

THE GEOLOGICAL RESERVOIR MODEL OF SIHAPAS GROUP AND PETROLEUM SYSTEM OF “DKG” FIELD CENTRAL SUMATERA BASIN

ABSTRACT

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The "DKG" field is one productive field located in Coastal Plains of Pekanbaru (CPP) Block. This field is located in Central Sumatra Basin, and is geographically located approximately 30 km northwest of the city of Pekanbaru, Riau Province. Discovered in 1969 by PT. Caltex through DKG-01 well.

Structural Geology of DKG field is divided into two periods fault, that first period fault trending NW-SE (Normal Fault) Oligo-Miocene and reactivated in the Middle Miocene (13.8 Ma) - Now (period of tectonic **F3**) and turned into right reverse slip fault. Strong compression in Plio - Plistosen also impact backthrusting fault (second period) from first period fault. These faults trending NE-SW direction up to the East-Southeast and stop at the fault of the first period. This compression also folding some asymmetrical fold that have trending NW-SE. Stratigraphy at DKG Field consists of Basement, Pematang Group, Sihapas Group (Menggala Formation, Bangko Formation, Bekasap Formation), and Telisa Formation. Sequences on DKG Field can be divided into six (6) stratigraphic sequences bounded by SB (Sequence Boundary). Field reservoir zone boundary at DKG namely Echo Zone, Delta Zone, Charlie Zone, Beta Zone, and Alpha Zone. Depositional environment of each reservoir zone in the region are from Fluvial to upper deltaic to lower deltaic. Cut-Off is used for the entire reservoir layer DKG are Vsh: 0:45, porosity: 0:15 and Water Saturation: 0.6. OOIP of DKG Field at Alpha Zone is 35.64 MMSTB, Beta Zone 15.47 MMSTB, Charlie Zone 2.81 MMSTB, and Delta Zone 0.02 MMSTB with a total of OOIP 53.97 MMSTB. Palinspatic (Strain Analysis) Analysis results conducted by the age parameters of each formation to get results: Recent with 28.8% Shortening, Telisa Formation with 12.2% Lengthening, Bekasap Formation with 10% Lengthening, Bangko Formation with 9.75% Lengthening, Menggala Formation with 9.34% Lengthening, and Pematang Formation with 0.8% Lengthening. Source rock of Pematang Formation in the field are in the valley that located at west of DKG Field with TOC content of an average of 5%. Reservoir rocks in DKG Field consists of Menggala Formation, Bangko Formation and Bekasap Formation are divided into Zone Alpha, Beta, Charlie, Delta and Echo. Types of traps in DKG Field, is trap form of fault and anticline structure (four way dip closure). Oilgeneration on Field DKG occur in Late Oligocene - Early Miocene and migration occurs in the Middle Miocene (13.8 Ma) -Now that the period of tectonic **F3** (Inversion). Reserve potential of hydrocarbon reserve for development purpose at Segment A and Segment B is 1.98 MMSTB. The Scenario purpose used to enhanced oil recovery could be using CO₂ injection at Northwest of field and Waterflood at main anticline.