



DRILL STEM TEST REPORT

Prepared For: **TDI Inc**

1310 Bison Rd
Hays KS 67601

ATTN: Tom Denning, Herb Di

Robben Family #1

3-15s-16w Ellis,KS

Start Date: 2016.11.28 @ 00:15:42

End Date: 2016.11.28 @ 07:13:21

Job Ticket #: 63548 DST #: 1

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

Printed: 2016.11.29 @ 11:38:40

TDI Inc
3-15s-16w Ellis,KS
Robben Family #1
DST # 1
LKC A-C
2016.11.28



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Tom Denning, Herb Di

3-15s-16w Ellis,KS
Robben Family #1
Job Ticket: 63548 **DST#: 1**
Test Start: 2016.11.28 @ 00:15:42

GENERAL INFORMATION:

Formation: **LKC A-C**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 02:33:37
Time Test Ended: 07:13:21
Interval: **3146.00 ft (KB) To 3200.00 ft (KB) (TVD)**
Total Depth: 3200.00 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: 1902.00 ft (KB)
1893.00 ft (CF)
KB to GR/CF: 9.00 ft

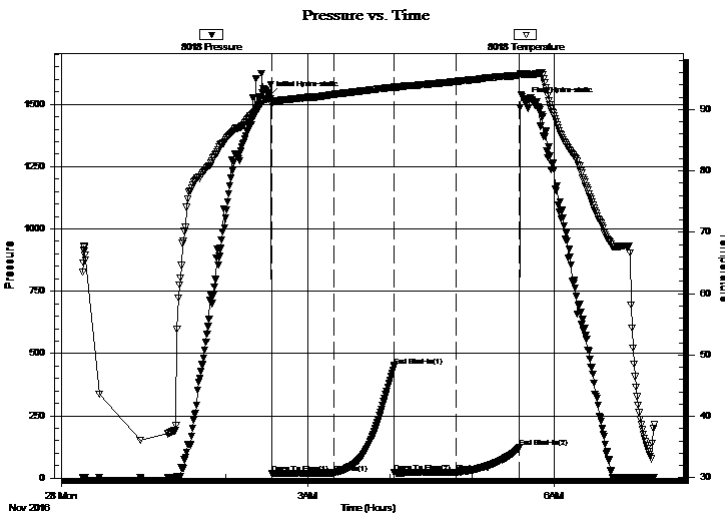
Serial #: 8018

Inside

Press@RunDepth: 22.15 psig @ 3150.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2016.11.28 End Date: 2016.11.28 Last Calib.: 2016.11.28
Start Time: 00:15:42 End Time: 07:13:21 Time On Btm: 2016.11.28 @ 02:31:52
Time Off Btm: 2016.11.28 @ 05:38:51

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

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1535.34	91.72	Initial Hydro-static
2	18.37	90.76	Open To Flow (1)
47	20.82	92.45	Shut-In(1)
92	451.57	93.65	End Shut-In(1)
92	21.94	93.46	Open To Flow (2)
137	22.15	94.56	Shut-In(2)
183	123.68	95.55	End Shut-In(2)
187	1509.66	95.76	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
15.00	Mud	0.21

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: Tom Denning, Herb Di

3-15s-16w Ellis,KS
Robben Family #1
Job Ticket: 63548 **DST#: 1**
Test Start: 2016.11.28 @ 00:15:42

Tool Information

Drill Pipe:	Length: 3143.00 ft	Diameter: 3.80 inches	Volume: 44.09 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: 45000.00 lb
			<u>Total Volume: 44.09 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	18.00 ft			String Weight: Initial 32000.00 lb
Depth to Top Packer:	3146.00 ft			Final 32000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	54.00 ft			
Tool Length:	75.00 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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Change Over Sub	1.00			3126.00	
Shut In Tool	5.00			3131.00	
Hydraulic tool	5.00			3136.00	
Packer	5.00			3141.00	21.00 Bottom Of Top Packer
Packer	5.00			3146.00	
Stubb	1.00			3147.00	
Perforations	3.00			3150.00	
Recorder	0.00	8018	Inside	3150.00	
Recorder	0.00	8700	Outside	3150.00	
Blank Spacing	33.00			3183.00	
Perforations	14.00			3197.00	
Bullnose	3.00			3200.00	54.00 Bottom Packers & Anchor

