



DRILL STEM TEST REPORT

Prepared For: **TDI Inc**

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

Munsch #B-4

4 15s 18w Ellis,KS

Start Date: 2014.12.08 @ 12:32:00

End Date: 2014.12.08 @ 18:37:00

Job Ticket #: 61380 DST #: 1

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

Printed: 2014.12.11 @ 13:55:11

TDI Inc
4 15s 18w Ellis,KS
Munsch #B-4
DST # 1
Arbuckie
2014.12.08



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

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

4 15s 18w Ellis,KS
Munsch #B-4
 Job Ticket: 61380 **DST#: 1**
 Test Start: 2014.12.08 @ 12:32:00

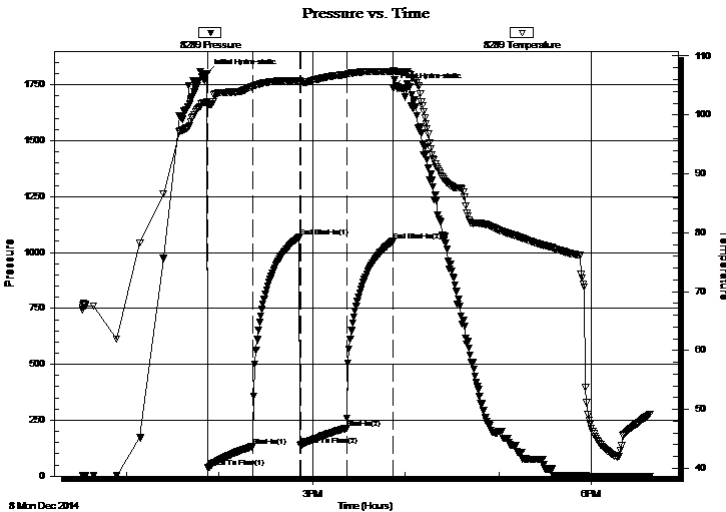
GENERAL INFORMATION:

Formation: **Arbuckle**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 13:52:30
 Time Test Ended: 18:37:00
 Interval: **3578.00 ft (KB) To 3637.00 ft (KB) (TVD)**
 Total Depth: 3697.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Straddle (Initial)
 Tester: Jim Svaty
 Unit No: 76
 Reference Elevations: 2020.00 ft (KB)
 2010.00 ft (CF)
 KB to GR/CF: 10.00 ft

Serial #: 8289 Outside
 Press@RunDepth: 214.34 psig @ 3596.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.08 End Date: 2014.12.08 Last Calib.: 2014.12.08
 Start Time: 12:32:02 End Time: 18:37:15 Time On Btm: 2014.12.08 @ 13:52:15
 Time Off Btm: 2014.12.08 @ 15:52:15

TEST COMMENT: 30-IFP- BOB in 8min.
 30-ISIP- No Blow
 30-FFP- BOB in 11min.
 30-FSIP- No Blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1800.51	102.16	Initial Hydro-static
1	37.61	101.57	Open To Flow (1)
30	132.72	104.82	Shut-In(1)
60	1069.13	105.84	End Shut-In(1)
60	137.37	105.54	Open To Flow (2)
90	214.34	106.87	Shut-In(2)
120	1049.91	107.35	End Shut-In(2)
120	1735.75	107.56	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
188.00	OSMCW 2%o 23%m 70%w	2.64
188.00	WOCM 10%w 30%o 60%m	2.64
10.00	WMCO 20%w 35%m 45%o	0.14
45.00	CO 100%	0.63

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

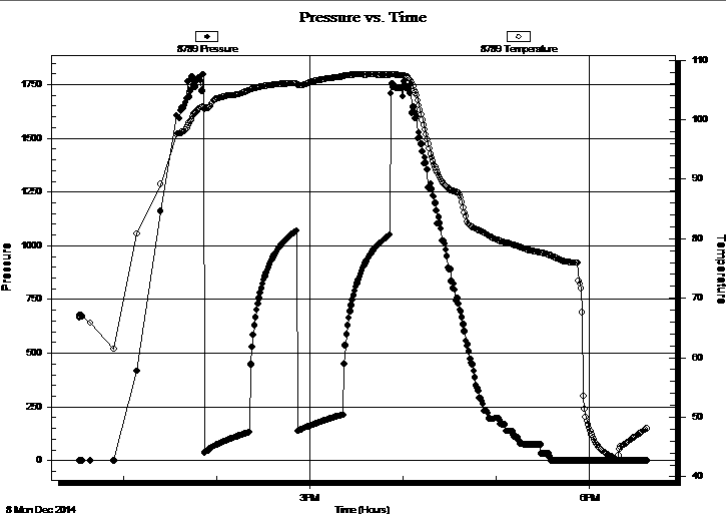
4 15s 18w Ellis, KS
Munsch #B-4
 Job Ticket: 61380 **DST#: 1**
 Test Start: 2014.12.08 @ 12:32:00

GENERAL INFORMATION:

Formation: **Arbuckle**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 13:52:30
 Time Test Ended: 18:37:00
Interval: 3578.00 ft (KB) To 3637.00 ft (KB) (TVD)
 Total Depth: 3697.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Straddle (Initial)
 Tester: Jim Svaty
 Unit No: 76
 Reference Elevations: 2020.00 ft (KB)
 2010.00 ft (CF)
 KB to GR/CF: 10.00 ft

Serial #: 8789 Inside
 Press@RunDepth: psig @ 3596.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.08 End Date: 2014.12.08 Last Calib.: 2014.12.08
 Start Time: 12:32:02 End Time: 18:37:00 Time On Btm:
 Time Off Btm:

