Horizontal Well Placement Optimization Using Stacked Pay Flags and Original Oil in Place Calculations in the 3rd Bone Spring Formation

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Based on the anticipated hydraulic fracture propagation distance and stacked pay flags it is demonstrated that one can optimize horizontal well placement using some relatively trivial calculations. The first element uses stacked pay flags to provide a first order approximation of producible hydrocarbons. The second element uses an assumed fracture propagation length whereby one seeks to maximize the amount of OOIP over a given well log interval post pay flag application. Initially, a series of systematic calculations were performed using Microsoft Excel (2013) and imported in to Techlog by Schlumberger (2013). Calculations performed included; (1) thermal maturity using vitrinite reflectance, (2) total porosity, (3) effective porosity, (4) total organic carbon, (5) variable matrix analysis using Elemental Capture Spectroscopy (ECS), (6) clay bound water using Elemental Capture Spectroscopy (ECS) and illite clay assumption, (7) OOIP using variable matrix analysis (ECS), (8) bitumen corrected OOIP (based on Total Organic Carbon), (9) T2 cutoff OOIP using nuclear magnetic resonance, (10) OOIP from rock evaluation data (S1), and finally (11) geo--mechanics from dipole sonic log data. The results presented demonstrate the sensitivity of optimal well placement to knowing the fracture propagation distance. Given that the research conducted uses only one data set it is quite possible that varying formation properties may demonstrate an increased sensitivity to the method used for calculating Original Oil in Place (OOIP).