

Predicting Matrix Production Potential of the Upper Monterey Using Pore Geometry Data

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Abstract

Although the Lower Monterey is the primary source rock for California hydrocarbon accumulations, the Upper Monterey is not. It is often incorrectly considered as a primary source or as a potential self-sourcing reservoir. Essentially all commercial Upper Monterey reservoirs have been conventionally charged from Lower Monterey somewhere deeper in the basin. Regardless of the silica phase present, there are only two types of reservoirs found: matrix supported and intensely fractured (pseudo matrix). The focus of this presentation is on matrix supported production. Particle surface area and the quantity of detrital material provide the compositional quality control of OPAL-A deposits that are reflected in pore geometry data. It is pore geometry that defines rock quality and ultimately reservoir performance. Pore geometry can also be used to understand how the rock changes as it undergoes diagenetic processes. This presentation will define matrix permeability and potential irreducible water saturation relationships and controls for all phases of bio-siliceous rock. Production potential can be predicted from these rock quality variations by applying charging scenarios that better reflect capillary pressure limitations found in these formations throughout California.