TEST COMMENT: 30-IFP- BOB in 8min.
 30-ISIP- No Blow
 30-FFP- BOB in 11min.
 30-FSIP- No Blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
188.00	OSMCW 2%o 23%m 70%w	2.64
188.00	WOCM 10%w 30%o 60%m	2.64
10.00	WMCO 20%w 35%m 45%o	0.14
45.00	CO 100%	0.63

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 15s 18w Ellis,KS
Munsch #B-4
Job Ticket: 61380 **DST#: 1**
Test Start: 2014.12.08 @ 12:32:00

Tool Information

Drill Pipe:	Length: 3586.00 ft	Diameter: 3.80 inches	Volume: 50.30 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 53000.00 lb
			<u>Total Volume: 50.30 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	29.00 ft			String Weight: Initial 48000.00 lb
Depth to Top Packer:	3578.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	3637.00 ft			
Interval between Packers:	59.00 ft			
Tool Length:	139.00 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			3558.00	
Shut In Tool	5.00			3563.00	
Hydraulic tool	5.00			3568.00	
Packer	5.00			3573.00	21.00 Bottom Of Top Packer
Packer	5.00			3578.00	
Stubb	1.00			3579.00	
Perforations	16.00			3595.00	
Change Over Sub	1.00			3596.00	
Recorder	0.00	8789	Inside	3596.00	
Recorder	0.00	8289	Outside	3596.00	
Blank Spacing	31.00			3627.00	
Change Over Sub	1.00			3628.00	
Perforations	5.00			3633.00	
Blank Off Sub	1.00			3634.00	
Blank Spacing	3.00			3637.00	59.00 Tool Interval
Packer	1.00			3638.00	
Recorder	0.00	6668	Below	3638.00	
Perforations	22.00			3660.00	
Change Over Sub	1.00			3661.00	
Blank Spacing	31.00			3692.00	
Change Over Sub	1.00			3693.00	
Bullnose	3.00			3696.00	59.00 Bottom Packers & Anchor

Total Tool Length: 139.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

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

4 15s 18w Ellis,KS
Munsch #B-4
Job Ticket: 61380 **DST#: 1**
Test Start: 2014.12.08 @ 12:32:00

Mud and Cushion Information

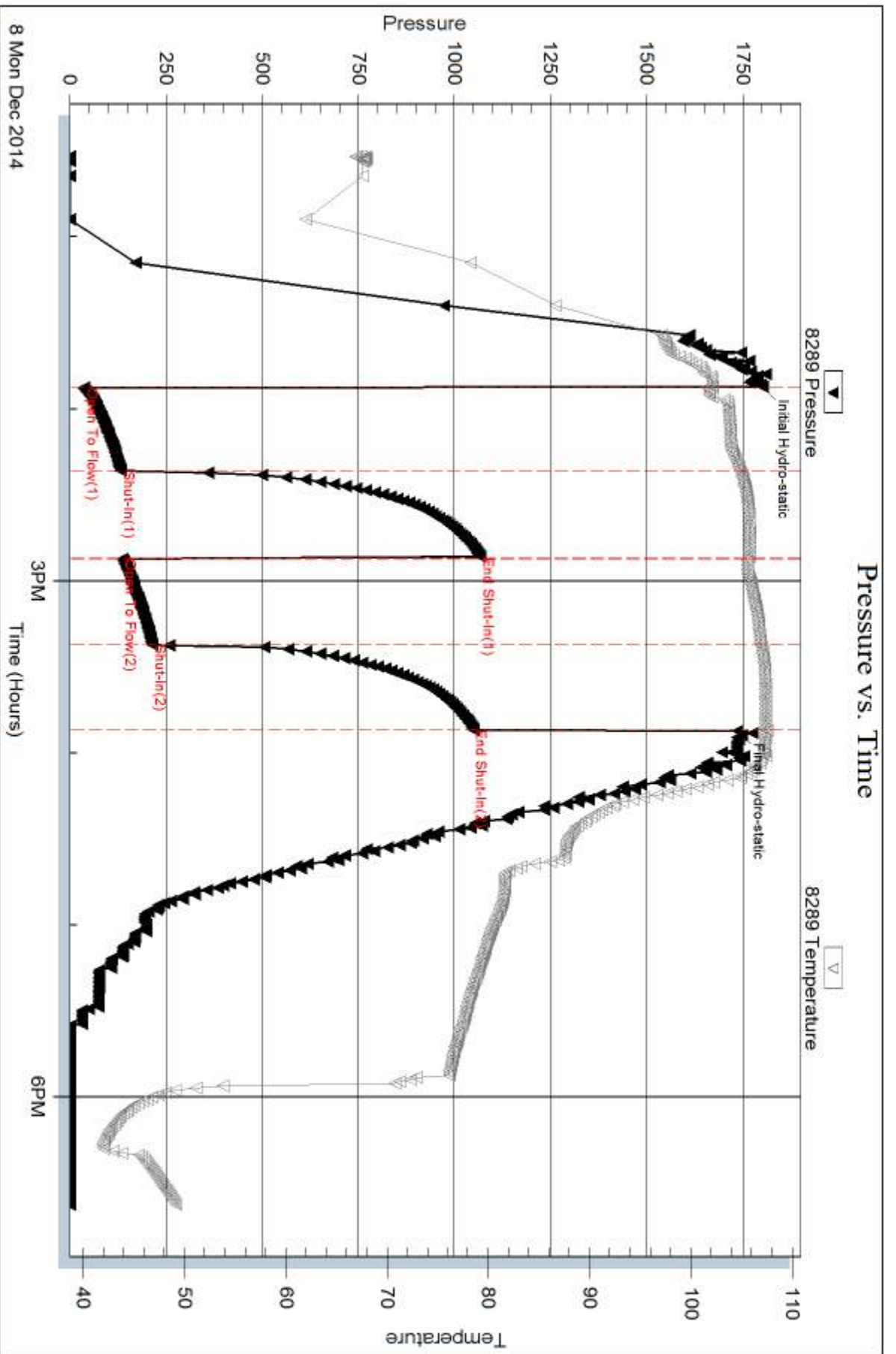
Mud Type: Gel Chem	Cushion Type:	Oil API: 31 deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity: 17500 ppm
Viscosity: 52.00 sec/qt	Cushion Volume: bbl	
Water Loss: 7.78 in ³	Gas Cushion Type:	
Resistivity: ohm.m	Gas Cushion Pressure: psig	
Salinity: 2500.00 ppm		
Filter Cake: 1.00 inches		

