You Can't Change the Rock - Lessons Learned from the Wolfcamp Shale in the Delaware Basin

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ABSTRACT

The evolution of the Wolfcamp Shale play in the Southern Delaware basin has unfolded over the past five years as operators have gained a greater understanding of the rock. In conjunction, technology has allowed for more efficient and effective practices in exploiting the vast amount of hydrocarbons contained within the upper section of the Wolfcamp Shale. The realization of multiple stacked economic target zones, or flow units within the Wolfcamp has led to a resurgence of acquisition and development activity in the basin over the past year. The average depth to the top of the Wolfcamp ranges from approximately 7,000 ft (TVD) on the west side of the basin in Culberson and Reeves Counties, to over 12,500 ft (TVD) in the center of the basin in Loving and Ward Counties. The gross thickness of the organic rich, productive facies of the Wolfcamp Shale section can be as much as 1,500 ft. However, the thickness of this facies varies across the basin, and its overall geometry is a function of the underlying paleostructure of the basin floor at the time of deposition. A regional structural framework can be established by mapping a 4th order residual surface on the base of Wolfcamp or Pennsylvanian formation top. The productive facies can then be identified and mapped using unconventional well log analysis and a density porosity cutoff greater than 10%, which can be tied to existing productive analogs. The purpose of this talk is to address three key questions regarding the productivity of the Wolfcamp Shale in the Southern Delaware Basin. First, how far toward the basin margins can the economic viability of the Wolfcamp Shale be pushed? Second, what are the key geologic and petrophysical characteristics that define good, marginal, and poor resource rock in the Wolfcamp? Finally, what role does technology play in targeting, drilling, and completing wells in areas which were previously thought of as poor to marginal, or "edgy"? Understanding these and other variables will maximize the future development of the play, and help operators grasp the full magnitude of stacked pay opportunities within the Wolfcamp.