



DRILL STEM TEST REPORT

Prepared For: **Sam Gary**

1515 Wynkoop St. Ste 700
Denver, CO
80202

ATTN: Claton Camozzi

1-16-16/Rush

Wagner Trust 4-1

Start Date: 2011.04.26 @ 08:34:38

End Date: 2011.04.26 @ 16:08:38

Job Ticket #: 42555 DST #: 1

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



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Sam Gary
 1515 Wynkoop St. Ste 700
 Denver, CO
 80202
 ATTN: Claton Camozzi

Wagner Trust 4-1
1-16-16/Rush
 Job Ticket: 42555 **DST#: 1**
 Test Start: 2011.04.26 @ 08:34:38

GENERAL INFORMATION:

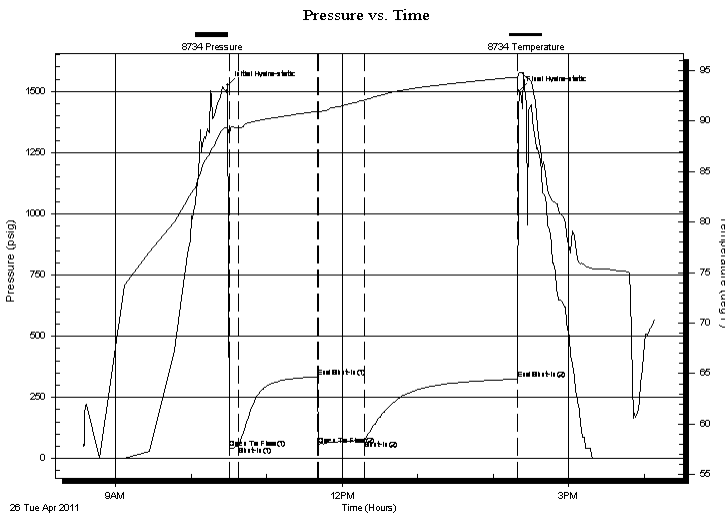
Formation: **LKC "A-C"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 10:30:08
 Time Test Ended: 16:08:38
Interval: 3151.00 ft (KB) To 3213.00 ft (KB) (TVD)
 Total Depth: 3213.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition:
 Test Type: Conventional Bottom Hole
 Tester: Brian Fairbank
 Unit No: 41
 Reference Elevations: 1917.00 ft (KB)
 1909.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 8734 Outside

Press @ Run Depth: 74.87 psig @ 3157.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2011.04.26 End Date: 2011.04.26 Last Calib.: 2011.04.26
 Start Time: 08:34:39 End Time: 16:08:38 Time On Btm: 2011.04.26 @ 10:29:08
 Time Off Btm: 2011.04.26 @ 14:20:38

TEST COMMENT: 10 - IFP - BOB 6 min
 60 - ISI - no blow back
 40 - FFP - BOB 5 min
 120 - FSI - 1" blow back

PRESSURE SUMMARY



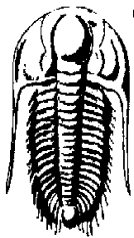
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1523.80	89.44	Initial Hydro-static
1	41.03	88.64	Open To Flow (1)
9	51.89	89.32	Shut-In(1)
71	334.19	90.96	End Shut-In(1)
72	54.97	90.88	Open To Flow (2)
109	74.87	92.09	Shut-In(2)
230	324.49	94.35	End Shut-In(2)
232	1501.21	94.76	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
65.00	GO & WCM 25%G, 10%O, 20%W, 45%M	0.64
45.00	GM 5%G, 95%M	0.63
0.00	150' GIP	0.00

