



DRILL STEM TEST REPORT

Prepared For: **TDI, Inc.**

1310 Bison Rd.
Hays, KS 67601

ATTN: Herb Deines

Munsch #10

9-15S-18W Ellis,KS

Start Date: 2017.11.09 @ 03:27:51

End Date: 2017.11.09 @ 11:27:57

Job Ticket #: 63109 DST #: 1

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

ph: 785-625-4778 fax: 785-625-5620

Printed: 2017.11.09 @ 15:50:40



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

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

9-15S-18W Ellis,KS
Munsch #10
Job Ticket: 63109 **DST#: 1**
Test Start: 2017.11.09 @ 03:27:51

GENERAL INFORMATION:

Formation: **LKC "I - J"**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 07:10:12
Time Test Ended: 11:27:57
Interval: **3462.00 ft (KB) To 3520.00 ft (KB) (TVD)**
Total Depth: 3751.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Reference Elevations: 2039.00 ft (KB)
2029.00 ft (CF)
KB to GR/CF: 10.00 ft

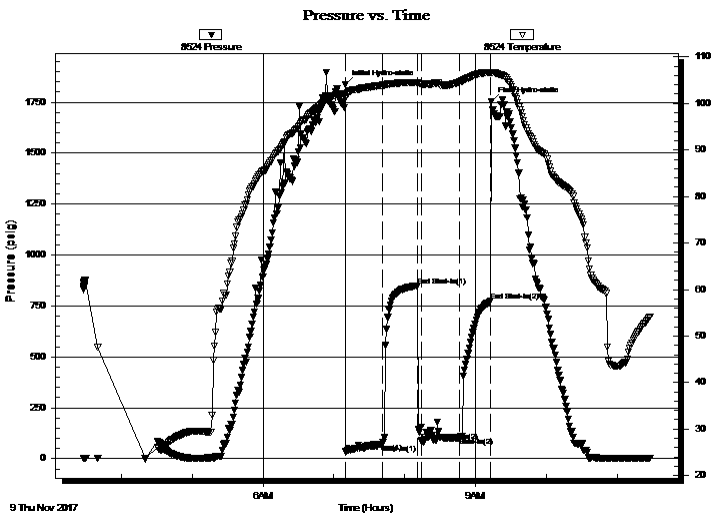
Serial #: 8524

Outside

Press@RunDepth: 103.85 psig @ 3464.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2017.11.09 End Date: 2017.11.09 Last Calib.: 2017.11.09
Start Time: 03:27:52 End Time: 11:27:57 Time On Btm: 2017.11.09 @ 07:09:57
Time Off Btm: 2017.11.09 @ 09:13:42

TEST COMMENT: 30- IF- Slowly built to 7 1/2"
30- IS- No blow
30- FF- BOB 20 mins
30- FSI- No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1836.43	102.07	Initial Hydro-static
1	33.52	101.31	Open To Flow (1)
32	71.63	103.89	Shut-In(1)
61	849.61	104.53	End Shut-In(1)
65	83.45	104.17	Open To Flow (2)
97	103.85	104.59	Shut-In(2)
123	772.73	106.58	End Shut-In(2)
124	1753.20	106.65	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
159.00	GSOCM, 15%G 5%O 80%M	2.25
0.00	32' GIP	0.00

Gas Rates

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



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1310 Bison Rd.
Hays, KS 67601
ATTN: Herb Deines

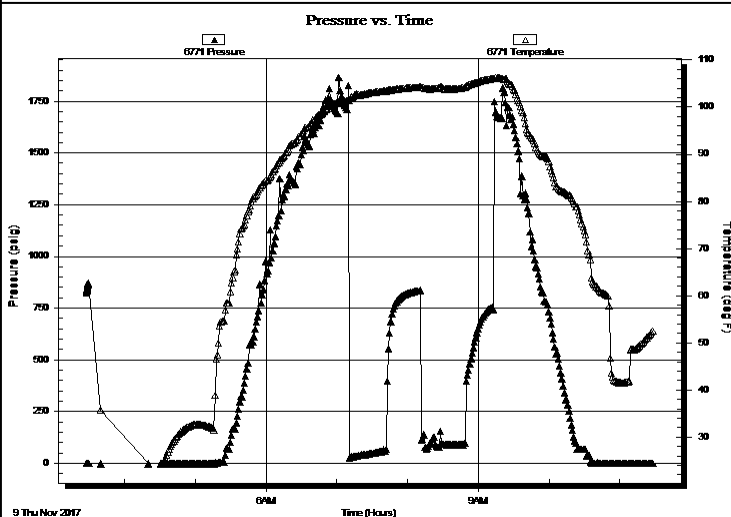
9-15S-18W Ellis,KS
Munsch #10
Job Ticket: 63109 **DST#: 1**
Test Start: 2017.11.09 @ 03:27:51