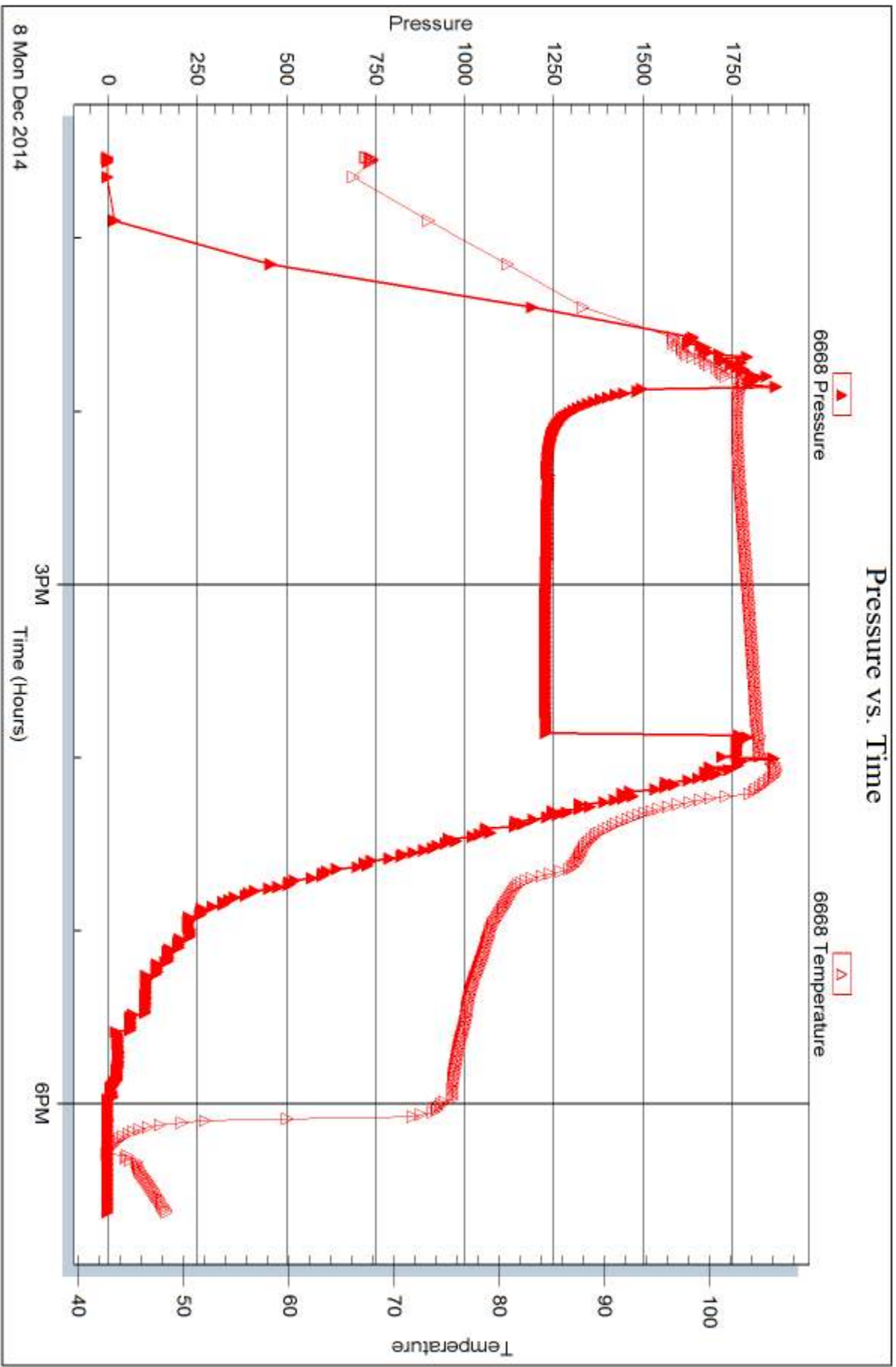
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
188.00	OSMCW 2%o 23%m 70%w	2.637
188.00	WOCM 10%w 30%o 60%m	2.637
10.00	WMCO 20%w 35%m 45%o	0.140
45.00	CO 100%	0.631

Total Length: 431.00 ft Total Volume: 6.045 bbl
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments: .538 @ 50





