



DRILL STEM TEST REPORT

Prepared For: **TDI Inc**

1310 Bison Rd
Hays KS 67601

ATTN: Herb Deines

Gross #1

24-15s-19w Ellis KS

Start Date: 2013.06.11 @ 23:13:00

End Date: 2013.06.12 @ 06:47:00

Job Ticket #: 53911 DST #: 1

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

Printed: 2013.06.14 @ 11:02:40

TDI Inc
24-15s-19w Ellis KS
Gross #1
DST # 1
LKC I-J
2013.06.11



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Herb Deines

24-15s-19w Ellis KS
Gross #1
Job Ticket: 53911 **DST#: 1**
Test Start: 2013.06.11 @ 23:13:00

GENERAL INFORMATION:

Formation: **LKC I-J**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 01:55:45
Time Test Ended: 06:47:00
Interval: **3446.00 ft (KB) To 3495.00 ft (KB) (TVD)**
Total Depth: 3495.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Reference Elevations: 2003.00 ft (KB)
1993.00 ft (CF)
KB to GR/CF: 10.00 ft
Test Type: Conventional Bottom Hole (Initial)
Tester: Cody Bloedorn
Unit No: 43

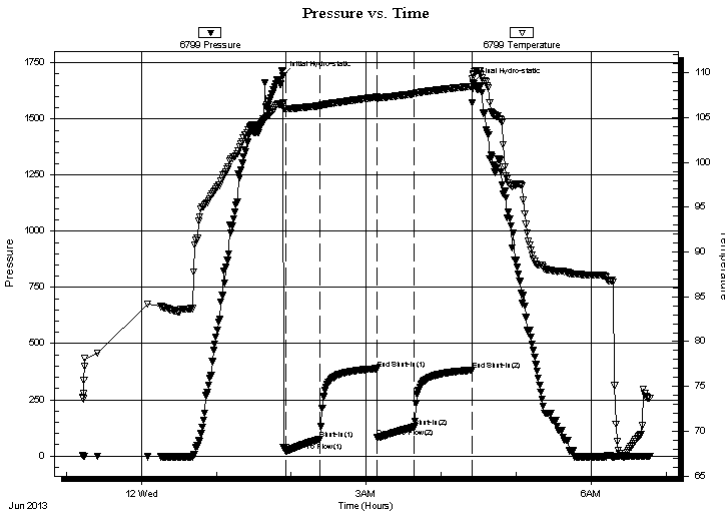
Serial #: 6799

Inside

Press @ Run Depth: 129.41 psig @ 3485.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2013.06.11 End Date: 2013.06.12 Last Calib.: 2013.06.12
Start Time: 23:13:05 End Time: 06:46:59 Time On Btm: 2013.06.12 @ 01:53:30
Time Off Btm: 2013.06.12 @ 04:25:30

TEST COMMENT: 30 - IF- B.O.B. in 30 seconds.
45 - IS- B.O.B. in 9 minutes.
30 - FF-B.O.B. from shut in
45 - FS- G.T.S. at bleed off, B.O.B. in 11 minutes

PRESSURE SUMMARY



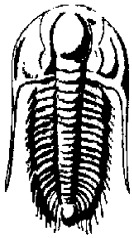
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1694.74	106.60	Initial Hydro-static
3	22.12	105.99	Open To Flow (1)
30	74.57	106.32	Shut-In(1)
75	388.29	107.27	End Shut-In(1)
76	81.50	107.19	Open To Flow (2)
105	129.41	107.65	Shut-In(2)
151	381.54	108.49	End Shut-In(2)
152	1662.32	109.79	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	GHOCM, 10%M, 40%O, 50%G	1.81
62.00	GO, 50%G, 50%O	0.91
186.00	GO, 40%G, 60%O	2.72
0.00	GTS	0.00

Gas Rates

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



TRILOBITE
TESTING, INC.

DRILL STEM TEST REPORT

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Herb Deines

24-15s-19w Ellis KS

Gross #1

Job Ticket: 53911 **DST#: 1**

Test Start: 2013.06.11 @ 23:13:00

GENERAL INFORMATION:

Formation: **LKC I-J**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 01:55:45

Time Test Ended: 06:47:00

Test Type: Conventional Bottom Hole (Initial)

Tester: Cody Bloedorn

Unit No: 43

Interval: 3446.00 ft (KB) To 3495.00 ft (KB) (TVD)

Reference Elevations: 2003.00 ft (KB)

Total Depth: 3495.00 ft (KB) (TVD)

1993.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 10.00 ft

Serial #: 8648

Outside

Press @ RunDepth: psig @ 3485.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2013.06.11 End Date: 2013.06.12 Last Calib.: 2013.06.12

