Low Resistivity Pay in the Upper Wasatch Interval of the Uinta Basin: From Theory to Appraisal

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Abstract

The amount of hydrocarbons the Uinta Basin generated and produced is significant. The petroleum-rich basin reaches vertically more than 6,000 feet of prospective intervals in some areas. Geoscientists working in the area have already discovered a variety of plays within various petroleum system. The variety of different plays, such as conventional four-way, stratigraphic, fault-dominated and both hybrid (tight reservoirs: carbonates and sandstones) and unconventional source rocks plays is captivating. In such a geologic setting as the Uinta Basin, having a low resistivity pay, whether due to a conductive mineral or a laminar section, should not be surprising. However, no such discovery in the basin has been made to date. This paper focuses on the idea of low resistivity pay as a viable appraisal objective in the Uinta Basin. At the end of 2023, hundreds of wells were scanned using mud log and open hole data. Predominantly, high gas data were retrieved and utilized in the area where few or no hydrocarbon discoveries have been made to date. After a candidate was identified, a proven petrophysical model was applied to check the validation of high gas versus outputs from the model. Additional preparation consisted of a search for a publicly available core data, geochemical data of both oil and water and constructing multiple cross-sections around the area to better understand the subsurface. Rigorous geological mapping and geophysical analysis were also part of this multi-discipline collaboration. The result of this diligent and energetic work led to the drilling of a well in May 2024. The core analysis and well results are expected by the end of 2024. If successful, the idea of bypassed pay through low resistivity analysis could be extrapolated to other zones across the basin.