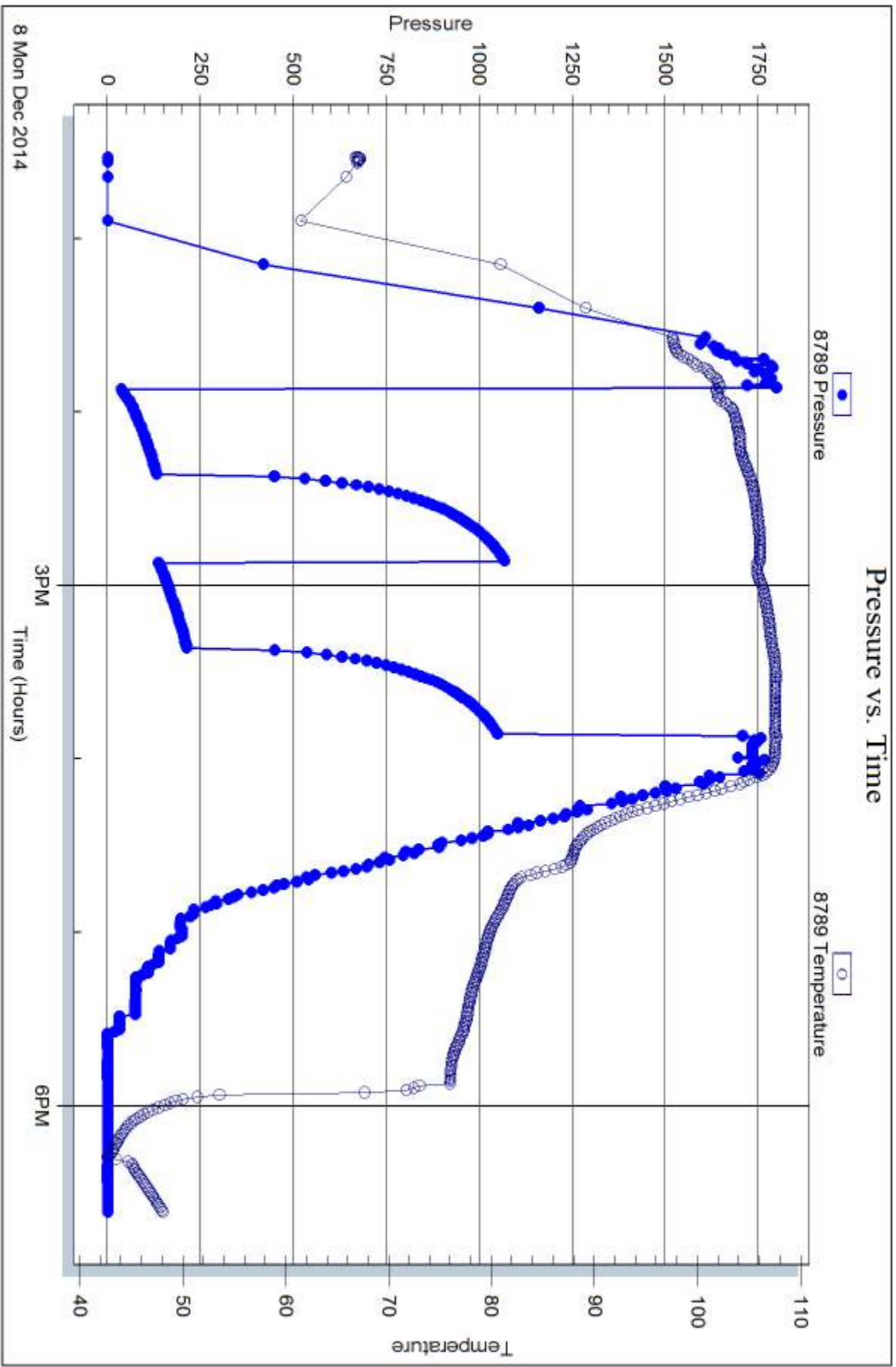
Serial #: 8789

Inside

TDI Inc

Munsch #B-4

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 61380

Printed: 2014.12.11 @ 13:55:12



DRILL STEM TEST REPORT

Prepared For: **TDI Inc**

1310 Bison Rd
Hays KS 67601-9696

ATTN: Herb Deines

Munsch #B-4

4 15s 18w Ellis,KS

Start Date: 2014.12.08 @ 19:06:00

End Date: 2014.12.09 @ 01:33:00

Job Ticket #: 61381 DST #: 2

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

Printed: 2014.12.11 @ 13:43:44

TDI Inc
4 15s 18w Ellis,KS
Munsch #B-4
DST # 2
Arbuckie
2014.12.08



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

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

4 15s 18w Ellis,KS
Munsch #B-4
Job Ticket: 61381 **DST#: 2**
Test Start: 2014.12.08 @ 19:06:00

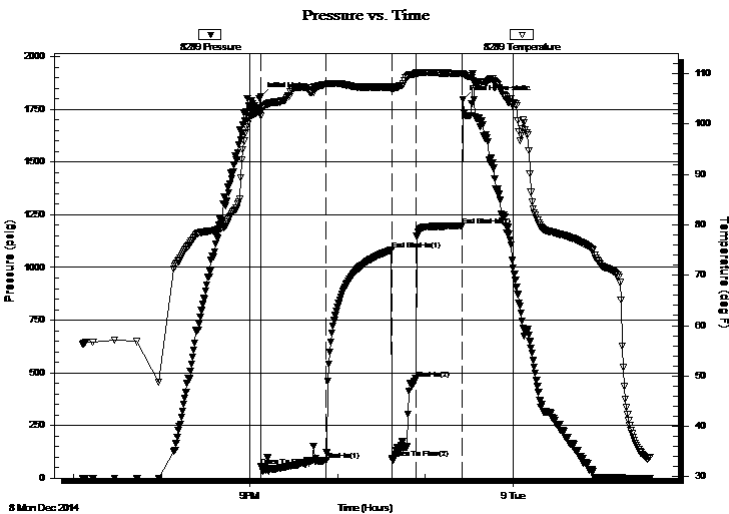
GENERAL INFORMATION:

Formation: **Arbuckle**
Deviated: No Whipstock: ft (KB) Test Type: Conventional Straddle (Reset)
Time Tool Opened: 21:07:45 Tester: Jim Svaty
Time Test Ended: 01:33:00 Unit No: 76
Interval: 3580.00 ft (KB) To 3627.00 ft (KB) (TVD) Reference Elevations: 2020.00 ft (KB)
Total Depth: 3697.00 ft (KB) (TVD) 2010.00 ft (CF)
Hole Diameter: 7.88 inches Hole Condition: Fair KB to GR/CF: 10.00 ft