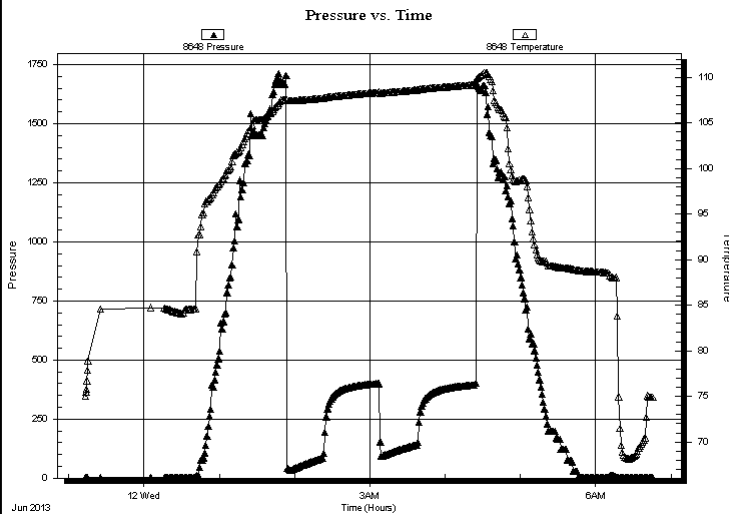
Start Time: 23:13:35 End Time: 06:45:59 Time On Btm:

TEST COMMENT: 30 - IF- B.O.B. in 30 seconds.

45 - IS- B.O.B. in 9 minutes.

30 - FF-B.O.B. from shut in

45 - FS- G.T.S. at bleed off, B.O.B. in 11 minutes



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
124.00	GHO CM, 10%M, 40%O, 50%G	1.81
62.00	GO, 50%G, 50%O	0.91
186.00	GO, 40%G, 60%O	2.72
0.00	GTS	0.00

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Herb Deines

24-15s-19w Ellis KS
Gross #1
Job Ticket: 53911 **DST#: 1**
Test Start: 2013.06.11 @ 23:13:00

Tool Information

Drill Pipe:	Length: 3440.00 ft	Diameter: 3.88 inches	Volume: 50.31 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: inches	Volume: 0.00 bbl	Weight set on Packer:	30000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose:	45000.00 lb
		Total Volume: 50.31 bbl		Tool Chased	0.00 ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial	39000.00 lb
Depth to Top Packer:	3446.00 ft			Final	39000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	49.00 ft				
Tool Length:	70.00 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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Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3426.00	
Shut In Tool	5.00			3431.00	
Hydraulic tool	5.00			3436.00	
Packer	5.00			3441.00	21.00 Bottom Of Top Packer
Packer	5.00			3446.00	
Stubb	1.00			3447.00	
Perforations	5.00			3452.00	
Change Over Sub	1.00			3453.00	
Drill Pipe	31.00			3484.00	
Change Over Sub	1.00			3485.00	
Recorder	0.00	6799	Inside	3485.00	
Recorder	0.00	8648	Outside	3485.00	
Perforations	7.00			3492.00	
Bullnose	3.00			3495.00	49.00 Bottom Packers & Anchor

Total Tool Length: 70.00



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Herb Deines

24-15s-19w Ellis KS
Gross #1
Job Ticket: 53911
Test Start: 2013.06.11 @ 23:13:00

DST#: 1

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: 48.00 sec/qt	Cushion Volume: bbl		
Water Loss: 7.18 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 3600.00 ppm			
Filter Cake: inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
124.00	GHOCM, 10%M, 40%O, 50%G	1.813
62.00	GO, 50%G, 50%O	0.907
186.00	GO, 40%G, 60%O	2.720
0.00	GTS	0.000

Total Length: 372.00 ft Total Volume: 5.440 bbl

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

Laboratory Name: Laboratory Location:

Recovery Comments:

Serial #: 6799

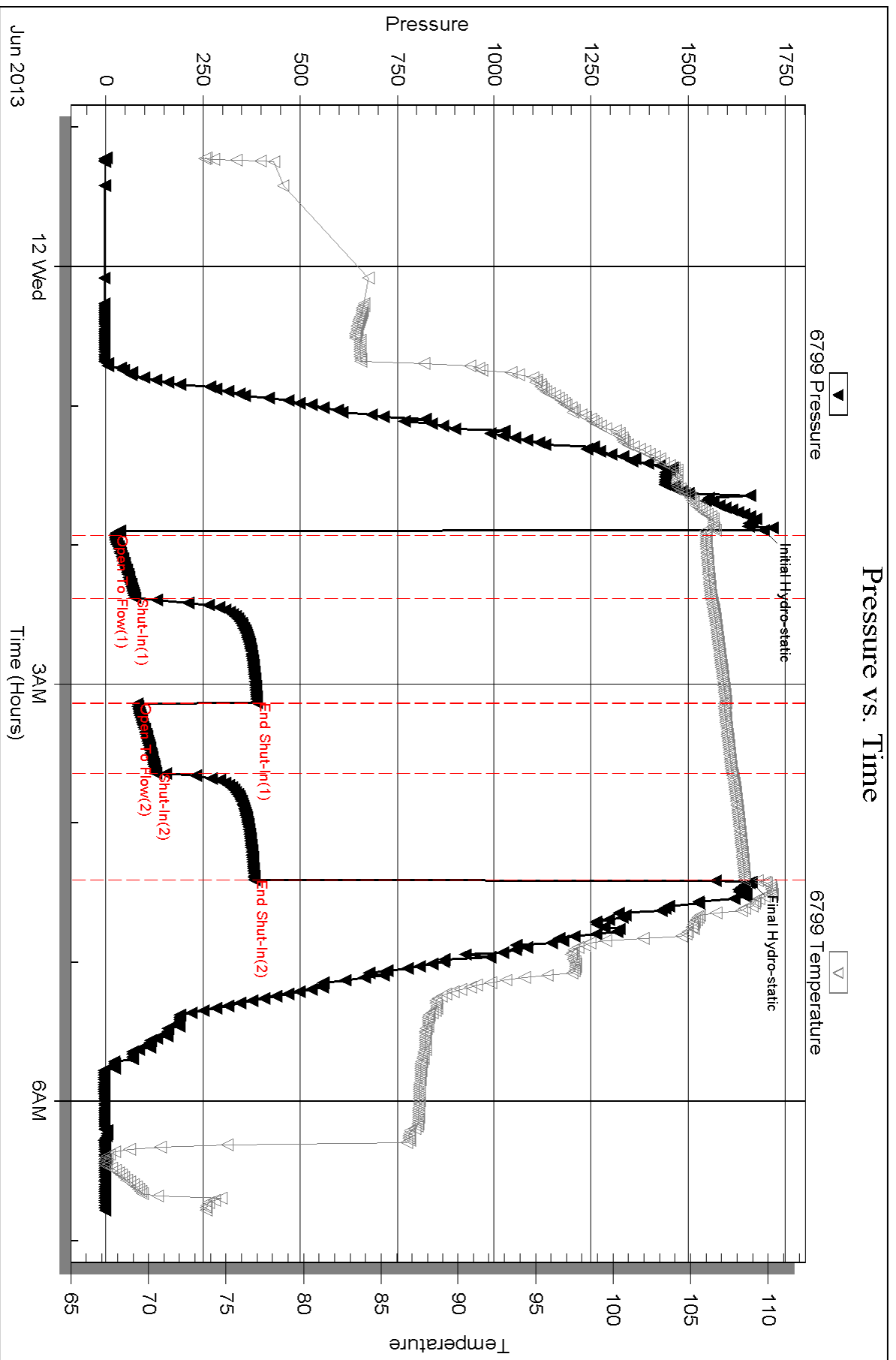
Inside

TDI Inc

Gross #1

DST Test Number: 1

Pressure vs. Time

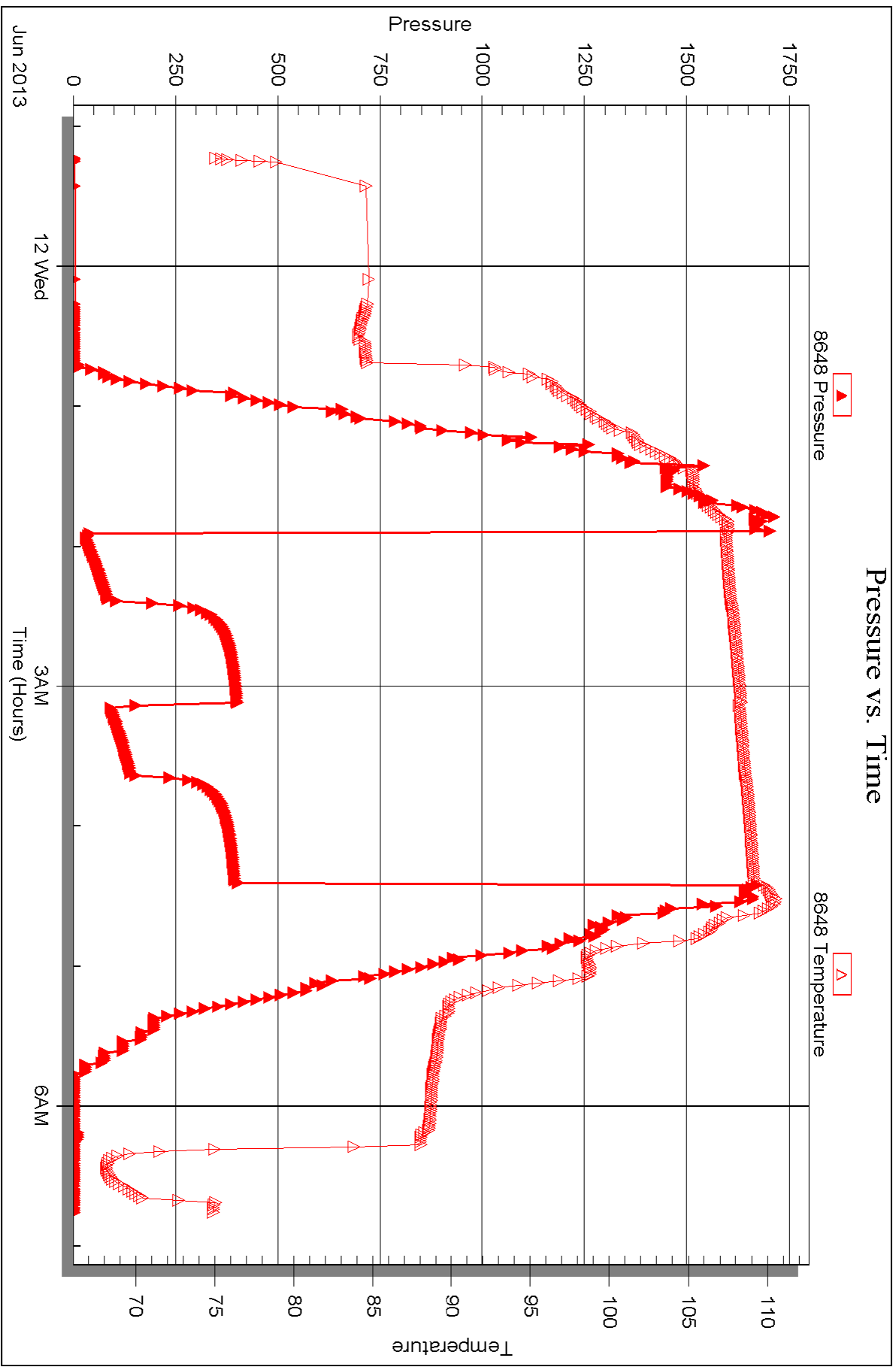


Serial #: 8648

Outside TDI Inc

Gross #1

DST Test Number: 1





DRILL STEM TEST REPORT

Prepared For: **TDI Inc**

1310 Bison Rd
Hays KS 67601

ATTN: Herb Deines

Gross #1

24-15s-19w Ellis KS

Start Date: 2013.06.13 @ 06:32:00

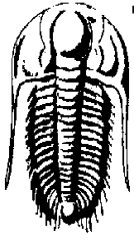
End Date: 2013.06.13 @ 13:44:00

Job Ticket #: 53912 DST #: 2

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

Printed: 2013.06.14 @ 11:01:51

TDI Inc
24-15s-19w Ellis KS
Gross #1
DST # 2
LKC D
2013.06.13



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

TDI Inc
 1310 Bison Rd
 Hays KS 67601
 ATTN: Herb Deines

24-15s-19w Ellis KS
Gross #1
