



DRILL STEM TEST REPORT

Prepared For: **TDI, Inc**

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

Derrick #3

4-15s18w Ellis,KS

Start Date: 2017.08.08 @ 19:40:24

End Date: 2017.08.09 @ 00:59:33

Job Ticket #: 63011 DST #: 1

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

Printed: 2017.08.09 @ 15:08:28

TDI, Inc
4-15s18w Ellis,KS
Derrick #3
DST # 1
Arbuckle
2017.08.08



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

TDI, Inc
 1310 Bison Rd
 Hays KS 67601-9696
 ATTN: Herb Deines

4-15s18w Ellis,KS
Derrick #3
 Job Ticket: 63011 **DST#: 1**
 Test Start: 2017.08.08 @ 19:40:24

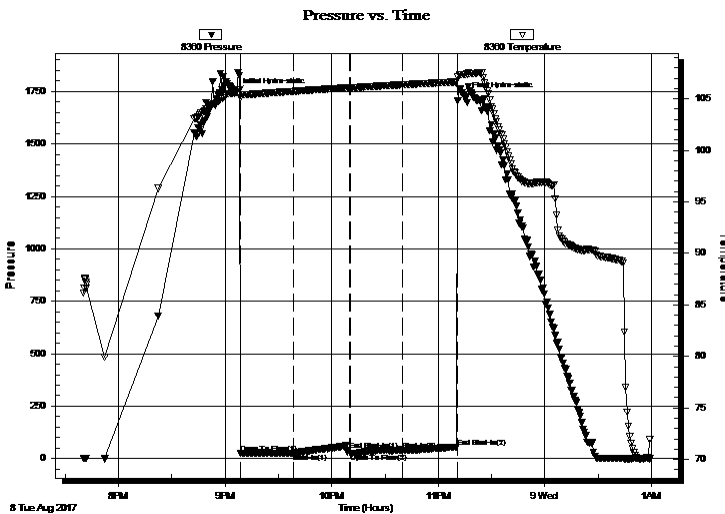
GENERAL INFORMATION:

Formation: **Arbuckle**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 21:08:49
 Time Test Ended: 00:59:33
 Interval: **3554.00 ft (KB) To 3636.00 ft (KB) (TVD)**
 Total Depth: 3636.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Ray Schwager
 Unit No: 77
 Reference Elevations: 2032.00 ft (KB)
 2023.00 ft (CF)
 KB to GR/CF: 9.00 ft

Serial #: 8360 Inside
 Press@RunDepth: 38.36 psig @ 3568.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.08.08 End Date: 2017.08.09 Last Calib.: 2017.08.09
 Start Time: 19:40:24 End Time: 00:59:33 Time On Btm: 2017.08.08 @ 21:06:34
 Time Off Btm: 2017.08.08 @ 23:15:04

TEST COMMENT: 30-IFP-w k bl ,died in 22 min
 30-ISIP-no bl
 30-FFP-no bl
 30-FSIP-no bl

PRESSURE SUMMARY



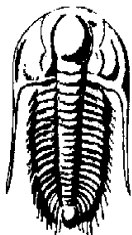
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1744.92	105.59	Initial Hydro-static
3	24.52	105.05	Open To Flow (1)
33	25.79	105.73	Shut-In(1)
64	39.18	106.06	End Shut-In(1)
64	25.93	106.07	Open To Flow (2)
94	38.36	106.36	Shut-In(2)
124	55.25	106.64	End Shut-In(2)
129	1723.40	107.37	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
10.00	mud w/ show of oil in tool	0.14

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TDI, Inc
 1310 Bison Rd
 Hays KS 67601-9696
 ATTN: Herb Deines

4-15s18w Ellis,KS
Derrick #3
 Job Ticket: 63011 **DST#: 1**
 Test Start: 2017.08.08 @ 19:40:24

GENERAL INFORMATION:

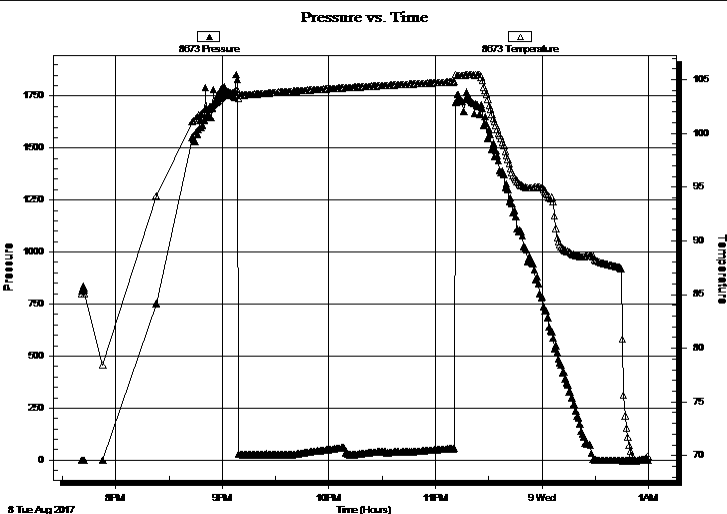
Formation: Arbuckle			
Deviated: No Whipstock:	ft (KB)	Test Type: Conventional Bottom Hole (Initial)	
Time Tool Opened: 21:08:49		Tester: Ray Schwager	
Time Test Ended: 00:59:33		Unit No: 77	
Interval: 3554.00 ft (KB) To 3636.00 ft (KB) (TVD)		Reference Elevations: 2032.00 ft (KB)	
Total Depth: 3636.00 ft (KB) (TVD)			2023.00 ft (CF)
Hole Diameter: 7.88 inches	Hole Condition: Fair	KB to GR/CF: 9.00 ft	

Serial #: 8673

Outside

Press@RunDepth: psig @ 3568.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2017.08.08 End Date: 2017.08.09	Last Calib.: 2017.08.09
Start Time: 19:40:49 End Time: 00:59:58	Time On Btm:
	Time Off Btm:

TEST COMMENT: 30-IFP-w k bl ,died in 22 min
 30-ISIP-no bl
 30-FFP-no bl
 30-FSIP-no bl



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
10.00	mud w/ show of oil in tool	0.14

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 67601-9696
ATTN: Herb Deines

4-15s18w Ellis,KS
Derrick #3
Job Ticket: 63011 **DST#: 1**
Test Start: 2017.08.08 @ 19:40:24

Tool Information

Drill Pipe:	Length: 3551.00 ft	Diameter: 3.80 inches	Volume: 49.81 bbl	Tool Weight: 2200.00 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: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose: 55000.00 lb
			<u>Total Volume: 49.81 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	18.00 ft			String Weight: Initial 46000.00 lb
Depth to Top Packer:	3554.00 ft			Final 46000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	82.00 ft			
Tool Length:	103.00 ft			
Number of Packers:	2	Diameter: 7.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Change Over Sub	1.00			3534.00	
Shut In Tool	5.00			3539.00	
Hydraulic tool	5.00			3544.00	
Packer	5.00			3549.00	21.00 Bottom Of Top Packer
Packer	5.00			3554.00	
Stubb	1.00			3555.00	
Perforations	13.00			3568.00	
Recorder	0.00	8360	Inside	3568.00	
Recorder	0.00	8673	Outside	3568.00	
Blank Spacing	65.00			3633.00	
Bullnose	3.00			3636.00	82.00 Bottom Packers & Anchor

Total Tool Length: 103.00



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

TDI, Inc
1310 Bison Rd
Hays KS 67601-9696
ATTN: Herb Deines

4-15s18w Ellis,KS
Derrick #3
Job Ticket: 63011 **DST#: 1**
Test Start: 2017.08.08 @ 19:40:24

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: 52.00 sec/qt	Cushion Volume: bbl		
Water Loss: 8.35 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 3900.00 ppm			
Filter Cake: 1.00 inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
10.00	mud w/ show of oil in tool	0.140

