PETROPHYSICAL ANALYSIS OF NAIMAT BASAL-01, KHIPRO BLOCK, LOWER INDUS BASIN, PAKISTAN

By

DANIAL AHMED NIZAMI

JAWAD FAROOQ

MUHAMMAD KHYZER JEHANGIRI

Department of Earth and Environmental Sciences
Bahria University, Islamabad

2014

ABSTRACT

The main rationale of this study is to evaluate the hydrocarbon potential using well log data of Naimat Basal-01, Khipro block, Lower Indus basin, Pakistan. The well under study lies in Sindh monocline which is bounded in north east by Sukkur rift, in south by Arabian sea, in west by Karachi depression and in northwest by Kirthar depression. Khipro block carries large amounts of oil and gas reserves. The above mentioned well was initially exploratory and gave out enormously large gas condensates. The target horizon has been Lower Goru Formation of Cretaceous age. For evaluating the hydrocarbon potential at reservoir level, three zones/sand packages are identified and are marked through log analysis, two of them are marked below Talhar shale and one above Talhar shale. Various physical properties like porosity, resistivity, volume of shale, are calculated through different logs suites. In sand package 1, the average values of volume of shale are found 28.22 %, effective porosity 8.11% and saturation of hydrocarbons is 62.98%. In sand package 2, the average values of volume of shale is 31.59%, effective porosity 12.51% and saturation of hydrocarbons is 52.01% while in sand package 3 the average values of volume of shale is 28.58%, effective porosity 9.04% and saturation of hydrocarbons is 60.70%. The net pay thicknesses of sand packages 1, 2 and 3 of Lower Goru Formation are 33, 21 and 38 feet respectively. On the basis of calculated parameters through petrophysical analysis, it is concluded that in Naimat Basal-01, Lower Goru Formation is showing fair to good hydrocarbon saturation

ACKNOWLEDGEMENTS

We are quite obliged to Dr Muhammad Zafar, Head of department, earth and environmental sciences, Bahria University Islamabad, for his respectable feedback throughout the whole study.

Special credit goes to our supervisor, Mr. Saqib Mehmood for his supervision and consistent help. His priceless and enlightening efforts helped all around this venture, to the achievement of this research.

Also a very special thanks to Ma`am Urooj Muyyasar for her ultimate guidance and selfless help during this thesis. We would also like to thank our parents and siblings because without their prayers, this goal would have been a dream to achieve. We would also like to thank all our friends and colleagues for always being there for help.

CONTENTS

CHAPTER 3

PETROPHYSICAL INTERPRETATION APPROACH

CHAPTER 4

INTERPRETATION OF NAIMAT BASAL-01

FIGURES

TABLES