

OPERATOR: WIEPKING - FULLERTON ENERGY LLC
WELL NAME: MAHALO 2

TEST NO: 2
TICKET NO: 2873

Contractor Murfin Drilling
Rig No. 25
Spot NE/NW
Sec 29
Twp 10 S
Rng 55 W
Field Great Plains
County Lincoln
State Colorado
Elevation 5225' KB - 5215' GL
Formation Cherokee

Surface Choke 1"
Bottom Choke 5/8"
Hole Size 7 7/8"
Core Hole Size
DP Size & Wt 4 1/2" 16.60
Wt Pipe
ID of DC 2 3/8"
Length of DC 542'
Total Depth 7125'
Type of Test Open Hole Dst
Interval 7090' - 7125'

Mud Type Chemical/Gel
Weight 9.0
Viscosity 62
Water Loss 8.8
Filter Cake
RW 1.3 @ 74 Deg F
Chlorides 4,174 Ppm

Co. Rep. Ralph Stansbury
Tester Mark Green

Pipe Recovery:

Reverse circulated:
5569' Gassy oil = 74.36 bbl.

Properties:

Surface blow:

Pre-Flow: Began with a bottom of bucket blow, increased to 22.0 psi at 11 minutes with gas to surface and remained thru flow period.
Flow: Began with a bottom of bucket blow, fluctuated 10.0 oz to 15.0 oz thru flow period.

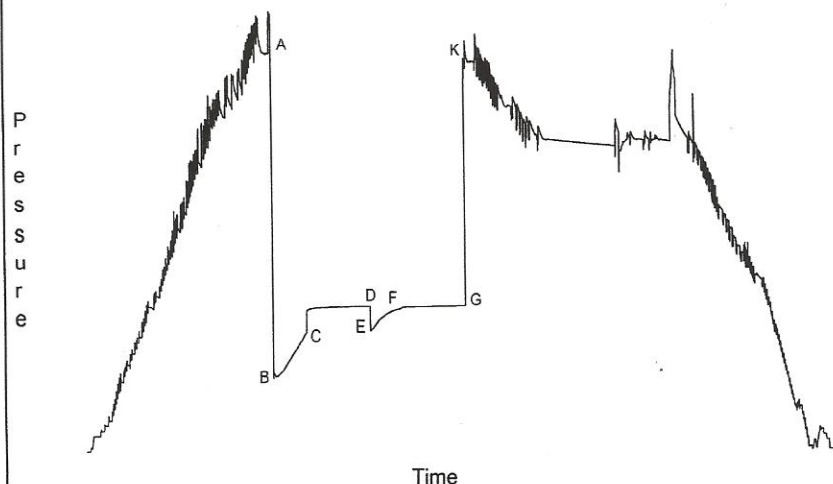
Downhole Sampler:

Pressure in Sampler 900 psig
Volume of Sampler 2050 cc
Volume of Sample 1450 cc
Oil: 1450 cc
Water: 0 cc
Mud: 0 cc
Gas: 5.54 cu ft
Other: 0
RW:
Chlorides:
Gas/Oil Ratio 611/1 cu.-ft./bbl.
Gravity 36.0 API @ 60 Deg F

Opened Tool @ 06:10 hrs on 07/12/2011

| | Reported | Corrected | |
|-----------|----------|-----------|-----|
| Flow 1 | 31 | 31 | min |
| Shut-in 1 | 60 | 60 | min |
| Flow 2 | 30 | 29 | min |
| Shut-in 2 | 60 | 59 | min |

Downhole Pressure Chart



Downhole Pressure Data

Recorder Type JMCO Memory Recorder
No. 30024 Cap 10000 psi
Depth 7071 ft.
Inside x Outside
Psi(a) Deg (f)
Initial Hydrostatic [A] 3292
Final Hydrostatic [K] 3215
Initial Flow 1 [B] 637 172
Final Flow 1 [C] 995 188
Initial Flow 2 [E] 1003 180
Final Flow 2 [F] 1175 186
Shut-in 1 [D] 1198 180
Shut-in 2 [G] 1199 182
Maximum Temperature 188