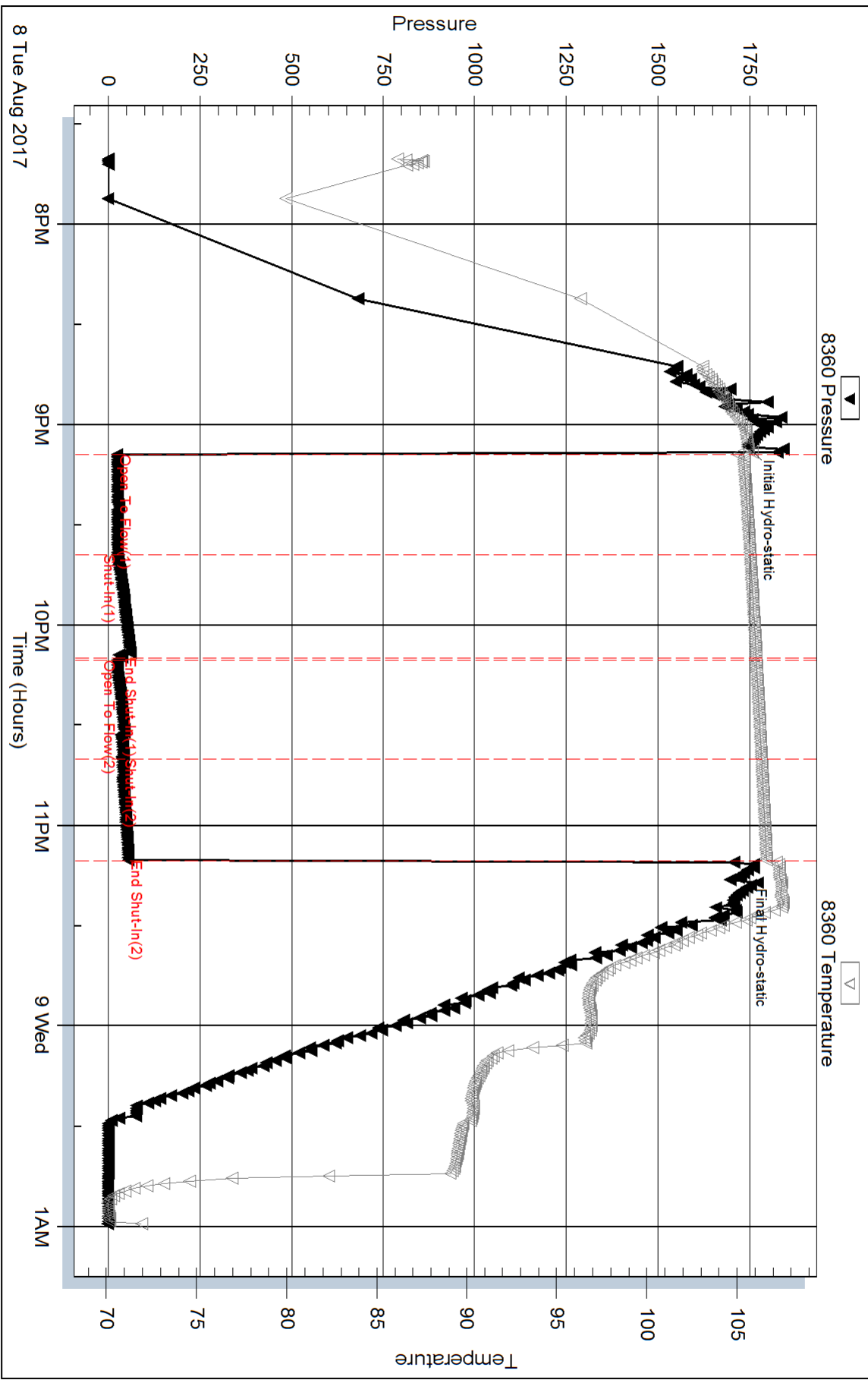
Total Length: 10.00 ft Total Volume: 0.140 bbl