GENERAL INFORMATION:

Formation: LKC "I - J"	Test Type: Conventional Straddle (Initial)
Deviated: No Whipstock: ft (KB)	Tester: Brannan Lonsdale
Time Tool Opened: 07:10:12	Unit No: 73
Time Test Ended: 11:27:57	Reference Elevations: 2039.00 ft (KB)
Interval: 3462.00 ft (KB) To 3520.00 ft (KB) (TVD)	2029.00 ft (CF)
Total Depth: 3751.00 ft (KB) (TVD)	KB to GR/CF: 10.00 ft
Hole Diameter: 7.88 inches	Hole Condition: Fair

Serial #: 6771	Inside	Capacity: 8000.00 psig
Press@RunDepth: psig @ 3464.00 ft (KB)	Start Date: 2017.11.09	Last Calib.: 2017.11.09
Start Time: 03:27:58	End Date: 2017.11.09	Time On Btm:
	End Time: 11:27:48	Time Off Btm:

TEST COMMENT:
30- IF- Slowly built to 7 1/2"
30- IS- No blow
30- FF- BOB 20 mins
30- FS- No blow



PRESSURE SUMMARY

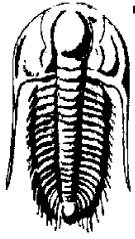
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
159.00	GSOCM, 15%G 5%O 80%M	2.25
0.00	32' GIP	0.00

Gas Rates

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



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DRILL STEM TEST REPORT

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

9-15S-18W Ellis,KS
Munsch #10
 Job Ticket: 63109 **DST#: 1**
 Test Start: 2017.11.09 @ 03:27:51

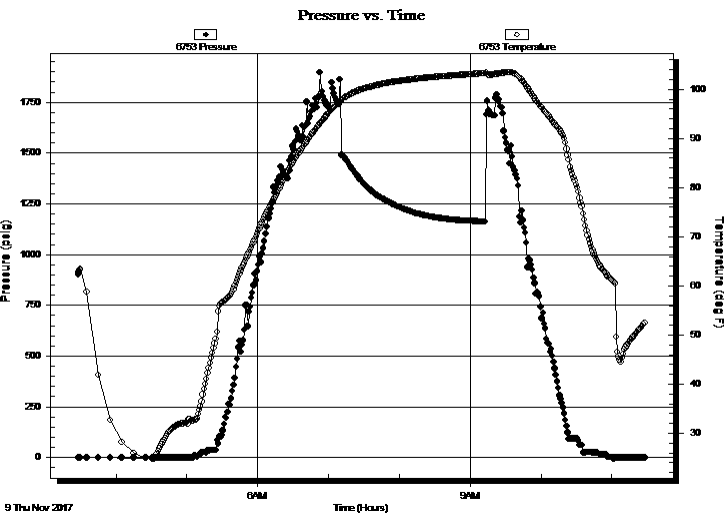
GENERAL INFORMATION:

Formation: **LKC "I - J"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 07:10:12
 Time Test Ended: 11:27:57
 Interval: **3462.00 ft (KB) To 3520.00 ft (KB) (TVD)**
 Total Depth: 3751.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Straddle (Initial)
 Tester: Brannan Lonsdale
 Unit No: 73
 Reference Elevations: 2039.00 ft (KB)
 2029.00 ft (CF)
 KB to GR/CF: 10.00 ft

Serial #: 6753 Below (Straddle)

Press@RunDepth: psig @ 3522.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.11.09 End Date: 2017.11.09 Last Calib.: 2017.11.09
 Start Time: 03:28:20 End Time: 11:28:14 Time On Btm:
 Time Off Btm:

TEST COMMENT: 30- IF- Slowly built to 7 1/2"
 30- IS- No blow
 30- FF- BOB 20 mins
 30- FS- No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
159.00	GSOCM, 15%G 5%O 80%M	2.25
0.00	32' GIP	0.00

