

IN-SITU STRESS EVALUATION IN CORE ANALYSIS

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ABSTRACT

Achieving the maximum economic benefit from core analysis requires a thorough understanding of reservoir in-situ stresses. The direct measurement of rock properties from oriented core is critical in the design of horizontal wellbores. An outline of the measures and testing necessary to effectively evaluate naturally fractured reservoirs using field and laboratory technologies is presented. The determination of rock mechanical properties, fracture strike and principal in-situ stress magnitudes-directions should be known prior to drilling a horizontal wellbore. These data can then be used to maximize the intersection of natural fractures and minimize the potential of borehole failure.

In exploration wells, it is necessary first to drill a vertical pilot-hole. The zone of interest is cored, field tests are performed, laboratory testing is completed and an evaluation of the reservoir is made. With this information available, decisions can be made to optimize the borehole azimuth and well placement. This approach to formation evaluation has been used widely by Oryx Energy Company in several reservoirs where rock characterization is an essential ingredient in the exploration and drilling program.