ABSTRAK

EVALUASI *PRIMARY CEMENTING* PADA *PRODUCTION CASING* SUMUR "AR-07" LAPANGAN "P" MENGGUNAKAN DATA LOG CBL – VDL

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Sumur "AR-07" Lapangan "P" merupakan salah satu sumur pengembangan yang memerlukan evaluasi penyemenan primer untuk memastikan integritas zonasi formasi sebelum tahapan produksi. Evaluasi keberhasilan penyemenan dilakukan untuk casing produksi 7" dengan menganalisis data hasil logging *Cement Bond Log* (CBL) dan *Variable Density Log* (VDL). Interpretasi data log ini menjadi krusial dalam menilai kualitas ikatan semen terhadap casing maupun formasi, serta untuk mengidentifikasi indikasi kebocoran seperti *channeling* atau *microannulus*.
Metodologi yang digunakan dalam penelitian ini meliputi analisis penyemenan primer secara kualitatif dan kuantitatif pada kedalaman 208–1110 m. Evaluasi kuantitatif dilakukan dengan menghitung nilai *Compressive Strength* (CS) dan *Bond Index* (BI) berdasarkan data *amplitude* CBL, sedangkan evaluasi kualitatif dilakukan dengan mengkorelasikan pola gelombang CBL-VDL untuk mengidentifikasi *good bond* dan potensi kegagalan ikatan.
Hasil evaluasi kuantitatif menunjukkan bahwa 42% interval memiliki CS > 500 psi (baik), 16% berada pada 300–500 psi (sedang), dan 42% < 300 psi (buruk). *Bond Index* hanya menunjukkan 8% interval dengan ikatan baik, sedangkan 92% buruk. Evaluasi kualitatif memperkuat hasil tersebut dengan hanya 13% zona *yang good bond* dan 87% menunjukkan indikasi *channeling*, *microannulus*, *bad to casing*, maupun *bad to formation*. Berdasarkan *guideline* Halliburton, ambang batas *free pipe* untuk casing 7" adalah *amplitude* CBL 61 mV, sehingga beberapa zona yang semula diasumsikan *free pipe* tidak dikategorikan demikian. Secara keseluruhan, parameter desain dan operasional seperti volume semen, pola aliran, dan *thickening time* telah sesuai standar *American Petroleum Institute* dan Halliburton, sehingga penyemenan dinilai layak tanpa memerlukan remedial cementing.

Kata Kunci: Penyemenan Primer, Logging CBL-VDL, *Compressive Strength*, *Bond Index*.

ABSTRACT

EVALUATION OF PRIMARY CEMENTING ON THE 7" PRODUCTION CASING OF WELL "AR-07", FIELD "P", USING CBL – VDL LOG DATA

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Well "AR-07" in Field "P" is a development well that requires primary cementing evaluation to ensure zonal isolation integrity prior to production operations. The success of the cementing job for the 7" production casing is evaluated by analyzing Cement Bond Log (CBL) and Variable Density Log (VDL) data. Interpretation of these acoustic logs is crucial to assess the quality of cement bonding to both the casing and the formation, and to identify potential issues such as channeling or microannulus.

The methodology used in this study includes both qualitative and quantitative evaluation of primary cementing within the depth interval of 208–1110 m. Quantitative analysis was conducted by calculating Compressive Strength (CS) and Bond Index (BI) from CBL amplitude data, while qualitative evaluation involved correlating CBL and VDL waveform patterns to determine good bond zones and potential bonding failures.

The quantitative evaluation results showed that 42% of the intervals had CS > 500 psi (good), 16% were at 300–500 psi (moderate), and 42% < 300 psi (poor). The Bond Index showed only 8% of the intervals with good bond, while 92% were poor. Qualitative evaluations supported these results with only 13% of the zones having good bond and 87% showing indications of channeling, microannulus, bad to casing, or bad to formation. Based on Halliburton guidelines, the free pipe threshold for 7" casing is a CBL amplitude of 61 mV, so some zones that were initially assumed to be free pipe were not categorized as such. Overall, design and operational parameters such as cement volume, flow pattern, and thickening time were in accordance with American Petroleum Institute and Halliburton standards, so cementing was considered feasible without requiring remedial cementing.

Keywords: Primary Cementing, CBL-VDL *Logging, Compressive Strength*, *Bond Index*.