

Production Performance of Gas Reservoirs under Bottom Water Drive Mechanisms: A Case Study of Nam Con Son Field Development Project

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ABSTRACT

Water production tends to kill gas wells and leaves significant amount of gas in the reservoir. This study addresses water drive mechanisms and its effects on production performance of gas reservoirs. The approach focuses on the use of an analysis and a construction of radial numerical models to physically describe the water coning and breakthrough phenomenon and to better understand the impact of an aquifer on deliverability and ultimate recovery of a gas reservoir. Analytical solution obtained from steady-state equation shows that water-gas ratio does not increase rapidly until 90% of perforation interval flooded with water. The results show that for a better reservoir quality (permeability >100 mD), withdrawal rates do not have significant impact on reservoir gas ultimate recoveries. High gas production rate helps reduce total water production (water treatment cost savings). Aquifer size has no impact on water breakthrough time but has an impact on recovery factor and total water production. This study also suggests perforating an interval sufficiently long to maximize production.