

Title of article: Realistic Optimization of Well Length for Horizontal Drilling

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Abstract

Evaluation of optimal drain-hole length for horizontal wells in the past, under the condition of pressure drop between the toe and heel of the well, has neglected some vital variables. These include drain hole diameter as a parameter in the objective function, diameter of vertical section for well deliverability consideration, and the composite pressure drop of the well as a system. The length was optimized based on net present value as the objective function (Case-1), flow rate (Case-2) and vertical well pressure drop with constant bottom-hole flowing pressure (Case-3). Optimizing drain-hole length requires more than adjusting variables that improve inflow performance to maximize return-on-investment. The optimization process demands the observation of spectrum of variables/events that are influenced by the dynamic nature of production as relates to fluid property and composite pressure of the entire well and reservoir system. A holistic approach, considering the inflow (entire horizontal section acting as oil inflow source) and vertical lift performance is paramount, focusing on flow resistivity in the drain hole.