



DRILL STEM TEST REPORT

Prepared For: **TDI**

1310 Bison Rd
Hays KS 67601-9696

ATTN: Tom Denning , Herb D

George #2

18-12s-18w Ellis,KS

Start Date: 2014.10.20 @ 16:45:29

End Date: 2014.10.20 @ 23:27:23

Job Ticket #: 60891 DST #: 1

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

Printed: 2014.10.24 @ 08:47:35



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

TDI
 1310 Bison Rd
 Hays KS 67601-9696
 ATTN: Tom Denning, Herb D

18-12s-18w Ellis,KS
George #2
 Job Ticket: 60891 **DST#: 1**
 Test Start: 2014.10.20 @ 16:45:29

GENERAL INFORMATION:

Formation: **Toronto - LKC D**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 18:46:54
 Time Test Ended: 23:27:23
 Interval: **3420.00 ft (KB) To 3540.00 ft (KB) (TVD)**
 Total Depth: 3540.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Ray Schwager
 Unit No: 70
 Reference Elevations: 2185.00 ft (KB)
 2175.00 ft (CF)
 KB to GR/CF: 10.00 ft

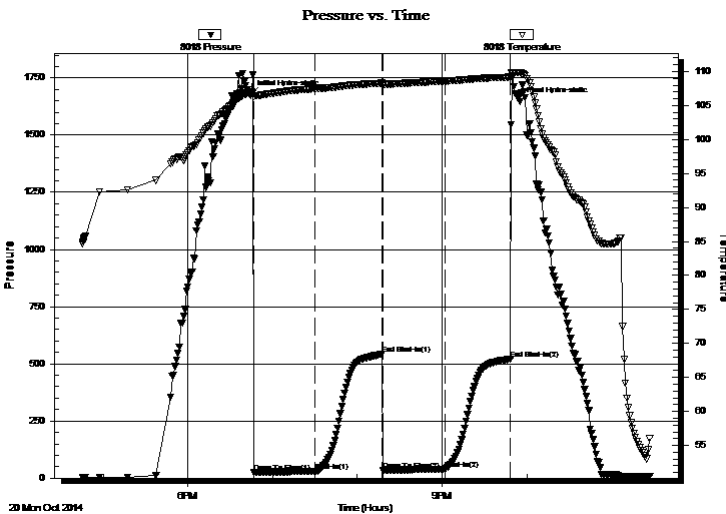
Serial #: 8018

Inside

Press@RunDepth: 40.16 psig @ 3422.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.10.20 End Date: 2014.10.20 Last Calib.: 2014.10.20
 Start Time: 16:45:29 End Time: 23:27:23 Time On Btm: 2014.10.20 @ 18:44:24
 Time Off Btm: 2014.10.20 @ 21:54:53

TEST COMMENT: 45-IFP-w k bl thru-out 1/4" to 1 1/2" bl
 45-ISIP-no bl
 45FFP-no bl 1st 7 min, then surface bl thru-out
 45-FSIP-no bl

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1675.71	106.78	Initial Hydro-static
3	25.90	106.27	Open To Flow (1)
46	30.66	107.47	Shut-In(1)
93	543.14	108.29	End Shut-In(1)
94	34.92	108.11	Open To Flow (2)
138	40.16	108.59	Shut-In(2)
184	520.12	109.18	End Shut-In(2)
191	1648.07	109.81	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
0.00	45' GIP	0.00
45.00	OCM 10%O90%M	0.63

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

TDI
1310 Bison Rd
Hays KS 67601-9696
ATTN: Tom Denning , Herb D

18-12s-18w Ellis,KS
George #2
Job Ticket: 60891 **DST#: 1**
Test Start: 2014.10.20 @ 16:45:29

Tool Information

Drill Pipe:	Length: 3429.00 ft	Diameter: 3.80 inches	Volume: 48.10 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: 48.10 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	30.00 ft			String Weight: Initial	38000.00 lb
Depth to Top Packer:	3420.00 ft			Final	38000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	120.00 ft				
Tool Length:	141.00 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			3400.00	
Shut In Tool	5.00			3405.00	
Hydraulic tool	5.00			3410.00	
Packer	5.00			3415.00	21.00 Bottom Of Top Packer
Packer	5.00			3420.00	
Stubb	1.00			3421.00	
Perforations	1.00			3422.00	
Recorder	0.00	8018	Inside	3422.00	
Recorder	0.00	8700	Outside	3422.00	
Blank Spacing	95.00			3517.00	
Perforations	20.00			3537.00	
Bullnose	3.00			3540.00	120.00 Bottom Packers & Anchor