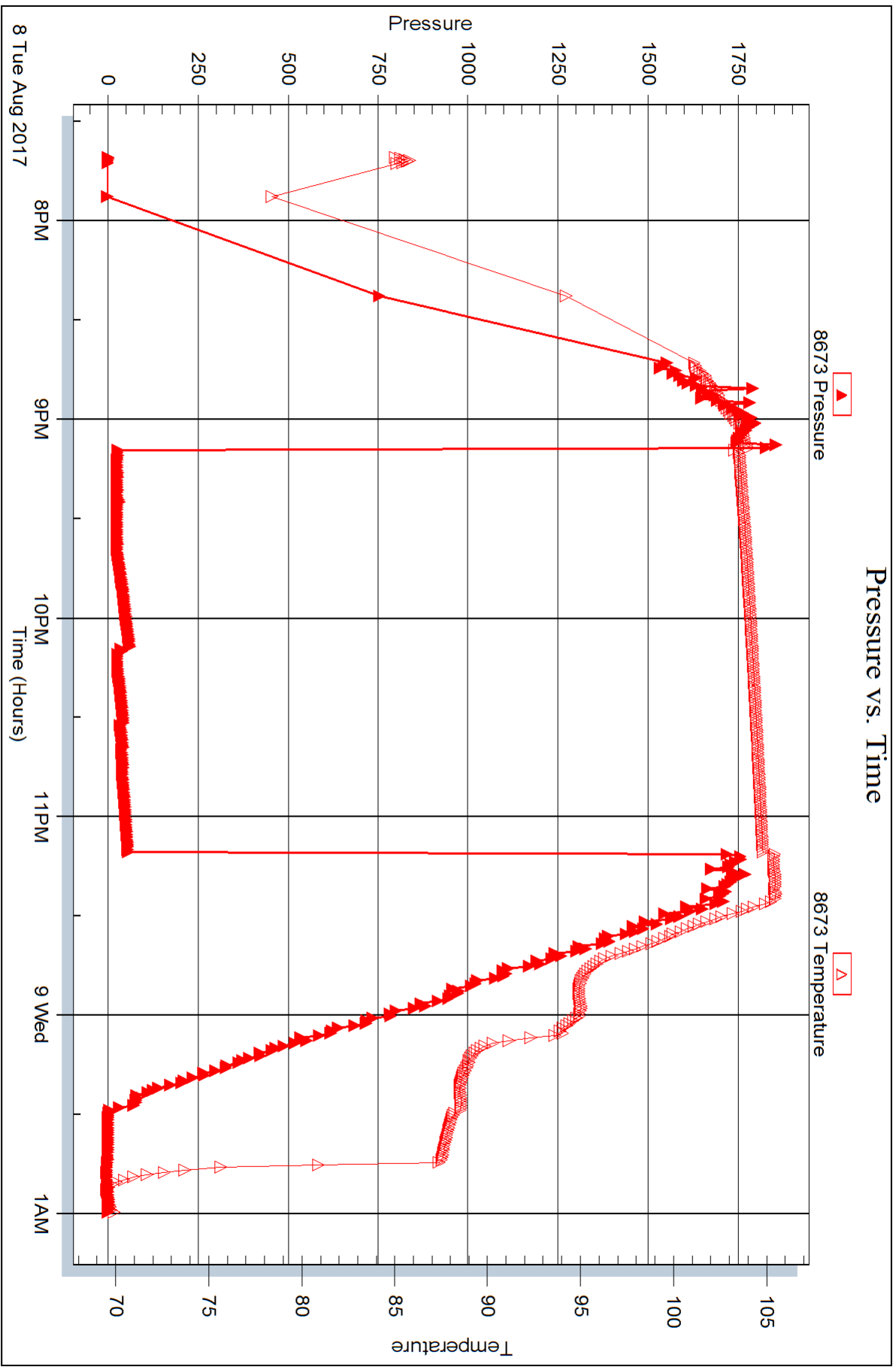
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments:

Pressure vs. Time







DRILL STEM TEST REPORT

Prepared For: **TDI, Inc**

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

Derrick #3

4-15s18w Ellis,KS

Start Date: 2017.08.09 @ 07:25:19

End Date: 2017.08.09 @ 13:17:19

Job Ticket #: 63012 DST #: 2

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

Printed: 2017.08.09 @ 15:05:42

TDI, Inc
4-15s18w Ellis,KS
Derrick #3
DST # 2
Arbuckle
2017.08.09



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

TDI, Inc
 1310 Bison Rd
 Hays KS 67601-9696
 ATTN: Herb Deines

4-15s18w Ellis,KS
Derrick #3
 Job Ticket: 63012 **DST#: 2**
 Test Start: 2017.08.09 @ 07:25:19

