ABSTRAK

EVALUASI *PROBLEM PACK OFF* PADA PEMBORAN SUMUR HORIZONTAL BERDASARKAN PARAMETER PEMBORAN DENGAN STUDI KASUS SUMUR HW-X07 DI LAPANGAN MINYAK DURI

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Pack-off merupakan salah satu permasalahan pada pemboran sumur horizontal yang terjadi akibat akumulasi *cutting* di dalam annulus sehingga menghambat sirkulasi fluida dan pergerakan *drill string.* Penelitian ini bertujuan untuk mengevaluasi penyebab terjadinya *Pack-off* pada Sumur HW-X07 di Lapangan Duri berdasarkan parameter pemboran.

Penelitian ini menggunakan metode kuantitatif dengan pendekatan studi kasus menggunakan data pemboran aktual. Parameter yang dianalisis meliputi *Weight on Bit* (WOB), *Rate of Penetration* (ROP), *Rotary Speed* (RPM), *Flow Rate*, *Torque, Drag* , dan *Equivalent Circulating Density* (ECD). Hasil penelitian menunjukkan WOB mencapai 13 kips (130% dari batas 10 kips) sebagai parameter dengan deviasi terbesar, memicu kenaikan ROP hingga 31,6 ft/jam dan *Torque* hingga 6.000 lb-ft (60,6% dari batas 9.900 lb-ft).

Evaluasi hidrolika menunjukkan *Cutting Transport Ratio* sebesar 73,7% (di bawah batas ideal 90%) dan *Particle Bed Index* 0,224 (jauh di bawah 1), sementara *cutting* terbukti mengendap hanya dalam jarak 0,828 ft pada sudut inklinasi 88–91°. Dengan demikian, penyebab utama *Pack-off* pada Sumur HW-X07 adalah kurang efektifnya *Hole Cleaning* akibat ketidakseimbangan antara laju produksi *cutting* yang tinggi dan kemampuan fluida pemboran mengangkutnya ke permukaan, meskipun sistem hidrolika secara umum bekerja pada rezim turbulen yang mendukung.

Kata kunci: *Pack-off, Hole Cleaning, Horizontal Well, Weight on Bit, Torque, Drag* .

ABSTRAC

EVALUATION OF PACK-OFF PROBLEMS IN HORIZONTAL WELL DRILLING BASED ON DRILLING PARAMETERS: A CASE STUDY OF WELL HW-X07 IN THE DURI OIL FIELD

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Pack-off is one of the major problems encountered during Horizontal Well Drilling, caused by the accumulation of drill cutting s in the annulus, which restricts Drilling fluid circulation and drill string movement. This study aims to evaluate the causes of Pack-off in Well HW-X07, Duri Field, based on Drilling parameters.

This research employed a quantitative method using a case study approach with actual Drilling data. The analyzed parameters included Weight on Bit (WOB), Rate of Penetration (ROP), Rotary Speed (RPM), Flow Rate, Torque, Drag , and Equivalent Circulating Density (ECD). The results indicate that the WOB reached 13 kips (130% of the recommended limit of 10 kips), representing the largest deviation among the Drilling parameters. This condition increased the ROP to 31.6 ft/hr and the Torque to 6,000 lb-ft (60.6% of the allowable limit of 9,900 lb-ft).

Hydraulic evaluation showed a Cutting Transport Ratio of 73.7%, which is below the recommended minimum value of 90%, and a Particle Bed Index of 0.224, significantly lower than the ideal value of 1. In addition, drill cutting s were found to settle within only 0.828 ft at an inclination angle of 88°–91°. Therefore, the primary cause of Pack-off in Well HW-X07 was ineffective Hole Cleaning due to an imbalance between the high rate of cutting s generation and the Drilling fluid's ability to transport cutting s to the surface , despite the hydraulic system generally operating in a turbulent flow regime that supports cutting s transport..

Keywords: *Pack-off, Hole Cleaning, Horizontal Well, Weight on Bit, Torque, Drag .*