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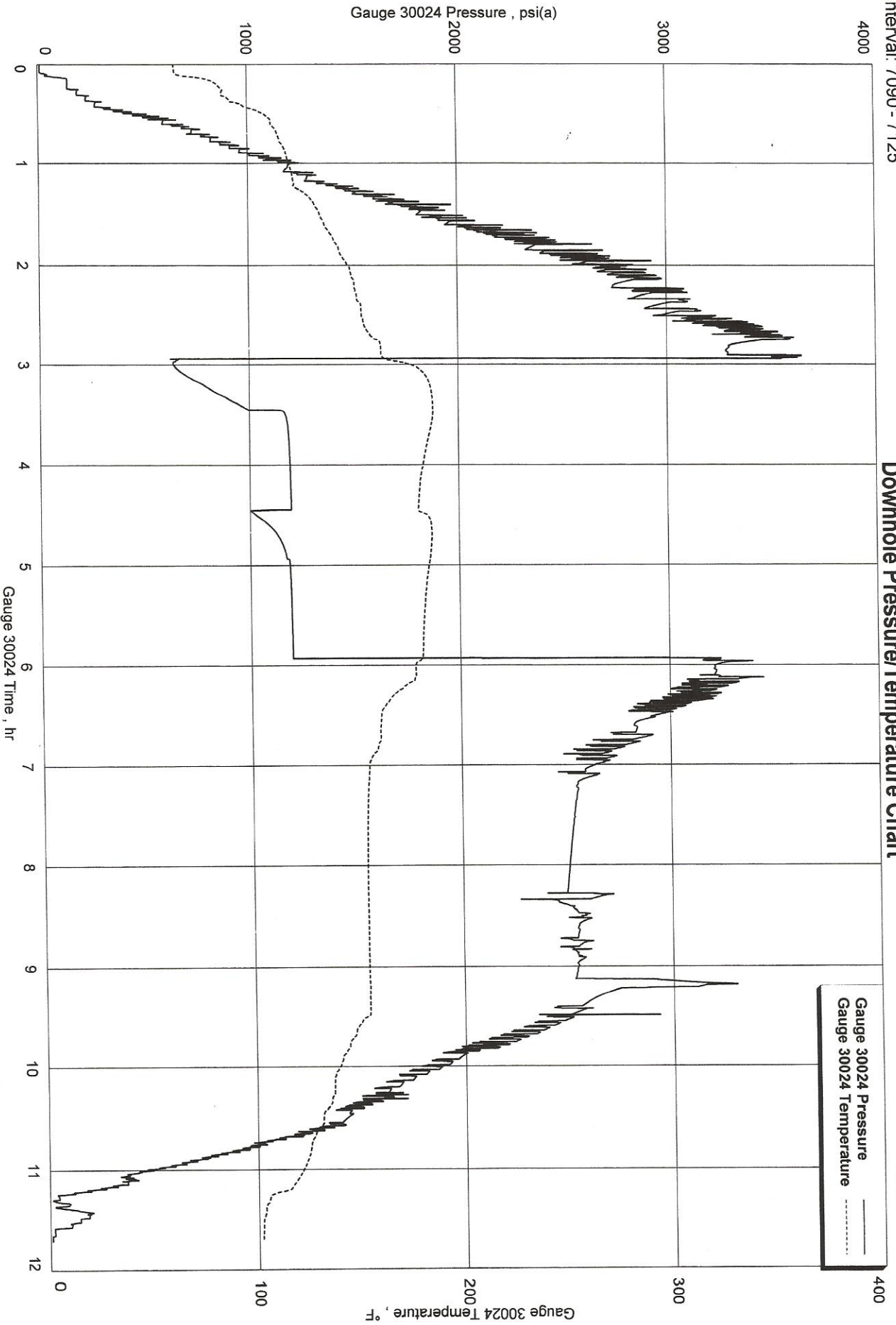
FORMATION: CHEROKEE
INTERVAL: 7090 - 7125'

TEST NO: 2
DATE: 07/12/2011



Downhole Pressure/Temperature Chart

Mahalo 2, Dst 2
Formation: Cherokee



Drill Stem Test – Buildup Interpretation

OPERATOR: Wiepking – Fullerton Energy LLC
WELL NAME: Mahalo 2
TEST NO: 2

Comments relative to analysis of the data obtained from the drill stem test that was run in the Cherokee formation by Test-A-Log Co. The evaluation criteria used in the drill stem test analysis system indicate the tools functioned properly and this is a successful test from a mechanical perspective.

This analysis is based upon the liquid recovery and equations applicable to liquid recovery tests; and established reservoir analysis techniques. A significant change in slope is noted on the diagnostic plots of both shut-in buildup curves, perhaps due to the presence of a boundary, but which represents a decrease in reservoir quality of nearly ten fold. The radius of investigation at the time of this slope change is about 95 – 100 feet. A composite oil well model was used for type curve matching and non-linear regression analysis. As well, a straight-line radial solution was used on the early time radial flow regime. It has been assumed, for purposes of this analysis that the tested reservoir system consisted of a single porosity zone 15 feet in thickness with an average porosity of 18 percent.

The diagnostic plots indicate a maximum initial reservoir pressure of approximately 1208 psi and a maximum final reservoir pressure of 1209 psi, which is equivalent to a subsurface pressure gradient of 0.171 psi/ft at gauge depth.

The Average Production Rates, which were used in this analysis, have been calculated from analysis of the flow pressure curves. Additionally, a straight-line solution and slope calculations have been generated for verification purposes.

