

**2D SEISMIC INTERPRETATION AND PETROPHYSICAL
ANALYSIS OF QADIRPUR AREA, CENTRAL INDUS BASIN,
PAKISTAN**



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A thesis submitted to Bahria University, Islamabad in partial fulfillment of the requirement for the degree of B.S in Geophysics.

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ABSTRACT

The main objective of the study was to carry out petro physical analysis and 2D seismic interpretation of Qadirpur area central Indus basin Pakistan. The purpose has been achieved by utilizing complete suite of wire line logs and the available well data and seismic data. All the reservoir zones were evaluated for the hydrocarbon potential in detail using set of equations and different formation evaluation charts made by Schlumberger. The methodology adopted included measurement of shale volume by employing gamma ray log, estimation of porosity using density and neutron log, estimation of effective porosity, calculation of resistivity of water utilizing spontaneous potential log, evaluation of saturation of water and hydrocarbon saturation using Archie equation. Seismic interpretation is done by the given data and two reflectors are marked on the seismic sections which are Habib Rahi and Sui Main Limestone. Saturation of water and hydrocarbons are 60% and 40% respectively. Average porosity for massive sands are around 13.7% in the prospect area.

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ABBREVIATIONS

Rxo	Resistivity of flushed zone
Rmc	Resistivity of mud cake
Dh	Borehole size
Rm	Drilling mud
Rmf	Mud filtrate
Rmc	Mud cake
CNL	Compensated Neutron Log
PEF	Photo-Electric Factor
LLS	Laterolog Shallow
LLD	Laterolog Deep
MSFL	Microspherically Focused Log
SP	Spontaneous Potential
Ec	Electrochemical potential
(Em)	Shale or membrane potential
(Elj)	Liquid Junction Potential
(Ek)	Electro Kinetic Potential
B.H.T	Borehole Temperature
Φ_{n-d}	Average Porosity
Φ_n	Neutron Porosity
Φ_{den}	Density Porosity
Ma	Million Years
Fm	Formation
V _{sh}	Volume of shale

GR_{log}	Gamma ray reading of formation
GR_{min}	Gamma ray minimum
GR_{max}	Gamma ray maximum (shale)
ρ_{ma}	Matrix density
ρ_b	Formation bulk density
ρ_f	Fluid density
F	Formation factor (a/ϕ_A^m)
M	constant, cementation exponent
Essp	Static spontaneous potential
H	Mud Cake thickness
Sh	Saturation of hydrocarbons
Sw	Saturation of water

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