PERSEBARAN BATUAN RESERVOAR DANGKAL MENGGUNAKAN DATA LOG RESISTIVITAS DAN GEOLISTRIK *SOUNDING* DENGAN KONSEP ANISOTROPI PADA FORMASI LEDOK, LAPANGAN "PNJ", ZONA REMBANG, CEKUNGAN JAWA TIMUR UTARA

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SARI

Lapangan "PNJ" terletak di Cekungan Jawa Timur Utara, Kabupaten Bojonegoro, sekitar ±145 km sebelah barat Kota Surabaya, Provinsi Jawa Timur. Metode geolistrik *sounding* dilakukan untuk mengetahui kondisi bawah permukaan berdasarkan sifat kelistrikan batuan. Data *resistivity logging* digunakan untuk mengetahui jenis fluida pada reservoar dan data *lithology cutting* digunakan untuk memverifikasi hasil dari pengolahan data geolistrik *sounding*. Sedangkan konsep anisotropi digunakan untuk mengetahui kisaran nilai resistivitas dan persebaran reservoar serta rekomendasi lokasi titik bor.

Pengukuran geolistrik *sounding* menggunakan konfigurasi *Schlumberger* dengan sepuluh titik ukur *sounding,* satu sumur referensi *(well logging),* dan satu sumur produksi. Pemodelan stratigrafi dan pemodelan litologi dibuat berdasarkan nilai resistivitas medium yang terkalibrasi dengan data *lithology cutting* dan Log Resistivitas (Log ILD). Berdasarkan pemodelan stratigrafi dapat ditentukan stratigrafi daerah penelitian berupa stratigrafi Formasi Selorejo, stratigrafi Formasi Mundu dan stratigrafi target yaitu Formasi Ledok. Pada penampang model litologi dapat diketahui bahwa litologi bawah permukaan terbagi menjadi tujuh macam litologi yaitu soil, Batugamping Pasiran, Batupasir Napalan, Batugamping Napalan, Batupasir Gampingan, Batulempung dan Batugamping. Berdasarkan nilai tahanan jenis medium terkalibrasi, batuan reservoar tersusun oleh litologi batupasir gampingan Formasi Ledok.

Kisaran nilai tahanan jenis reservoar berdasarkan nilai medium terkalibrasi adalah 55 ohm.m – 70 ohm.m berada pada kedalaman 245 meter - 255 meter dengan arah orientasi penyebaran Barat – Timur dan Barat – Timur Laut. Peta *isoresistivity* dibuat berdasarkan korelasi nilai resistivitas pada kedalaman tertentu untuk mengetahui dimana titik untuk penentuan rekomendasi titik bor. Berdasarkan peta *depth slicing isoresistivity* pada kedalaman 245 meter, 250 meter dan 255 meter menunjukkan bahwa sumur L01, L02 dan L03 memiliki nilai resistivitas yang konsisiten yaitu berkisar antara 55 ohm.m – 70 ohm.m. Berdasarkan hal tersebut diinterpretasikan bahwa rekomendasi titik pengeboran adalah pada sumur L01, L02 dan L03.

Kata kunci : *geolistrik sounding, resistivity logging, lithology cutting, schlumberger, isoresistivity.*

DISTRIBUTION OF SHALLOW RESERVOIR USING RESISTIVITY LOG DATA AND GEOELECTRICAL SOUNDING WITH ANISOTROPIC CONCEPT IN LEDOK FORMATION, "PNJ" FIELD, NORTH-EAST JAVA BASIN

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ABSTRACT

"PNJ" field is located in the North East Java Basin, district of Bojonegoro, about 145 km west of Surabaya, East Java. Geoelectric sounding method is a method to determine the subsurface conditions based on the electrical properties of the rock. Resistivity logging data is used to determine the type of fluid in the reservoir and the lithology cutting data is used to verify the results of the data processing of the geolistrik sounding. While the concept of anisotropy is used to determine the range of resistivity values and reservoir distribution as well as recommendation of the location of the drill point.

Geoelectric sounding measurements use Schlumberger configuration with ten sounding point, one well logging, and one production well. Stratigraphic modeling and lithology modeling are based on the calibrated of resistivity medium with lithology cutting data and Resistivity Log (ILD Log). Based on stratigraphic modeling, stratigraphy of the research area can be divided into three form namely Selorejo Formation, Mundu Formation and the target stratigraphy is Ledok Formation. In the cross-section of the lithologic model it can be seen that subsurface lithology is divided into seven kinds of lithology namely soil, sandy limestone, silty sandstone, silty limestone, calcareous sandstone, claystone and limestone. Based on the resistance value of the calibrated medium type, the reservoir rock is composed by the lithology of calcareous sandstone Ledok Formation.

The range of reservoir resistivity values is 55 ohm.m - 70 ohm.m at depth 245 meters - 255 meters with orientation spread West - East and West - Northeast. The isoresistivity map is based on the correlation of the resistivity value at a certain depth to find the drill point recommendation. Based on the map "depth slicing isoresistivity" at depths of 245 meters, 250 meters and 255 meters indicates that the wells L01, L02 and L03 have a consistent resistivity value that ranges from 55 ohm.m to 70 ohm.m. Based on that, the drilling point recommendation is on wells L01, L02 and L03.

Keywords : Geo-electrical Sounding Method, Resistivity, Anisotropy Concept, Resistivity Medium Pseudosection, Iso-resistivity Map, Reservoir, Hydrocarbon.