Gas Rates

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



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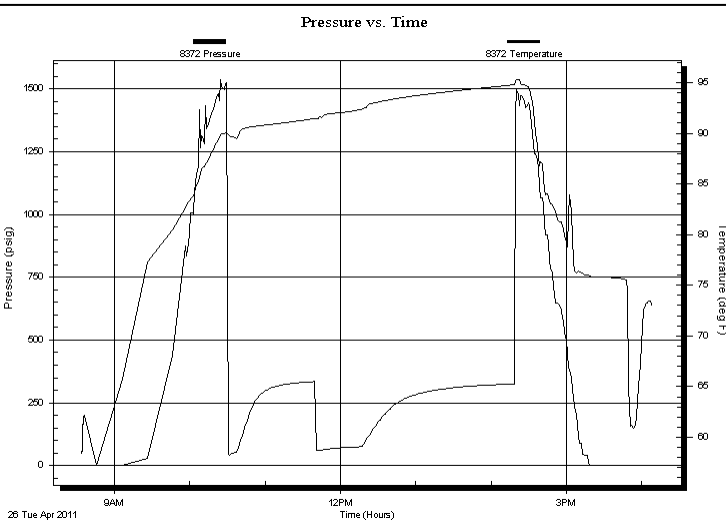
Wagner Trust 4-1
1-16-16/Rush
 Job Ticket: 42555 **DST#: 1**
 Test Start: 2011.04.26 @ 08:34:38

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 Hole Condition:
 Test Type: Conventional Bottom Hole
 Tester: Brian Fairbank
 Unit No: 41
 Reference Elevations: 1917.00 ft (KB)
 1909.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 8372 Inside
 Press @ Run Depth: psig @ 3157.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2011.04.26 End Date: 2011.04.26 Last Calib.: 2011.04.26
 Start Time: 08:34:09 End Time: 16:08:38 Time On Btm:
 Time Off Btm:

TEST COMMENT: 10 - IFP - BOB 6 min
 60 - ISI - no blow back
 40 - FFP - BOB 5 min
 120 - FSI - 1" blow back



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
65.00	GO & WCM 25%G, 10%O, 20%W, 45%M	0.64
45.00	GM 5%G, 95%M	0.63
0.00	150' GIP	0.00

Gas Rates

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



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DRILL STEM TEST REPORT

TOOL DIAGRAM

Sam Gary
1515 Wynkoop St. Ste 700
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ATTN: Claton Camozzi

Wagner Trust 4-1
1-16-16/Rush
Job Ticket: 42555 **DST#: 1**
Test Start: 2011.04.26 @ 08:34:38

Tool Information

Drill Pipe:	Length: 3105.00 ft	Diameter: 3.80 inches	Volume: 43.55 bbl	Tool Weight: 2500.00 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: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 55000.00 lb
			<u>Total Volume: 43.70 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	19.00 ft			String Weight: Initial 45000.00 lb
Depth to Top Packer:	3151.00 ft			Final 47000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	62.00 ft			
Tool Length:	97.00 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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Recorder	0.00	8365	Fluid	3116.00	
Blank Spacing	5.00			3121.00	
Shut In Tool	5.00			3126.00	
Sampler	3.00			3129.00	
Hydraulic tool	5.00			3134.00	
Jars	5.00			3139.00	
Safety Joint	2.00			3141.00	
Packer	5.00			3146.00	35.00 Bottom Of Top Packer
Packer	5.00			3151.00	
Stubb	1.00			3152.00	
Perforations	4.00			3156.00	
Change Over Sub	1.00			3157.00	
Recorder	0.00	8372	Inside	3157.00	
Recorder	0.00	8734	Outside	3157.00	
Blank Spacing	32.00			3189.00	
Change Over Sub	1.00			3190.00	
Perforations	20.00			3210.00	
Bullnose	3.00			3213.00	62.00 Bottom Packers & Anchor

Total Tool Length: 97.00



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FLUID SUMMARY

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Job Ticket: 42555 **DST#: 1**
Test Start: 2011.04.26 @ 08:34:38

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:	40000 ppm
Viscosity: 53.00 sec/qt	Cushion Volume: bbl		
Water Loss: 7.98 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 6100.00 ppm			
Filter Cake: inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
65.00	GO & WCM 25%G, 10%O, 20%W, 45%M	0.638
45.00	GM 5%G, 95%M	0.631
0.00	150' GIP	0.000

Total Length: 110.00 ft Total Volume: 1.269 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location:
 Recovery Comments: SAMPLER: 1200ml G, 1400ml O, 600ml M, 800ml W, 260#

