

ABSTRAK

PERENCANAAN PENGEMBANGAN LAPANGAN “AZZ” LAPISAN “AFN” DENGAN SUMUR *DEVELOPMENT* UNTUK MENINGKATKAN *RECOVERY FACTOR* MENGGUNAKAN SIMULASI RESERVOIR

Oleh

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Lapangan “AZZ” merupakan salah satu lapangan minyak yang secara regional merupakan bagian dari Sub-Cekungan Jatibarang, dan Cekungan Jawa Barat Utara. Reservoir utama pada lapangan ini adalah Formasi Cibulakan Atas, dimana Lapisan “AFN” menjadi sasaran studi simulasi reservoir. Kegiatan eksplorasi di lapangan ini dimulai pada tahun 1995 dan berhasil menemukan kandungan minyak dan gas dengan pengeboran 3 sumur *existing* yaitu sumur CMB-01, CMB-03, dan CMB-025. Perhitungan *Original Oil In Place (OOIP)* untuk Lapisan “AFN” sebesar 4.085 MMSTB.

Studi simulasi reservoir dalam penelitian ini dilakukan melalui tahapan pengumpulan serta pengolahan data, yang mencakup penentuan rock region, kurva permeabilitas relatif, tekanan kapiler, dan data PVT. Selanjutnya, data tersebut dimasukkan ke dalam simulator untuk melalui proses inisialisasi, history matching, hingga tahap prediksi dengan berbagai skenario pengembangan.

Pada tahap prediksi dilakukan penambahan *development well* dengan menganalisa peta *OPU*, *OPP*, *Sw*, dan *flowrate capability*. Terdapat 4 skenario dengan penambahan 1 sumur tiap skenario. Skenario 1 dilakukan dengan *basecase* ditambah 1 *development well*, yaitu sumur DVL-05 diperoleh kumulatif produksi minyak sebesar 0.406 MMSTB dan *recovery factor* sebesar 9.9%. Skenario 2 yaitu sumur DVL-07 diperoleh kumulatif produksi minyak sebesar 0.487 MMSTB dan *recovery factor* sebesar 11.9%. Skenario 3 yaitu sumur DVL-03 diperoleh kumulatif produksi minyak sebesar 0.567 MMSTB dan *recovery factor* sebesar 13.9%. Skenario 4 yaitu sumur DVL-06 diperoleh kumulatif produksi minyak sebesar 0.635 MMSTB dan *recovery factor* sebesar 15.5%. Skenario terbaik yang dipilih adalah skenario 4 karena memiliki nilai kumulatif produksi dan *recovery factor* tertinggi diantara skenario lainnya.

Kata Kunci: CMG, *Flow Capability*, *OPP*, *OPU*, *Recovery Factor*, Simulasi Reservoir, *Water Saturation*.

ABSTRACT

DEVELOPMENT PLANNING OF “AZZ” FIELD “AFN” LAYER WITH DEVELOPMENT WELL TO INCREASE RECOVERY FACTOR USING RESERVOIR SIMULATION

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The “AZZ” field is one of the oil fields that is regionally part of the Jatibarang Sub-Basin, and the North West Java Basin. The main reservoir in this field is the Upper Cibulakan Formation, where the “AFN” layer is the target of reservoir simulation studies. Exploration activities in this field began in 1995 and succeeded in discovering oil and gas content by drilling 3 existing wells namely CMB-01, CMB-03, and CMB-025. The Original Oil In Place (OOIP) calculation for the “AFN” layer is 4,085 MMSTB.

The reservoir simulation study in this research is carried out through the stages of data collection and processing, which includes determination of rock region, relative permeability curve, capillary pressure, and PVT data. Furthermore, the data is entered into the simulator to go through the initialization process, history matching, to the prediction stage with various development scenarios.

In the prediction stage, additional development wells are added by analyzing the OPU, OPP, Sw, and flowrate capability maps. There are 4 scenarios with the addition of 1 well per scenario. Scenario 1 is carried out with the basecase plus 1 development well, namely the DVL-05 well obtained cumulative oil production of 0.406 MMSTB and a recovery factor of 9.9%. Scenario 2, namely the DVL-07 well, obtained cumulative oil production of 0.487 MMSTB and a recovery factor of 11.9%. Scenario 3, the DVL-03 well, obtained a cumulative oil production of 0.567 MMSTB and a recovery factor of 13.9%. Scenario 4, namely the DVL-06 well, obtained a cumulative oil production of 0.635 MMSTB and a recovery factor of 15.5%. The best scenario chosen is scenario 4 because it has the highest cumulative production value and recovery factor among other scenarios.

Keywords: CMG, , Flow Capability, OPP, OPU, Development Well, Recovery Factor, Reservoir Simulation, Water Saturation