

**2D SEISMIC INTERPRETATION AND
PETROPHYSICAL ANALYSIS OF GUPCHANI AREA,
LOWER INDUS BASIN, PAKISTAN**



By

MUHAMMAD ASIM KHATTAK

SHAHAB UD DIN AFRIDI

Department of Earth and Environmental Sciences

Bahria University, Islamabad

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A thesis submitted to Bahria University, Islamabad in partial fulfillment
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ABSTRACT

The present study area of Gupchani is located in Nawabshah block of Lower Indus Basin, Pakistan which is located in the southwestern periphery of Indian plate. Regional tectonics of area indicates deformation caused by extensional forces during the rifting phase of Indo-Australian plate from Gondwanaland. These forces caused the formation of various normal faults in the area that resulted in the displacement of strata of widely varying ages in close proximity throughout Lower Indus Basin. The faults also resulted in the formation of some structural traps in the area.

The dissertation focuses on delineating those subsurface structures and analyzing the resulting displacement utilizing contour maps for time and depth. 2D seismic interpretation is carried out manually on the study area and Time and Depth contour maps are generated. Moreover the Petrophysical properties of the area are studied to determine the hydrocarbon potential in order to carry out the structural and stratigraphic interpretation of Gupchani area. Three dip lines and two strike line were interpreted. TWT and depth mapping helped in delineating the structural trend and understanding the tectonics of the area. Subsurface mapping reveals that the major fault trend is NNW-SSE. Tectonic activity continued throughout the deposition of Lower Goru – Khadro level. Existing structural trend of the area provides basic component of a profile petroleum system.

The outcomes of study concluded that the area has few normal faults that have caused displacement of strata. Petrophysical analysis reveals that the rock properties of Chiltan and sands of Lower Goru are suitable to act as reservoir. Faults are also helping in the formation of hydrocarbon traps. The main constituents of petroleum system are present but there is still a requirement of advance techniques to improve seismic resolution and quality of interpretation.

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