



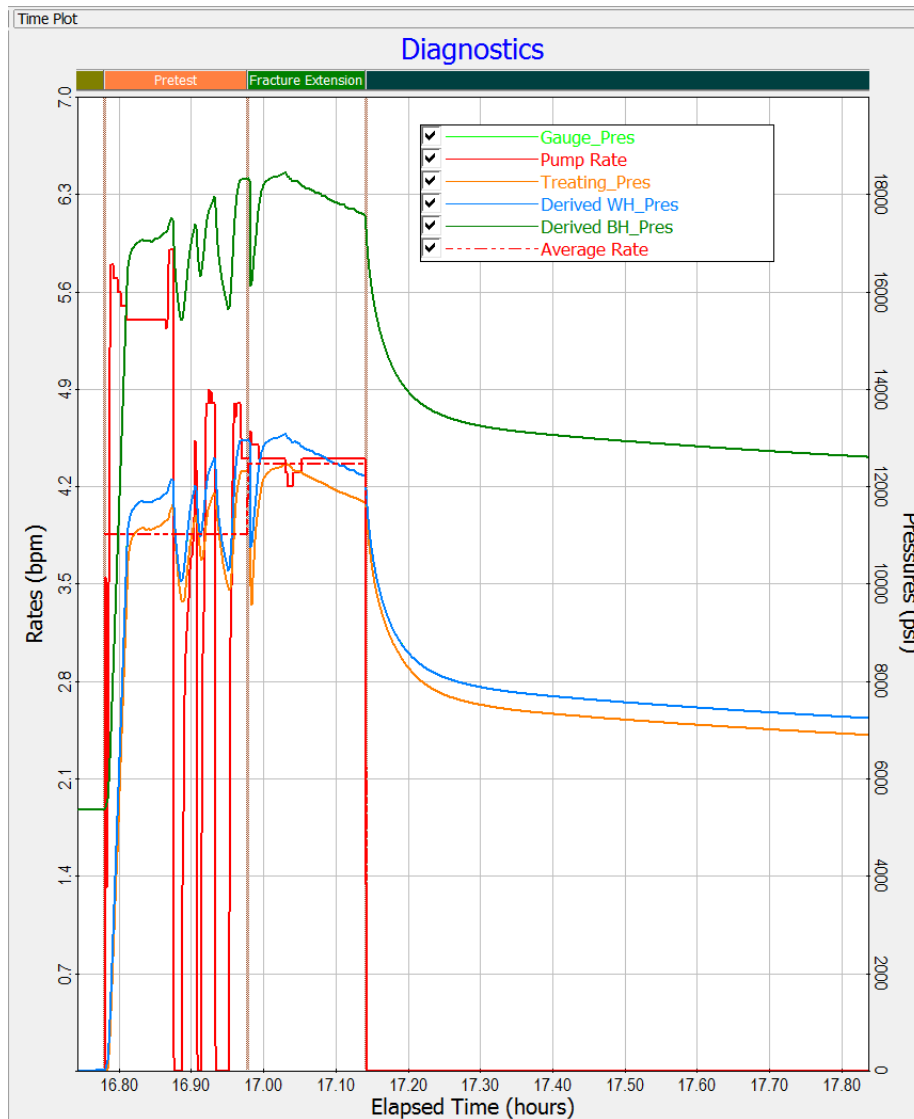
5/18/2015

# RWF 724-16 Mancos B1 DFIT Analysis

Analysis by Kristin Trahan



# Job Data



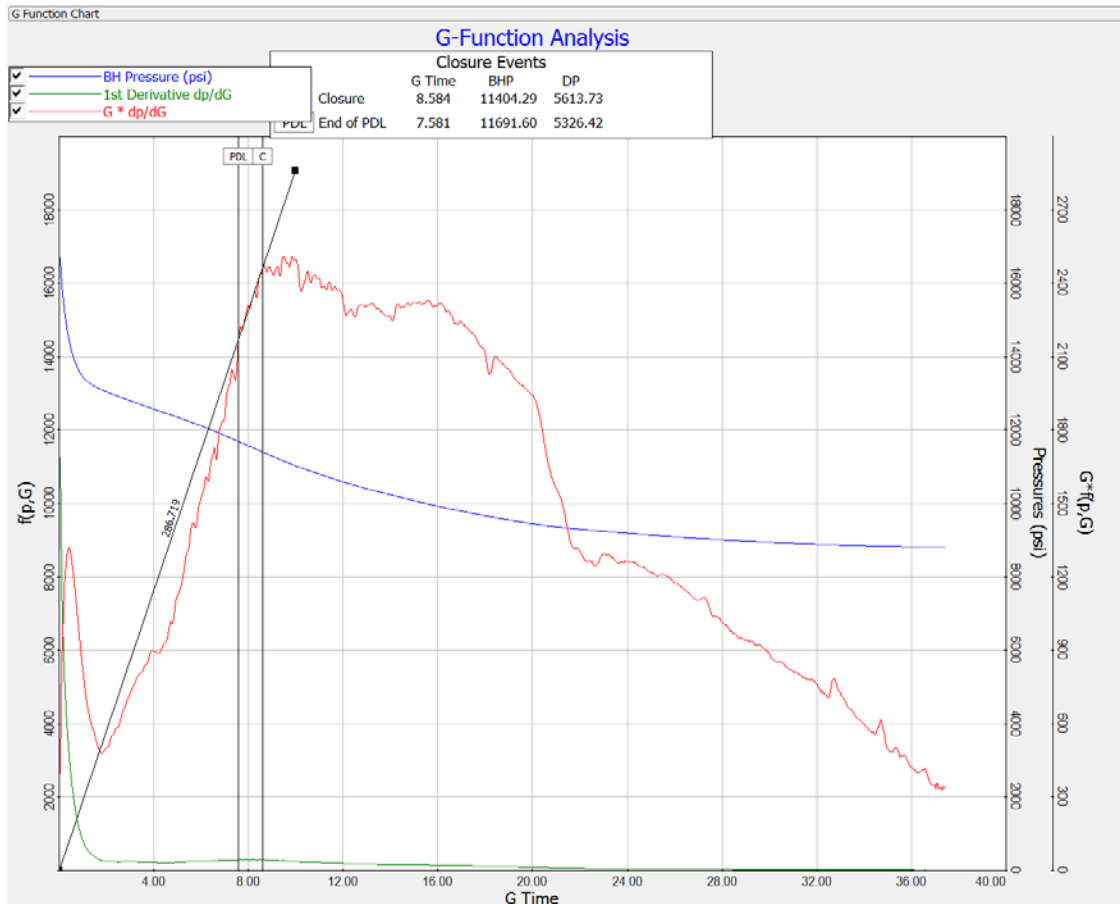
## Toe DFIT

- 4 holes total
  - 12,330'
- 1800 gal produced water
  - .439 fluid gradient
- 4 bpm pump rate
- 15k gauges

## Issues during job

- Pumps kicked out twice , but finally able to get lined out and pump 10 minutes at 4bpm with no kick outs.