Total Tool Length: 75.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

TDI Inc **3-15s-16w Ellis,KS**
 1310 Bison Rd **Robben Family #1**
 Hays KS 67601 Job Ticket: 63548 **DST#: 1**
 ATTN: Tom Denning, Herb Di Test Start: 2016.11.28 @ 00:15:42

Mud and Cushion Information

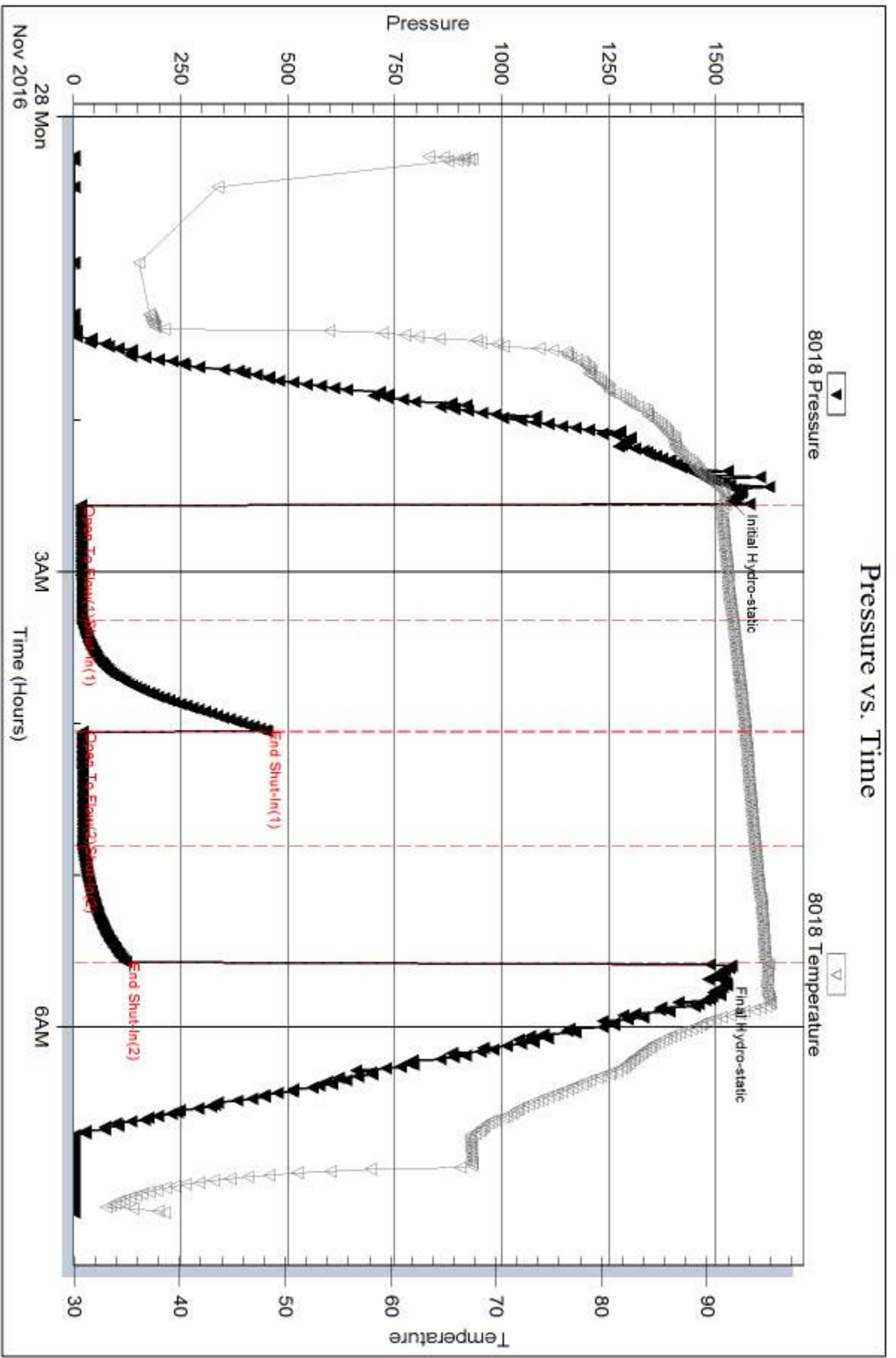
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 62.00 sec/qt	Cushion Volume: bbl		
Water Loss: 7.18 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 4800.00 ppm			
Filter Cake: 1.00 inches			