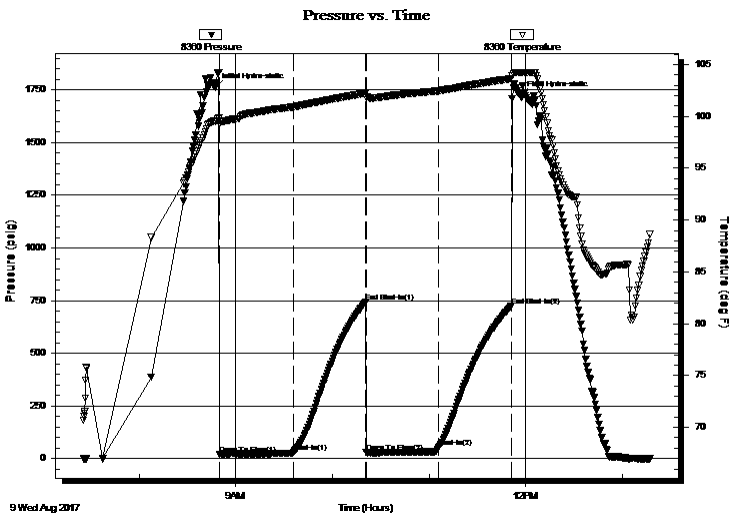
GENERAL INFORMATION:

Formation: **Arbuckle**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Bottom Hole (Reset)
 Time Tool Opened: 08:50:04
 Tester: Ray Schwager
 Time Test Ended: 13:17:19
 Unit No: 77
 Interval: **3554.00 ft (KB) To 3646.00 ft (KB) (TVD)**
 Reference Elevations: 2032.00 ft (KB)
 Total Depth: 3646.00 ft (KB) (TVD) 2023.00 ft (CF)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 KB to GR/CF: 9.00 ft

Serial #: 8360 **Inside**
 Press@RunDepth: 52.04 psig @ 3578.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.08.09 End Date: 2017.08.09 Last Calib.: 2017.08.09
 Start Time: 07:25:24 End Time: 13:17:18 Time On Btm: 2017.08.09 @ 08:47:19
 Time Off Btm: 2017.08.09 @ 11:56:34

TEST COMMENT: 45_IFP-w k bl thru-out 1/2to 3"bl
 45-ISIP-no bl
 45-FFP-w k bl thru-out 1/4" to 1"bl
 FSIP-no bl

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1761.47	99.57	Initial Hydro-static
3	22.37	99.31	Open To Flow (1)
49	32.06	100.91	Shut-In(1)
94	743.62	102.24	End Shut-In(1)
94	31.82	101.83	Open To Flow (2)
139	52.04	102.47	Shut-In(2)
184	724.01	103.63	End Shut-In(2)
190	1724.06	104.24	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
0.00	75'GIP	0.00
10.00	CO	0.14
35.00	OCM 25%O75	0.49

* Recovery from multiple tests

Gas Rates

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



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DRILL STEM TEST REPORT

TOOL DIAGRAM

TDI, Inc
1310 Bison Rd
Hays KS 67601-9696
ATTN: Herb Deines

4-15s18w Ellis,KS
Derrick #3
Job Ticket: 63012 **DST#: 2**
Test Start: 2017.08.09 @ 07:25:19

Tool Information

Drill Pipe:	Length: 3550.00 ft	Diameter: 3.80 inches	Volume: 49.80 bbl	Tool Weight: 2200.00 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: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose: 55000.00 lb
			<u>Total Volume: 49.80 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	17.00 ft			String Weight: Initial 46000.00 lb
Depth to Top Packer:	3554.00 ft			Final 46000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	92.00 ft			
Tool Length:	113.00 ft			
Number of Packers:	2	Diameter: 7.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3534.00	
Shut In Tool	5.00			3539.00	
Hydraulic tool	5.00			3544.00	
Packer	5.00			3549.00	21.00 Bottom Of Top Packer
Packer	5.00			3554.00	
Stubb	1.00			3555.00	
Perforations	23.00			3578.00	
Recorder	0.00	8360	Inside	3578.00	
Recorder	0.00	8673	Outside	3578.00	
Blank Spacing	65.00			3643.00	
Bullnose	3.00			3646.00	92.00 Bottom Packers & Anchor

Total Tool Length: 113.00



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ATTN: Herb Deines

4-15s18w Ellis,KS
Derrick #3
Job Ticket: 63012 **DST#: 2**
Test Start: 2017.08.09 @ 07:25:19

