Influence of Regional River Systems on Lacustrine Reservoir Quality of the Green River Formation of Wyoming

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ABSTRACT

Lacustrine basins are known to amass large amounts of sedimentary organic matter; for example, the Green River Formation in the Western U.S. contains an in-situ oil shale resource estimated at 4.3 trillion barrels. Reservoir quality in lacustrine sedimentary basins, however, often poses a challenge owing to the predominance of fine-grained sediment. Regional river systems systematically organize sediment over the course of their flow-path, often retaining sandier sediments and ejecting their fine-grained fraction onto floodplains. As such, deposits found at the terminus of regionally sourced rivers may offer more favorable reservoir quality. This study will test this hypothesis through field description, sedimentology, paleocurrent analysis, and U-Pb detrital zircon analysis of fluvial sandstone beds interbedded in the Wilkins Peak Member of the Green River Formation. Previous studies inferred a local (intrabasinal) sand source, but recent studies have suggested an alternate source in central Colorado. The results of this study will not only offer a new method of predicting the distribution of high-quality reservoir in lacustrine systems, but could also advance understanding of the evolution of lacustrine systems by elucidating the link between lakes and the watersheds they drain.

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