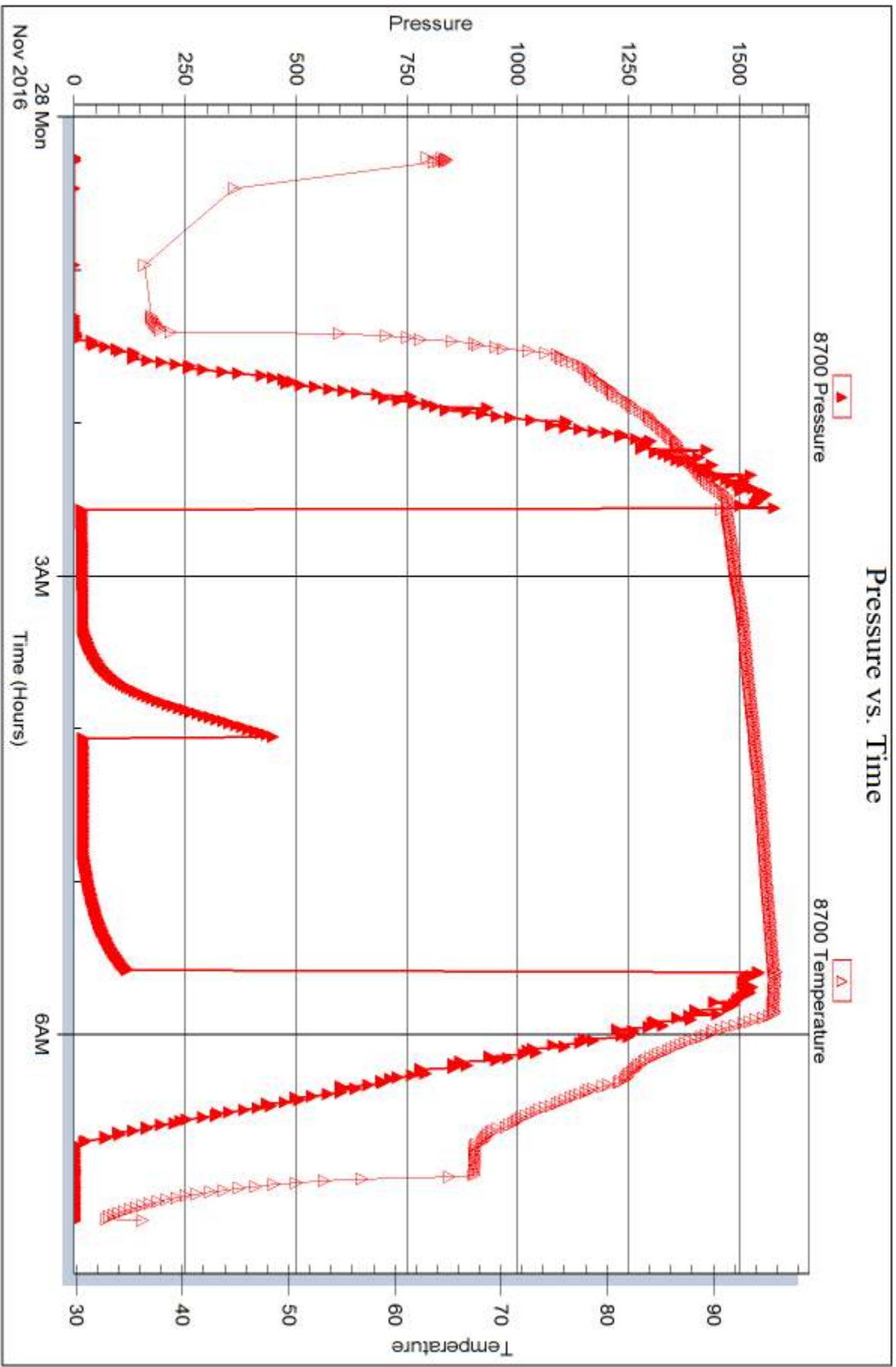
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
15.00	Mud	0.210

