ABSTRAK

PERENCANAAN *WELL DESIGN* *LIGHT STUCTURE MONOBORE* SUMUR AL-3Y PADA PENGEMBANGAN LAPANGAN AG UNTUK OPTIMASI BIAYA DAN WAKTU PEMBORAN

Oleh
Aldy Gunawan
NIM: 113220109
(Program Studi Sarjana Teknik Perminyakan)

Pengembangan lapangan kini dituntut untuk mencapai produktivitas optimal dengan biaya operasional yang semakin efisien. Setiap perancangan sumur harus menghasilkan desain yang aman, efisien dalam pengoperasian, dan bernilai ekonomis. Sumur *existing* pada Lapangan AG yang menggunakan desain *conventional* dinilai kurang optimal akibat kompleksitas konstruksi serta waktu dan biaya pemboran yang relatif tinggi. Sumur AL-3Y direncanakan menggunakan konsep *light structure monobore* sebagai alternatif desain *completion* yang lebih sederhana untuk meningkatkan efisiensi biaya dan waktu pemboran.

Perancangan sumur mengacu pada panduan *Pertamina Drilling Way* meliputi perencanaan *surface location*, perencanaan *trajectory*, *casing setting depth*, *casing design*, dan *well completion.* Penelitian melakukan perbandingan estimasi waktu dan estimasi biaya dari desain *light structure monobore* dengan desain *conventional casing*, *conventional liner*, dan *GL Monobore*.

Hasil penelitian menunjukkan skenario pengembangan terpilih mampu mengoptimalkan jumlah 8 *wellpad* menjadi 2. Sumur AL-3Y dirancang menggunakan lintasan *J-Type* dengan *maximum inclination* 43° serta tidak memiliki potensi *well collision*. Konfigurasi *casing s*umur AL-3Y terdiri atas *conductor casing* 13⅜" H-40 48 ppf BTC pada 100 mTVD, *surface casing* 9⅝" K-55 36 ppf BTC pada 849,14 mTVD, dan *production monobore tubing* 3½" L-80 9,2 ppf VAM21 pada 1908,82 mTVD. Konfigurasi *completion* menggunakan sistem *cemented packerless* dengan susunan *jewelry* ialah *shoe track*, *pup joint*, *landing nipple*, *flow coupling*, TR-SCSSV, & *tubing.* Dengan desain ini direkomendasikan menggunakan *rig PDSI #20.2/EMSCOD2–M*, estimasi *drilling time* selama 34 hari yang lebih cepat 4,1 hari dibandingkan desain *conventional*, serta total biaya sebesar $ 5.604.547,99 dengan efisiensi biaya sebesar $ 737.193,00. *Light structure monobore* sumur AL-3Y mengurangi kompleksitas, optimasi biaya serta waktu pemboran, tanpa mengabaikan *well integrity* pada pengembangan lapangan AG.

Kata kunci: *Light Structure monobore, Monobore, Well completion, Well design*

ABSTRACT

WELL DESIGN PLANNING OF A LIGHT STRUCTURE MONOBORE WELL AL-3Y IN THE AG FIELD DEVELOPMENT TO OPTIMIZE DRILLING COST AND TIME

By
Aldy Gunawan
NIM: 113220109
(*Petroleum Engineering Undergraduated Program*)

Field development is now required to achieve optimal productivity with increasingly efficient operational costs. Every well design must produce a configuration that is safe, operationally efficient, and economically viable. The existing wells in the AG Field, which use a conventional design, are considered suboptimal due to construction complexity as well as relatively high drilling time and cost. The AL-3Y well is planned using the light structure monobore concept as a simpler completion design alternative to improve drilling cost and time efficiency.

The well design refers to the Pertamina Drilling Way guidelines, including surface location planning, trajectory design, casing setting depth, casing design, and well completion design. The proposed light structure monobore design was evaluated by comparing its estimated drilling time and cost with those of the conventional casing, conventional liner, and GL Monobore designs.

The results show that the selected development scenario was able to optimize the number of wellpads from 8 to 2. The AL-3Y well was designed using a J-Type trajectory with a maximum inclination of 43°, and no potential well collision. The casing configuration consists of a 13⅜" H-40 48 ppf BTC conductor casing set at 100 mTVD, a 9⅝" K-55 36 ppf BTC surface casing set at 849.14 mTVD, and a 3½" L-80 9.2 ppf VAM21 production monobore tubing set at 1908.82 mTVD. The completion configuration utilizes a cemented packerless system with completion jewelry consisting of a shoe track, pup joint, landing nipple, flow coupling, TR-SCSSV, and tubing. Based on this design, PDSI #20.2/EMSCOD2–M rig is recommended, with an estimated well completion time of 34 days, which is 4.1 days faster than the conventional design, and a total cost of $ 5,604,547.99 with a cost efficiency of $ 737.193,00. The light structure monobore design for the AL-3Y well reduces complexity, optimizes drilling cost and time, and maintains well integrity for the development of the AG Field.

Keywords: Light structure monobore, Monobore, Well completion, Well design