Serial #: 8289 Outside
Press@RunDepth: 470.15 psig @ 3587.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2014.12.08 End Date: 2014.12.09 Last Calib.: 2014.12.09
Start Time: 19:06:02 End Time: 01:33:30 Time On Btm: 2014.12.08 @ 21:07:30
Time Off Btm: 2014.12.08 @ 23:25:30

TEST COMMENT: 45-IFP- BOB in 19 min.
45-ISIP- No Blow
45-FFP- BOB in 12 min.
45-FSIP- No Blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1812.65	102.40	Initial Hydro-static
1	54.01	101.54	Open To Flow (1)
45	84.46	107.83	Shut-In(1)
90	1082.18	107.31	End Shut-In(1)
90	93.07	106.70	Open To Flow (2)
106	470.15	109.88	Shut-In(2)
138	1196.58	109.96	End Shut-In(2)
138	1796.68	110.05	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
315.00	MCW 40%w 60%w Show of Oil	4.42
126.00	WCM 20%w 80%w Show of Oil	1.77
219.00	WOCM 10%w 25%o 65%w	3.07

* Recovery from multiple tests

Gas Rates

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



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

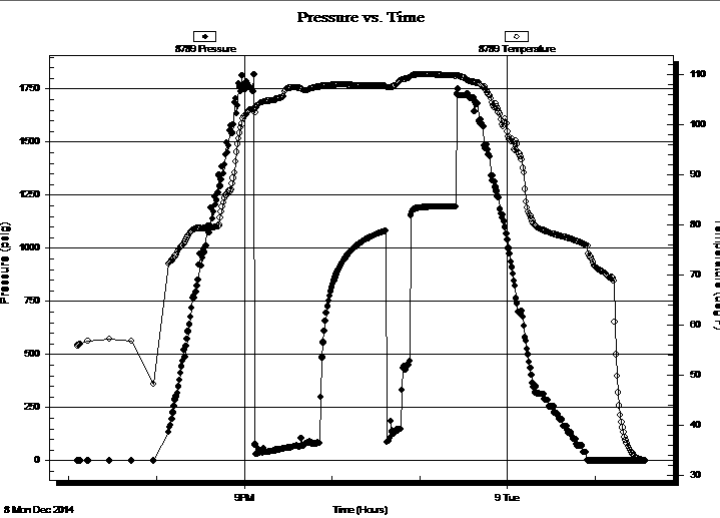
4 15s 18w Ellis, KS
Munsch #B-4
Job Ticket: 61381 **DST#: 2**
Test Start: 2014.12.08 @ 19:06:00

GENERAL INFORMATION:

Formation: **Arbuckle**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 21:07:45
Time Test Ended: 01:33:00
Interval: **3580.00 ft (KB) To 3627.00 ft (KB) (TVD)**
Total Depth: 3697.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Test Type: Conventional Straddle (Reset)
Tester: Jim Svaty
Unit No: 76
Reference Elevations: 2020.00 ft (KB)
2010.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8789 Inside
Press@RunDepth: psig @ 3587.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2014.12.08 End Date: 2014.12.09 Last Calib.: 2014.12.09
Start Time: 19:06:02 End Time: 01:34:00 Time On Btm:
Time Off Btm:

TEST COMMENT: 45-IFP- BOB in 19 min.
45-ISIP- No Blow
45-FFP- BOB in 12 min.
45-FSIP- No Blow



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

Recovery		
Length (ft)	Description	Volume (bbl)
315.00	MCW 40% m 60% w Show of Oil	4.42
126.00	WCM 20% w 80% m Show of Oil	1.77
219.00	WOCM 10% w 25% o 65% m	3.07

* Recovery from multiple tests

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 15s 18w Ellis,KS
Munsch #B-4
Job Ticket: 61381 **DST#: 2**
Test Start: 2014.12.08 @ 19:06:00

Tool Information

Drill Pipe:	Length: 3587.00 ft	Diameter: 3.80 inches	Volume: 50.32 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 50.32 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	28.00 ft			String Weight: Initial 44000.00 lb
Depth to Top Packer:	3580.00 ft			Final 46000.00 lb
Depth to Bottom Packer:	3627.00 ft			
Interval between Packers:	47.00 ft			
Tool Length:	137.00 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			3560.00	
Shut In Tool	5.00			3565.00	
Hydraulic tool	5.00			3570.00	
Packer	5.00			3575.00	21.00 Bottom Of Top Packer
Packer	5.00			3580.00	
Stubb	1.00			3581.00	
Perforations	5.00			3586.00	
Change Over Sub	1.00			3587.00	
Recorder	0.00	8789	Inside	3587.00	
Recorder	0.00	8289	Outside	3587.00	
Blank Spacing	31.00			3618.00	
Change Over Sub	1.00			3619.00	
Perforations	4.00			3623.00	
Blank Off Sub	1.00			3624.00	
Blank Spacing	3.00			3627.00	47.00 Tool Interval
Packer	1.00			3628.00	
Recorder	0.00	6668	Below	3628.00	
Perforations	1.00			3629.00	
Change Over Sub	1.00			3630.00	
Blank Spacing	62.00			3692.00	
Change Over Sub	1.00			3693.00	
Bullnose	3.00			3696.00	69.00 Bottom Packers & Anchor

Total Tool Length: 137.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

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

4 15s 18w Ellis,KS
Munsch #B-4
Job Ticket: 61381 **DST#: 2**
Test Start: 2014.12.08 @ 19:06:00