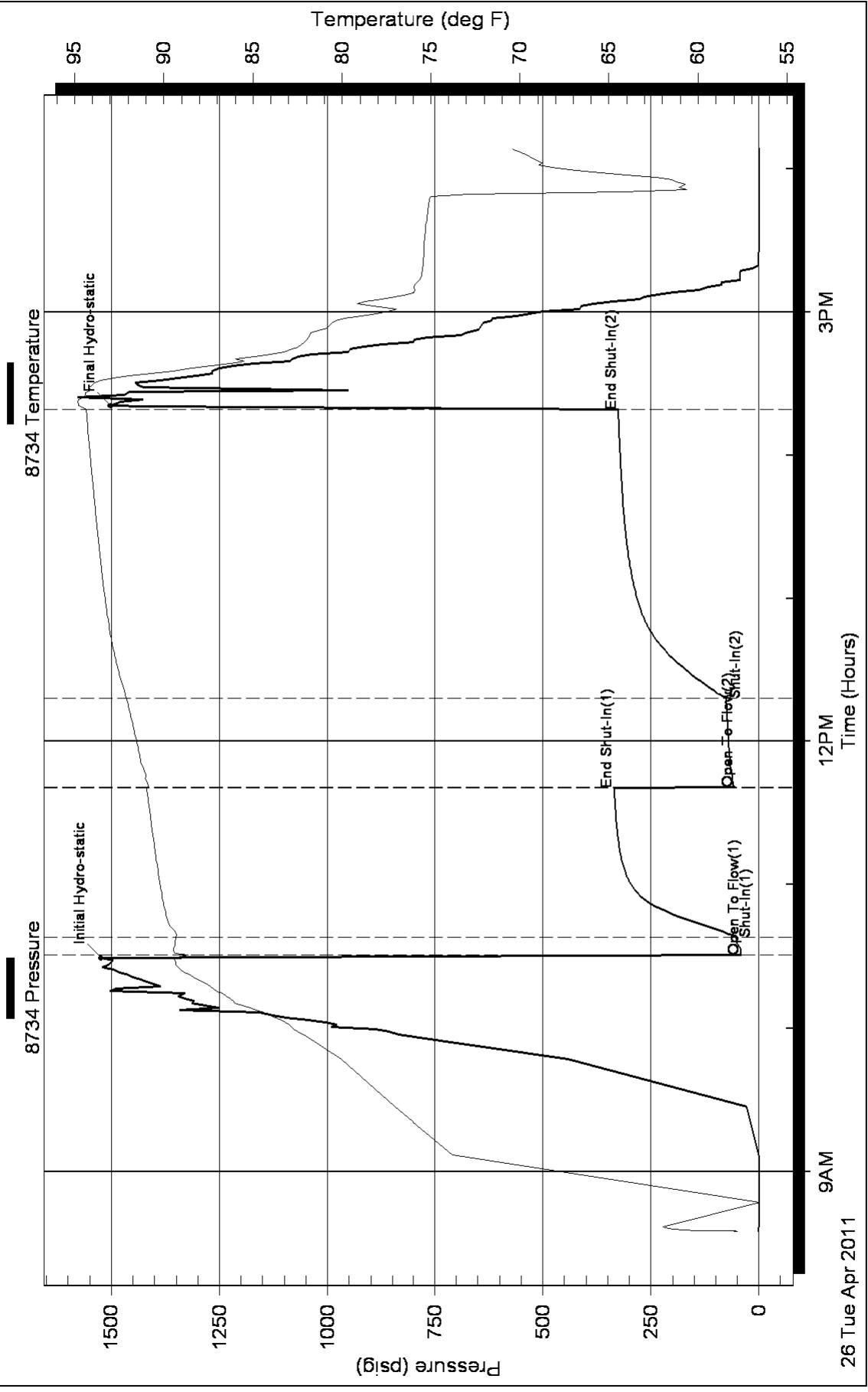
Serial #: 8734

Outside Sam Gary

1-16-16/Rush

DST Test Number: 1

