ABSTRAK

EVALUASI POTENSI SUMUR *IDLE* PADA STRUKTUR PULAI DI LAPANGAN "SS"

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Lapangan minyak yang telah memasuki tahap *mature field* umumnya mengalami penurunan laju produksi akibat berkurangnya energi *reservoir* dan meningkatnya produksi air, sehingga menyebabkan bertambahnya jumlah sumur *idle*. Reaktivasi sumur *idle* merupakan salah satu strategi untuk mengoptimalkan produksi minyak dari sumur yang masih memiliki potensi hidrokarbon. Penelitian ini bertujuan untuk mengevaluasi kinerja produksi, mengidentifikasi mekanisme produksi air, menganalisis karakteristik penurunan produksi, serta menentukan prioritas sumur yang paling prospektif untuk direaktivasi pada Struktur Pulai Lapangan "SS".

Penelitian dilakukan pada Sumur SS-035, SS-055, dan SS-127. Evaluasi dilakukan melalui analisis performa produksi, *Chan's Diagnostic Plot* untuk mengidentifikasi mekanisme produksi air, serta *Decline Curve Analysis* (DCA) untuk menentukan karakteristik penurunan produksi, melakukan peramalan produksi, dan mengestimasi *Estimated Ultimate Recovery* (EUR), *Remaining Reserves* (RR), *oil gain*, serta umur produksi sumur. Selanjutnya, seluruh parameter hasil analisis diintegrasikan untuk menentukan prioritas reaktivasi sumur.

Hasil penelitian menunjukkan bahwa mekanisme produksi air yang dominan pada ketiga sumur adalah *water coning*, dengan indikasi *channeling* pada beberapa interval produksi. Hasil *Decline Curve Analysis* menunjukkan bahwa ketiga sumur memiliki karakteristik *harmonic decline*. Berdasarkan hasil peramalan produksi, reaktivasi ketiga sumur diperkirakan memberikan tambahan produksi minyak sebesar 31,67 MBbl dengan estimasi umur produksi berkisar antara 77 hingga 88 bulan. Berdasarkan integrasi hasil analisis mekanisme produksi air, karakteristik penurunan produksi, estimasi *Estimated Ultimate Recovery* (EUR), *Remaining Reserves* (RR), *oil gain*, dan umur produksi, Sumur SS-127 ditetapkan sebagai kandidat yang paling prospektif untuk direaktivasi karena memiliki potensi produksi tambahan yang paling baik dibandingkan Sumur SS-035 dan SS-055. Oleh karena itu, Sumur SS-127 direkomendasikan sebagai prioritas utama dalam program reaktivasi sumur *idle* untuk mendukung optimalisasi produksi di Struktur Pulai Lapangan "SS".

Kata kunci: *Chan's Diagnostic Plot*, *Decline Curve Analysis*, *mature field*, *reaktivasi*, *sumur idle*.

ABSTRACT

EVALUATION OF IDLE WELL POTENTIAL IN THE PULAI STRUCTURE OF THE "SS" FIELD

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Oil fields that have reached the mature stage generally experience declining oil production rates due to reservoir energy depletion and increasing water production, resulting in a growing number of idle wells. Idle well reactivation has become one of the strategies to optimize oil production from wells that still possess remaining hydrocarbon potential. This study aims to evaluate production performance, identify water production mechanisms, analyze production decline characteristics, and determine the most prospective idle well for reactivation in the Pulai Structure of the "SS" Field.

The study was conducted on Wells SS-035, SS-055, and SS-127. The evaluation was carried out using production performance analysis, Chan's Diagnostic Plot to identify water production mechanisms, and Decline Curve Analysis (DCA) to determine production decline characteristics, forecast future production, and estimate the Estimated Ultimate Recovery (EUR), Remaining Reserves (RR), oil gain, and the remaining production life of each well. The results of these analyses were subsequently integrated to determine the priority well for reactivation.

The results indicate that the dominant water production mechanism in all three wells is water coning, with indications of channeling observed in several production intervals. The Decline Curve Analysis results show that all wells exhibit a harmonic decline trend. Production forecasting estimates that reactivating the three wells could generate an additional 31.67 MBbl of oil, with estimated production lives ranging from 77 to 88 months. Based on the integrated evaluation of water production mechanisms, production decline characteristics, Estimated Ultimate Recovery (EUR), Remaining Reserves (RR), oil gain, and remaining production life, Well SS-127 was identified as the most prospective candidate for reactivation, demonstrating the highest production potential among the evaluated wells. Therefore, Well SS-127 is recommended as the highest-priority candidate for the idle well reactivation program to support production optimization in the Pulai Structure of the "SS" Field.

***Keywords**: Chan's Diagnostic Plot, Decline Curve Analysis, idle well, mature field, reactivation.*