 Job Ticket: 53912 **DST#: 2**
 Test Start: 2013.06.13 @ 06:32:00

GENERAL INFORMATION:

Formation: **LKC D**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Straddle (Reset)
 Time Tool Opened: 08:37:00
 Tester: Cody Bloedorn
 Time Test Ended: 13:44:00
 Unit No: 43
Interval: 3328.00 ft (KB) To 3350.00 ft (KB) (TVD)
 Reference Elevations: 2003.00 ft (KB)
 Total Depth: 3750.00 ft (KB) (TVD) 1993.00 ft (CF)
 Hole Diameter: 7.88 inches Hole Condition: Fair KB to GR/CF: 10.00 ft

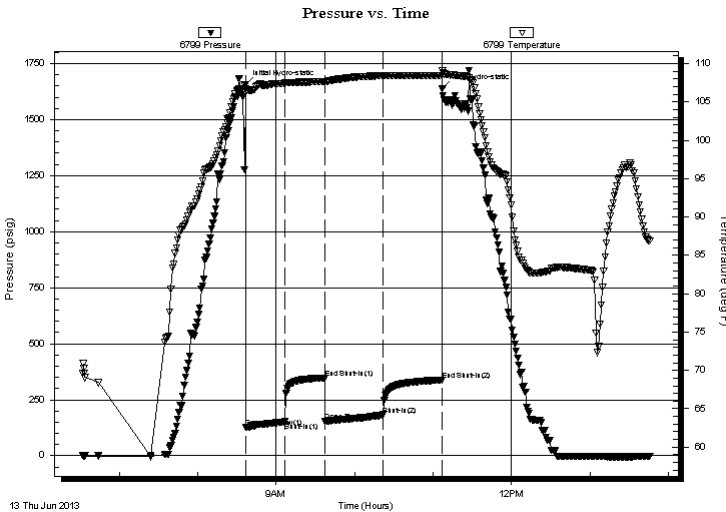
Serial #: 6799

Inside

Press @ Run Depth: 182.14 psig @ 3329.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2013.06.13 End Date: 2013.06.13 Last Calib.: 2013.06.13
 Start Time: 06:32:05 End Time: 13:45:44 Time On Btm: 2013.06.13 @ 08:36:45
 Time Off Btm: 2013.06.13 @ 11:07:15