Pressure vs. Time



Serial #: 8372

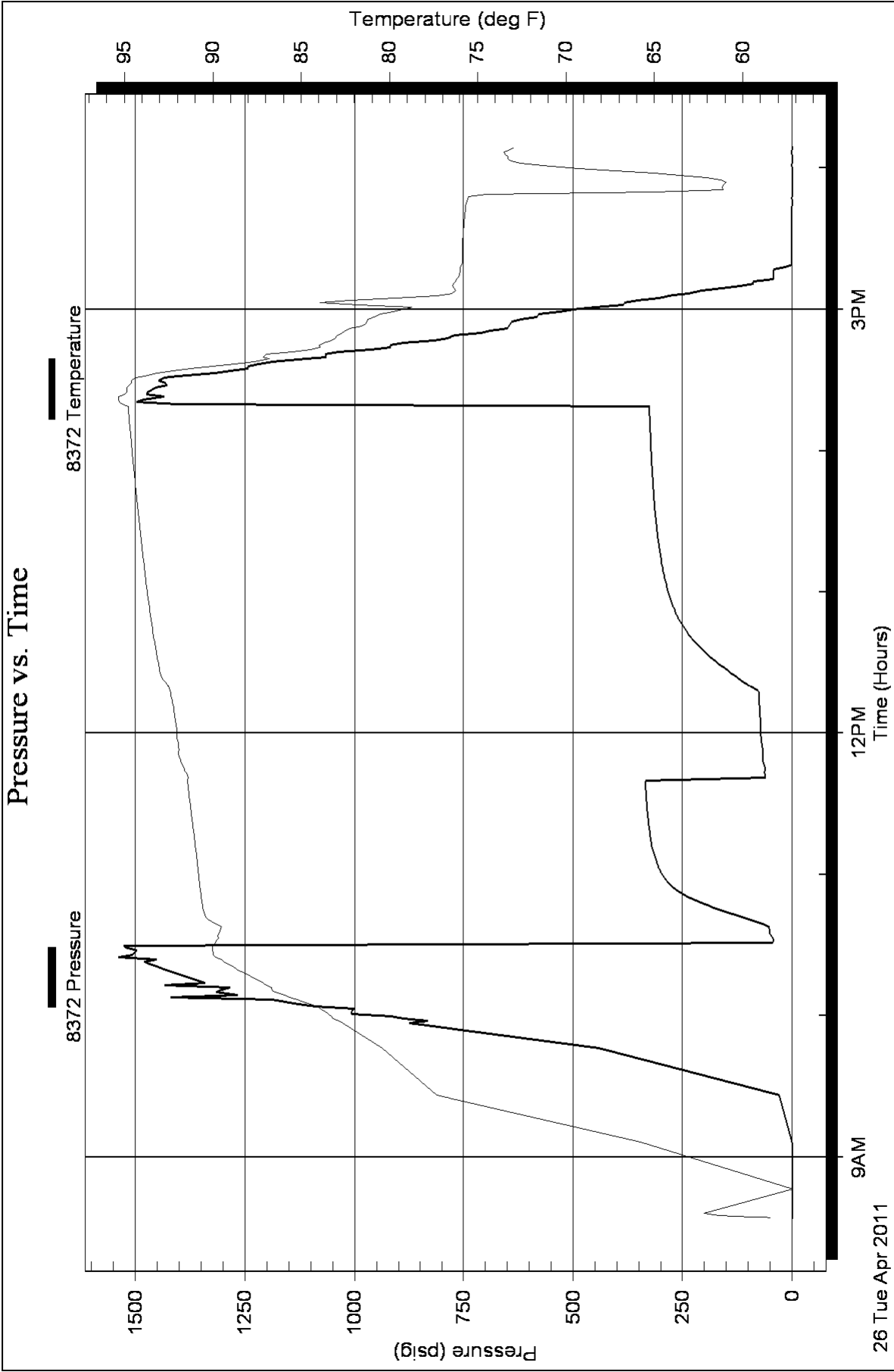
Inside

Sam Gary

1-16-16/Rush

DST Test Number: 1