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
ATTN: Herb Deines

9-15S-18W Ellis,KS
Munsch #10
Job Ticket: 63109 **DST#: 1**
Test Start: 2017.11.09 @ 03:27:51

Tool Information

Drill Pipe:	Length: 3465.00 ft	Diameter: 3.82 inches	Volume: 49.12 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - 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:	56000.00 lb
			<u>Total Volume:</u> - bbl	Tool Chased	0.00 ft
Drill Pipe Above KB:	23.00 ft			String Weight: Initial	50000.00 lb
Depth to Top Packer:	3462.00 ft			Final	52000.00 lb
Depth to Bottom Packer:	3520.00 ft				
Interval between Packers:	58.00 ft				
Tool Length:	308.00 ft				
Number of Packers:	3	Diameter: 6.75 inches			

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3443.00	
Shut In Tool	5.00			3448.00	
Hydraulic tool	5.00			3453.00	
Packer	5.00			3458.00	20.00 Bottom Of Top Packer
Packer	4.00			3462.00	
Stubb	1.00			3463.00	
Change Over Sub	1.00			3464.00	
Recorder	0.00	6771	Inside	3464.00	
Recorder	0.00	8524	Outside	3464.00	
Drill Pipe	32.00			3496.00	
Change Over Sub	1.00			3497.00	
Perforations	19.00			3516.00	
Blank Off Sub	1.00			3517.00	
Blank Spacing	3.00			3520.00	58.00 Tool Interval
Packer	1.00			3521.00	
Stubb	1.00			3522.00	
Recorder	0.00	6753	Below	3522.00	
Change Over Sub	1.00			3523.00	
Drill Pipe	223.00			3746.00	
Change Over Sub	1.00			3747.00	
Bullnose	3.00			3750.00	230.00 Bottom Packers & Anchor
Total Tool Length:	308.00				



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FLUID SUMMARY

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ATTN: Herb Deines

9-15S-18W Ellis,KS
Munsch #10
Job Ticket: 63109 **DST#: 1**
Test Start: 2017.11.09 @ 03:27:51

Mud and Cushion Information

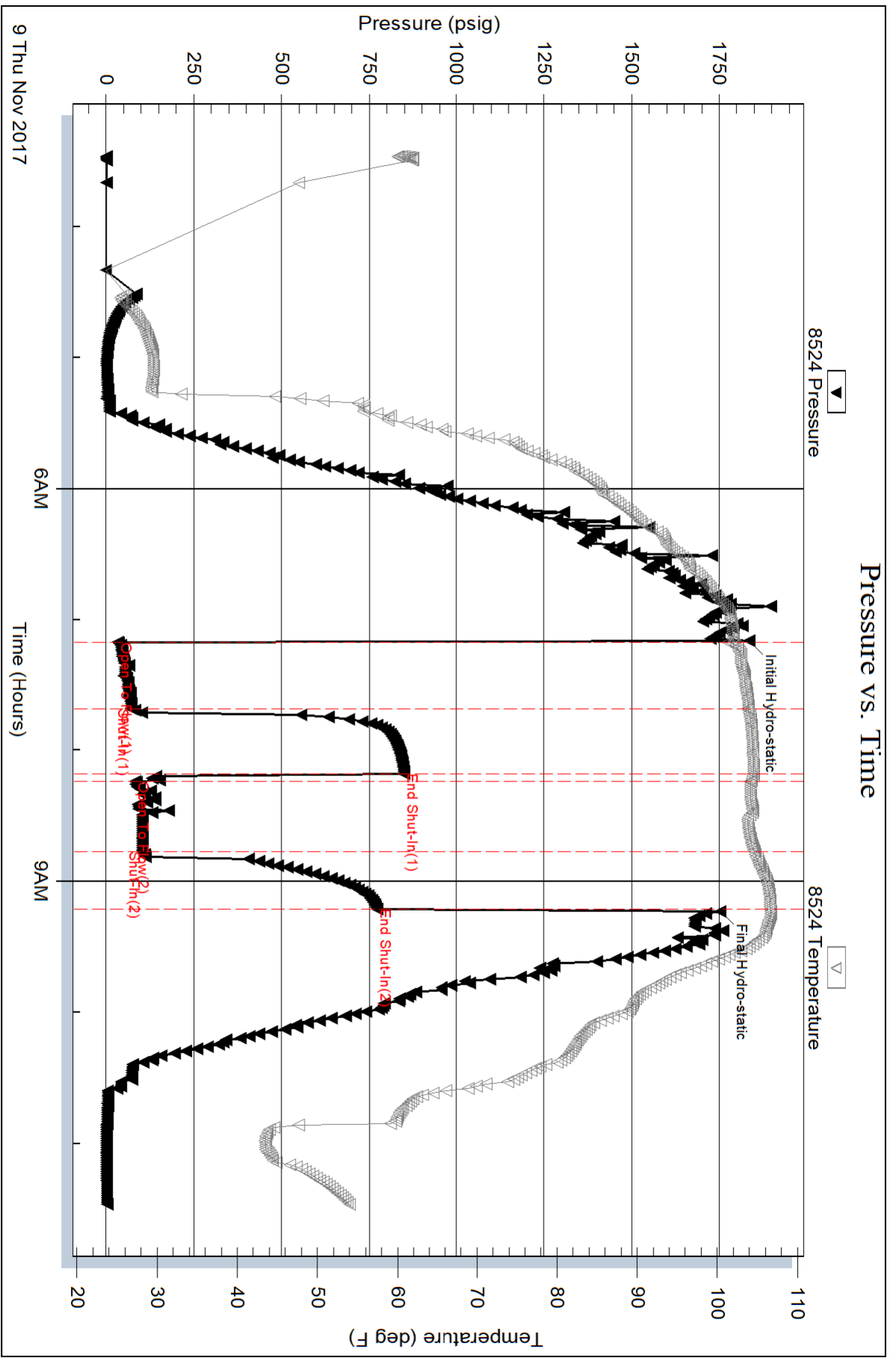
Mud Type: Gel Chem	Cushion Type:	Oil API: 33 deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity: ppm
Viscosity: 51.00 sec/qt	Cushion Volume: bbl	
Water Loss: 7.19 in ³	Gas Cushion Type:	
Resistivity: ohm.m	Gas Cushion Pressure: psig	
Salinity: 4100.00 ppm		
Filter Cake: inches		

