ABSTRAK

EVALUASI *REMEDIAL CEMENTING* GUNA MENINGKATKAN *CEMENT BOND* SUMUR PS-31

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Sumur PS-31 merupakan sumur yang sudah tidak berproduksi secara ekonomis dan mengalami kerusakan kualitas ikatan semen serta tingginya nilai *water cut* mencapai 90 % . Kualitas penyemenan dievaluasi menggunakan *Cement Bond Log* (CBL) dan *Variable Density Log* (VDL) Pada sumur PS-31, analisis CBL-VDL menunjukkan adanya indikasi *channeling* pada interval 6690-6694 ftMD dan 6702-6712 ftMD. Kondisi ini terindikasi dari nilai amplitudo CBL yang tinggi/meningkat yaitu (20–30 mV) dan pola *waveform* VDL yang didominasi oleh sinyal *casing*. Ikatan semen yang buruk dan lemah ini berpotensi menyebabkan migrasi fluida (kebocoran) yang dapat mengganggu proses produksi, terutama pada zona produktif di interval 6696–6710 ftMD.

Sebagai langkah penanggulangan terhadap masalah yang terindikasi *channeling* pada interval 6690-6694 ftMD dan 6702-6712 ftMD, dilakukan tindakan *remedial squeeze cementing* pada interval kedalaman 6702-6712 ftMD dengan metode *bradenhead*. Meliputi estimasi volume *slurry,* ketinggian kolom semen, tekanan hidrostatik, dan tekanan maksimum pompa.

Hasil evaluasi menunjukan bahwa setelah dilakukan *squeeze cementing* , kualitas penyemenan mengalami peningkatan yang cukup baik, pada interval 6695-6710 ftMD *bond index* meningkat melebihi 0,8 dan *compressive strength* mencapai diatas 1063 psi telah memenuhi standar minimal ≥500 psi. Tekanan *squeeze* yang diterapkan sebesar 3007,28 psi , nilai ini berada di bawah tekanan rekah formasi (6025,5 psi), sehingga aman dari risiko rekahnya formasi. Dengan demikian, pekerjaan *remedial squeeze cementing* berhasil mengisolasi zona dan meningkatkan integritas sumur.

Kata kunci: Penyemenan Sumur, Log CBL-VDL, *Remedial Squeeze Cementing*, Tekanan *Squeeze , Well intervention, Bullhead Method*

ABSTRACT

EVALUATION REMEDIAL CEMENTING OPERATIONS TO IMPROVE THE CEMENT BOND IN WELL PS-31

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Well PS-31 is a well that is no longer producing economically and has experienced poor cement bond quality along with a high water cut reaching 90%. Cementing quality was evaluated using Cement Bond Log (CBL) and Variable Density Log (VDL). In Well PS-31, CBL-VDL analysis indicates channeling at the intervals of 6690–6694 ftMD and 6702–6712 ftMD. This condition is identified by high/increasing CBL amplitude values (20–30 mV) and a VDL waveform pattern dominated by casing signal. This poor and weak cement bond has the potential to cause fluid migration (leakage), which could disrupt the production process, particularly in the productive zone at the interval of 6696–6710 ftMD.

As a remedial measure to address the channeling identified at the intervals of 6690–6694 ftMD and 6702–6712 ftMD, remedial squeeze cementing was performed at the depth interval of 6702–6712 ftMD using the bradenhead method. This included estimation of the slurry volume, cement column height, hydrostatic pressure, and maximum pump pressure.

Evaluation results show that after squeeze cementing was performed, cementing quality improved considerably; at the interval of 6695–6710 ftMD, the bond index increased to above 0.8 and compressive strength reached above 1063 psi, satisfying the minimum standard of ≥500 psi. The applied squeeze pressure was 3007.28 psi, which is below the formation fracture pressure (6025.5 psi), thereby remaining safe from the risk of formation fracturing. Thus, the remedial squeeze cementing operation successfully isolated the zone and improved well integrity.

Keywords: Well Cementing, CBL-VDL Log, Remedial Squeeze Cementing, Squeeze Pressure.