Pressure vs. Time



Serial #: 8365

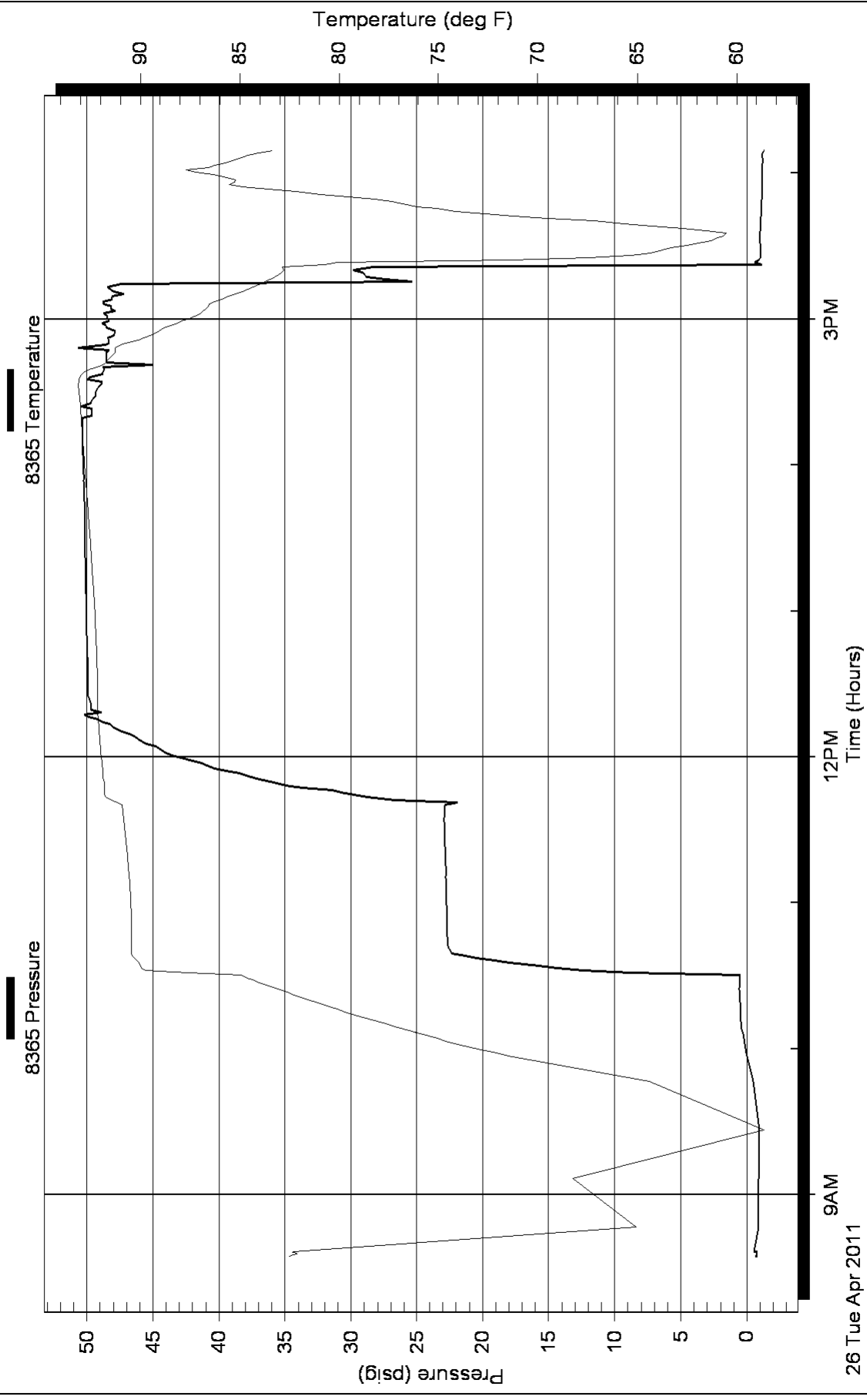
Fluid

Sam Gary

1-16-16/Rush