Mud and Cushion Information

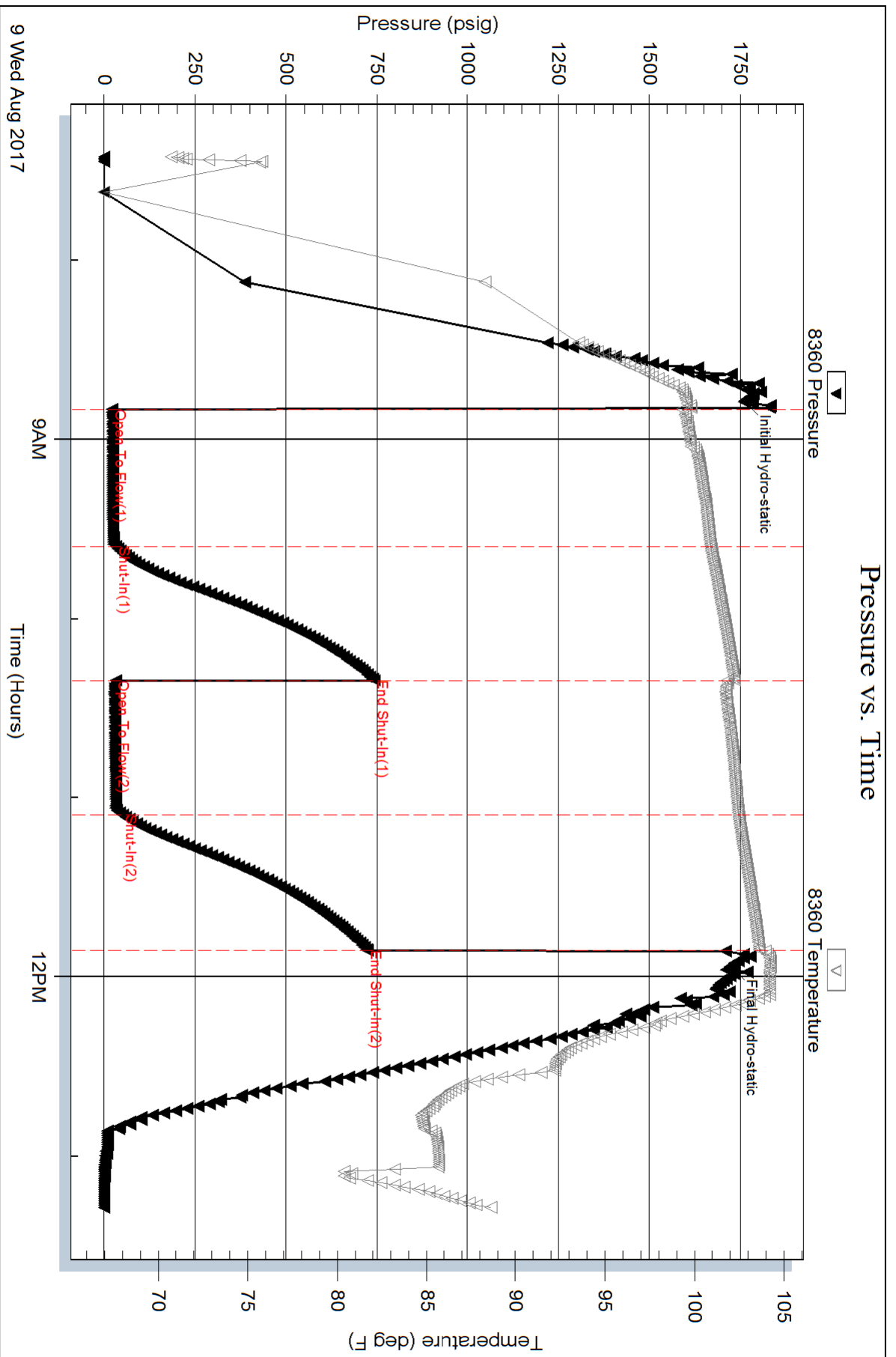
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 49.00 sec/qt	Cushion Volume: bbl		
Water Loss: 8.35 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 6800.00 ppm			
Filter Cake: 1.00 inches			