Total Tool Length: 141.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

TDI **18-12s-18w Ellis,KS**
 1310 Bison Rd **George #2**
 Hays KS 67601-9696 Job Ticket: 60891 **DST#: 1**
 ATTN: Tom Denning , Herb D Test Start: 2014.10.20 @ 16:45:29

Mud and Cushion Information

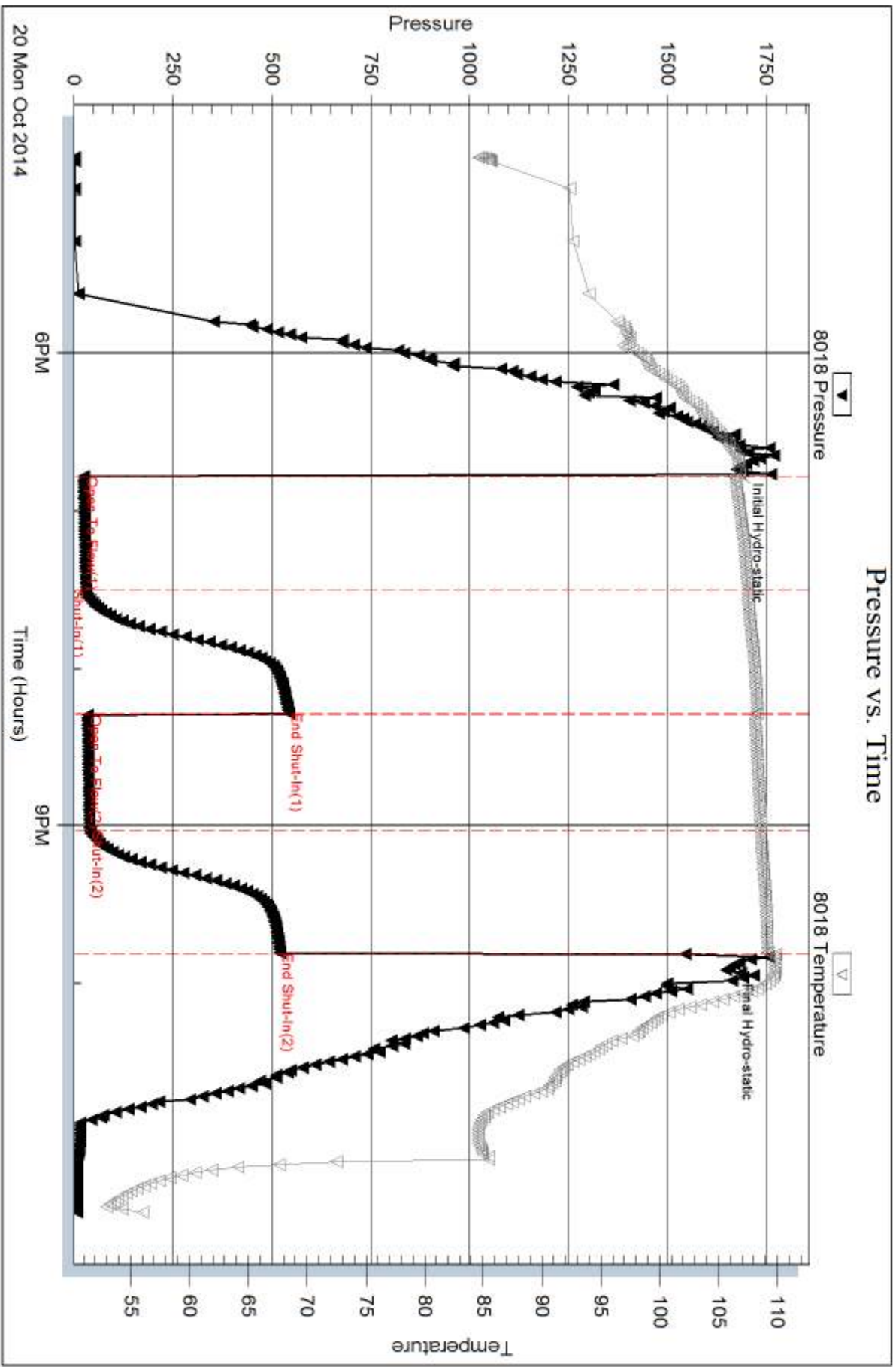
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 10.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 50.00 sec/qt	Cushion Volume: bbl		
Water Loss: 7.37 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1400.00 ppm			
Filter Cake: 1.00 inches			