SUMMARY:

The primary pressure derivatives are consistent and indicate the entire buildup is reservoir related and should be considered in the evaluation. As noted above, a significant slope change is noted with may indicate a reservoir boundary at approximately 95 – 100 feet of the well bore. A very good curve match was obtained and the average error was only 0.006 percent, therefore confidence levels are high. There was no significant skin damage present at the time of this formation test. The results obtained in this analysis should be reliable within reasonable limits relative to the assumptions, which have been made.

Michael Hudson
Analyst
(888) 389-8389



Drill Stem Test - Buildup

Composite Oil Well Model

Wiepking - Fullerton Energy LLC

Interval: 7090'- 7125'

Mahalo 2, Dst 2

Formation: Cherokee

Model Parameters

Formation Parameters

Region 1

Region 2

| | |
|---------------------------------|----------------------------|
| Total Mobility $(k/\mu)_t$ | 519.55 md/cp |
| Permeability $(k)_1$ | 474.000 md |
| Net Pay $(h)_1$ | 15.00 ft |
| Total Porosity $(\phi_t)_1$ | 18.00 % |
| Viscosity $(\mu)_1$ | 0.912 cp |
| Total Compressibility $(c_t)_1$ | 2.096e-5 psi ⁻¹ |
| Region Radius $(r)_1$ | 99.944 ft |
| Skin (s) | 0.620 |

| | |
|---------------------------------|----------------------------|
| Total Mobility $(k/\mu)_t$ | 55.33 md/cp |
| Permeability $(k)_2$ | 50.476 md |
| Net Pay $(h)_2$ | 15.00 ft |
| Total Porosity $(\phi_t)_2$ | 18.00 % |
| Viscosity $(\mu)_2$ | 0.912 cp |
| Total Compressibility $(c_t)_2$ | 2.096e-5 psi ⁻¹ |
| Region Radius $(r)_2$ | 360.000 ft |

| | |
|-----------------------------|----------|
| Oil Saturation (S_o) | 80.00 % |
| Gas Saturation (S_g) | 0.00 % |
| Water Saturation (S_w) | 20.00 % |
| Wellbore Radius (r_w) | 0.33 ft |
| Formation Temperature (T) | 188.0 °F |

Fluid Properties

| | |
|-------------------------------------|------------------------------|
| Oil Compressibility (c_o) | 2.06453e-5 psi ⁻¹ |
| Gas Compressibility (c_g) | 8.97143e-4 psi ⁻¹ |
| Oil Formation Volume Factor (B_o) | 1.172 |
| Gas Formation Volume Factor (B_g) | 0.002459 bbl/scf |
| Oil Viscosity (μ_o) | 0.912 cp |
| Gas Viscosity (μ_g) | 0.0141 cp |
| Solution Gas Ratio (R_s) | 197 scf/bbl |
| Oil Gravity (γ_o) | 36.00 ° API |
| PVT Reference Pressure (p_{pVT}) | 1198.75 psi |
| Bubble Point Pressure (P_{bp}) | 1198.75 psi |

Production and Pressure

| | |
|---------------------------------------|---------------|
| $Q_t B_t$ | 115.097 bbl/d |
| Final Oil Rate | 98.200 bbl/d |
| Final Flowing Pressure (p_{wfo}) | 1175.25 psi |
| Final Measured Pressure | 1198.75 psi |
| Cumulative Oil Production During Test | 22.291 bbl |

Forecasts

Synthesis Results

| | |
|--|-------------|
| Average Error | 5.64e-3 % |
| Synthetic Initial Pressure (p_i) | 1215.04 psi |
| Extrapolated Pressure at Specified Time | 1208.68 psi |
| Pressure Drop Due To Skin (Δp_s) | 1.29 psi |
| Flow Efficiency (FE) | 0.961 |
| Damage Ratio (DR) | 1.040 |

