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Corrected Fracture Evaluation Using Borehole Image Data

Evaluation of fractured reservoirs traditionally involves the identification and orientation of the fractures. Not all fractures are created equally! Their connectivity to the wellbore, density and aperture all play important rolls.

Fractures are newly characterized by scribing only the fracture surface present along the image contact. Correcting the fracture scribe for the percentage of image coverage, a petrophysical log curve can be derived using a standard window size. Cumulating the scribed footage of ''fracture trace length'', wells can be accurately compared for the footage of fracture connectivity to the borehole.

With a horizontal well, drilled perpendicular to the fracture strike, measuring a fracture density is intuitive. As the well deviation changes in dip and direction, the wellbore trajectory generates a horizontal drift projection that must be contrasted to every natural fracture strike. The fracture density of the imaged section is now a simple derivation from the # of fractures and the horizontal measured trajectory perpendicular to their respective strike. With multiple fracture strikes, typical with joint sets, individual fracture densities must calculated.

This paper presents examples of borehole image logs used in the complete evaluation of natural fractures. Multiple well cumulative production history/completion flow back data will be compared to: Fracture Count, Cumulative Trace Length, Trace Length per Fracture, Trace Length per Productive Reservoir Foot and Horizontally Corrected Fracture Density. Reservoir simulation, armed with these in-situ measurements, can now be performed based on actual data.