

*The College of Science & Math, Department of Earth & Environmental Sciences,
Associated Students Inc., Fresno State AAPG Student Chapter presents:*

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Chevron North America Exploration and Production, Bakersfield, CA

Improved Reservoir Characterization at Kern River Field, California, USA: New Insights into an Old Field Using 4D Saturation Modeling

Friday, Feb 8, 2013 noon-1:00pm Peters Business Bldg, Room 191



The Kern River Field is one of the largest fields in the state of California and the US. Located northeast of Bakersfield, California in the San Joaquin Basin, production is primarily from the Late Miocene Kern River Formation, a ~1000 ft thick succession of sandstones and mudstones deposited in a braided fluvial environment. The majority of production is low gravity (12-13° API) heavy oil which is produced by steam assisted gravity drainage.

Although the field was discovered in 1899 and over two billion of the estimated 3 billion barrels of OOIP have been produced, significant reserves and resources remain. Previously, there had been no clear

understanding of the rock properties and production behavior for the lower resistivity portion of the reservoir even though estimates of OIP contain considerable volumes. Additionally, while steam injection has typically resulted in good production from the higher resistivity reservoir, zones of bypassed and unproduced oil exist in intervals that have been steamed for many years.

A portion of the reservoir was described lithologically from core and by the nature of drainage interpreted from 4D saturation modeling. The integration of these two approaches has resulted in the characterization of drainage within a heterogeneous, complex fluvial reservoir for the entire section. The evolution of the oil leg and production character has been described both qualitatively and quantitatively. This approach has allowed for the identification of portions of the reservoir that are actively draining versus portions where drainage is not occurring, despite the fact that the oil has been characterized as recoverable. These non-draining areas can then be targeted for improved reservoir management.

The Kern River asset team, now recognizing that the increased number of opportunities within the reservoir, is investigating ways to specifically identify and target these volumes in an effort to maximize future potential.

Dr. Jonathan Allen is an earth scientist at Chevron in Bakersfield, CA. Jon joined Chevron in 2003 and has worked a number of reservoir characterization projects integrating outcrop, core, log, and earth modeling data. Currently, he is working on development projects in the Midway-Sunset Field. He holds a BA in Geology-Biology from Colby College, Maine and an MS and PhD in Geosciences from the University of Nebraska-Lincoln. His areas of interest include fluvial sedimentology and stratigraphy, integrated reservoir characterization, paleoclimate analysis, and floral paleoecology.

