

ABSTRACT

The Application of Frac & Pack Technology to the Mahogany Field

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This project investigates the fracture geometries and performance characteristics of several gas wells in BP-Amoco's Mahogany Field. These wells were completed using Frac & Pack technology.

Fracture design and analysis were done using BP-Amoco's Ultrafrac 2.3.1 software program. Data for the program were obtained from well logs, reservoir management plans and well reports. The results of the program are compared with those from an on-site simulator and field data. Correction factors are presented for the use of the program in the Mahogany Field, as well as conversion factors for estimating field results.

The application of Frac and Pack technology to the Mahogany field has resulted in fractures with the following characteristics:

- i. Fracture lengths between 30 ft and 124 ft.
- ii. Fracture heights between 64 ft and 173 ft
- iii. Fracture widths of approximately one inch
- iv. Average fracture conductivities between 2075 md-ft and 22,500 md-ft.
- v. Dimensionless fracture conductivities between 0.2 and 5.7, the majority of fractures having FCD values greater than 1.0.
- vi. Folds of increase between 1.4 and 2.5
- vii. Areal proppant concentration (APC) values between 3.5 lbs/ft² and 10.5 lbs/ft²

Owing to the relatively low maximum net pressures and maximum treatment pressures obtained in the field, a radial model seems appropriate for the Mahogany Field.

Based on the results of this project empirical correlations between the following formation and fracture characteristics have been developed:

- i. Fracture Closure Pressure and Reservoir Pressure
- ii. Young's Modulus and Reservoir Pressure

iii. Maximum Pressure, Fracture Closure Pressure, Young's Modulus and Areal Proppant Concentration.

Keywords: Charlie Baynes; Frac & Pack technology; Mahogany Field.

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