Total Length: 15.00 ft Total Volume: 0.210 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location:
 Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **TDI Inc**

1310 Bison Rd
Hays KS 67601

ATTN: Tom Denning, Herb Di

Robben Family #1

3-15s-16w Ellis,KS

Start Date: 2016.11.29 @ 01:30:44

End Date: 2016.11.29 @ 08:44:38

Job Ticket #: 63549 DST #: 2

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

Printed: 2016.11.29 @ 11:39:34

TDI Inc
3-15s-16w Ellis,KS
Robben Family #1
DST # 2
Arbuckle
2016.11.29



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Tom Denning, Herb Di

3-15s-16w Ellis,KS
Robben Family #1
Job Ticket: 63549 **DST#: 2**
Test Start: 2016.11.29 @ 01:30:44

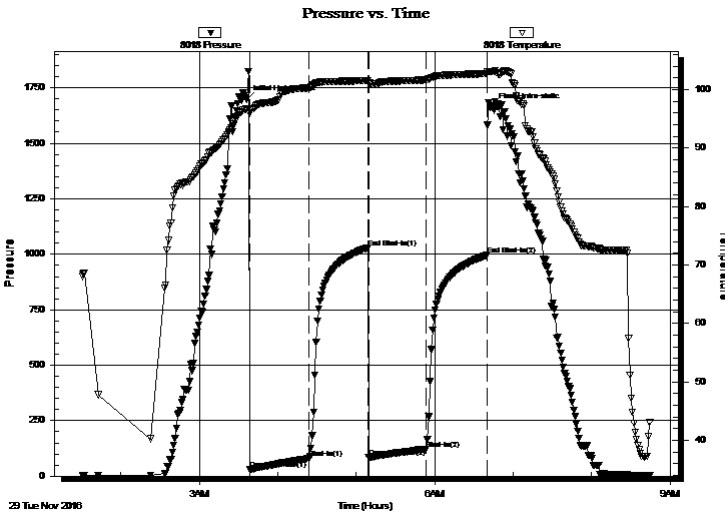
GENERAL INFORMATION:

Formation: **Arbuckle**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 03:38:24
Time Test Ended: 08:44:38
Interval: **3390.00 ft (KB) To 3452.00 ft (KB) (TVD)**
Total Depth: 3452.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Reference Elevations: 1902.00 ft (KB)
1893.00 ft (CF)
KB to GR/CF: 9.00 ft
Test Type: Conventional Bottom Hole (Reset)
Tester: Ray Schwager
Unit No: 77

Serial #: 8018 Inside
Press@RunDepth: 122.19 psig @ 3395.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2016.11.29 End Date: 2016.11.29 Last Calib.: 2016.11.29
Start Time: 01:30:44 End Time: 08:44:38 Time On Btm: 2016.11.29 @ 03:36:24
Time Off Btm: 2016.11.29 @ 06:44:08