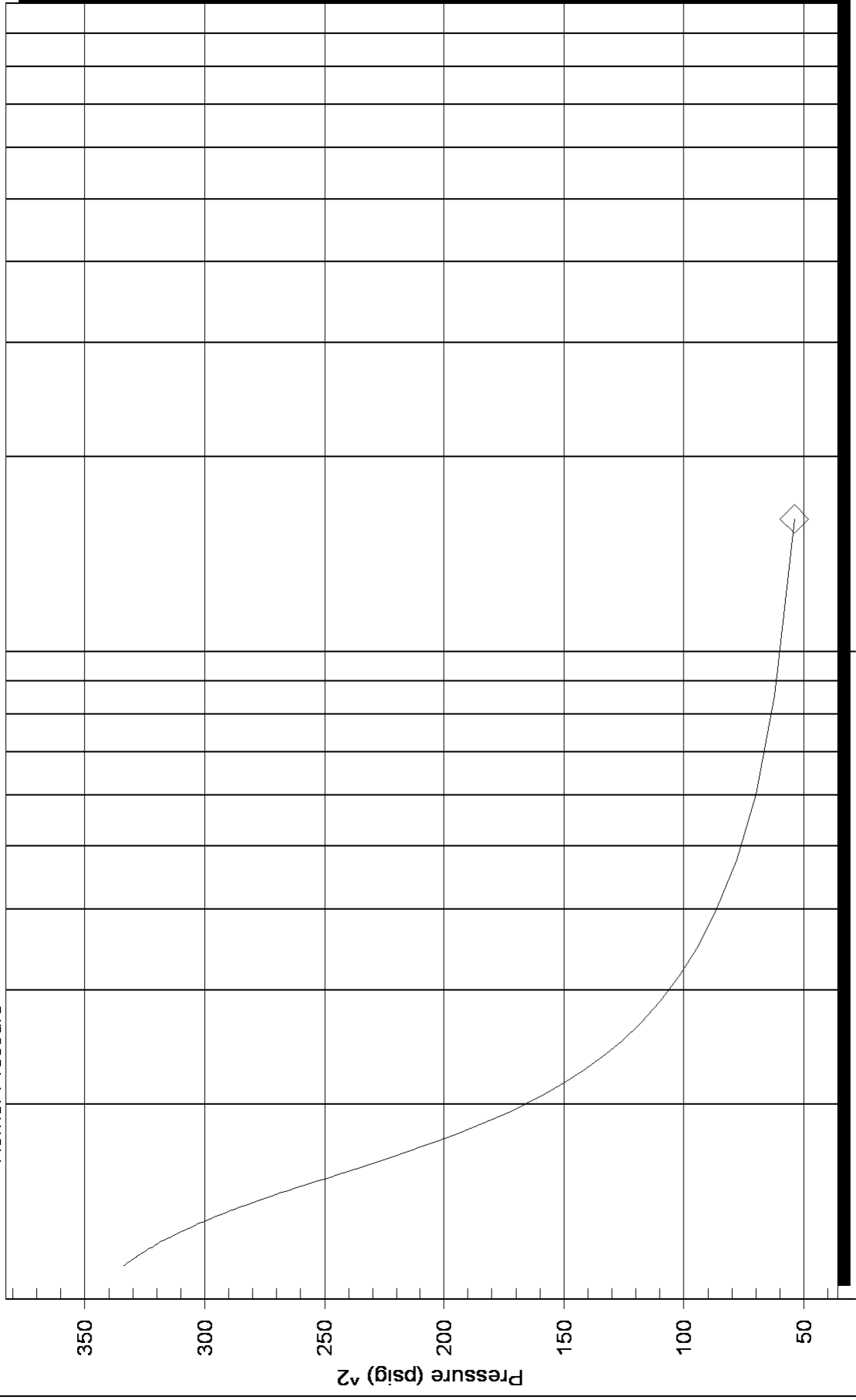
DST Test Number: 1

Pressure vs. Time



Homer Plot

Horner Pressure



Horner Time: (Twf + dt) / dt

