Practical Methods for Estimating In-situ Stresses in Sedimentary Basins

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This paper does not pretend to describe optimal stress measurement methods. Instead, it outlines how best to measure and estimate stress orientations and magnitudes using the kind of information that that is commonly available to operators and that is publicly released in many jurisdictions.

In order of preference, stress data sources are as follows. For S_{Hmin} and S_{Hmax} orientations: 1) Borehole image logs, 2) Multi-arm dipmeters. For S_V magnitudes: 1) Density logs, 2) rock samples, 3) Lithological descriptions. For S_{Hmin} magnitudes: 1) Micro and mini-fracs 2) Leak-off tests, 3) Massive hydraulic fractures. For S_{Hmax} magnitudes: 1) Failure simulations, 2) Equations. If one or more data sets are available for each category, a reasonable assessment of a stress regime can be assembled. It need not be a costly endeavour, particularly in areas where wells have been drilled previously and where the logs and drilling reports are available. Examples of practical applications will be presented.