San Joaquin Basin Outcropping Oilfields - Conventional and Unconventional Reservoir for Analysis

Jere Jay
Innex Energy, Plano, TX.

Outcropping oilfields and petroleum systems with oil saturation and active seeps occur within or adjacent to producing billion and multibillion barrel oil fields in the San Joaquin and adjacent basins of central California. The oil-saturated reservoirs occurring in diverse geologic settings combine to provide a unique “natural laboratory” for evaluating a wide range of petroleum system topics and issues from source deposition, generation, and diagenesis to hydrocarbon migration, traps, and seals to reservoir facies, complexity, and petrophysics. Of special interest for current exploration programs are unconventional outcropping oil source rocks, which are also fractured “resource” shale reservoir sections that provide excellent examples for discussing migration, trapping, storage and reservoir issues for a variety of ongoing resource scale shale projects. Conventional sandstone reservoirs in outcrop include non-marine fluvial and alluvial fan, shallow marine, and deep water turbidites. The reservoir outcrops often occur within the confines of producing fields, providing an interesting juxtaposition of geology with hard data from historic performance, reservoir engineering, well logging, cores, production, and research issues. These sections serve as hands-on visual analogue models of the appropriate scale to illustrate projects with international scope.

This talk will give an overview of some of the important outcropping reservoirs along with analogue data illustrating their use and impact on international and domestic exploration and development projects. Multinational majors, independents, and individuals have used these sections to gain perspectives of scale, reservoir complexity, economics, and development strategies on which to base investments in a variety of international and domestic projects. Additionally, multidisciplinary project groups have benefitted by using the outcropping sections as a venue to discuss means for integrating new ideas into ongoing projects.

The outcropping reservoirs and petroleum systems are easily accessed and occur in relatively close proximity to each other. This provides a convenient study area where a wide variety of petroleum topics and issues can be illustrated and discussed, saving multiple expensive jaunts to various corners of the world.