TEST COMMENT: 30 - IF- B.O.B. in 25 minutes
 30 - IS- No return
 45 - FF- 2 1/2" blow
 45 - FS- No return

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1655.09	107.31	Initial Hydro-static
1	126.89	106.66	Open To Flow (1)
30	151.29	107.46	Shut-In(1)
61	347.57	107.68	End Shut-In(1)
61	153.07	107.60	Open To Flow (2)
105	182.14	108.44	Shut-In(2)
151	337.86	108.41	End Shut-In(2)
151	1639.55	109.12	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
35.00	Mud, 100%M	
186.00	Mud with oil specs, 100%M	
62.00	MW, 30%M, 70%W	
62.00	GWM, 5%G, 5%W, 90%M	

* Recovery from multiple tests

Gas Rates

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



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TESTING, INC.**

DRILL STEM TEST REPORT

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Herb Deines

24-15s-19w Ellis KS

Gross #1

Job Ticket: 53912

DST#: 2

Test Start: 2013.06.13 @ 06:32:00

GENERAL INFORMATION:

Formation: **LKC D**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:37:00

Time Test Ended: 13:44:00

Test Type: Conventional Straddle (Reset)

Tester: Cody Bloedorn

Unit No: 43

Interval: 3328.00 ft (KB) To 3350.00 ft (KB) (TVD)

Total Depth: 3750.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2003.00 ft (KB)

1993.00 ft (CF)

KB to GR/CF: 10.00 ft

Serial #: 8655 Below (Straddle)

Press @ Run Depth: psig @ 3740.00 ft (KB)

Start Date: 2013.06.13 End Date: 2013.06.13

Start Time: 06:32:05 End Time: 13:44:14

Capacity: 8000.00 psig

Last Calib.: 1899.12.30

Time On Btm:

Time Off Btm:

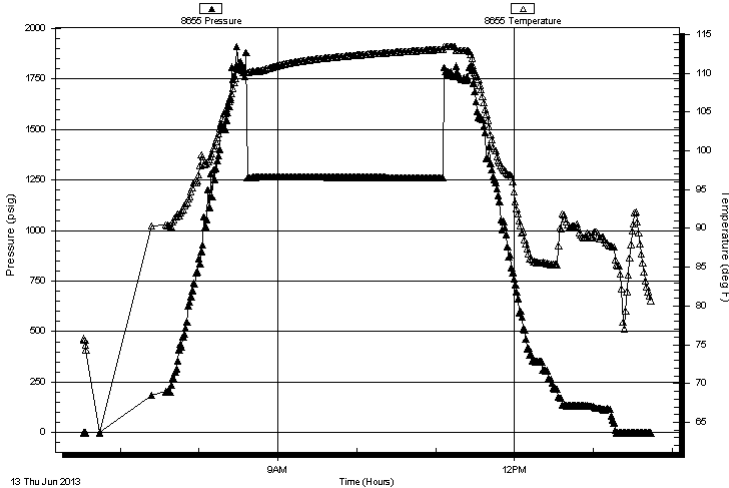
TEST COMMENT: 30 - IF- B.O.B. in 25 minutes

30 - IS- No return

45 - FF- 2 1/2" blow

45 - FS- No return

Pressure vs. Time



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
35.00	Mud, 100%M	
186.00	Mud w ith oil specs, 100%M	
62.00	MW, 30%M, 70%W	
62.00	GWM, 5%G, 5%W, 90%M	

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Herb Deines

24-15s-19w Ellis KS
Gross #1
Job Ticket: 53912 **DST#: 2**
Test Start: 2013.06.13 @ 06:32:00

Tool Information

Drill Pipe:	Length: 3324.00 ft	Diameter: 3.80 inches	Volume: 46.63 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: inches	Volume: 0.00 bbl	Weight set on Packer: 30000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: inches	Volume: 0.00 bbl	Weight to Pull Loose: 50000.00 lb
			<u>Total Volume: 46.63 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial 37000.00 lb
Depth to Top Packer:	3328.00 ft			Final 45000.00 lb
Depth to Bottom Packer:	3350.00 ft			
Interval between Packers:	22.00 ft			
Tool Length:	451.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments: 2nd recorder on top did not read.