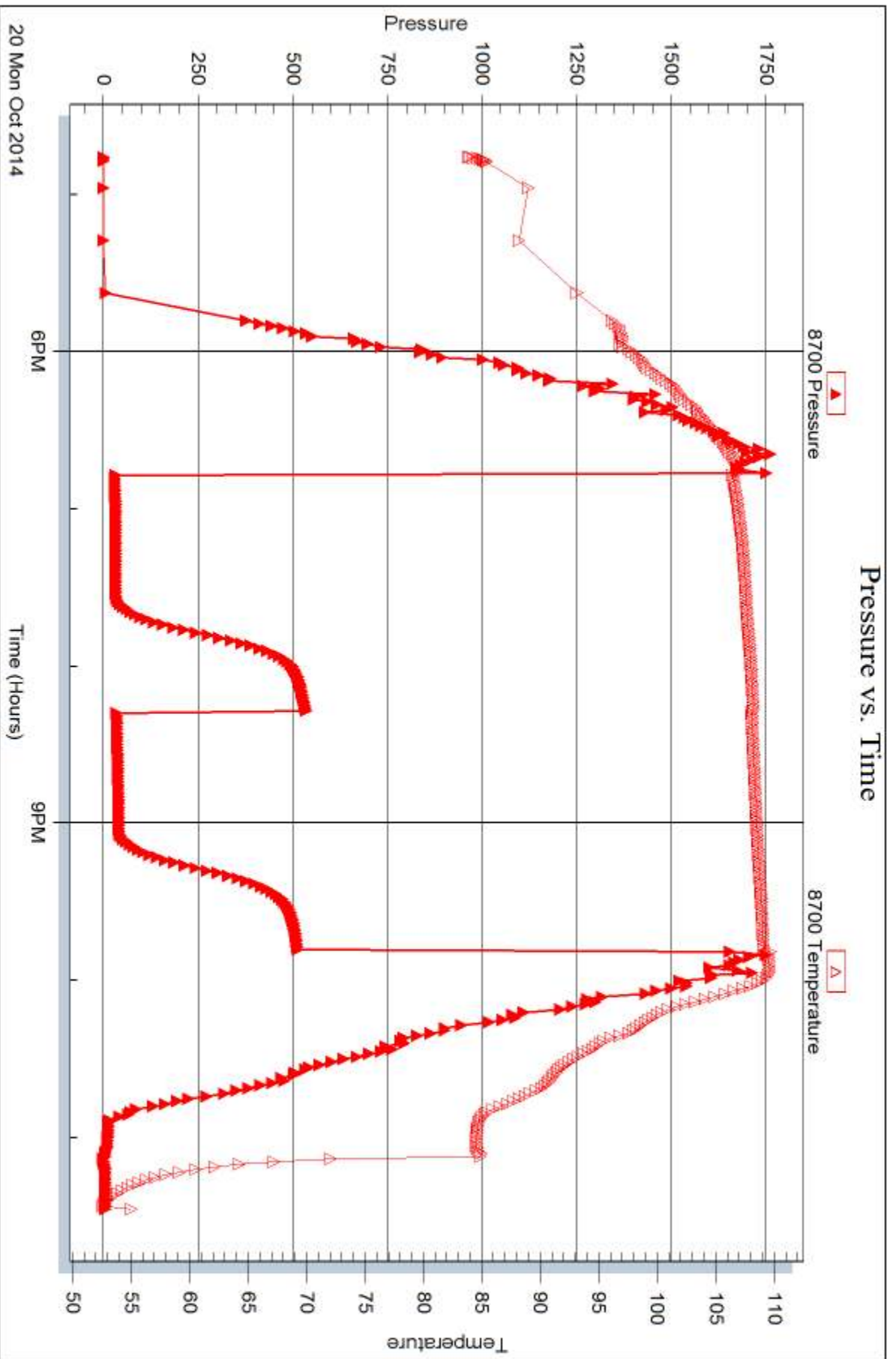
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
0.00	45' GIP	0.000
45.00	OCM 10%O90%M	0.631

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:







DRILL STEM TEST REPORT

Prepared For: **TDI**

1310 Bison Rd
Hays KS 67601-9696

ATTN: Tom Denning , Herb D

George #2

18-12s-18w Ellis,KS

Start Date: 2014.10.21 @ 11:15:48

End Date: 2014.10.21 @ 16:52:12

Job Ticket #: 60892 DST #: 2

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

Printed: 2014.10.24 @ 08:47:07

TDI
18-12s-18w Ellis,KS
George #2
DST # 2
LKC H-J
2014.10.21



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

TDI
 1310 Bison Rd
 Hays KS 67601-9696
 ATTN: Tom Denning, Herb D

18-12s-18w Ellis,KS
George #2
 Job Ticket: 60892 **DST#: 2**
 Test Start: 2014.10.21 @ 11:15:48

GENERAL INFORMATION:

Formation: **LKC H-J**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 12:46:43
 Time Test Ended: 16:52:12
 Interval: **3574.00 ft (KB) To 3660.00 ft (KB) (TVD)**
 Total Depth: 3660.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Ray Schwager
 Unit No: 70
 Reference Elevations: 2185.00 ft (KB)
 2175.00 ft (CF)
 KB to GR/CF: 10.00 ft

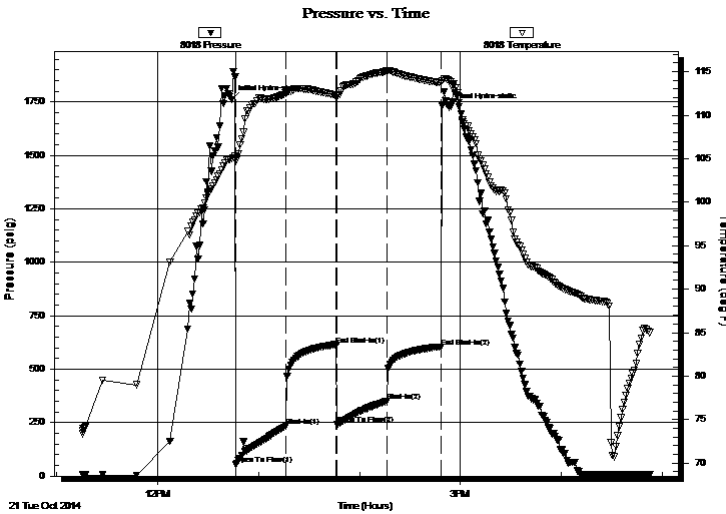
Serial #: 8018

Inside

Press@RunDepth: 352.16 psig @ 3576.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.10.21 End Date: 2014.10.21 Last Calib.: 2014.10.21
 Start Time: 11:15:48 End Time: 16:52:12 Time On Btm: 2014.10.21 @ 12:44:13
 Time Off Btm: 2014.10.21 @ 14:53:13

TEST COMMENT: 30-IFP-w k to strg in 4 min
 30-ISIP-no bl
 30-FFP-w k to strg in 8 min
 30-FSIP-no bl

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1761.55	104.96	Initial Hydro-static
3	54.70	104.71	Open To Flow (1)
32	232.42	112.48	Shut-In(1)
62	613.33	112.29	End Shut-In(1)
63	241.13	112.22	Open To Flow (2)
92	352.16	115.06	Shut-In(2)
124	604.14	113.71	End Shut-In(2)
129	1725.25	113.94	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
278.00	SOCWM 2%O38%W60%M	3.90
434.00	SOCMW 1%O20%M79%W	6.09

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

TDI
1310 Bison Rd
Hays KS 67601-9696
ATTN: Tom Denning , Herb D

18-12s-18w Ellis,KS
George #2
Job Ticket: 60892 **DST#: 2**
Test Start: 2014.10.21 @ 11:15:48

Tool Information

Drill Pipe:	Length: 3559.00 ft	Diameter: 3.80 inches	Volume: 49.92 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: 49.92 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	6.00 ft			String Weight: Initial	38000.00 lb
Depth to Top Packer:	3574.00 ft			Final	45000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	86.00 ft				
Tool Length:	107.00 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			3554.00	
Shut In Tool	5.00			3559.00	
Hydraulic tool	5.00			3564.00	
Packer	5.00			3569.00	21.00 Bottom Of Top Packer
Packer	5.00			3574.00	
Stubb	1.00			3575.00	
Perforations	1.00			3576.00	
Recorder	0.00	8018	Inside	3576.00	
Recorder	0.00	8700	Outside	3576.00	
Blank Spacing	63.00			3639.00	
Perforations	18.00			3657.00	
Bullnose	3.00			3660.00	86.00 Bottom Packers & Anchor