Mud and Cushion Information

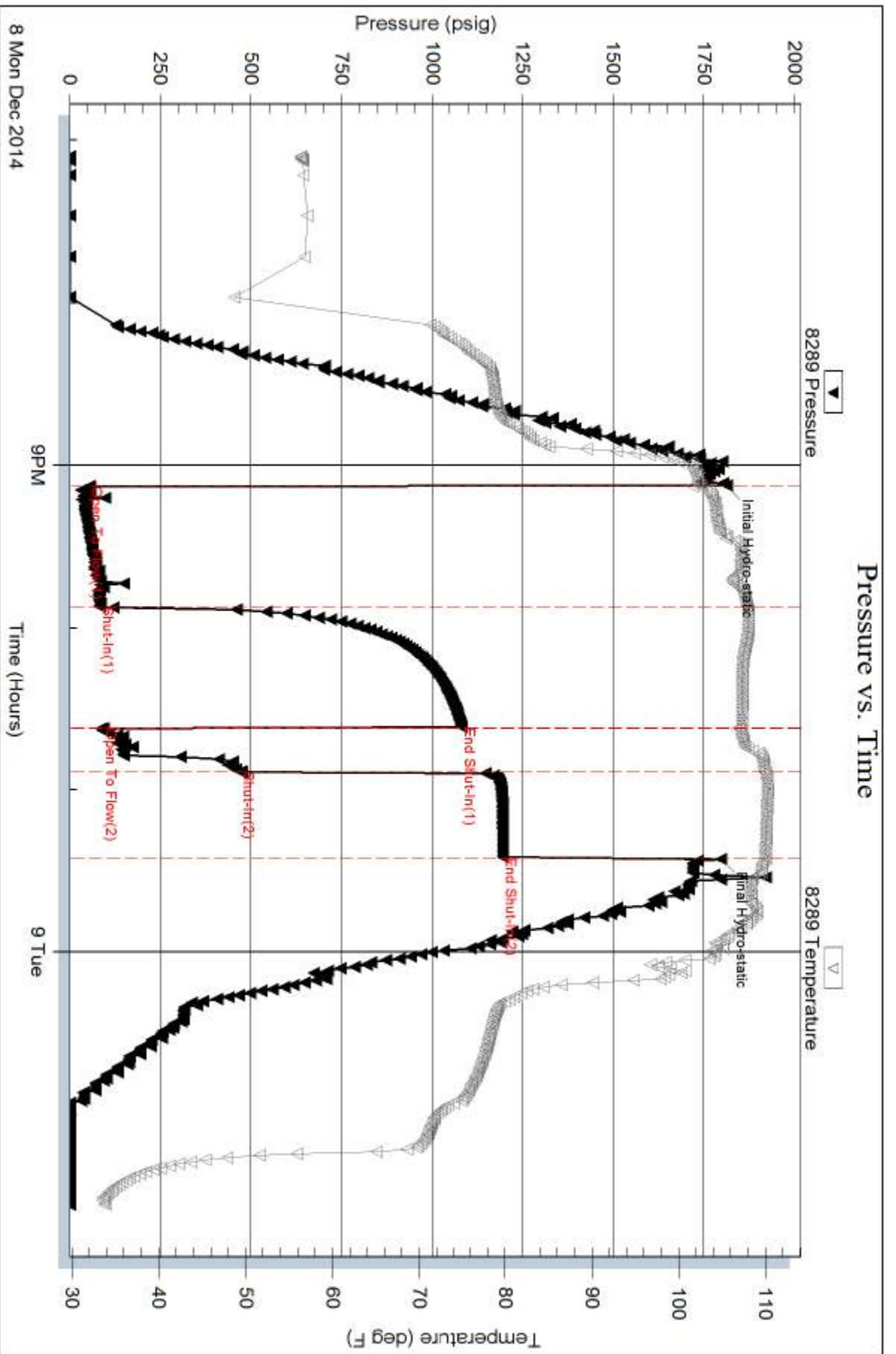
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	23000 ppm
Viscosity: 52.00 sec/qt	Cushion Volume: bbl		
Water Loss: 7.78 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 2500.00 ppm			
Filter Cake: 1.00 inches			