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3309.00	
Shut In Tool	5.00			3314.00	
Hydraulic tool	5.00			3319.00	
Packer	5.00			3324.00	20.00 Bottom Of Top Packer
Packer	4.00			3328.00	
Stubb	1.00			3329.00	
Recorder	0.00	6799	Inside	3329.00	
Recorder	0.00	8648	Outside	3329.00	
Perforations	20.00			3349.00	
Blank Off Sub	1.00			3350.00	22.00 Tool Interval
Packer	4.00			3354.00	
Change Over Sub	1.00			3355.00	
Drill Pipe	379.00			3734.00	
Perforations	5.00			3739.00	
Change Over Sub	1.00			3740.00	
Recorder	0.00	8655	Below	3740.00	
Perforations	16.00			3756.00	
Bullnose	3.00			3759.00	409.00 Bottom Packers & Anchor
Total Tool Length:	451.00				



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Herb Deines

24-15s-19w Ellis KS
Gross #1
Job Ticket: 53912
Test Start: 2013.06.13 @ 06:32:00

DST#: 2

Mud and Cushion Information

Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 10.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 56.00 sec/qt	Cushion Volume: bbl		
Water Loss: 7.78 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 3500.00 ppm			
Filter Cake: inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
35.00	Mud, 100%M	
186.00	Mud with oil specs, 100%M	
62.00	MW, 30%M, 70%W	
62.00	GWM, 5%G, 5%W, 90%M	

Total Length: 345.00 ft Total Volume: bbl

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

Laboratory Name: Laboratory Location:

Recovery Comments:

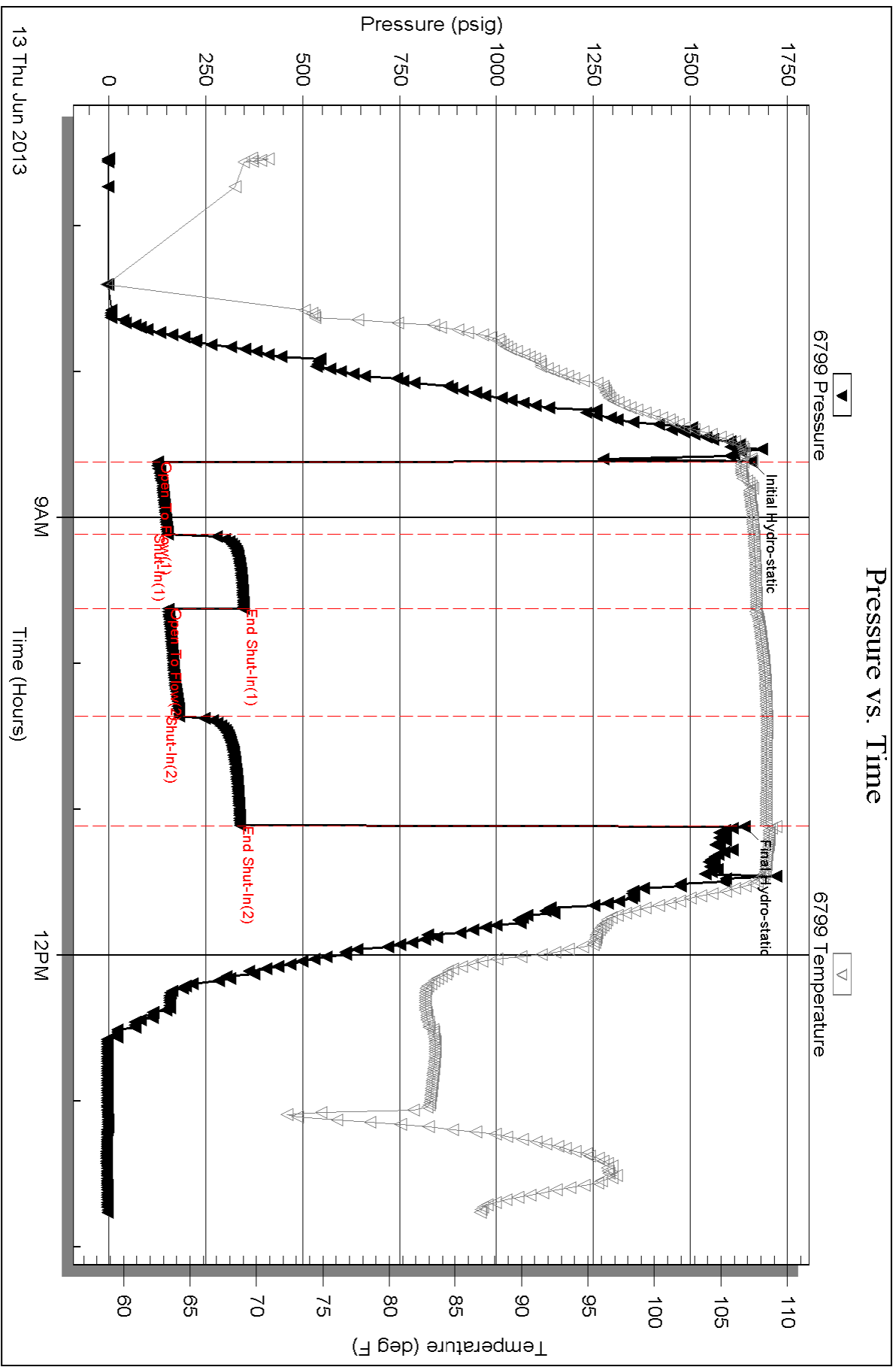
Serial #: 6799

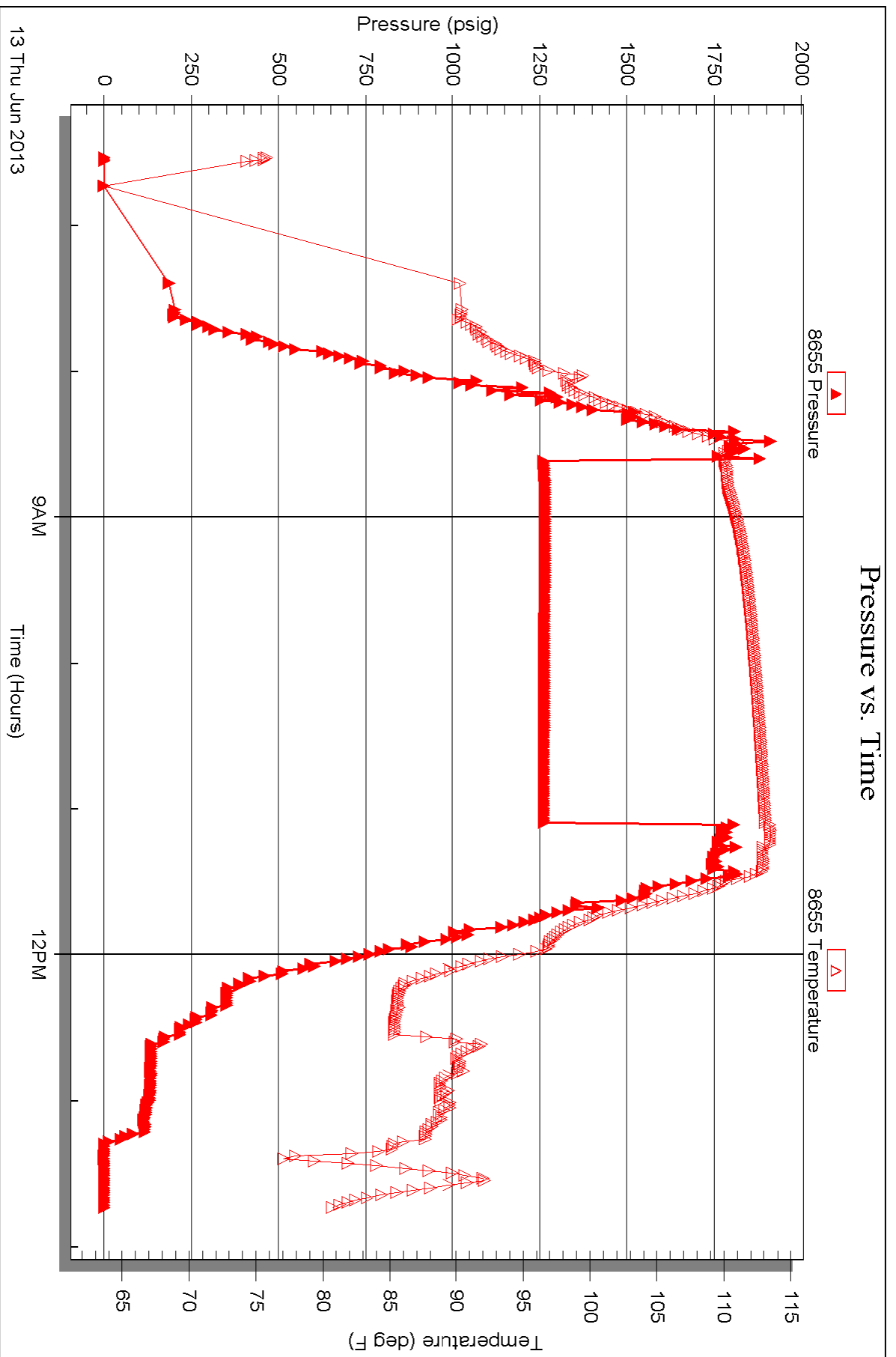
Inside

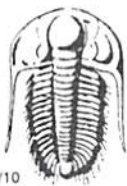
TDI Inc

Gross #1

DST Test Number: 2







TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 53911

Well Name & No. Gross # 1 Test No. 1 Date 6-11-13
 Company TDF Inc Elevation ~~1992~~ 2003 KB ~~1992~~ 1993 GL
 Address 1310 Bison rd, Hays KS, 67601
 Co. Rep / Geo. Herb Rig Southwind #1
 Location: Sec. 24 Twp. 15s Rge. 19W Co. Ellis State KS