Total Tool Length: 107.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

TDI **18-12s-18w Ellis,KS**
 1310 Bison Rd **George #2**
 Hays KS 67601-9696 Job Ticket: 60892 **DST#: 2**
 ATTN: Tom Denning , Herb D Test Start: 2014.10.21 @ 11:15:48

Mud and Cushion Information

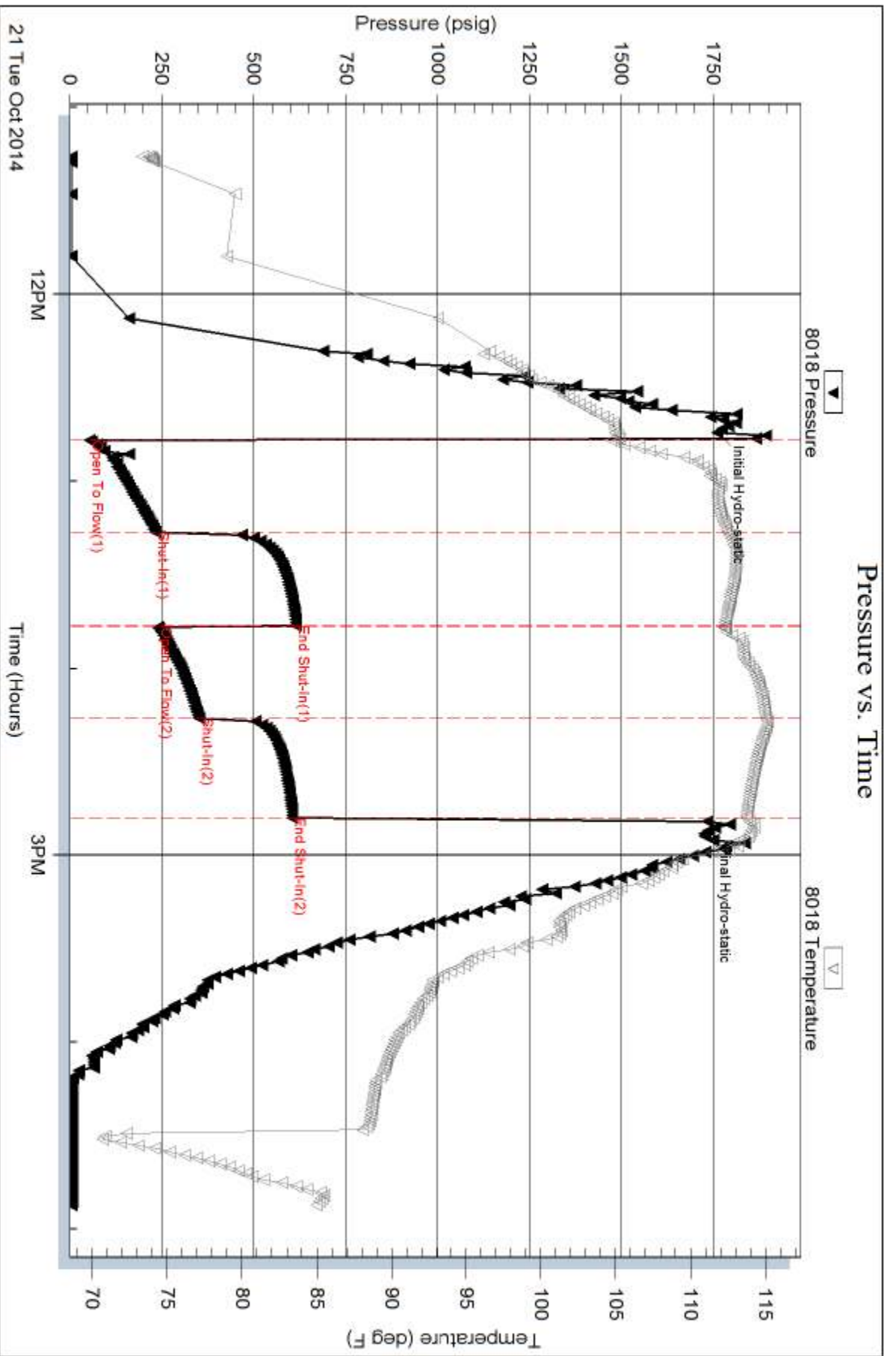
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	55000 ppm
Viscosity: 50.00 sec/qt	Cushion Volume: bbl		
Water Loss: 7.96 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1700.00 ppm			
Filter Cake: 1.00 inches			