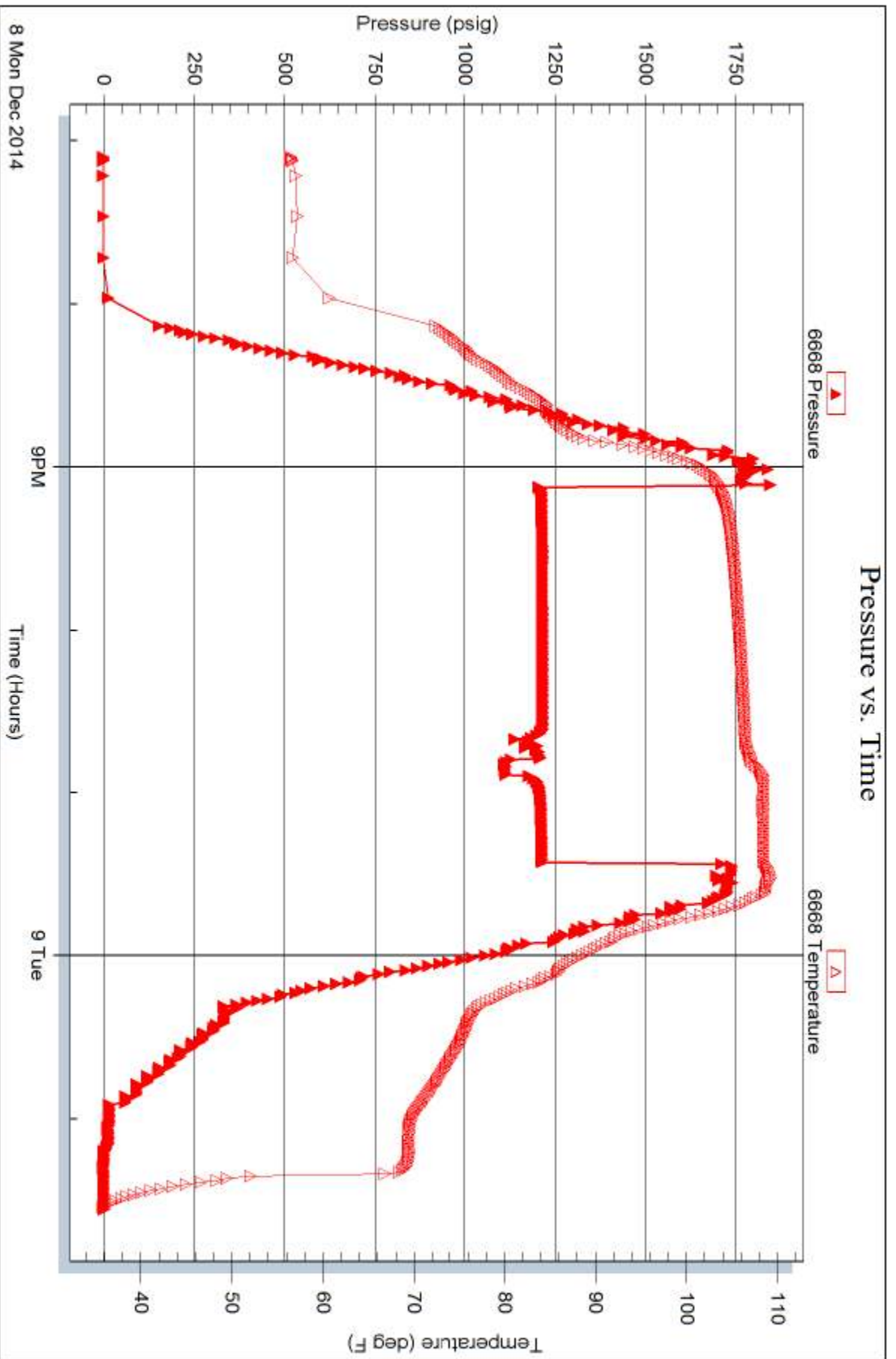
Recovery Information

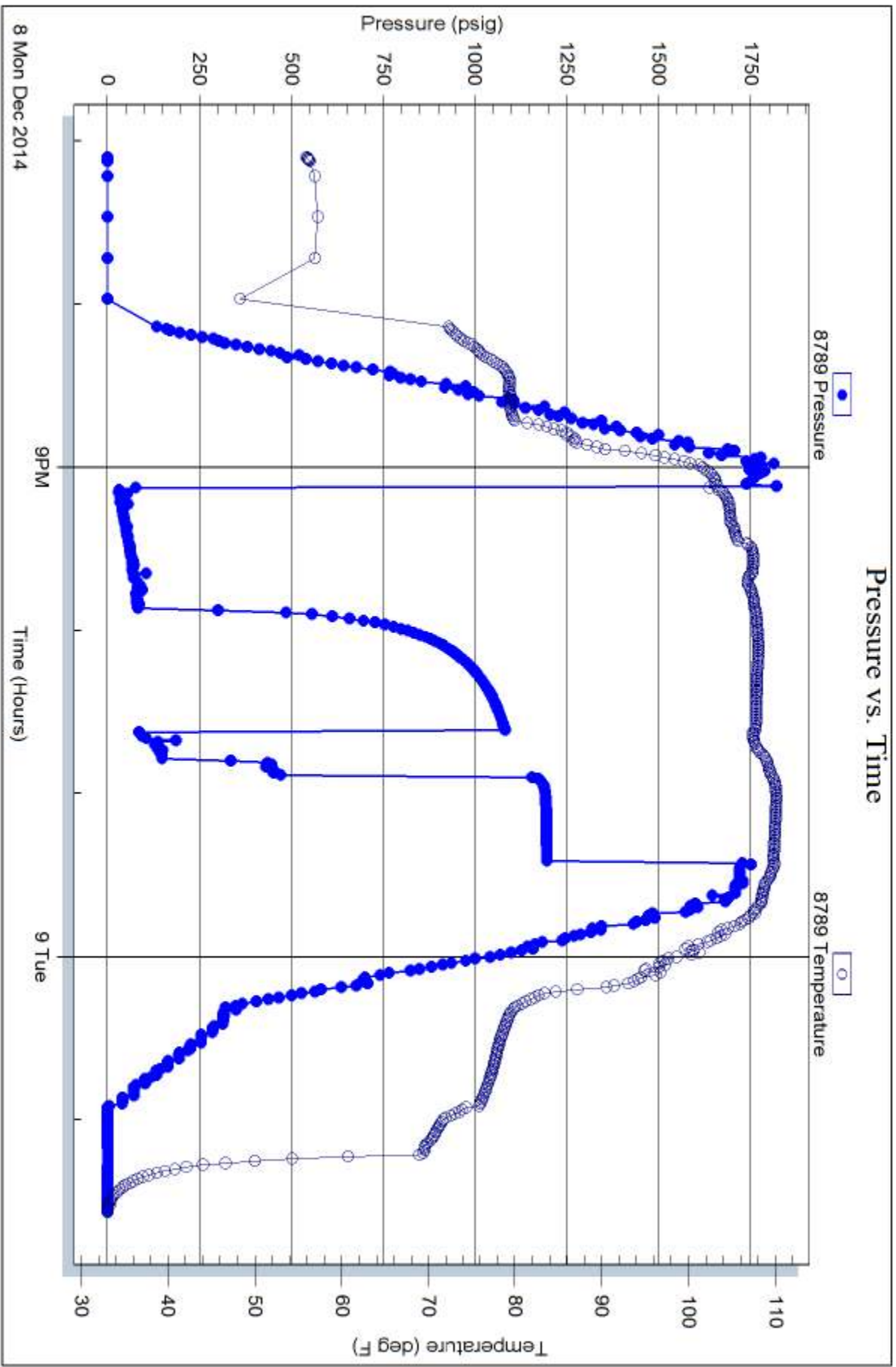
Recovery Table

Length ft	Description	Volume bbl
315.00	MCW 40%m 60%w Show of Oil	4.419
126.00	WCM 20%w 80%m Show of Oil	1.767
219.00	WOCM 10%w 25%o 65%m	3.072

