NEW SYSTEMATIC SIMULATION METHOD TO ESTIMATE FORMATION FLUID TYPE BY USING WELL LOGGING CROSSPLOTS IN CASE OF THE ABSENCE OF PRESSURE DATA FOR THE UNTESTED MIDDLE MIOCENE BABA AND SIDRI SANDSTONE OF BELAYIM FORMATION, BADRI FIELD,GULF OF SUEZ, EGYPT

RADWAN, A. E

Gulf of Suez petroleum company, BP EGYPT

Abstract- All over the Gulf of Suez, the Miocene sediments seems to have a very important role in oil accumulation in the Gulf of Suez basin, Badri area is one of the most prolific areas in the Gulf of Suez province; it is located in the southern part of the Gulf of Suez. The presence of sandstone streaks in the Sidri and Baba Members within Belayim Formation (which belongs to the Middle Miocene (Serravallian) age in some wells of Badri field with relatively high resistivity signature on the E-logs response attracted our attention and push us to investigate its petrophysical parameters in the field and evaluate these sands from the petrophysical evaluation point of view to delineate the main characterization of these sands and to evaluate the possibility of hydrocarbon accumulation and production from Sidri and Baba Members sands, that lies between two productive zones ((S.S.) of Kareem FM and (S.S.) of Hammam Faraun Mbr),in which may represent a good hydrocarbon potentiality will be added to the Egyptian oil production. Determination of Fluid type in the untested two studied zones is considered essential step in the formation evaluation processes.

In general the fluid type can be determined by using the formation pressure data and the pressure gradient, which play a great role in differentiation between the different formation fluids (oil, gas and water), but the absence of pressure data in the studied area push us to think about using of this suggested simulation method by using the well logging cross-plots response in the different fluid types, which had been tested before to estimate the fluid type in the untested two studied zones by using of a systematic cross-plots steps, which include (Density-Neutron_ Sonic-Neutron_ M-N_MID) cross plots, So the main purpose of this study is to estimate the fluid type of Sidri and Baba sands within Belayim Formation in case of the absence of pressure data by using of the well logging cross-plots and correlate it's response in the different produced fluid types to get the most likely fluid type in the pores. reservoir and production engineers interested in knowing the fluid type which affect in their volumetric calculations and production facilities.

This study revealed that, the using of the suggested systematic cross-plots simulation method shows good results to estimate formation fluid types in case of the absence of the pressure data, which it shows different response between gas and oil fluids which help us to estimate the most likely estimated fluid type in case of hydrocarbon, but it cannot differentiate between hydrocarbon and water, the Baba (S.S.) interval in BDR(A8) well and the Sidri (S.S.) interval in BDR (B9) well had been studied with this suggested systematic cross-plots simulation method.

This study recommended the following: first using this suggested simulation method in case of the absence of the pressure data to estimate the fluid type, second to

perform repeated formation test (RFT) against the studied zones to know the reservoir pressure third to perforate the untested Baba (S.S.) interval in BDR(A8) well and the untested Sidri (S.S.) interval in BDR (B9) well, which had shown proven gas zone.

Keywords- Cross-Plots, Fluid Types, Badri Field.