TEST COMMENT: 45-IFP-w k to strg in 19 min
45-FSIP-no bl
45-FFP-w k to strg in 35 min
45-FSIP-w k bl bk,

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1697.85	96.68	Initial Hydro-static
2	31.34	95.83	Open To Flow (1)
48	81.88	100.26	Shut-In(1)
93	1030.09	101.53	End Shut-In(1)
93	84.71	101.20	Open To Flow (2)
138	122.19	101.67	Shut-In(2)
184	995.80	102.72	End Shut-In(2)
188	1660.62	103.11	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	MGO 20%G35%M45%O	1.74
102.00	MGO 10%G20%M70%O	1.43
75.00	CO	1.05
0.00	330'GIP	0.00

* Recovery from multiple tests

Gas Rates

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



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TOOL DIAGRAM

TDI Inc
1310 Bison Rd
Hays KS 67601
ATTN: Tom Denning, Herb Di

3-15s-16w Ellis,KS
Robben Family #1
Job Ticket: 63549 **DST#: 2**
Test Start: 2016.11.29 @ 01:30:44

Tool Information

Drill Pipe:	Length: 3395.00 ft	Diameter: 3.80 inches	Volume: 47.62 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: 45000.00 lb
			<u>Total Volume: 47.62 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	26.00 ft			String Weight: Initial 33000.00 lb
Depth to Top Packer:	3390.00 ft			Final 36000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	62.00 ft			
Tool Length:	83.00 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			3370.00	
Shut In Tool	5.00			3375.00	
Hydraulic tool	5.00			3380.00	
Packer	5.00			3385.00	21.00 Bottom Of Top Packer
Packer	5.00			3390.00	
Stubb	1.00			3391.00	
Perforations	4.00			3395.00	
Recorder	0.00	8018	Inside	3395.00	
Recorder	0.00	8700	Outside	3395.00	
Blank Spacing	33.00			3428.00	
Perforations	21.00			3449.00	
Bullnose	3.00			3452.00	62.00 Bottom Packers & Anchor

Total Tool Length: 83.00



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

TDI Inc **3-15s-16w Ellis,KS**
 1310 Bison Rd **Robben Family #1**
 Hays KS 67601 Job Ticket: 63549 **DST#: 2**
 ATTN: Tom Denning, Herb Di Test Start: 2016.11.29 @ 01:30:44