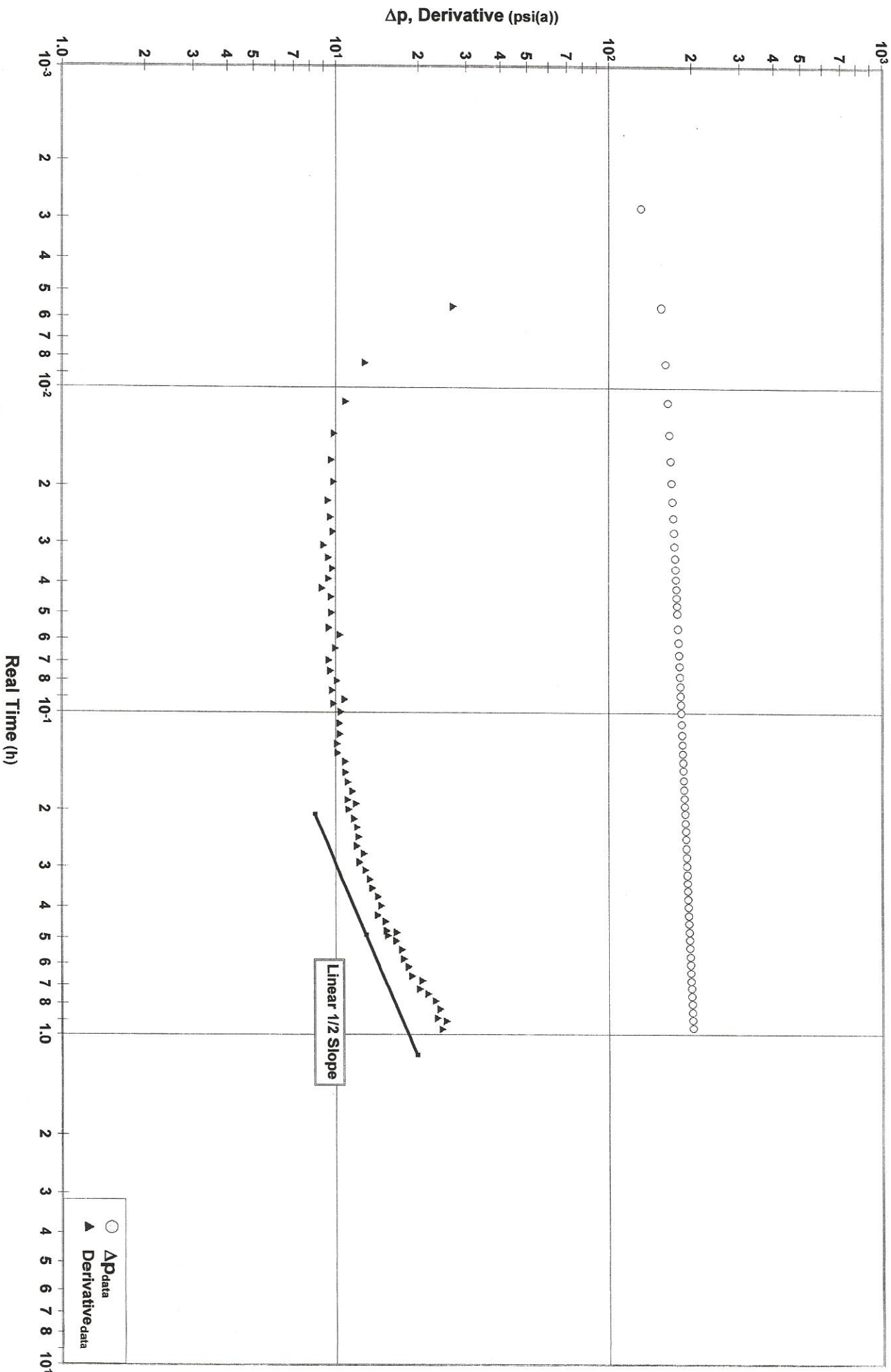
| | |
|---|-----------------|
| Forecast Flowing Pressure (P_{flow}) | 1175.25 psi |
| 3 - Month Constant Rate Forecast @ Curr. Skin | 1.269 bbl/d |
| 6 - Month Constant Rate Forecast @ Curr. Skin | 0.638 bbl/d |
| Forecast Flow Duration (t_{flow}) | 12.00 month |
| Constant Rate Forecast @ Curr. Skin | 0.320 bbl/d |
| PI / II (Total Liquids - Actual) | 3.904 bbl/d/psi |
| Constant Rate Forecast @ Skin=0 | 0.320 bbl/d |
| PI / II (Total Liquids - Ideal) | 4.115 bbl/d/psi |
| Constant Rate Forecast @ Skin=-4 | 0.320 bbl/d |

Wiepking - Fullerton Energy LLC
Interval: 7090' - 7125'

