

RINGKASAN

PREDIKSI *PORE PRESSURE FRACTURE GRADIENT MODEL* PADA SUMUR “RI-01” LAPANGAN “RIDHO” DENGAN PENDEKATAN METODE EATON UNTUK PENENTUAN *CASING SETTING DEPTH*

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Sumur “RI-01” merupakan sumur eksplorasi pada Lapangan “Ridho” yang terletak di daerah Cekungan Jawa Timur Utara dengan kedalaman mencapai 2526 m. Sumur “RI-01” ditujukan untuk membuktikan adanya perolehan hidrokarbon. Sumur “RI-01” menembus formasi Kujung dan Ngimbang dengan dominan batuan *shale* dan *limestone*. Pada pemboran sumur ini terjadi *loss circulation problem* pada kedalaman 1424 m sampai 1485 m pada trayek 8 ½” di Formasi *Upper* Ngimbang yang dimana didominasi oleh batuan *limestone*. Selanjutnya pada kedalaman 1775 m sampai 1975 m pada trayek 6” kembali terjadi *loss* di Formasi *Lower* Ngimbang yang didominasi oleh batuan *limestone*.

Pada penelitian ini, prediksi *pore pressure fracture gradient* dilakukan dengan metode eaton berdasarkan data *sonic log* Sumur “RI-01”. Tekanan pori di prediksi berdasarkan data *sonic log*, NCT, tekanan *overburden*, dan tekanan hidrosatik. Tekanan rekah di prediksi berdasarkan dari hasil tekanan pori, tekanan *overburden*, dan *poisson’s ration* dari metode perhitungan Brocher. Kemudian, hasil dari prediksi tekanan pori divalidasi menggunakan data *drill stem test* dan prediksi tekanan rekah formasi divalidasi menggunakan data *leak-off test*. Dari hasil Prediksi PPF Model digunakan untuk penentuan kedalaman *casing* dengan memperhatikan grafik PPF Model, litologi batuan, dan *problem* yang terjadi.

Berdasarkan hasil prediksi *pore pressure fracture gradient* menggunakan metode Eaton didapatkan hasil tekanan pori pada kedalaman 1000 m sebesar 9.84 ppg atau 1678.82 psi dan tekanan rekah formasi pada kedalaman 1000 m sebesar 14.21 ppg atau 2424.4 psi. Didapatkan hasil penentuan *re-design casing setting depth* berdasarkan analisa PPF, analisa *problem* pemboran, dan litologi didapatkan hasil *casing setting depth* yang efektif dan aman untuk pemboran selanjutnya pada sumur pengembangan di sekitar.

Kata kunci: eaton, tekanan *overburden*, tekanan pori, tekanan rekah, *poisson’s ratio*.

ABSTRACT

PREDICTION OF PORE PRESSURE FRACTURE GRADIENT MODEL IN "RI-01" WELL OF "RIDHO" FIELD WITH EATON METHOD APPROACH FOR CASING SETTING DEPTH PLANNING

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The "RI-01" well is an exploration well in the "Ridho" field located in the North East Java Basin with a depth of 2526m. The "RI-01" well is intended to prove the existence of hydrocarbon recovery. The "RI-01" well penetrates the Kujung and Ngimbang formations with dominant shale and limestone rocks. In the drilling of this well there was a loss circulation problem at a depth of 1424 m to 1485 m on an 8 ½" route in the Upper Ngimbang Formation which is dominated by limestone rocks. Furthermore, at a depth of 1775 m to 1975 m on the 6 "route, loss again occurs in the Lower Ngimbang Formation which is dominated by limestone rocks.

In this research, the prediction of pore pressure fracture gradient is done by eaton method based on sonic log data of Well "RI-01". Pore pressure is predicted based on sonic log data, NCT, overburden pressure, and hydrosatic pressure. Fracturing pressure is predicted based on the results of pore pressure, overburden pressure, and Poisson's ration from Brocher's calculation method. Then, the results of the pore pressure prediction are validated using drill stem test data and the formation fracture pressure prediction is validated using leak-off test data. The PPFG Model prediction results are used to determine the casing depth by considering the PPFG Model graph, rock lithology, and problems that occur.

Based on the prediction of pore pressure fracture gradient using Eaton method, the pore pressure at 1000 m depth is 9.84 ppg or 1678.82 psi and the formation fracture pressure at 1000 m depth is 14.21 ppg or 2424.4 psi. The results of re-designing the casing setting depth based on PPFG analysis, drilling problem analysis, and lithology resulted in an effective and safe casing setting depth for further drilling in nearby development wells.

Keywords: eaton, overburden pressure, pore pressure, fracture pressure, poisson's ratio..