Mud and Cushion Information

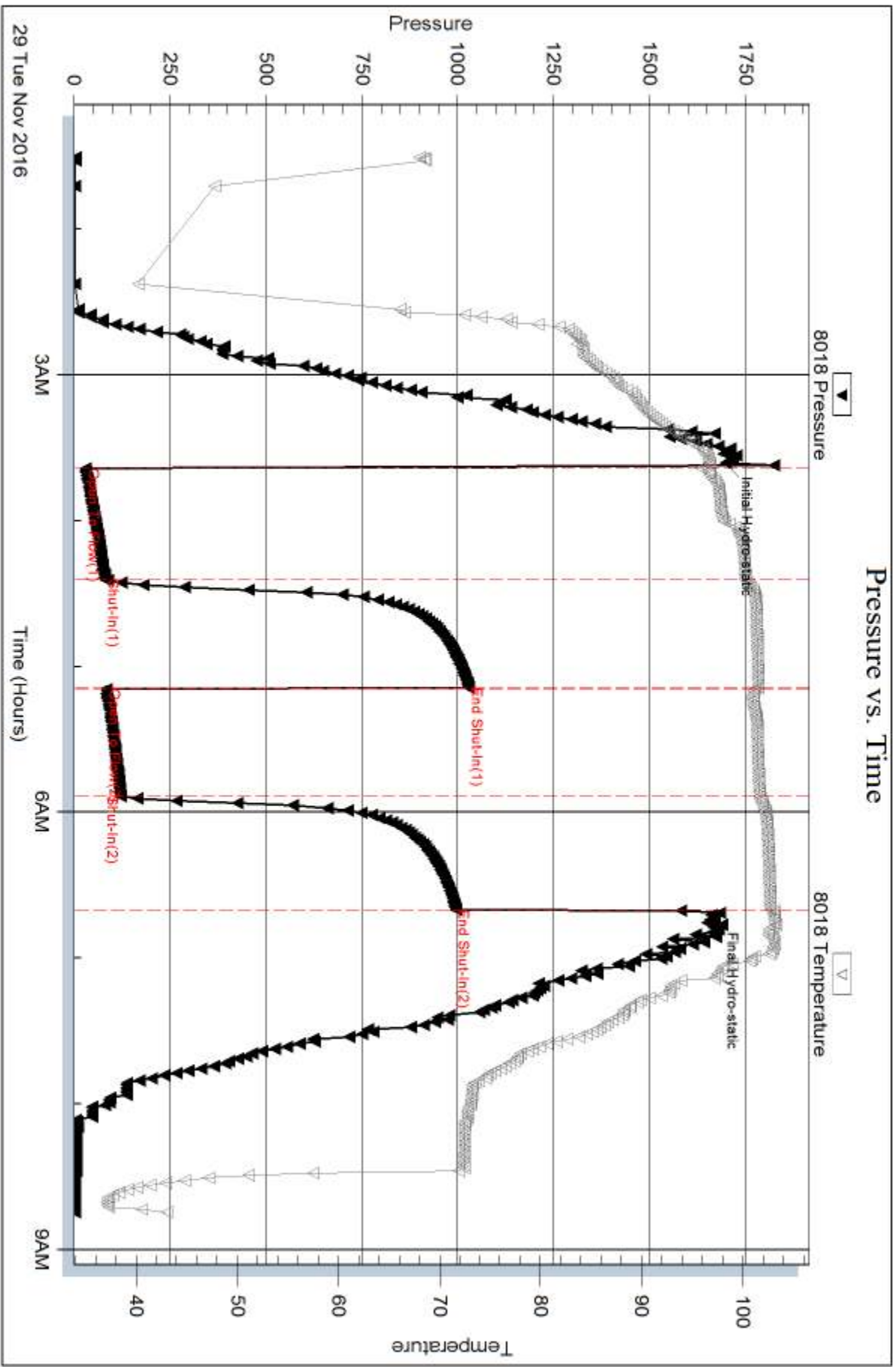
Mud Type: Gel Chem	Cushion Type:	Oil API: 36 deg API
Mud Weight: 10.00 lb/gal	Cushion Length: ft	Water Salinity: ppm
Viscosity: 64.00 sec/qt	Cushion Volume: bbl	
Water Loss: 7.78 in ³	Gas Cushion Type:	
Resistivity: ohm.m	Gas Cushion Pressure: psig	
Salinity: 5500.00 ppm		
Filter Cake: 1.00 inches		

