

**TRILOBITE  
TESTING, INC.**

## DRILL STEM TEST REPORT

Prepared For: **Central Operating Inc**

1600 Broadway # 1050  
Denver Colo 80202

ATTN: P A Brew

**4-15-14-Russell-Ks**

**Krug # 1-4**

Start Date: 2004.11.22 @ 16:25:24

End Date: 2004.11.23 @ 02:28:24

Job Ticket #: 20872                      DST #: 1

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

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

Central Operating Inc

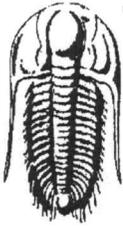
Krug # 1-4

4-15-14-Russell-Ks

DST # 1

Tarkio

2004.11.22



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Central Operating Inc  
 1600 Broadway # 1050  
 Denver Colo 80202  
 ATTN: PA Brew

**Krug # 1-4**  
**4-15-14-Russell-Ks**  
 Job Ticket: 20872      **DST#: 1**  
 Test Start: 2004.11.22 @ 16:25:24

## GENERAL INFORMATION:

Formation: **Tarkio**  
 Deviated: **No Whipstock:**      **ft (KB)**  
 Time Tool Opened: 19:52:24  
 Time Test Ended: 02:28:24  
 Interval: **2338.00 ft (KB) To 2430.00 ft (KB) (TVD)**  
 Total Depth: **2430.00 ft (KB) (TVD)**  
 Hole Diameter: **7.88 inches** Hole Condition: **Good**  
 Test Type: **Conventional Bottom Hole**  
 Tester: **Dan Bangle**  
 Unit No: **21**  
 Reference Elevations: **1772.00 ft (KB)**  
**1767.00 ft (CF)**  
 KB to GR/CF: **5.00 ft**

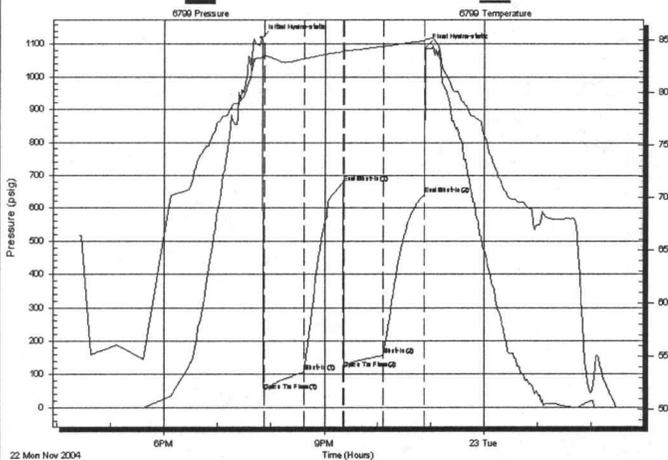
## Serial #: 6799

Inside

Press@RunDepth: 157.35 psig @ 2399.00 ft (KB)      Capacity: 7000.00 psig  
 Start Date: 2004.11.22      End Date: 2004.11.23      Last Calib.: 2004.11.23  
 Start Time: 16:25:25      End Time: 02:28:24      Time On Btm: 2004.11.22 @ 19:49:24  
 Time Off Btm: 2004.11.22 @ 22:53:24

TEST COMMENT: IF-Strong B-B in 1.5 min  
 IS-Weak building to 8"  
 FF-Strong B-B in 1 min-GTS in 2 min-TSTM  
 FSI-Weak building to 4"

Pressure vs. Time



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1118.72	83.36	Initial Hydro-static
3	48.59	83.66	Open To Flow (1)
48	108.23	83.24	Shut-In(1)
91	676.48	83.93	End Shut-In(1)
93	116.28	83.95	Open To Flow (2)
137	157.35	84.41	Shut-In(2)
183	642.09	84.95	End Shut-In(2)
184	1088.68	85.12	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
330.00	O&WCGsyM 20%g 20%o 20%w 40%m	1.76
62.00	Gsy M 20%g 80%m	0.46
0.00	GTS	0.00

## Gas Rates

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



**TRILOBITE  
TESTING, INC**

## DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Central Operating Inc  
1600 Broadway # 1050  
Denver Colo 80202  
ATTN: PA Brew