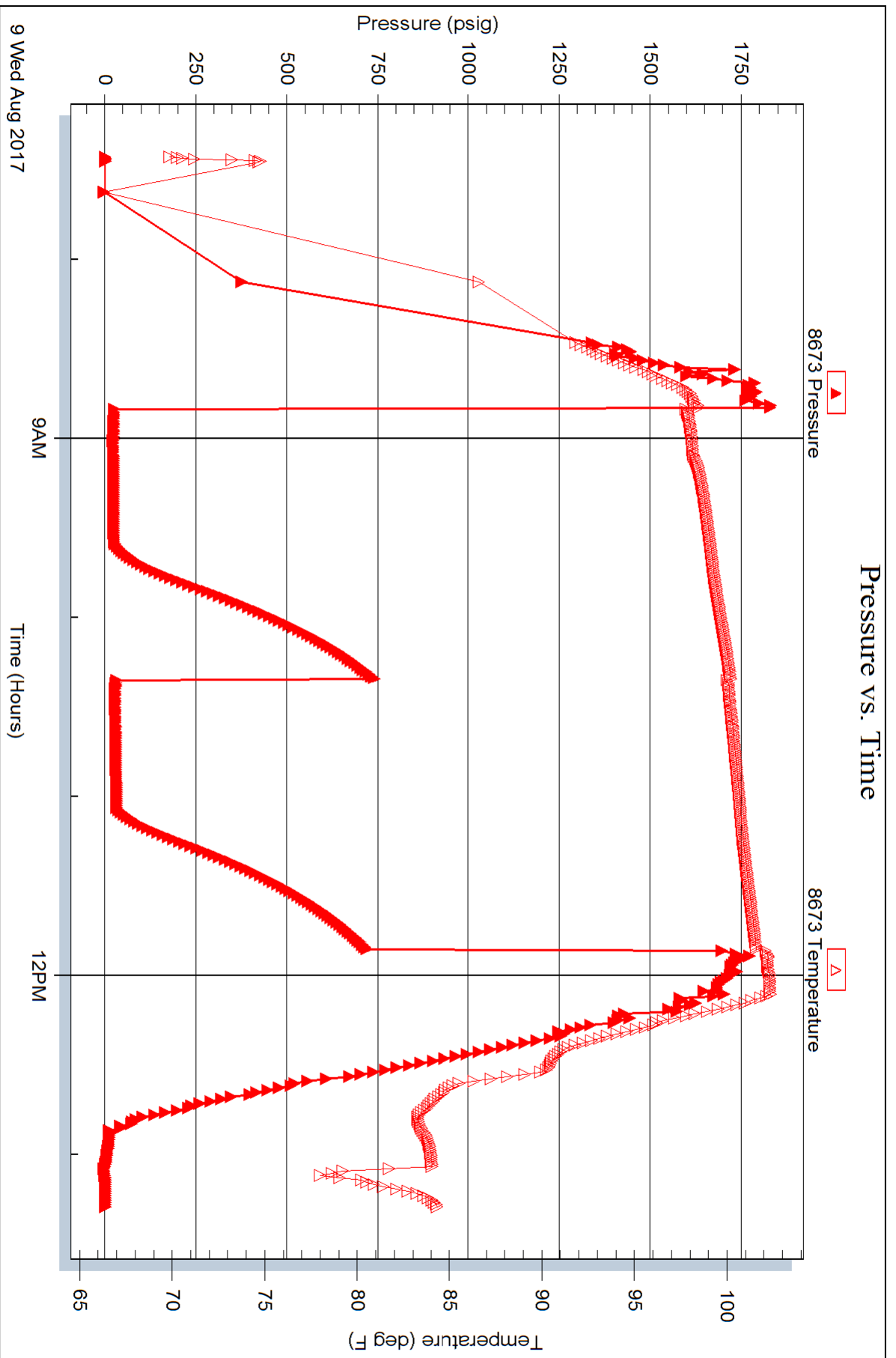
Recovery Information

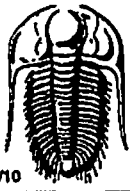
Recovery Table

Length ft	Description	Volume bbl
0.00	75'GIP	0.000
10.00	CO	0.140
35.00	OCM 25%O75	0.491

Total Length: 45.00 ft Total Volume: 0.631 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. 63011

