Waterflood susceptibility of ngrayong sandstone reservation in "X"-well, XYZ Field, East Java / Rosidelly

Rosidelly, author

Abstrak

ABSTRACT
Antiklinorium structures that are spreading in the area of Rembang Zone along the Central Java to East Java reflect oil traps that lay under the surface. The oil fields have been exploited since the time of the Dutch occupation leaving the water cut at above 95%. Interpretation of reserves and production forecasts made by many researchers conclude that the remaining oil is still in the range of 50% (OOIP). To overcome the problem, the Government recently encouraged researchers to conduct a comprehensive review in terms of enhanced oil recovery with the goal of increasing the oil recovery in this zone by as much as possible. The XYZ-oil field in the Rembang Zone has a widely spread reservoir sandstone in the border area of the Central Java - East Java. Reservoir rocks in this area contain calcareous and silty matrix. Clay minerals are distributed almost evenly with high kaolinite content (30% of the bulk clay mineral). Kaolinite is a mineral that is easily removed by fluid flow so that it would create problems during the oil production process. The composition of injection water collected from several wells can also easily form slugs and scale as indicated by the occurrence of crude oil and bacteria that behave as a very corrosive substance that tends to facilitate the creation of production and equipment damage. This study conducted an experiment in enhanced oil recovery using waterflooding. To avoid the occurence of non-Darcy flow, critical velocity analysis was conducted obtaining a value of 37.6 ft/day. This velocity is defined as a maximum injection velocity of the water displacement in this waterflooding experiment. Based on the waterflooding experiment of X-Well in the laboratory, the injection of oil using injection water without additives led to an increase in oil recovery of 0.77% Pore Volume (%PV), while the displacement of injection water added with additives resulted in an increase in oil recovery by as much as 1.31%PV.