**Krug # 1-4**  
**4-15-14-Russell-Ks**  
Job Ticket: 20872      **DST#: 1**  
Test Start: 2004.11.22 @ 16:25:24

### Tool Information

Drill Pipe:	Length: 2063.00 ft	Diameter: 2.76 inches	Volume: 15.27 bbl	Tool Weight: 2300.00 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: 273.00 ft	Diameter: 2.25 inches	Volume: 1.34 bbl	Weight to Pull Loose: 35000.00 lb
			<u>Total Volume: 16.61 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	30.00 ft			String Weight: Initial 30000.00 lb
Depth to Top Packer:	2338.00 ft			Final 31000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	92.00 ft			
Tool Length:	124.00 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			2307.00	
Shut In Tool	5.00			2312.00	
Sampler	3.00			2315.00	
Hydraulic tool	5.00			2320.00	
Jars	5.00			2325.00	
Safety Joint	3.00			2328.00	
Packer	5.00			2333.00	32.00      Bottom Of Top Packer
Packer	5.00			2338.00	
Stubb	1.00			2339.00	
Perforations	2.00			2341.00	
Change Over Sub	1.00			2342.00	
Drill Collar	56.00			2398.00	
Change Over Sub	1.00			2399.00	
Recorder	0.00	6799	Inside	2399.00	
Perforations	28.00			2427.00	
Recorder	0.00	13254	Outside	2427.00	
Bullnose	3.00			2430.00	92.00      Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>124.00</b>				



**TRILOBITE  
TESTING, INC**

**DRILL STEM TEST REPORT**

**FLUID SUMMARY**

Central Operating Inc

**Krug # 1-4**

1600 Broadway # 1050  
Denver Colo 80202

**4-15-14-Russell-Ks**

Job Ticket: 20872

**DST#: 1**

ATTN: PA Brew

Test Start: 2004.11.22 @ 16:25:24

**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: 47.00 sec/qt

Cushion Volume:

bbl

Water Loss: 9.59 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5500.00 ppm

Filter Cake: inches

**Recovery Information**

Recovery Table

Length ft	Description	Volume bbl
330.00	O&WCGsyM 20%g 20%o 20%w 40%m	1.764
62.00	Gsy M 20%g 80%m	0.459
0.00	GTS	0.000

Total Length: 392.00 ft

Total Volume: 2.223 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

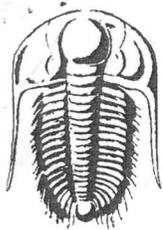
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:





# TRILOBITE TESTING INC.

P.O. Box 362 • Hays, Kansas 67601

TUV  
6975

No 20872

05/03

## Test Ticket

Well Name & No. Krug #1-4 Test No. 1 Date 11-22-04  
 Company Central Operating, Inc Zone Tested Tarkio  
 Address 1600 Broadway, #1050 Denver, Colo. 80202 Elevation 1772 KB 1767 GL  
 Co. Rep / Geo. Jerry Green Cont. Forest Energy #3 Est. Ft. of Pay \_\_\_\_\_ Por. \_\_\_\_\_ %  
 Location: Sec. 4 Twp. 15 Rge. 14 Co. Russell State Ks.  
 No. of Copies \_\_\_\_\_ Distribution Sheet (Y, N) \_\_\_\_\_ Turnkey (Y, N) \_\_\_\_\_ Evaluation (Y, N) \_\_\_\_\_

Interval Tested 2338 — 2430 Initial Str Wt./Lbs. 30,000 Unseated Str Wt./Lbs. 31,000  
 Anchor Length 92 Wt. Set Lbs. 25,000 Wt. Pulled Loose/Lbs. 35,000  
 Top Packer Depth 2333 Tool Weight 2300  
 Bottom Packer Depth 2338 Hole Size 7 7/8" Rubber Size 6 3/4"  
 Total Depth 2430 Wt. Pipe Run \_\_\_\_\_ Drill Collar Run 273  
 Mud Wt. 8.7 LCM \_\_\_\_\_ Vis. 47 WL 9.6 Drill Pipe Size 3 1/2 XH Ft. Run 2063

