

RINGKASAN

ANALISA PERILAKU RESERVOIR UNTUK MENENTUKAN *CURRENT WATER OIL CONTACT* DAN CADANGAN SISA PADA RESERVOIR “ANA” LAPANGAN “UR”

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Reservoir “ANA” Lapangan “UR” memiliki *Original Oil in Place* sebesar 44 MMSTB dengan tebal reservoir 112 ft, dan *water oil contact initial* 2920 ft. Produksi dimulai pada tahun 1975 sampai sekarang dengan tekanan mula mula 1272 psia, dan jumlah produksi minyak 10,1 MMSTB dan produksi air 11,7 MMSTB pada tahun 2020. Lapangan “UR” akan dilakukan evaluasi perforasi pada sumur *existing* dan pengembangan lapangan berupa sumur *infill* sehingga perlu dilakukan analisa kedalaman WOC dan sisa cadangan.

Analisa dimulai dengan persiapan data tekanan, data PVT, data sifat fisik batuan, data produksi, dan data penunjang lainnya, kemudian dilakukan analisa *drive mechanism* menggunakan metode *Ganesh Thakur*. Pada analisa *drive mechanism* menggunakan metode *Ganesh Thakur* diketahui Reservoir “ANA” memiliki *drive mechanism water drive*. Kemudian dilakukan analisa jenis *water drive* yang bekerja menggunakan metode *campble plot*. Selanjutnya dilakukan perhitungan *water influx* dengan persamaan *material balance* untuk kemudian mencari model *water influx* yang sesuai dengan nilai *water influx material balance*. Nilai dari kenaikan WOC dicari dengan melakukan plot layer reservoir terhadap *influx* akuifer ke dalam reservoir sehingga didapatkan nilai dari kenaikan WOC nya. Nilai matching model *water influx* ini yang kemudian dijadikan dasar prediksi dari penentuan nilai EUR dan RR dengan menarik garis perpanjangan pada titik *matching*.

Berdasarkan metode *Gasnesh Thakur* dan *campble plot* Reservoir “ANA” memiliki tenaga pendorong berupa *weak water drive*, dengan rumus *material balance* nilai *water influx material balance* adalah sebesar 23.697.971 bbl. Kemudian berdasarkan model *steady state schilthuis* didapatkan nilai *water influx* sebesar 32.780.050 bbl, sedangkan pada model *unsteady state van everdingen-hurz* didapatkan nilai *water influx* 23.697.971 bbl dengan nilai $A = 0,2$ dan $rD = 5$. Sehingga model akuifer yang bekerja adalah model *unsteady state van everdingen-hurz*. Perhitungan kenaikan *water influx* dengan prinsip pengurangan volume pori yang terisi oleh minyak dan didapatkan kenaikan WOC sebesar 15,6 ft sehingga *current water oil contact* adalah 2904,4 ft. Pada perhitungan cadangan sisa, Reservoir “ANA” memiliki *Estimate Ultimate Recovery* (EUR) 17,2 MMSTB, dan *Remaining Reserve* (RR) 7,1 MMSTB.

Kata Kunci : *Material Balance, Water influx, Water Oil Contact, Sisa Cadangan*

ABSTRACT

RESERVOIR BEHAVIOR ANALYSIS TO DETERMINE CURRENT WATER OIL CONTACT AND REMAINING RESERVES IN THE RESERVOIR "ANA" FIELD "UR"

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Reservoir "ANA" Field "UR" has Original Oil in Place of 44 MMSTB with reservoir thickness of 112 ft, and initial water oil contact of 2920 ft. Production started in 1975 until now with an initial pressure of 1272 psia, and total oil production of 10.1 MMSTB and water production of 11.7 MMSTB in 2020. The "UR" field will be evaluated for perforations on existing wells and field development in the form of infill wells so it is necessary to analyze the depth of WOC and remaining reserves.

The analysis begins with the preparation of pressure data, PVT data, physical rock properties data, production data, and other supporting data, then drive mechanism analysis using the Ganesh Thakur method is carried out. In analyzing the drive mechanism using the Ganesh Thakur method, it is known that the "ANA" Reservoir has a water drive mechanism. Then analyze the type of water drive that works using the campble plot method. Furthermore, the calculation of water influx is carried out with the material balance equation to then find a water influx model that matches the material balance water influx value. The value of the increase in WOC is sought by plotting the reservoir layer against the aquifer influx into the reservoir so that the value of the increase in WOC is obtained. The matching value of the water influx model is then used as the basis for predicting the determination of EUR and RR values by drawing an extension line at the matching point.

Based on the method of Gasnesh Thakur and campble plot Reservoir "ANA" has a driving force in the form of weak water drive, with the material balance formula the value of water influx material balance is 23.697.971 bbl. Then based on the steady state schilthuis model, the water influx value is 32,780,050 bbl, while in the unsteady state van everdingen-hurz model, the water influx value is 23.697.971 bbl with the value of $A = 0.2$ and $rD = 5$. So the aquifer model that works is the van everdingen-hurz unsteady state model. Calculation of the increase in water influx with the principle of reducing the volume of pores filled by oil and obtained an increase in WOC of 15.6 ft so that the current water oil contact is 2904.4 ft. In the calculation of remaining reserves, Reservoir "ANA" has an Estimate Ultimate Recovery (EUR) of 17,2 MMSTB, and Remaining Reserve (RR) of 7,1 MMSTB.

Keywords: Material Balance, Water influx, Water Oil Contact, Remaining Reserves