

Detrital Zircon Geochronology and Sediment Transport of the Miocene Stevens Sandstone; Characterizing Turbidite Channel and Fan Complexes of the San Joaquin Valley, California

Mark Korte-Nahabedian¹

¹San Diego State University, Stratigraphy, San Diego, CA USA
marknahabedian@gmail.com

Contributors: Dr. David Kimbrough (San Diego State University)

ABSTRACT

The Upper Miocene Stevens turbidite sands are prolific petroleum reservoirs in the southern San Joaquin Basin of California and were deposited as a series of submarine fan systems and deep water channels sourced from paleodrainages emanating from the Sierra Nevada, Techachapi Mtns., and the Salinian block across the proto-San Andreas fault system. The stratigraphy of Stevens channel-fan complexes is complicated by syn-depositional faulting and folding in a deep marine basin, and correlating the discontinuous sand bodies is not easily resolved with conventional electric logs or other methods. A detrital zircon U-Pb age provenance study is reported here with the goal of identifying regional-scale sources and sediment-dispersal patterns and that will hopefully also enable detailed correlation of producing sand reservoirs widely across the region. Provenance shifts could be particularly important in the southwestern portion of the basin where the Salinian block sediment sources were being transported to the northwest across on the San Andreas fault plate boundary during the late upper Miocene. By collecting detrital zircon populations from existing core and outcrop data, we hope to group individual channel and fan complexes together based on the composition of their provenance, and provide a new correlation tool to supplement conventional electric log correlation. This study could have implications for the discovery of new Stevens oil pools, and supplement characterization of other reservoirs in existing oilfields by providing a new potentially high resolution correlation tool in the San Joaquin Basin.