Blow Description I.F. Strong B-B in 1.5 min.  
IST Weak - building to 8"  
E.F. Strong B-B in 1 min. GTS in 2 min (TSTM)  
KSI Weak - building to 4"

Recovery - Total Feet	<u>392</u>	GFP	<u>GTS</u>	Ft. in DC	<u>273</u>	Ft. in DP	<u>119</u>
Rec.	<u>62</u>	Feet of	<u>Gsy Mud</u>	<u>20</u>	%gas	%oil	%water <u>80</u> %mud
Rec.	<u>330</u>	Feet of	<u>Oil w C Gsym</u>	<u>20</u>	%gas	<u>20</u> %oil	<u>20</u> %water <u>40</u> %mud
Rec.		Feet of			%gas	%oil	%water %mud
Rec.		Feet of			%gas	%oil	%water %mud
Rec.		Feet of			%gas	%oil	%water %mud
BHT	<u>84</u>	°F Gravity		°API D @		°F Corrected Gravity	°API
RW		@	°F	Chlorides		ppm Recovery	Chlorides <u>5500</u> ppm System

(A) Initial Hydrostatic Mud	<u>1118</u>	PSI	Recorder No.	<u>6799</u>	Test	<u>900</u>
(B) First Initial Flow Pressure	<u>48</u>	PSI	(depth)	<u>2399</u>	Elec. Rec.	<u>X</u>
(C) First Final Flow Pressure	<u>108</u>	PSI	Recorder No.	<u>13254</u>	Jars	<u>X</u> <u>200</u>
(D) Initial Shut-In Pressure	<u>676</u>	PSI	(depth)	<u>2427</u>	Safety Jt.	<u>X</u> <u>50</u>
(E) Second Initial Flow Pressure	<u>116</u>	PSI	Recorder No.		Circ Sub	
(F) Second Final Flow Pressure	<u>157</u>	PSI	(depth)		Sampler	<u>X</u> <u>200</u>
(G) Final Shut-In Pressure	<u>642</u>	PSI	Initial Opening	<u>45</u>	Straddle	
(Q) Final Hydrostatic Mud	<u>1058</u>	PSI	Initial Shut-In	<u>45</u>	Ext. Packer	
			Final Flow	<u>45</u>	Shale Packer	
			Final Shut-In	<u>45</u>	Mileage	<u>64</u> <u>64</u>

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.

T-On Location	<u>15:30</u>
T-Started	<u>16:25</u>
T-Open	<u>19:52</u>
T-Pulled	<u>22:52</u>
T-Out	<u>02:28</u>
Sub Total:	<u>1414</u>
Std. By	<u>shr</u> <u>90</u>
Other	
Total:	<u>1504</u>

Approved By \_\_\_\_\_  
 Our Representative Dan Rangle

# TRILOBITE TESTING L.L.C.

P.O. Box 362 - Hays, Kansas 67601

## FLUID SAMPLER DATA

Ticket No. 20872 Date 11-22-04  
Company Name Central Operating, Inc  
Lease Krug #1-4 Test No. 1  
County Russell Sec. 4 Twp. 15 Rng. 14

### SAMPLER RECOVERY

Gas 2.3 ML  
Oil 2200 ML  
Mud 400 ML  
Water 400 ML  
Other \_\_\_\_\_ ML  
Pressure 600 PSI  
Total 3000 ML

### PIT MUD ANALYSIS

Chlorides 5500 ppm.  
Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
Viscosity 47  
Mud Weight 8.7  
Filtrate 9.6  
Other \_\_\_\_\_

### SAMPLER ANALYSIS

Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
Chlorides \_\_\_\_\_ ppm.  
Gravity \_\_\_\_\_ corrected @ 60 F

### PIPE RECOVERY

TOP  
Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
Chlorides \_\_\_\_\_ ppm.  
MIDDLE  
Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
Chlorides \_\_\_\_\_ ppm.  
BOTTOM  
Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
Chlorides \_\_\_\_\_ ppm.

**CHART PAGE**

This is a photocopy of the actual AK-1 recorder chart

