

## RINGKASAN

### PERENCANAAN MANAGED PRESSURE DRILLING PADA PEMBORAN TRAYEK 8 ½" SUMUR "KI-003" LAPANGAN "MY" BERDASARKAN DATA SUMUR EKSISTING

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Operasi pemboran pada sumur "KI-003" ditargetkan mencapai Formasi Kujung Unit 1 dengan kedalaman akhir 6912 ft TVD/7466,38 ft MD. Berdasarkan data sumur eksisting "KI-002" pemboran berpotensi menembus zona kritis yaitu zona transisi dengan kondisi *narrow pressure window* dengan kedalaman 5691 ft TVD / 6096,02 ft MD hingga 6799 ft TVD / 7339,54 ft MD dan zona bertekanan tinggi (*kick*) pada kedalaman 6800 ft TVD / 7340,68 ft MD hingga 6912 ft TVD / 7466,38 ft MD, sehingga membutuhkan teknik khusus agar dapat menghindari kemungkinan permasalahan yang dapat terjadi. Untuk itu skripsi ini bertujuan untuk melakukan perencanaan *managed pressure drilling* terhadap pemboran pada trayek 8 1/2" Sumur "KI-003" dengan metode *constant bottom hole pressure*.

Studi ini mengusulkan perencanaan *managed pressure drilling* untuk pemboran yang menghadapi zona kritis. Perencanaan yang dilakukan meliputi prediksi tekanan formasi dan tekanan rekah formasi, menentukan densitas lumpur, dan menentukan *surface back pressure* metode *constant bottom hole pressure*, serta perencanaan peningkatan densitas lumpur pemboran secara bertahap.

Berdasarkan analisis prediksi tekanan didapatkan selisih tekanan formasi dan tekanan rekah sangat sempit. Pada perencanaannya digunakan densitas lumpur pemboran digunakan dalam perencanaan ini yaitu 10,75 ppg dalam kondisi *underbalanced*. Pada zona transisi besarnya *equivalent circulating density* 11,53 ppg, dengan minimum tekanan pompa pemboran 2385 psi. Penambahan *surface back pressure* sebesar 186 psi pada kondisi statis. Pada zona bertekanan tinggi besarnya *equivalent circulating density* 11,53 ppg, dengan minimum tekanan pompa pemboran 2401 psi. Penambahan *surface back pressure* sebesar 191 psi Sebelum pemboran mencapai target kedalaman dilakukan peningkatan densitas lumpur pemboran secara bertahap dari *original mud weight* sebesar 10,75 ppg menjadi 11,53 ppg dengan peningkatan 0,1 ppg per *step*, dengan waktu operasi selama 103,9 menit. Sehingga saat pemboran selesai sumur dalam kondisi *overbalanced* yang aman. Hasil analisa menunjukkan penggunaan *managed pressure drilling* pada zona kritis mampu menghindari secara efektif permasalahan pemboran yang memungkinkan terjadi.

Kata kunci: zona kritis, *managed pressure drilling*, *narrow pressure window*, *kick*.

## ABSTRACT

### **MANAGED PRESSURE DRILLING DESIGN FOR 8 ½” DRILLING TRAJECTORY IN “KI” WELL “MY” FIELD BASED ON EXISTING WELL DATA**

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*The drilling operation on the “KI-003” well is targeted to reach the Kujung Formation Unit 1 with a final depth of 6912 ft TVD/7466.38 ft MD. Based on data from the existing well "KI-002" the drilling has the potential to penetrate the critical zone, namely the transition zone with narrow pressure window conditions with a depth of 5691 ft TVD / 6096.02 ft MD to 6799 ft TVD / 7339.54 ft MD and a high pressure zone (kick) at a depth of 6800 ft TVD / 7340.68 ft MD to 6912 ft TVD / 7466.38 ft MD, requiring special techniques to avoid possible problems that may occur. For this reason, this thesis aims to plan managed pressure drilling for drilling on route 8 1/2" "KI-003" well with the constant bottom hole pressure method.*

*This study proposes a managed pressure drilling plan for drilling facing critical zones. The planning includes predicting formation pressure and formation fracture pressure, determining mud density, and determining surface back pressure using the constant bottom hole pressure method, as well as planning to gradually increase the density of drilling mud.*

*Based on the pressure prediction analysis, the difference between formation pressure and fracture pressure is very narrow. The density of the drilling mud used in this plan is 10.75 ppg in an underbalanced condition. In the transition zone, the equivalent circulating density is 11.53 ppg, with a minimum drilling pump pressure of 2385 psi. Additional surface back pressure of 186 psi in static conditions. In the high pressure zone, the equivalent circulating density is 11.53 ppg, with a minimum drilling pump pressure of 2401 psi. Additional surface back pressure of 191 psi. Before drilling reaches the target depth, the density of the drilling mud is gradually increased from the original mud weight of 10.75 ppg to 11.53 ppg with an increase of 0.1 ppg per step, with an operating time of 103.9 minutes. So that when the drilling is completed the well is in a safe overbalanced condition. The results of the analysis show that the use of managed pressure drilling in the critical zone is able to effectively avoid drilling problems that might occur.*

*Keywords: critical zone, managed pressure drilling, narrow pressure window, kick.*