

ABSTRAK

PERENCANAAN PENENTUAN ZONA PROSPEK HYDROCARBON UNTUK KERJA ULANG PINDAH LAPISAN MENGUNAKAN ANALISIS LOG PADA SUMUR “A-18”, LAPANGAN “DA”

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Penelitian ini dilakukan pada Sumur A-18 di Lapangan DA yang terletak di Kabupaten Kutai Timur, Provinsi Kalimantan Timur, yang mengalami penurunan laju produksi minyak secara signifikan hingga sumur disuspend. Kondisi ini menunjukkan penurunan kinerja interval *Reservoir* sehingga diperlukan evaluasi melalui kerja ulang pindah lapisan (KUPL) dengan mengidentifikasi zona prospek hidrokarbon yang lebih optimal. Penelitian ini bertujuan untuk mengevaluasi dan menentukan zona prospek hidrokarbon melalui integrasi data log sumur, data *core*, serta analisis petrofisika guna mendukung pengambilan keputusan pengembangan sumur.

Metodologi meliputi analisis petrofisika kualitatif dan kuantitatif menggunakan log *Gamma Ray* (GR), *neutron-density*, dan resistivitas untuk menentukan volume *shale* (Vsh), porositas (Φ), dan saturasi air (Sw), serta integrasi data *core* untuk memperoleh permeabilitas. Selain itu, dilakukan estimasi cadangan dan potensi laju alir menggunakan persamaan Darcy.

Hasil menunjukkan beberapa interval *Reservoir* berkualitas baik dengan porositas tinggi, volume *shale* rendah, dan saturasi air rendah. *Cut-off* petrofisika ($Vsh \leq 0,3-0,4$; $\Phi \geq 10\%$; $Sw \leq 50-60\%$) menghasilkan delapan interval prospektif, yaitu P2, M8, FS-P6, G8, J4, FS-QS1, P5, dan Q2. Interval P2 merupakan zona paling prospektif dengan Φ_e 0,309, Sw 8%, Vsh 0,048, permeabilitas 335 mD, net pay 2,60 m, estimasi oil in place 148,92 MSTB, serta potensi laju maksimum sekitar 606,47 BOPD.

Kata kunci: analisis petrofisika, *oil in place*, porositas, saturasi air, zona prospek hidrokarbon

ABSTRACT

PLANNING THE DETERMINATION OF PROSPECTIVE HYDROCARBON ZONES FOR RECOMPLETION USING LOG ANALYSIS IN WELL "A-18", "DA" FIELD

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This study was conducted on Well A-18 in DA Field, located in Kutai Timur Regency, East Kalimantan Province, which has experienced a significant decline in oil production rate until the well was suspended. This condition indicates a decrease in the performance of existing Reservoir intervals, thus requiring further evaluation through workover by layer transfer (KUPL) by identifying more optimal hydrocarbon prospect zones. This study aims to evaluate and determine hydrocarbon prospect zones through the integration of well log data, core data, and petrophysical analysis in order to support decision-making in well development.

The methodology includes qualitative and quantitative petrophysical analysis using Gamma Ray (GR), neutron-density, and resistivity logs to determine volume shale (V_{sh}), porosity (Φ), and water saturation (S_w), as well as integration with core data to obtain permeability. In addition, hydrocarbon reserve estimation and flow rate potential were calculated using the Darcy equation.

The results indicate several reservoir intervals with good quality, characterized by high porosity, low volume shale, and low water saturation. The application of petrophysical cut-off values ($V_{sh} \leq 0.3-0.4$; $\Phi \geq 10\%$; $S_w \leq 50-60\%$) resulted in eight prospective intervals, namely P2, M8, FS-P6, G8, J4, FS-QS1, P5, and Q2. Among these, interval P2 is identified as the most prospective zone, with effective porosity of 0.309, water saturation of 8%, volume shale of 0.048, permeability of 335 mD, net pay of 2.60 m, estimated oil in place of 148.92 MSTB, and a maximum flow rate potential of approximately 606.47 BOPD.

Keywords: oil in place, petrophysical analysis, porosity, water saturation, hydrocarbon prospect zone