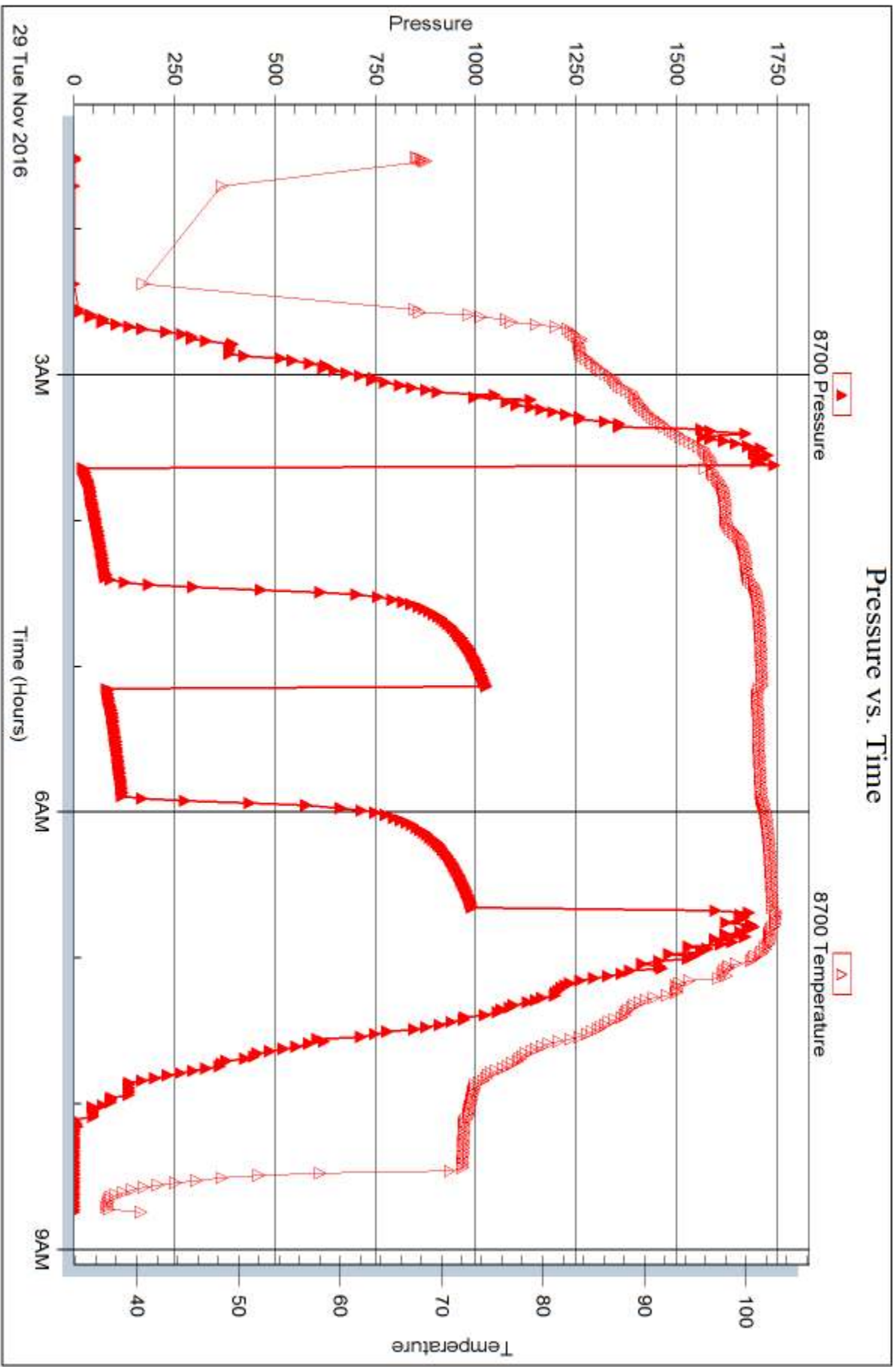
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
124.00	MGO 20%G35%M45%O	1.739
102.00	MGO 10%G20%M70%O	1.431
75.00	CO	1.052
0.00	330'GIP	0.000

Total Length: 301.00 ft Total Volume: 4.222 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. **63548**

Well Name & No. Robben Family #1 Test No. 1 Date 11-27-16
 Company TOI, Inc Elevation 1902 KB 1893 GL
 Address 1310 Bison Rd. Hays, Ko 67601
 Co. Rep / Geo. Herb Oicnes Rig Southwindrig 1
 Location: Sec. 3 Twp. 15^s Rge. 16^w Co. ELLIS State Ko

Interval Tested 3146-3200 Zone Tested LKC A-C
 Anchor Length 54 Drill Pipe Run 3143 Mud Wt. 9.1
 Top Packer Depth 3141 Drill Collars Run - Vis 6.2
 Bottom Packer Depth 3146 Wt. Pipe Run - WL 7.2
 Total Depth 3200 Chlorides 4800 ppm System LCM 1#
 Blow Description IFP - Weak Blow thru-out 1/4" to 1/2" Blow
ISTP - NO Blow
FFP - surface Blow thru-out
FSTP - NO Blow