Well Name & No. Derrick #3 Test No. 1 Date 8-8-17
 Company TDI Inc Elevation 2032 KB 2023 GL
 Address 1310 Bison Rd. Hays, Ks 67601-9696
 Co. Rep / Geo. Herb Deines Rig Southwind rig 1
 Location: Sec. 4 Twp. 15^s Rge. 18^w Co. Ellis State Ks

Interval Tested 3554-3636 Zone Tested Arbuckle
 Anchor Length 82 Drill Pipe Run 3551 Mud Wt. 9.5
 Top Packer Depth 3549 Drill Collars Run — Vis 52
 Bottom Packer Depth 3554 Wt. Pipe Run — WL 8.4
 Total Depth 3636 Chlorides 3900 ppm System LCM 2#

Blow Description IFP - Weak Blow died in 22 min
ISIP - NO Blow
FFP - NO Blow
FSTP - NO Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>Mud</u>				
	<u>w/show foil Top of Tool</u>				

Rec Total 10 BHT 106 Gravity — API RW — @ — °F Chlorides — ppm

- (A) Initial Hydrostatic 1744
- (B) First Initial Flow 24
- (C) First Final Flow 25
- (D) Initial Shut-In 39
- (E) Second Initial Flow 25
- (F) Second Final Flow 38
- (G) Final Shut-In 55
- (H) Final Hydrostatic 1723

- Test 1050
- Jars
- Safety Joint
- Circ Sub
- Hourly Standby
- Mileage 20 RT 15
- Sampler
- Straddle
- Shale Packer
- Extra Packer
- Extra Recorder
- Day Standby
- Accessibility
- Sub Total 1065

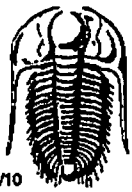
T-On Location 1720
 T-Started 1940
 T-Open 2115
 T-Pulled 2315
 T-Out 0120

Comments _____
 Ruined Shale Packer
 Ruined Packer
 Extra Copies
 Sub Total 0
 Total 1065
 MP/DST Disc't _____

Initial Open 30
 Initial Shut-In 30
 Final Flow 30
 Final Shut-In 30

Approved By _____

Our Representative Ray Schwager Thank you



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63012

Well Name & No. Deerick #3 Test No. 2 Date 8-9-17
 Company TDI Inc Elevation 2032 KB 2023 GL
 Address 1310 Bison Rd Hays Ks 67601-9696
 Co. Rep / Geo. Herb Deines Rig Southwind rig
 Location: Sec. 4 Twp. 15' Rge. 18" Co. ELLIS State Ks

Interval Tested 3554-3646 Zone Tested Arbuckle
 Anchor Length 92 Drill Pipe Run 3550 Mud Wt. 9.4
 Top Packer Depth 3549 Drill Collars Run — Vis 49
 Bottom Packer Depth 3554 Wt. Pipe Run — WL 7.8
 Total Depth 3646 Chlorides 6800 ppm System LCM 2#
 Blow Description IFP - Weak Blow thru-out 1/2" To 3" Blow
Istp - NO Blow
FFP - Weak Blow thru-out 1/4" To 1" Blow
Fstp - NO Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>75</u>	<u>GIP</u>				
<u>10</u>	<u>CO</u>				
<u>35</u>	<u>OCM</u>		<u>25</u>		<u>25</u>

Rec Total 45 BHT 123 Gravity 28 API RW — @ — °F Chlorides — ppm
 (A) Initial Hydrostatic 1761 Test 1050 T-On Location 0705
 (B) First Initial Flow 22 Jars — T-Started 0725
 (C) First Final Flow 32 Safety Joint — T-Open 0850
 (D) Initial Shut-In 243 Circ Sub — T-Pulled 1150
 (E) Second Initial Flow 31 Hourly Standby — T-Out 1317
 (F) Second Final Flow 52 Mileage 20RT 15 Comments —
 (G) Final Shut-In 224 Sampler —
 (H) Final Hydrostatic 1724 Straddle —
 Shale Packer —
 Extra Packer —
 Extra Recorder —
 Day Standby —
 Accessibility —
 Sub Total 1065

Initial Open 45
 Initial Shut-In 45
 Final Flow 45
 Final Shut-In 45

Approved By _____

Our Representative

RAY SWAGAN Thank you