



ROBERT H. LANDER
Wallace E. Pratt Memorial Award



LINDA M. BONNELL
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The Wallace E. Pratt Memorial Award for the best paper published in the *AAPG Bulletin* is presented to Robert H. Lander and Linda M. Bonnell for “A model for fibrous illite nucleation and growth in sandstones” (v. 94, p. 1161–1187).

Reservoir quality is becoming an increasingly important control on the economic viability of both conventional and unconventional reservoirs as we explore more deeply buried and older reservoirs. Nonetheless scientifically rigorous, predictive models are lacking for some of the key diagenetic processes that control reservoir quality. "A model for fibrous illite nucleation and growth in sandstones" represents one of the first attempts to develop such a model for the occurrence and properties of fibrous illite in sandstones. Fibrous illite can have a severe detrimental effect on reservoir properties by substantially reducing permeability while increasing capillary entry pressure and irreducible water saturation. The reaction leading to this type of illite in many cases appears to involve a kaolinite precursor but does not tend to include a succession of mixed-layer intermediate phases comparable to those associated with the more familiar process of smectite illitization. The model proposed in the paper departs from previous work on the topic by (1) providing a number of specific, testable predictions about fibrous illite occurrence and properties and (2) reproducing key observations from geologic datasets.

An important aspect of the model is that it is designed to provide a means to assess the potential impact of fibrous illite formation on reservoir quality away from well control and through geologic time. Consequently, it has the potential to improve the accuracy of pre-drill reservoir quality predictions in exploration areas. In such areas model predictions about the timing of illite formation also may provide insights into the impact that the

illite could have on hydrocarbon migration into the reservoir when used in concert with petroleum systems models. Finally, the modeling approach may yield more realistic rock property predictions for interwell and flank reservoir locations that could lead to better production strategies in fields. The research in this paper was funded by The Consortium for the Quantitative Prediction of Reservoir Quality, a group of more than 20 industry and public institutions working together to develop tools to improve the accuracy of rock property predictions.

Rob Lander's primary research interest is in understanding the controls on diagenetic processes in clastic rocks and using this understanding to develop accurate models of rock properties away from well control and through geologic time. He was turned on to diagenesis and clay mineralogy as an undergraduate at Knox College under the tutelage of Dewey Moore. He carried his undergraduate Honors thesis through to a doctoral dissertation at the University of Illinois, under the supervision of Dick Hay. After receiving his Ph.D. in 1991 he joined Exxon Production Research in Houston, Texas. He then spent seven years in Stavanger, Norway working for Rogaland Research and Geologica AS (a spin-off company). Rob co-founded Geocosm LLC in 2000 where he is a scientific advisor and partner.

Linda Bonnell is a scientific advisor and partner at Geocosm LLC. Linda received her PhD from the University of Illinois in 1990. Following a postdoctoral appointment at Washington University, she moved to Houston where she worked as a research

associate at Rice University and then on to Stavanger, Norway where she worked as a senior researcher in Rogaland Research and Geologica AS. In 2000, Linda returned to the United States from Norway and co-founded Geocosm LLC in Austin, Texas. In 2003–2004, Linda had the good fortune to be an AAPG Distinguished Lecturer. For the last 15 years, Linda's research interests have been focused on sandstone diagenesis and the prediction of reservoir properties. However, she started her geology career looking at shales for her PhD and at carbonate rocks during her postdoctoral research and while at Rogaland Research in Norway.