Interval Tested 3446 - 3495 Zone Tested I 25
 Anchor Length 49' Drill Pipe Run 3440' Mud Wt. 9.0
 Top Packer Depth 3441 Drill Collars Run - Vis 48
 Bottom Packer Depth 3446 Wt. Pipe Run - WL 7.2
 Total Depth 3495 Chlorides 3,600 ppm System LCM -

Blow Description ±F - B.O.B. in 30 seconds
ISI - B.O.B. in 9 minutes
FF B.O.B. from shut in
FSI - G.T.S. @ bleed off, B.O.B. in 11 minutes.

Rec	Feet of	%gas	%oil	%water	%mud
<u>124</u>	<u>GHOCM</u>	<u>50</u>	<u>40</u>	<u>10</u>	
<u>62</u>	<u>60</u>	<u>50</u>	<u>50</u>		
<u>186</u>	<u>60</u>	<u>40</u>	<u>60</u>		

Rec Total 372' BHT 108° Gravity 37 API RW - @ - °F Chlorides - ppm

(A) Initial Hydrostatic 1694 Test 1150 T-On Location 10:44 pm
 (B) First Initial Flow 22 Jars _____ T-Started 11:13 pm
 (C) First Final Flow 74 Safety Joint _____ T-Open 1:55 am
 (D) Initial Shut-In 388 Circ Sub _____ T-Pulled 4:25 am
 (E) Second Initial Flow 81 Hourly Standby _____ T-Out 6:48 am
 (F) Second Final Flow 129 Mileage 32 RT 49.60
 (G) Final Shut-In 381 Sampler _____
 (H) Final Hydrostatic 1662 Straddle _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____

Initial Open 30
 Initial Shut-In 45
 Final Flow 30
 Final Shut-In 45
 Sub Total 1199.60

Approved By _____ Our Representative Cody B...

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. 53912

Well Name & No. Gross #1 Test No. 2 Date 6-13-13
 Company TDI INC Elevation 2003 KB 1993 GL
 Address 1310 Bison rd, Hays KS, 67601
 Co. Rep / Geo. Herb Rig Southwind #1
 Location: Sec. 24 Twp. 15s Rge. 19w Co. Ellis State KS

Interval Tested 3328 - 3350 TD 3750 Zone Tested "D"
 Anchor Length 22' Drill Pipe Run 3324' Mud Wt. 9.5
 Top Packer Depth 3323 Drill Collars Run — Vis 56
 Bottom Packer Depth 3328 Wt. Pipe Run — WL 7.8
 Total Depth 3350 Chlorides 3,500 ppm System LCM —

Blow Description IF - B.O.B. in 25 minutes
ISI - No return
FF - 2 1/2" blow
FSI - No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>62</u>	<u>Feet of GWM</u>	<u>5</u>	<u>5</u>	<u>90</u>	<u>—</u>
<u>62</u>	<u>Feet of MW</u>	<u>—</u>	<u>70</u>	<u>30</u>	<u>—</u>
<u>186</u>	<u>Feet of Mud with oil specs</u>	<u>—</u>	<u>—</u>	<u>100</u>	<u>—</u>
<u>35</u>	<u>Feet of Mud</u>	<u>—</u>	<u>—</u>	<u>100</u>	<u>—</u>
<u>—</u>	<u>Feet of</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Rec Total 445' BHT 108° Gravity — API RW .18 @ 91.5 F Chlorides 29,000 ppm

(A) Initial Hydrostatic 1655 Test 1150
 (B) First Initial Flow 126 Jars —
 (C) First Final Flow 151 Safety Joint —
 (D) Initial Shut-In 347 Circ Sub —
 (E) Second Initial Flow 153 Hourly Standby —
 (F) Second Final Flow 182 Mileage 49.60
 (G) Final Shut-In 337 Sampler —
 (H) Final Hydrostatic 1639 Straddle 600
 Shale Packer —
 Extra Packer —
 Extra Recorder —
 Day Standby —
 Accessibility —
 Sub Total 1799.60

T-On Location 5:58am
 T-Started 6:32am
 T-Open 8:38am
 T-Pulled 11:08am
 T-Out 1:46pm

Comments —
 Ruined Shale Packer —
 Ruined Packer —
 Extra Copies —
 Sub Total 0
 Total 1799.60
 MP/DST Disc't —

Approved By _____ Our Representative Cody Blalock

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.