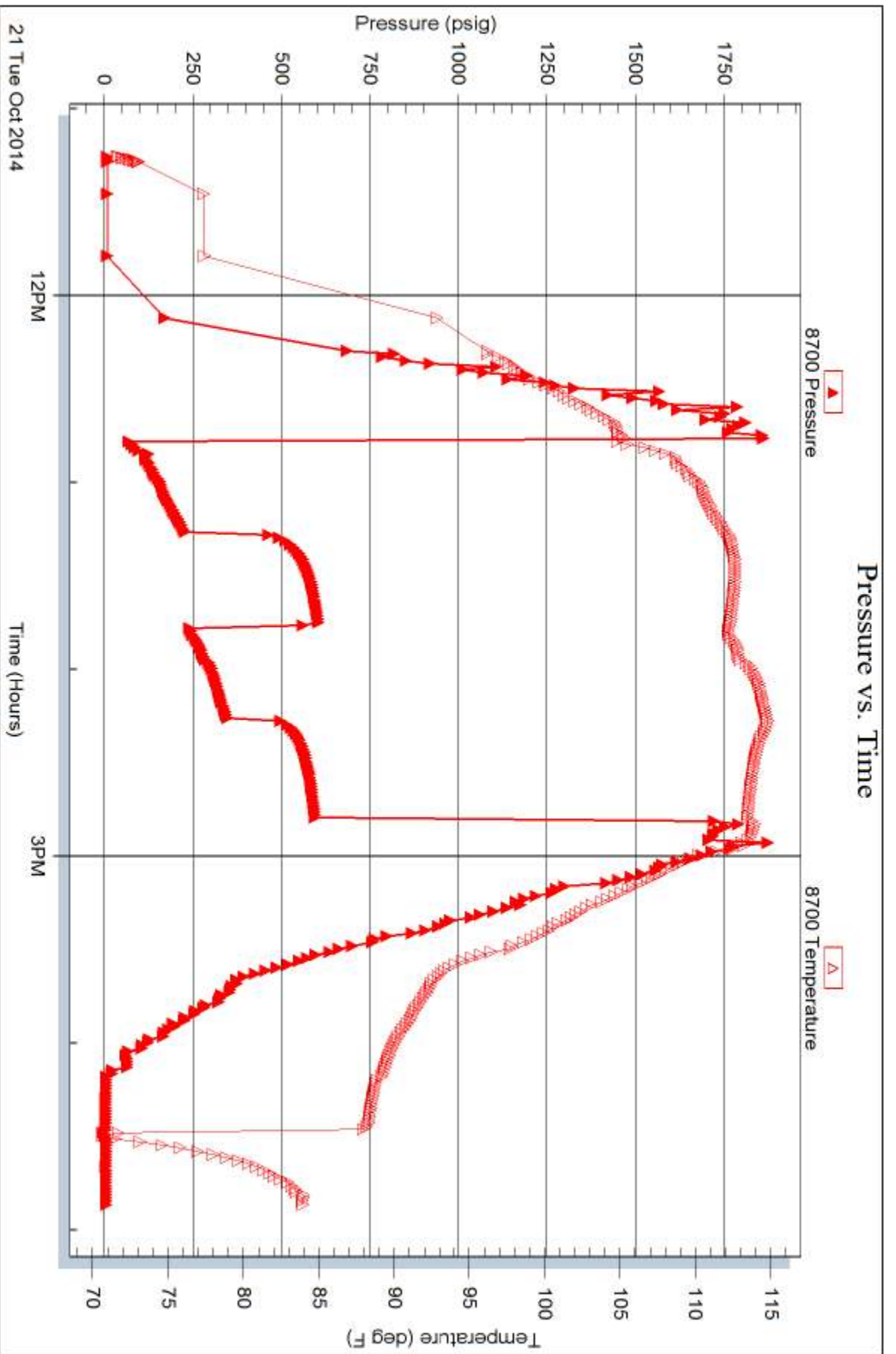
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
278.00	SOCWM 2%O38%W60%M	3.900
434.00	SOCMW 1%O20%M79%W	6.088