## G – Function Analysis



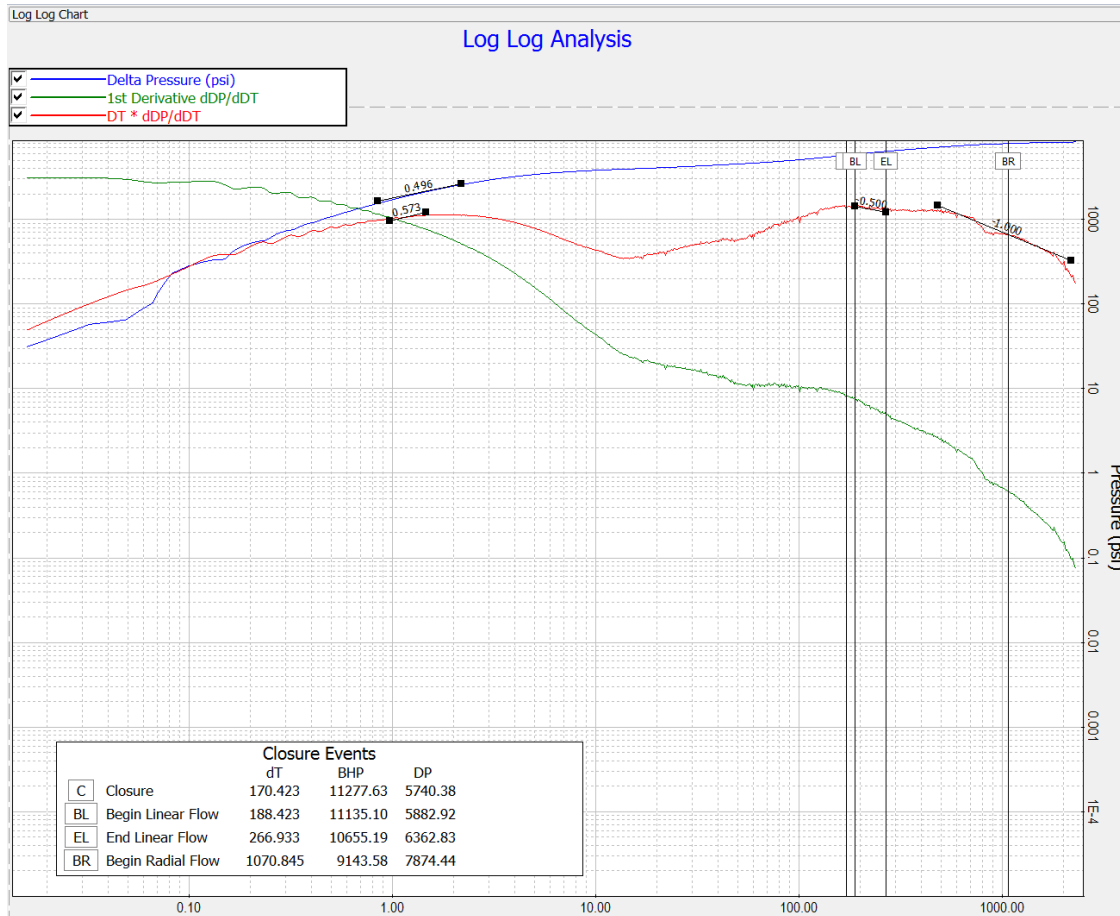
Closure was identified when the tangent line through the axis departs from the superposition curve.

- Bottom hole pressure at closure was 11,404 psi

Transverse Storage was observed from the concave shape of the superposition curve under the tangent line from the axis

- PDL could be present, but masked by the transverse storage

# Log – Log Plot



Closure is identified when the superposition curve changes from a positive slope to a negative slope