Diagnostic Plot - Shut In 1

Typecurve

Mahalo 2, Dst 2
Formation: Cherokee

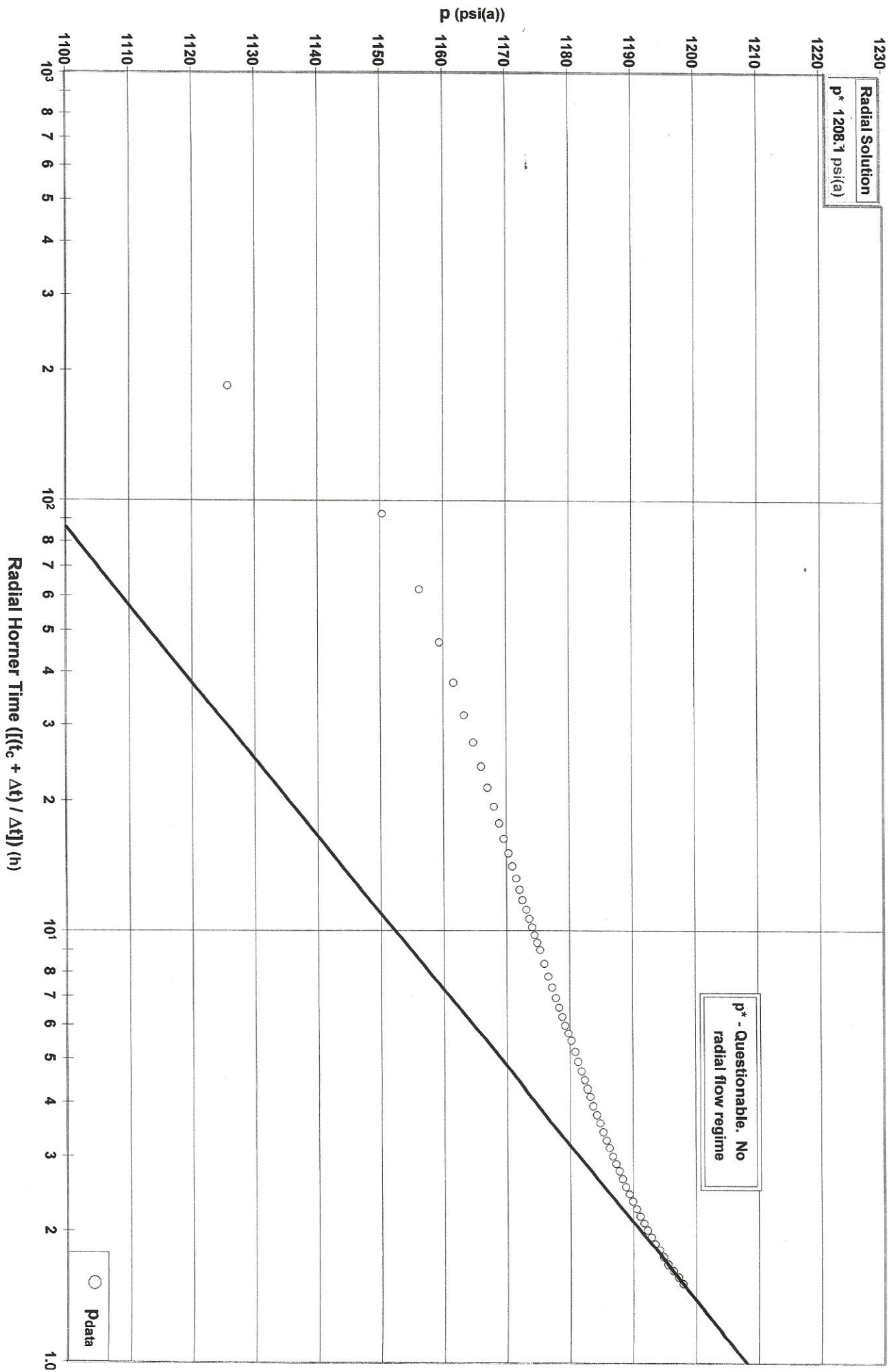


Whepking - Fullerton Energy LLC
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Diagnostic Plot - Shut In 1