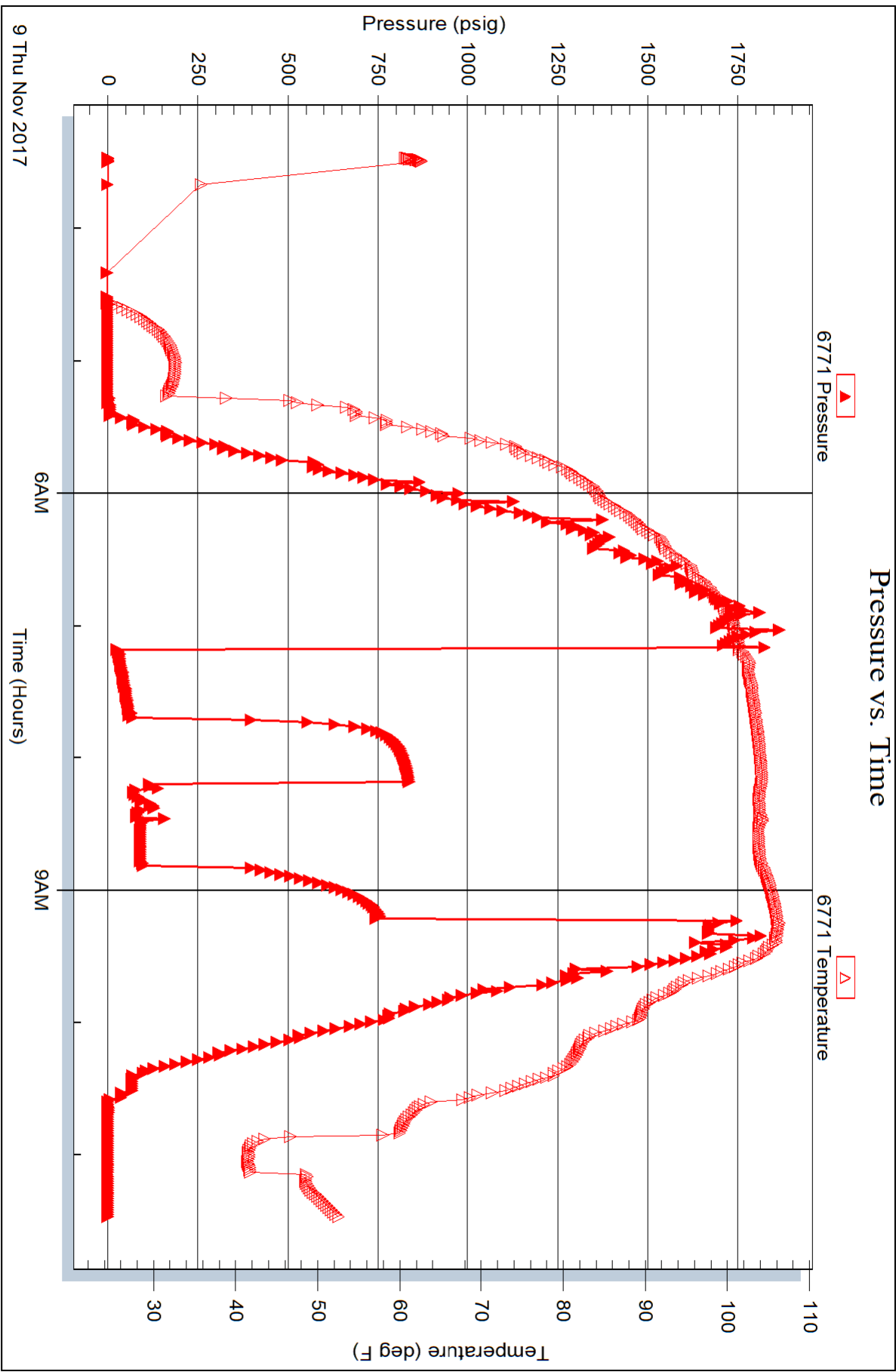
Recovery Information

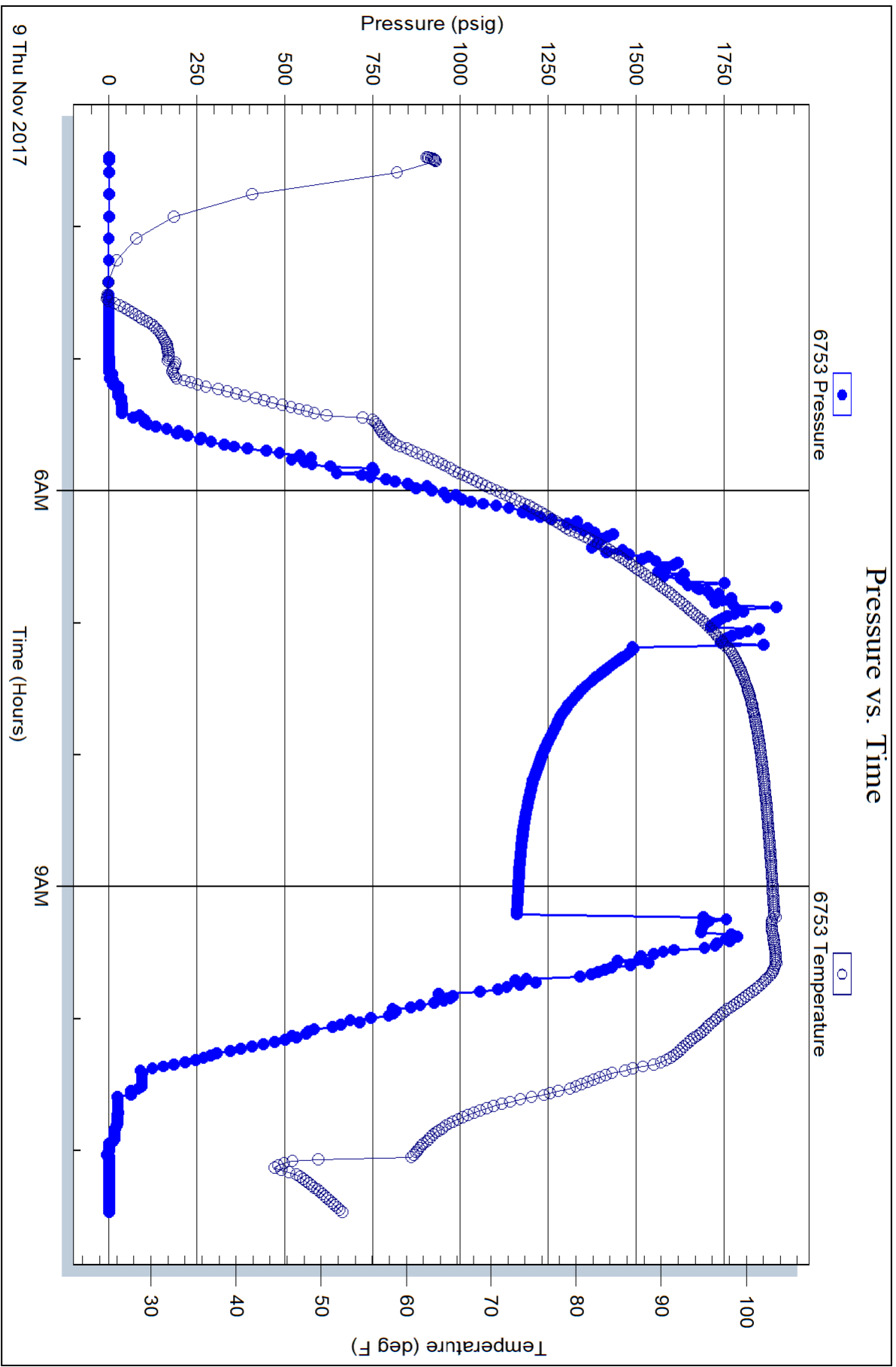
Recovery Table

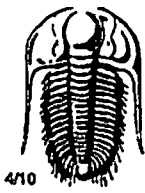
Length ft	Description	Volume bbl
159.00	GSOCM, 15%G 5%O 80%M	2.254
0.00	32' GIP	0.000

Total Length: 159.00 ft Total Volume: 2.254 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. 63109

Well Name & No. Mwasch #10 Test No. 1 Date 11/9/17
 Company TRE, Inc. Elevation 2039 KB 2629GL
 Address 1310 Beson Rd. Hays, KS 67601
 Co. Rep / Geo. Herb Deines Rig Southwind #8
 Location: Sec. 9 Twp. 15 S Rge. 18 W/Co. Ellis State KS

Interval Tested 3462-3520 Zone Tested LKC "IT"
 Anchor Length 58' Tail: 231' Drill Pipe Run 3465 Mud Wt. 9.4
 Top Packer Depth 3457-2462 Drill Collars Run --- Vis 51
 Bottom Packer Depth 3520 Wt. Pipe Run --- WL 7.2
 Total Depth 3751 Chlorides 4,100 ppm System LCM 1*