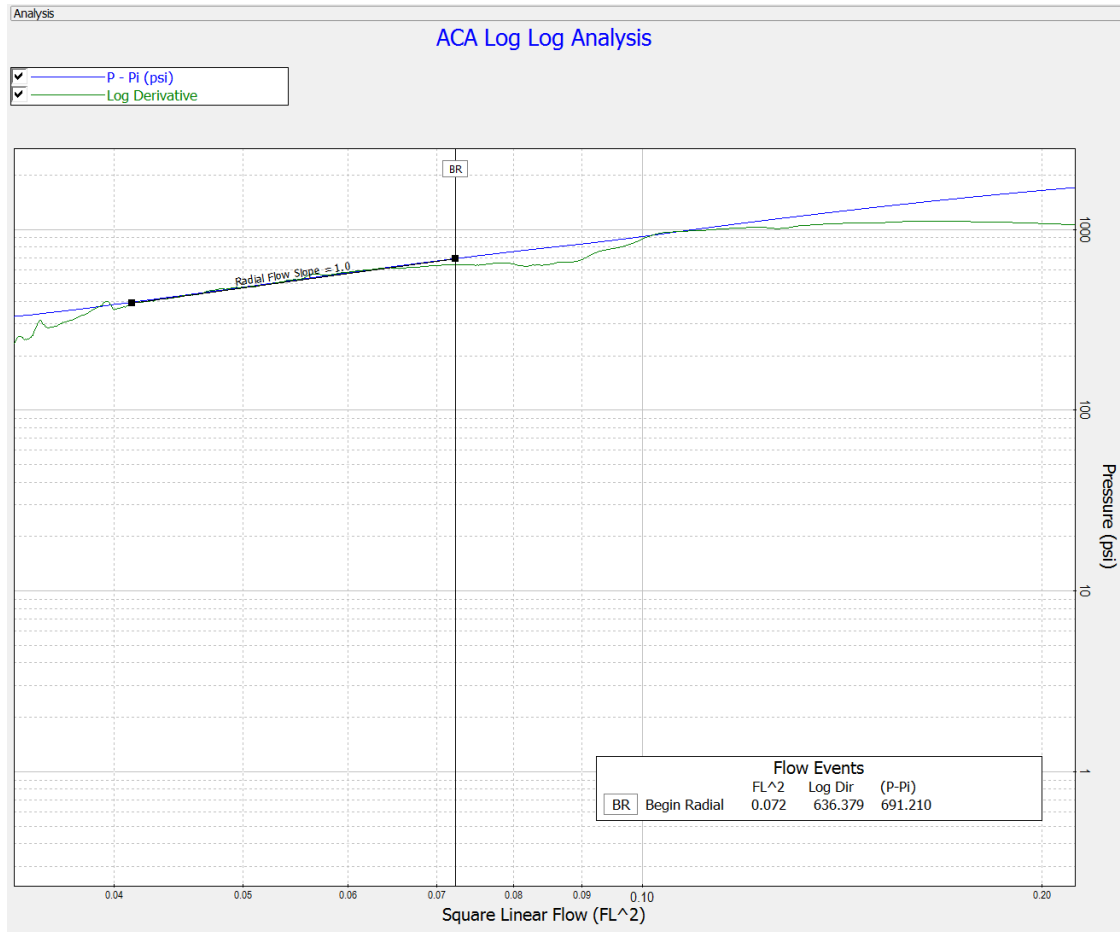
## Linear flow observed

- Identified from -0.5 slope of the superposition curve after closure

## Radial flow observed

- Identified from -1.00 slope of the superposition curve after closure

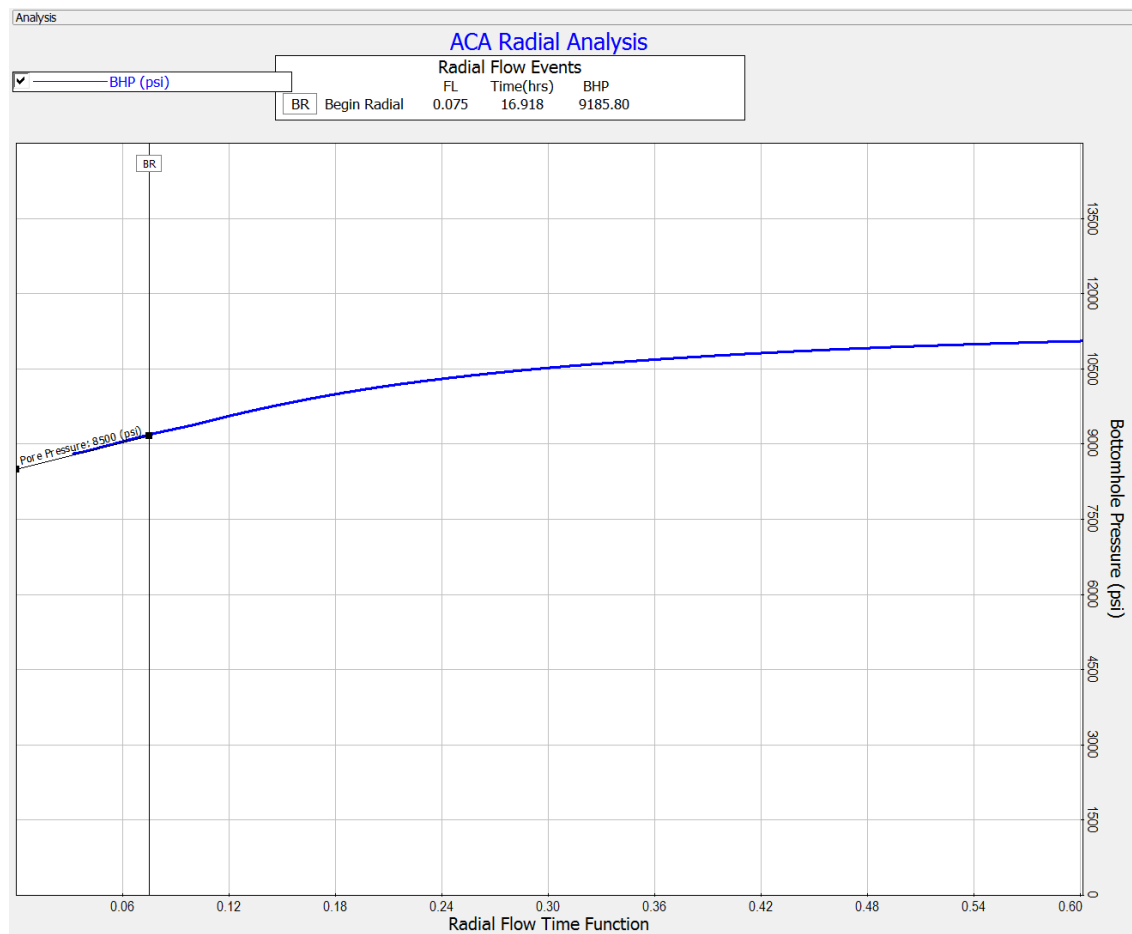
# ACA Log-Log Plot



After closure analysis shows the pressure differential curve and log derivative overlap on the same 1.0 slope

- Estimated reservoir pressure 8494 psi

# ACA Radial Analysis



**ACA Radial Analysis estimates the pore pressure to be 8500 psi.**

- Identified by drawing a tangent line from the beginning of radial flow and extrapolating to the y-axis (bottom hole pressure)

# After Closure Summary

## Diagnostic Results

### Event Times

Begin linear flow time (min)	0.000
Begin radial flow time (min)	1015.06
End linear flow time (min)	0.000
Fracture initiation time (min)	0.000
G time at closure (G time)	9.037
G time at end of PDL (G time)	7.581
Pump stop time (min)	9.867
Test end time (min)	2339.02
Time at closure (min)	180.290
Time at end of PDL (min)	135.947

### Pressures

PDL coefficient of leakoff (1/psi)	-2.949E-04
BHP at end of PDL (psi)	11691.60
Closure gradient (psi/ft)	0.915
Process Zone Stress (psid)	5740.38
dP at end of PDL (psid)	5326.42
Total Closure Stress (psi)	11277.64
Fissure opening pressure (psi)	413.960
Fluid gradient (well) (psi/ft)	0.435