Radial

Mahalo 2, Dst 2
Formation: Cherokee

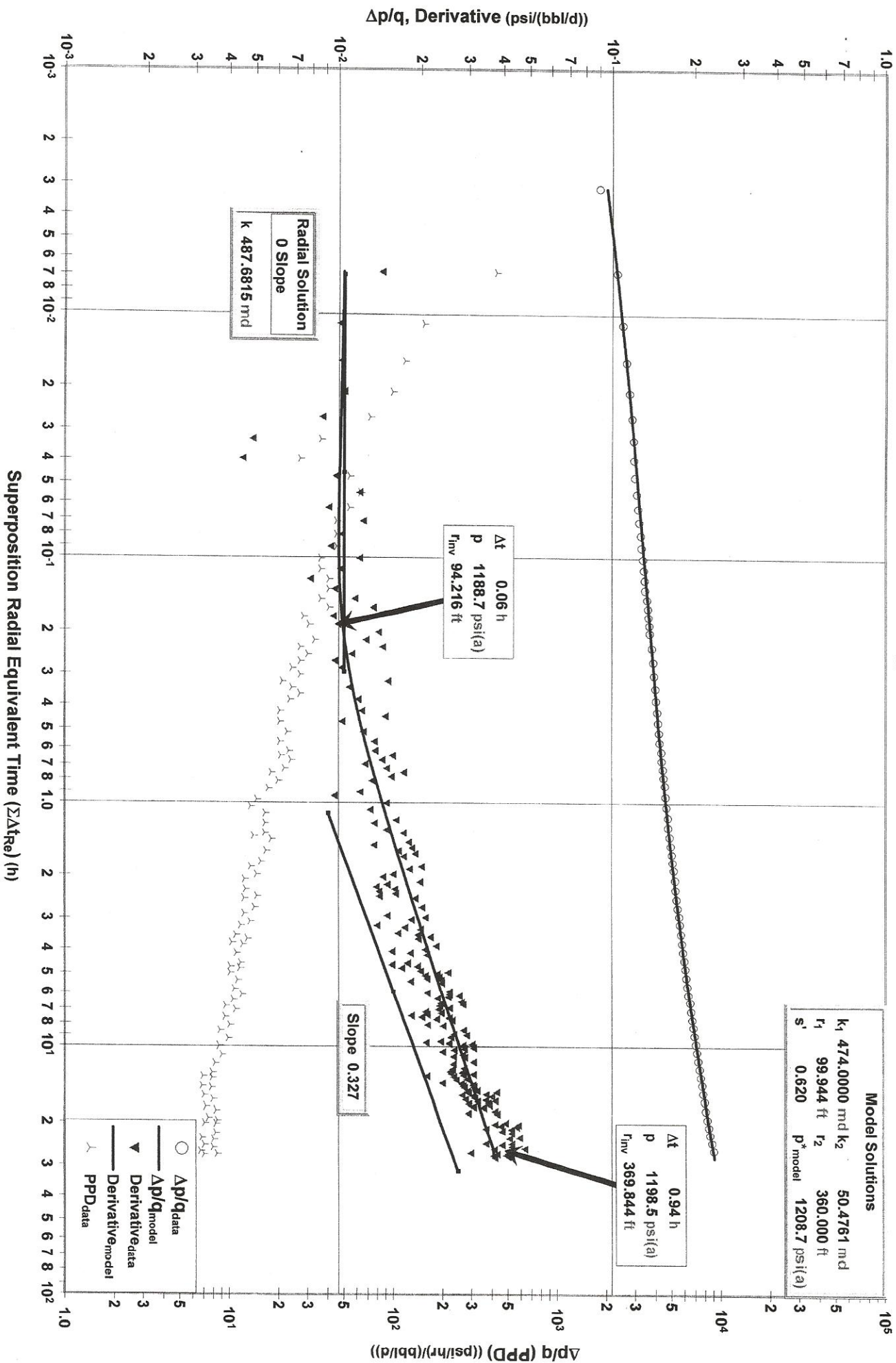


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Composite Model - Shut In 2

Typecurve

Mahato 2, Dst 2
Formation: Cherokee

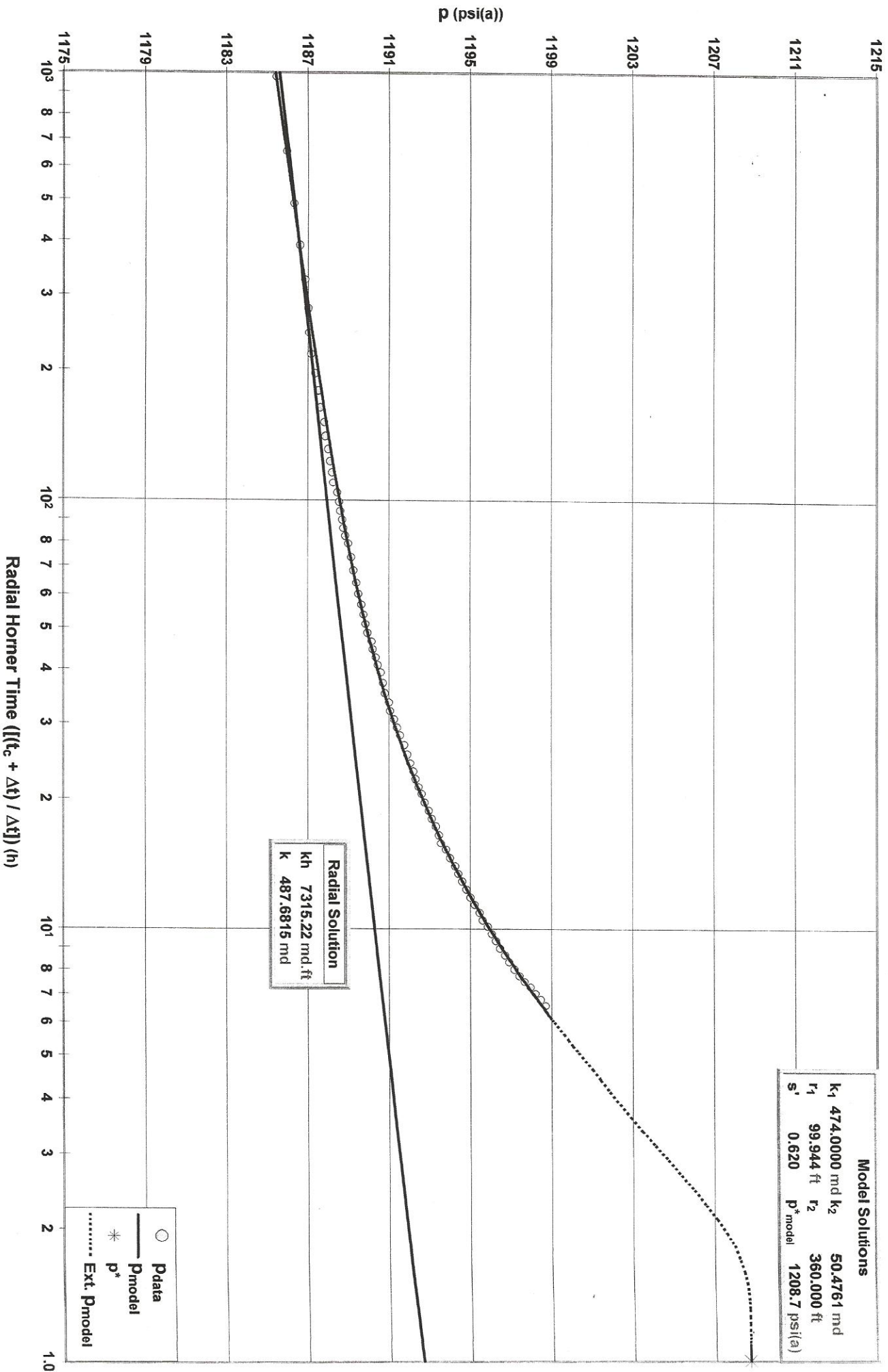