Slope (m) : kpa/log cycle

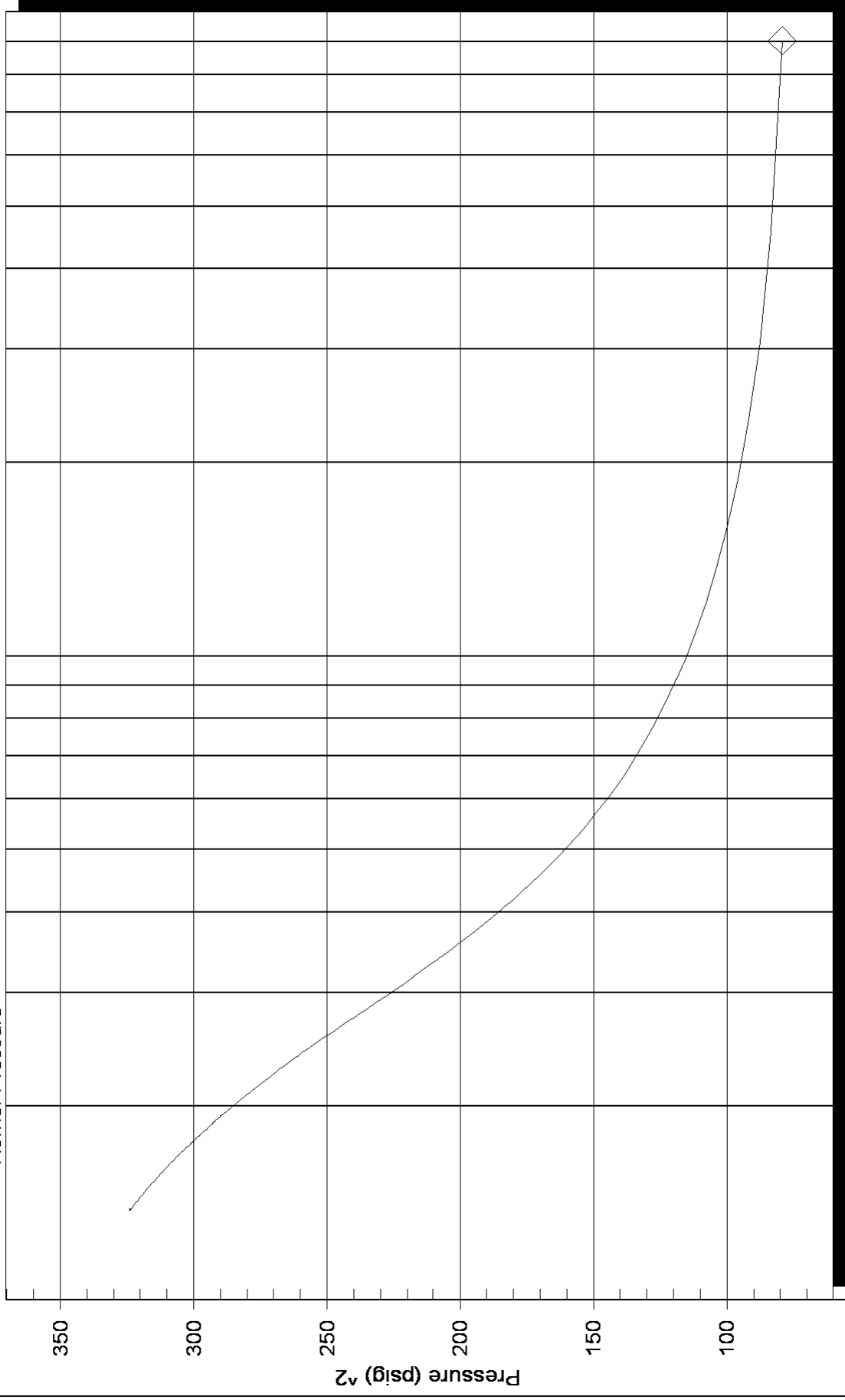
P* :

Serial Number: 8734 (Outside)

