In(2)
181	1080.42	104.05	End Shut-In(2)
182	1665.85	104.84	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
33.00	Mud, 100%M	0.19

\* 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

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56098

**DST#: 2**

ATTN: Andy White

Test Start: 2014.04.02 @ 19:31:00

## Tool Information

Drill Pipe:	Length: 3450.00 ft	Diameter: 3.80 inches	Volume: 48.39 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: 30000.00 lb
Drill Collar:	Length: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 54000.00 lb
			<u>Total Volume: 48.54 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	13.00 ft			String Weight: Initial 50000.00 lb
Depth to Top Packer:	3496.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	69.00 ft			
Tool Length:	98.00 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			3468.00	
Shut In Tool	5.00			3473.00	
Hydraulic tool	5.00			3478.00	
Jars	5.00			3483.00	
Safety Joint	3.00			3486.00	
Packer	5.00			3491.00	29.00 Bottom Of Top Packer
Packer	5.00			3496.00	
Stubb	1.00			3497.00	
Perforations	3.00			3500.00	
Change Over Sub	1.00			3501.00	
Drill Pipe	31.00			3532.00	
Change Over Sub	1.00			3533.00	
Recorder	0.00	8648	Inside	3533.00	
Recorder	0.00	8940	Outside	3533.00	
Perforations	29.00			3562.00	
Bullnose	3.00			3565.00	69.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>98.00</b>				



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling Co Inc

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56098

**DST#: 2**

ATTN: Andy White

Test Start: 2014.04.02 @ 19:31:00

### Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.79 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1100.00 ppm

Filter Cake: inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
33.00	Mud, 100%M	0.190