 Blow Description IF - Built slowly to 7 1/2"
FSI - No blow
PF - BOB 20 mins
FSI - No blow

Rec	Feet of	%gas	%oil	%water	%mud
159	CASOCMA	15	5		80
82	GIP 32'				

Rec Total 159' BHT 107° Gravity 33 API RW --- @ --- °F Chlorides --- ppm

(A) Initial Hydrostatic <u>1836</u>	<input checked="" type="checkbox"/> Test <u>1050</u>	T-On Location <u>0246</u>
(B) First Initial Flow <u>34</u>	<input type="checkbox"/> Jars <u>---</u>	T-Started <u>0328</u>
(C) First Final Flow <u>72</u>	<input type="checkbox"/> Safety Joint <u>---</u>	T-Open <u>0711</u>
(D) Initial Shut-In <u>850</u>	<input type="checkbox"/> Circ Sub <u>---</u>	T-Pulled <u>0911</u>
(E) Second Initial Flow <u>83</u>	<input type="checkbox"/> Hourly Standby <u>---</u>	T-Out <u>1128</u>
(F) Second Final Flow <u>104</u>	<input checked="" type="checkbox"/> Mileage <u>20 RT</u> 15	Comments <u>---</u>
(G) Final Shut-In <u>773</u>	<input type="checkbox"/> Sampler <u>---</u>	
(H) Final Hydrostatic <u>1753</u>	<input checked="" type="checkbox"/> Straddle <u>600</u>	
Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer <u>---</u>	<input type="checkbox"/> Ruined Shale Packer <u>---</u>
Initial Shut-In <u>30</u>	<input type="checkbox"/> Extra Packer <u>---</u>	<input type="checkbox"/> Ruined Packer <u>---</u>
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder <u>---</u>	<input type="checkbox"/> Extra Copies <u>---</u>
Final Shut-In <u>30</u>	<input type="checkbox"/> Day Standby <u>---</u>	Sub Total <u>0</u>
	<input type="checkbox"/> Accessibility <u>---</u>	Total <u>1665</u>
	Sub Total <u>1665</u>	MP/DST Disc't <u>---</u>

Approved By _____

Our Representative
Brannan Lonsdale