Total Length: 712.00 ft Total Volume: 9.988 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location:
 Recovery Comments: RW .14@70F







TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 60891

4/10

Well Name & No. George #2 Test No. 1 Date 10-20-14
 Company TDI, Inc Elevation 2185 KB 2175 GL
 Address 1310 Bison Rd. Hays, Ks 67601-9696
 Co. Rep / Geo. Herb Deines, Tom Denning Rig Southwind rig 1
 Location: Sec. 18 Twp. 12^s Rge. 18^w Co. ELLIS State Ks

Interval Tested 3420-3540 Zone Tested TOR - LKCD
 Anchor Length 120 Drill Pipe Run 3429 Mud Wt. 9.5
 Top Packer Depth 3415 Drill Collars Run - Vis 50
 Bottom Packer Depth 3420 Wt. Pipe Run - WL 7.4
 Total Depth 3540 Chlorides 1400 ppm System LCM 2#
 Blow Description I/FP - WEAK Blow thru-out 1/4" to 1/2" Blow
J/SIP - NO Blow
FFP - NO Blow 1st 7 min, then surface Blow thru-out
FSIP - NO Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>45</u>	<u>GIP</u>				
<u>45</u>	<u>OCM</u>		<u>10</u>		<u>90</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 45 BHT 109 Gravity - API RW - @ - ° F Chlorides - ppm

(A) Initial Hydrostatic	<u>1675</u>	<input checked="" type="checkbox"/> Test	<u>1150</u>	T-On Location	<u>1545</u>
(B) First Initial Flow	<u>25</u>	<input type="checkbox"/> Jars		T-Started	<u>1645</u>
(C) First Final Flow	<u>30</u>	<input type="checkbox"/> Safety Joint		T-Open	<u>1845</u>
(D) Initial Shut-In	<u>543</u>	<input type="checkbox"/> Circ Sub		T-Pulled	<u>2145</u>
(E) Second Initial Flow	<u>34</u>	<input type="checkbox"/> Hourly Standby		T-Out	<u>2327</u>
(F) Second Final Flow	<u>40</u>	<input checked="" type="checkbox"/> Mileage	<u>29 RT</u> 44.95	Comments	
(G) Final Shut-In	<u>520</u>	<input type="checkbox"/> Sampler			
(H) Final Hydrostatic	<u>1648</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>1194.95</u>
		<input type="checkbox"/> Accessibility		MP/DST Disc't	
		Sub Total	<u>1194.95</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. 60892

Well Name & No. George #2 Test No. 2 Date 10-21-14
 Company TDT, Inc Elevation 2185 KB 2175 GL
 Address 1310 Bison Rd. Hays, Ks 67601-9696
 Co. Rep / Geo. Herb Deines, Tom Denning Rig Southwind rig 1
 Location: Sec. 18 Twp. 12^s Rge. 18^w Co. Ellis State Ks

Interval Tested 3574-3660 Zone Tested 1KC H-J
 Anchor Length 86 Drill Pipe Run 3559 Mud Wt. 9.4
 Top Packer Depth 3569 Drill Collars Run - Vis 50
 Bottom Packer Depth 3574 Wt. Pipe Run - WL 8
 Total Depth 3660 Chlorides 1700 ppm System LCM 2#
 Blow Description IFP - WEAK TO STRONG IN 4min
ISIP - NO BLOW
FFP - WEAK TO STRONG IN 8min
FSIP - NO BLOW

Rec	Feet of	%gas	%oil	%water	%mud
<u>278</u>	<u>50CWM</u>	<u>2</u>	<u>38</u>	<u>60</u>	
<u>434</u>	<u>50CMW</u>	<u>1</u>	<u>79</u>	<u>20</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 712 BHT 113 Gravity - API RW .14 @ 70 ° F Chlorides 55000 ppm
 Test 1150
 Jars _____
 Safety Joint _____
 Circ Sub _____
 Hourly Standby _____
 Mileage 29RT 44.95
 Sampler _____ 44.95
 Straddle _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____
 Sub Total 1239.90

T-On Location 1015
 T-Started 1115
 T-Open 1245
 T-Pulled 1445
 T-Out 1652
 Comments Loaded Tool 1600
10-22-14
 Ruined Shale Packer _____
 Ruined Packer _____
 Extra Copies _____
 Sub Total 0
 Total 1239.90
 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. 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.