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Composite Model - Shut In 2

Radial

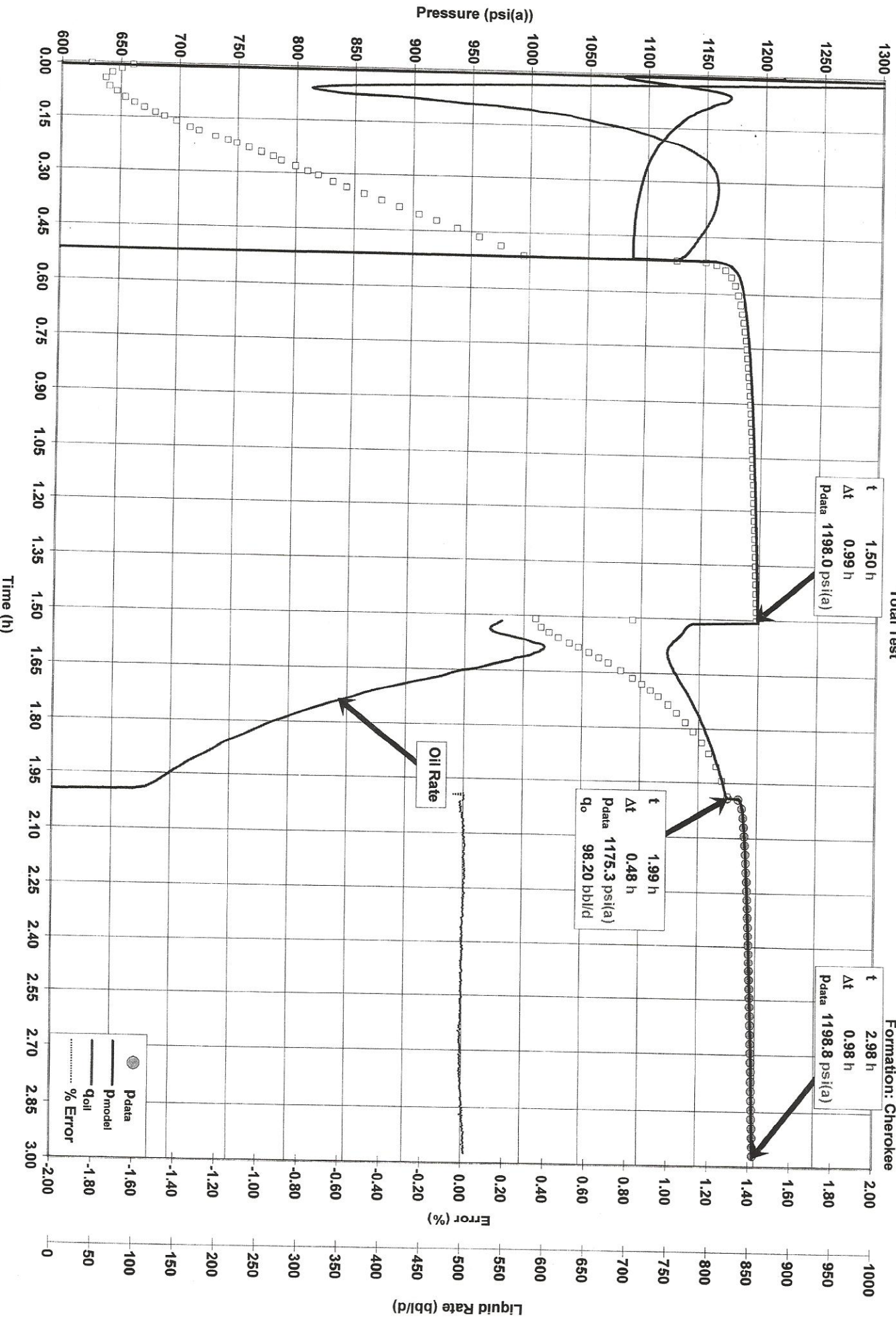
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Wiepking - Fullerton Energy LLC
Interval: 7090' - 7125'

