ABSTRAK

Lapangan "AL" berada pada PT. Pertamina Hulu Rokan Zona 4 Cekungan Sumatra Selatan dimana dalam cekungan tersebut terdapat Formasi Talangakar. Penelitian ini akan dipusatkan pada Formasi Talangakar karena formasi tersebut memiliki aspek-aspek yang dibutuhkan pada *petroleum system*, diantaranya terdapat batupasir sebagai *reservoir rock*, dan batuserpih sebagai *seal rock*. Dengan batuan penyusun didominasi oleh batupasir dan batuserpih sehingga berpotensi menjadi *low-resistivity hydrocarbon reservoir*. Berdasarkan analisis tersebut diketahui bahwa *reservoir low-resistivity* pada lapangan "AL" disebabkan oleh ukuran butir batupasir yang sangat halus sehingga mampu mengikat air secara signifikan (*irreducible water*), kandungan serpih yang melimpah dan terdistribusi secara *laminated shale, dispersed shale dan structural shale* sehingga menyebabkan terjadinya *clay bound water*, dan terdapat kemunculan mineral konduktif berupa glaukonit.

Metode yang dilakukan dalam penelitian ini berupa analisis sumuran kualitatif menggunakan data *core, mudlog*, dan *wireline log*, serta analisis petrofisika menggunakan *wireline log, header log*, data *core*, *mudlog*, dan data perforasi. Pada analisis petrofisika metode yang digunakan adalah metode multimineral. Data log yang digunakan berasal dari sumur pemboran yang berada di Lapangan "AL" dengan jumlah keseluruhan sebanyak 5 sumur.

Berdasarkan analisis kualitatif, fasies yang terbentuk pada daerah penelitian yaitu pada diendapkan pada lingkungan *estuarine* didapatkan asosiasi fasies berupa *tidal sand bar, tidal mixed flat, mud flat,* dan *sand flat*. Analisis kuantitatif dilakukan dengan melakukan perhitungan petrofisika dimana didapatkan hasil berupa *volume shale* dengan menggunakan *gamma ray* log, untuk porositas menggunakan metode *neutron-density*, untuk penentuan saturasi dengan metode Indonesia, sedangkan penentuan permeabilitas menggunakan analisis *rock typing* sehingga didapatkan nilai *cut-off* kandungan serpih sebesar 45 %, porositas efektif sebesar 6 %, dan permeabilitas dengan nilai 0,5 -1 mD dan saturasi air sebesar 72 % berdasarkan data *fractional flow*.

Kata Kunci: Cekungan Sumatra Selatan, Formasi Talangakar, *Low Resistivity Hydrocarbon Reservoir,* Petrofisika, Fasies, Lingkungan Pengendapan.

ABSTRACT

The "AL" field is located at PT. Pertamina Hulu Rokan Zone 4 South Sumatra Basin where in the basin there is the Talangakar Formation. This research will focus on the Talangakar Formation because this formation has aspects needed in a petroleum system, including sandstone as a reservoir rock, and shale as a seal rock. With the constituent rocks being dominated by sandstone and shale, it has the potential to become a low-resistivity hydrocarbon reservoir. Based on this analysis, it is known that the low-resistivity reservoir in the "AL" field is caused by the very fine sandstone grain size so that it is able to bind water significantly (irreducible water), the abundant shale content and distribution in laminated shale, dispersed shale and structural shale, thus causing the occurrence of clay bound water, and the appearance of conductive minerals in the form of glauconite.

The methods used in this research are qualitative well analysis using core, mudlog and wireline log data, as well as petrophysical analysis using wireline logs, header logs, core data, mudlog and perforation data. In petrophysical analysis, the method used is the multimineral method. The log data used comes from drilling wells in the "AL" Field with a total of 5 wells.

Based on qualitative analysis, the facies that were formed in the research area were deposited in an estuarine environment and found facies associations in the form of tidal sand bar, tidal mixed flat, mud flat, and sand flat. Quantitative analysis was carried out by carrying out petrophysical calculations where the results were obtained in the form of shale volume using a gamma ray log, for porosity using the neutron-density method, for determining saturation using the Indonesian method, while determining permeability used rock typing analysis to obtain a cut-off value for shale content of 45%, effective porosity of 6%, and permeability with a value of 0.5 -1 mD and water saturation of 72% based on fractional flow data.

***Keywords:** South Sumatra Basin, Talangakar Formation, Low Resistivity Hydrocarbon Reservoir, Petrophysics, Facies, Depositional Environment.*