Petrophysical analysis of Ratana well 03, Ratana, upper Indus basin, Pakistan

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PETROPHYSICAL ANALYSIS OF RATANA WELL 03, RATANA, UPPER INDUS BASIN, PAKISTAN

Thesis submitted to Bahria University, Islamabad in partial fulfillment of the requirement for the degree of Bachelors in Geology.

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ABSTRACT

Petroleum is vital to almost all industries, and is of importance to the maintenance of industrialized civilization itself, and thus is a critical concern for many nations. Due to its importance this field has developed special interests of the scientists and various hydrocarbon agencies and a number of new geological and geophysical techniques have been developed to explore and exploit the hydrocarbon buried in subsurface geological formations. Petrophysics and well logging is one of thestrong tools which are used to evaluate the formation characteristic features having potential for hydrocarbon development.

A successful petrophysical analysis of Ratana well#3 is carried out interpreting the given logs. Different parameters calculated are shale volume, saturation of water and hydrocarbon and porosity was determined using different logs. These were plotted onto MS-Excel understand sub surface characteristics and presence of fluids.

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FIGURES

ABBREVIATIONS

Porosity	φ
Log response	ΔT
Lithological Constant	A
Constant based on hydrocarbon density	C
Caliper Log	CALI
Gamma Ray Log	GR
Log response in the zone of interest, API units	GR_{log}
Log response in the shale beds, API unit	GR_{max}
Log response in the clean beds, API units	GR_{min}
Gamma ray Index	IGR
Permeability	k
Deep LateroLog	LLD
Cementation exponent	m
Main Boundary Thrust	MBT
milli Volt	mV
Saturation Exponent	n
North PotwarDeformed Zone	NPDZ
Neutron Log	NPHI
Density Log	RHOB
Resistivity of mud filtrate	R_{mf}
Equivalent resistivity	R_{mfe}
True Resistivity	Rt
Equivalent water resistivity SP	R_{we}
Salt Range PotwarFold Belt	SRPFB
Saturation water	S_w
Time of fluid	t_f
Volume of shale	V_{sh}
Constant	W
Water oil contact	WOC