Total Length: 33.00 ft      Total Volume: 0.190 bbl

Num Fluid Samples: 0

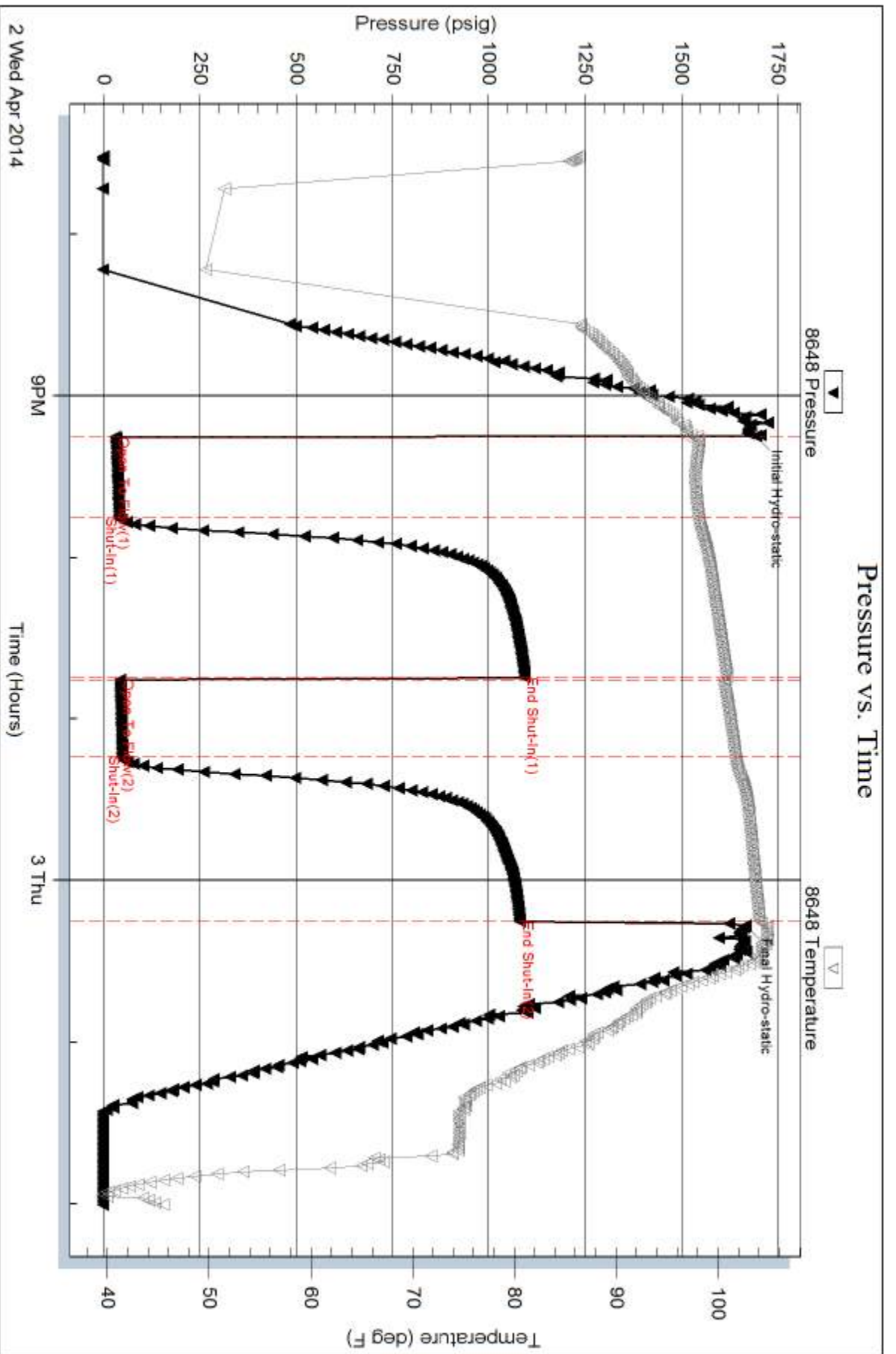
Num Gas Bombs: 0

Serial #:

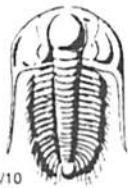
Laboratory Name:

Laboratory Location:

Recovery Comments:







# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **56097**

Well Name & No. Hagen 2-12 Test No. 1 Date 4-2-14  
 Company Murfin Drilling Co Inc Elevation 2156 KB 2151 GL  
 Address 250 N Water STE 300, Wichita KS, 67202  
 Co. Rep / Geo. Andy White Rig Murfin 16  
 Location: Sec. 12 Twp. 12s Rge. 20w Co. Ellis State KS

Interval Tested 3374 - 3496 Zone Tested Oread  
 Anchor Length 122' Drill Pipe Run 3325 Mud Wt. 8.6  
 Top Packer Depth 3369 Drill Collars Run 30' Vis 60+  
 Bottom Packer Depth 3374 Wt. Pipe Run — WL 5.8  
 Total Depth ~~3369~~ 3496 Chlorides 1,100 ppm System LCM —  
 Blow Description IF- 1 1/2" blow  
FSI - No return  
FF- 1/2" blow  
FSI - No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>50'</u>	<u>Mud - with oil 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

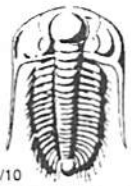
Rec Total 50 BHT 103° Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>1664</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>0234</u>
(B) First Initial Flow <u>67</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>0256</u>
(C) First Final Flow <u>80</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>0526</u>
(D) Initial Shut-In <u>1214</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>0826</u>
(E) Second Initial Flow <u>80</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1009</u>
(F) Second Final Flow <u>88</u>	<input checked="" type="checkbox"/> Mileage <u>52RT</u> 80.60	Comments
(G) Final Shut-In <u>1172</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1634</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer
	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Packer
Initial Open <u>30</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
Final Flow <u>30</u>	<input type="checkbox"/> Day Standby	Total <u>1555.60</u>
Final Shut-In <u>60</u>	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>1555.60</u>	

Approved By \_\_\_\_\_

Our Representative Cody Bluff

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. 56098

Well Name & No. Hagen #2-12 Test No. 2 Date 4-2-14  
 Company Murfin Drilling Co Inc Elevation 2156 KB 2151 GL  
 Address 250 N. Water STE 300, Wichita KS, 67202  
 Co. Rep / Geo. Andy White Rig Murfin #16  
 Location: Sec. 12 Twp. 12s Rge. 20w Co. Ellis State KS

Interval Tested 3496 - 3565 Zone Tested "B-F"  
 Anchor Length 69' Drill Pipe Run 3450' Mud Wt. 8.6  
 Top Packer Depth 3491 Drill Collars Run 30' Vis 60  
 Bottom Packer Depth 3496 Wt. Pipe Run — WL 5.8  
 Total Depth 3565 Chlorides 1100 ppm System LCM —

Blow Description IF-1" blow  
ISI - No return  
FF - Surface blow  
FST - No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>33</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 33 BHT 104° Gravity — API RW — @ —°F Chlorides — ppm

(A) Initial Hydrostatic <u>1692</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>1918</u>
(B) First Initial Flow <u>30</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>1931</u>
(C) First Final Flow <u>40</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>2117</u>
(D) Initial Shut-In <u>1093</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>1217</u>
(E) Second Initial Flow <u>42</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>0201</u>
(F) Second Final Flow <u>47</u>	<input checked="" type="checkbox"/> Mileage <u>52 RT</u> <u>161.20</u>	Comments <u>loaded tools 4/3 15:00</u>
(G) Final Shut-In <u>1080</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1665</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer

Initial Open 30  
 Initial Shut-In 60  
 Final Flow \_\_\_\_\_  
 Final Shut-In \_\_\_\_\_

Shale Packer  
 Extra Packer  
 Extra Recorder  
 Day Standby  
 Accessibility

Sub Total 1636.20

Total 1636.20  
 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative Cody Bledson

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.