Flow Cycle: 1

Homer Plot

Horner Pressure



10⁰

10¹

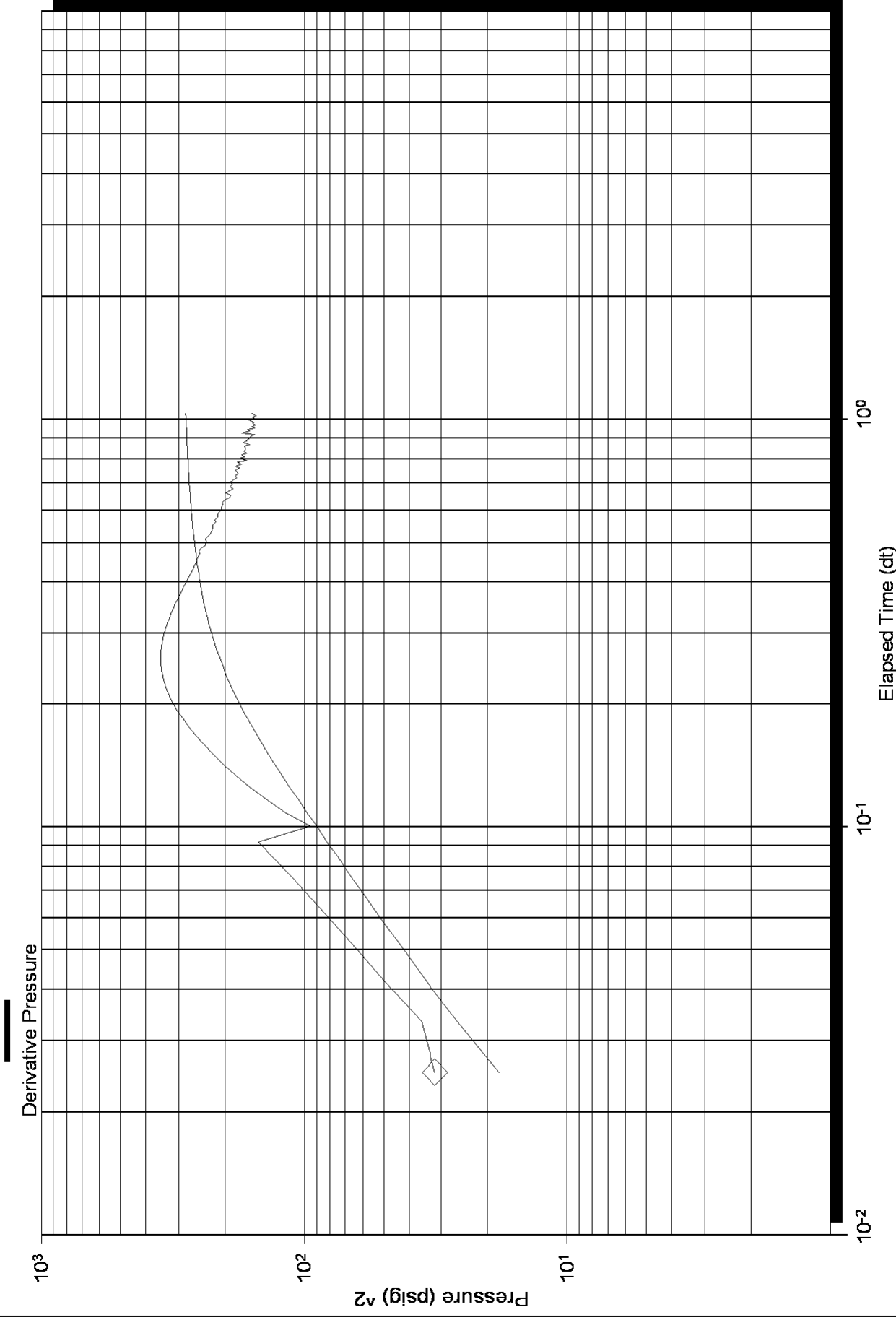
Horner Time: $(T_{wf} + dt) / dt$

P* : Slope (m) : kpa/log cycle

Serial Number: 8734 (Outside)

Flow Cycle: 2

Log-Log and Pseudo-Derivative



Log-Log and Pseudo-Derivative