Total Test

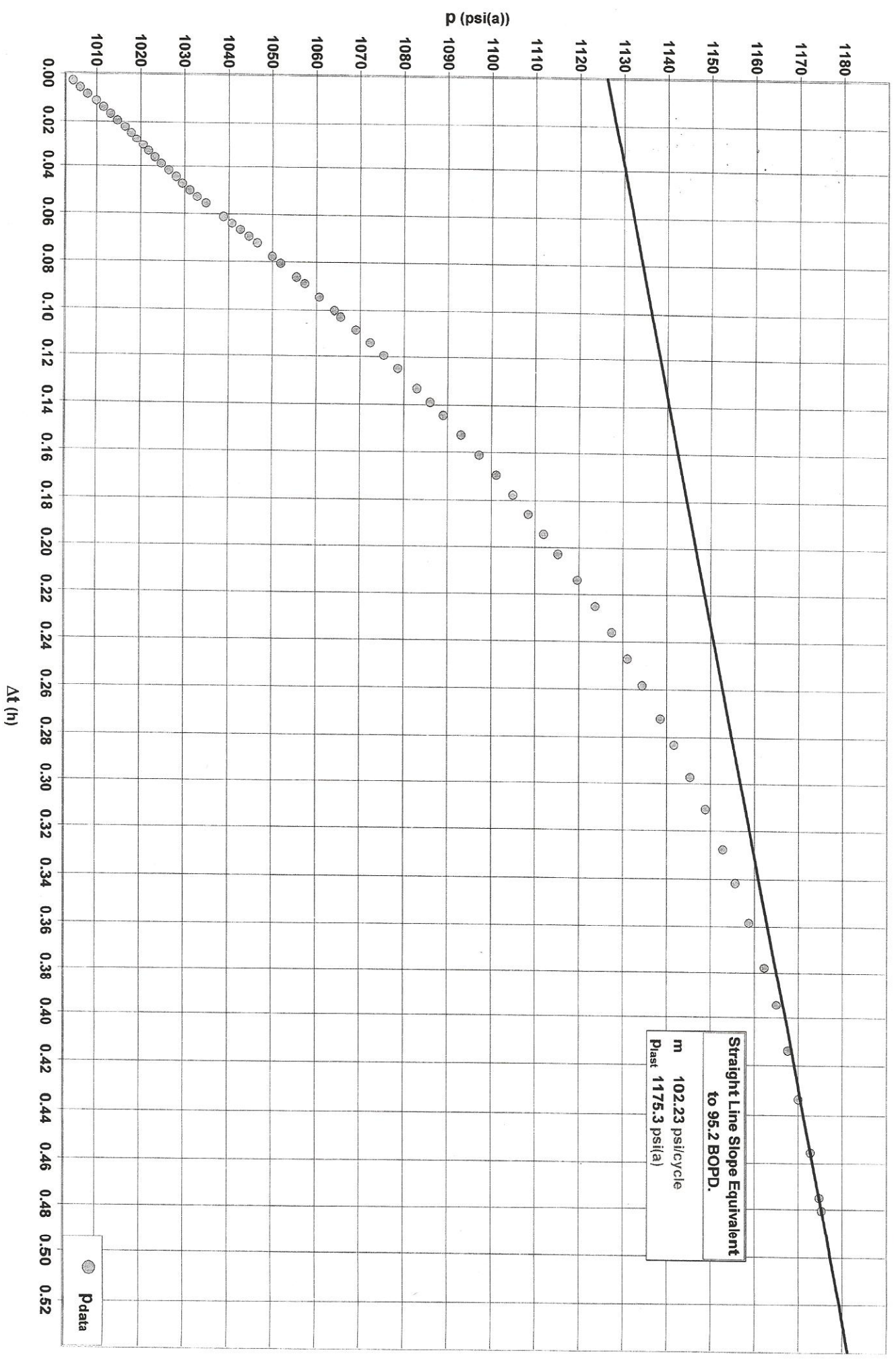
Mahalo 2, Dst 2
Formation: Cherokee



Whepking - Fullerton Energy LLC
Interval: 7090' - 7125'

Final Flow

Mahalo 2, Dst 2
Formation: Cherokee



Straight Line Slope Equivalent
to 95.2 BOPD.
m 102.23 psi/cycle
Pasi 1175.3 psi(a)

● Pdata