

Application of Waterflooding to the Kashkari Oil Field in Northern Afghanistan

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Abstract : Hydrocarbons represent an important natural resource for the rehabilitation and sustainable development of Afghanistan. In this paper, the use of waterflooding is demonstrated for the petroleum reservoirs of the Kashkari oil field in northern Afghanistan. The technique is based on the Buckley-Leverett frontal-displacement theory, which enables computation of the progress of the waterfront in the reservoir. The relative permeabilities of oil and water, the residual oil saturation, and the irreducible water saturation are obtained from a laboratory experiment. The technique is applied to the laboratory plane-reservoir model to investigate the displacement mechanism and is then compared with the theoretical calculation. Lastly, the technique is applied to the Kashkari oil field to predict the feasible amount of oil that could be produced from this reservoir.

Keywords : Buckley-Leverett, waterflooding, petroleum reservoir engineering, two-phase flow, immiscible displacement, porous media, relative permeability

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