

UNDERSTANDING THE EFFECT OF STRESSES ON THE PRODUCTIVITY OF LOWER GORU FORMATION THROUGH ROCK PHYSICS AND RHEOLOGICAL STUDIES IN THE SAWAN GAS FIELD – SOUTHERN PAKISTAN

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The aim of this study is to verify that the low impedance and over-pressured petroleum systems (gas reservoirs) in the vicinity of high stresses are unproductive with the hydrocarbons. The study has been conducted in and around the Sawan Gas Field, located in Southern Pakistan. Rock Physics Parameters (Poison's Ratio, Vp/Vs Ratio) are calculated in this area. The behaviour of these properties resembles to that for low impedance and over-pressured gas reservoir, which in this case is the Lower Goru Sands. Sequence stratigraphic studies are carried out to comprehend the depositional model of sand & shale. Conformity has been established between this model and the pattern achieved from detailed rock physics investigations, which further helped in the identification of the anomalous gas zones for the reservoir.

Next, it needs to be confirmed, whether or not these anomalous zones can be productive? This goal is achieved by the following rheological studies.

- Finding the longitudinal and shear strain around the interpreted faults.
- Converting this strain into the stresses.
- Contouring the Stress and Strain values.

These contour maps give a complete picture of where the reservoir falls in high stresses zone? In these areas it is not productive. On the other hand, we can predict its productivity in the location of low stresses. These scenarios can be demonstrated by examples of some productive and failed wells in the field.

Technical Area: Petroleum Geophysics