

Water Coning Study In One of the Iranian Gas Reservoirs, Problems and Remedial Techniques

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Abstract:

The water coning phenomenon usually occurs in water drive reservoirs. Water coning in Iranian hydrocarbon reservoirs is one of the most important problems that affects the cumulative production, operation costs and causes environmental problems. Before producing from a reservoir, the fluids are in equilibrium and their contact surfaces remain unchanged, but after starting production from the reservoir, when the viscous force overcome gravitational force in vertical direction, contact surfaces will displace and coning will occur. Therefore, the production rates will be controlled in a range that prevents entering water to the production well. For this reason, investigation and modeling of this phenomenon is extremely necessary. In this study, the coning phenomenon, controlling methods (i.e. below critical rate production, plug in and DWS technology) and problems due to coning (such as increase in pressure gradient in well, permeability reduction near wellbore region and increase in residual gas saturation) had been studied for one of the Iranian gas reservoirs. The simulation study shows that the best choice for water coning controlling method in gas reservoirs, at rates above critical is strong function of allowable water production rate in DWS technology; but a more simple and efficient method in these cases is plug in.

Key words: water coning, critical rate, plug in, DWS, gas reservoir.

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