Fracture gradient (psi/ft)	1.380
Est. Net pay height (ft)	50.000
ISIP (surface) (psi)	11654.47

### Reservoir

ACA Radial Kh (md ft)	1.701
ACA Radial Kh/mu (md ft/cp)	6.796
ACA Radial permeability (md)	0.0340
ACA Radial reservoir pressure (psi)	8500.00
Horner Kh (md ft)	1.653
Horner Kh/mu (md ft/cp)	6.608
Horner permeability (md)	0.0331
Horner reservoir pressure (psi)	8494.59
Horner slope	154522.56
Permeability from G closure time (md)	0.0290
ACA Linear reservoir pressure (psi)	0.000
Pore pressure (psi)	8500.00
Res pressure gradient (psi/ft)	0.689

### Test

Avg. pump rate (bpm)	4.361
Holes open	10.000
Minimum test pressure (psi)	3439.56
Minimum test pressure time (min)	2338.58
Relative Pump time (min)	9.867
Tortuosity psi/sqrt(bpm)	0.000

### Fracture

Fluid efficiency (%)	81.879
Rp area ratio	0.995
PDL coefficient of leakoff (1/psi)	-2.949E-04

### Other

Closure found	True	...
Linear Flow Found	False	...
PDL found	True	...
Radial Flow Found	True	...
Reservoir pore pressure found	True	...

## DFIT Summary

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- Surface ISIP 11,654 psi Bottom Hole ISIP 17,017 psi
  - Fracture gradient of 1.38 psi/ft
- Bottom hole closure pressure was 11,277 psi
  - Closure gradient of .915 psi/ft.
- Reservoir pressure 8,500 psi
  - Pore pressure gradient .689 psi/ft
- Net pressure was observed at 5740 psi
- Transverse Storage observed