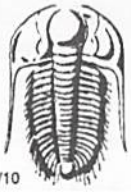
Rec	Feet of	%gas	%oil	%water	%mud
<u>15</u>	<u>Mud</u>				
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 15 BHT 95 Gravity - API RW - @ - ° F Chlorides - ppm

(A) Initial Hydrostatic <u>1535</u>	<input checked="" type="checkbox"/> Test <u>1050</u>	T-On Location <u>2145</u>
(B) First Initial Flow <u>18</u>	<input type="checkbox"/> Jars	T-Started <u>0015</u>
(C) First Final Flow <u>20</u>	<input type="checkbox"/> Safety Joint	T-Open <u>0235</u>
(D) Initial Shut-In <u>451</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>0535</u>
(E) Second Initial Flow <u>21</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>0713</u>
(F) Second Final Flow <u>22</u>	<input checked="" type="checkbox"/> Mileage <u>36RT</u> 27	Comments
(G) Final Shut-In <u>123</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1509</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer
Initial Open <u>45</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Packer
Initial Shut-In <u>45</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Final Flow <u>45</u>	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
Final Shut-In <u>45</u>	<input type="checkbox"/> Day Standby	Total <u>1077</u>
	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>1077</u>	

Approved By _____ Our Representative RAY SCHWAGA *Thank you*

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. **63549**

Well Name & No. Robben Family #1 Test No. 2 Date 11-28-16
 Company T O I, Inc Elevation 1902 KB 1893 GL
 Address 1310 Bison Rd Hays, Ks 67601
 Co. Rep / Geo. Herb Dienes Rig Southwind rig 1
 Location: Sec. 3 Twp. 15^s Rge. 16^w Co. ELLIS State Ks

Interval Tested 3390-3452 Zone Tested Arbuckle
 Anchor Length 62 Drill Pipe Run 3395 Mud Wt. 9.5
 Top Packer Depth 3385 Drill Collars Run - Vis 64
 Bottom Packer Depth 3390 Wt. Pipe Run - WL 7.8
 Total Depth 3452 Chlorides 5500 ppm System LCM 2#
 Blow Description TFP - WEAK TO STRONG IN 19 MIN
ISTP - NO BLOW
FFP - WEAK TO STRONG IN 35 MIN
FSTP - WEAK SURFACE BLOW BACK

Rec	Feet of	%gas	%oil	%water	%mud
<u>330</u>	<u>GIP</u>				
<u>75</u>	<u>CO</u>				
<u>102</u>	<u>MGO</u>	<u>10</u>	<u>7045</u>		<u>20</u>
<u>124</u>	<u>MGO</u>	<u>20</u>	<u>45</u>		<u>35</u>
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 301 BHT 102 Gravity 36 API RW - @ - °F Chlorides - ppm

(A) Initial Hydrostatic 1697 Test 1050 T-On Location 2315
 (B) First Initial Flow 31 Jars _____ T-Started 0130
 (C) First Final Flow 81 Safety Joint _____ T-Open 0335
 (D) Initial Shut-In 1030 Circ Sub _____ T-Pulled 0635
 (E) Second Initial Flow 84 Hourly Standby _____ T-Out 0844
 (F) Second Final Flow 122 Mileage 36 RT 27
 (G) Final Shut-In 995 Sampler _____
 (H) Final Hydrostatic 1660 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____
 Extra Packer _____ Extra Copies _____
 Initial Open 45 Extra Recorder _____ Sub Total 0
 Initial Shut-In 45 Day Standby _____ Total 1077
 Final Flow 45 Accessibility _____ MP/DST Disc't _____
 Final Shut-In 45 Sub Total 1077

Approved By _____

Our Representative Ray Schwager Thank you