Total Length: 660.00 ft Total Volume: 9.258 bbl
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments: .585 @ 35









TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 61380

4/10

Well Name & No. Munsch # B-4 Test No. 1 Date 12-8-14
 Company TDI Inc. Elevation 2020 KB 2010 GL
 Address 1310 Bison Rd Hays KS 67601-9696
 Co. Rep / Geo. Herb Deines Rig Southwind #1
 Location: Sec. 4 Twp. 15^s Rge. 18^w Co. Ellis State KS

Interval Tested 3578-3637 Zone Tested Arbuckle
 Anchor Length 59 (60 TP) Drill Pipe Run 3586 Mud Wt. 9.1
 Top Packer Depth ~~3578~~ 3578 Drill Collars Run 0 Vis 52
 Bottom Packer Depth ~~3578~~ 3637 Wt. Pipe Run 0 WL 7.8
 Total Depth 3697 LTD Chlorides 2500 ppm System LCM 1

Blow Description IFP-BOB in Sumin
ISIP- No Blow
FFP-BOB in Sumin.
FSIP- No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>188</u>	<u>05 mCW</u>	<u>2</u>	<u>70</u>	<u>23</u>	
<u>188</u>	<u>WOCM</u>	<u>30</u>	<u>10</u>	<u>60</u>	
<u>10</u>	<u>WMCO</u>	<u>45</u>	<u>20</u>	<u>35</u>	
<u>45</u>	<u>CO</u>	<u>100</u>			

Rec Total 431 BHT 107 Gravity 31 API RW 538 @ 50 ° F Chlorides 17500 ppm

(A) Initial Hydrostatic 1800 Test 1150 T-On Location 10:03
 (B) First Initial Flow 37 Jars _____ T-Started 12:32
 (C) First Final Flow 132 Safety Joint _____ T-Open 13:52
 (D) Initial Shut-In 1069 Circ Sub _____ T-Pulled 15:52
 (E) Second Initial Flow 137 Hourly Standby _____ T-Out 18:37
 (F) Second Final Flow 214 Mileage 20 RT 31 Comments _____
 (G) Final Shut-In 1049 Sampler _____
 (H) Final Hydrostatic 1735 Straddle 600 Ruined Shale Packer _____
 Shale Packer 250 Ruined Packer _____

Initial Open 30 Extra Packer _____ Extra Copies _____
 Initial Shut-In 30 Extra Recorder _____ Sub Total 0
 Final Flow 30 Day Standby _____ Total 2031
 Final Shut-In 30 Accessibility _____ MP/DST Disc't _____
 Sub Total 2031

Approved By _____ Our Representative [Signature]

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. 61381

Well Name & No. Munsch # B-4 Test No. 2 Date 12-8-14
 Company TDI Inc. Elevation 2020 KB 2010 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 3580 ~~3580~~ 3627 Zone Tested Arbuckle
 Anchor Length 47 (70TP) Drill Pipe Run 3587 Mud Wt. 9.1
 Top Packer Depth 3580 Drill Collars Run 0 Vis 52
 Bottom Packer Depth 3627 Wt. Pipe Run 0 WL 7.8
 Total Depth 3697 LTD Chlorides 2500 ppm System LCM 1

Blow Description IFP - BOB in 19min
ISIP - No Blow
FFP - BOB 12min
FSIP - No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>315</u>	<u>mcw show of oil</u>		<u>60</u>	<u>40</u>	
<u>126</u>	<u>wcm show of oil</u>		<u>20</u>	<u>80</u>	
<u>219 219</u>	<u>wocm</u>	<u>25</u>	<u>10</u>	<u>65</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 660 BHT 110 Gravity 1150 API RW .585 @ 35° F Chlorides 23000 ppm

(A) Initial Hydrostatic <u>1812</u>	<input checked="" type="checkbox"/> Test	T-On Location <u>10:03</u>
(B) First Initial Flow <u>54</u>	<input type="checkbox"/> Jars	T-Started <u>19:06</u>
(C) First Final Flow <u>84</u>	<input type="checkbox"/> Safety Joint	T-Open <u>21:07</u>
(D) Initial Shut-In <u>1082</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>23:24 23:24</u>
(E) Second Initial Flow <u>93</u>	<input type="checkbox"/> Hourly Standby	T-Out
(F) Second Final Flow <u>470</u>	<input type="checkbox"/> Mileage	Comments
(G) Final Shut-In <u>1196</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1796</u>	<input checked="" type="checkbox"/> Straddle <u>600</u>	<input type="checkbox"/> Ruined Shale Packer
	<input checked="" type="checkbox"/> Shale Packer <u>250</u>	<input type="checkbox"/> Ruined Packer
Initial Open <u>45</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Initial Shut-In <u>45</u>	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
Final Flow <u>17 17</u>	<input type="checkbox"/> Day Standby	Total <u>2000</u>
Final Shut-In <u>30 30</u>	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>2000</u>	

Approved By _____ Our Representative [Signature]
 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.