

## **Source Rock Organic Facies Correlation for Tar Sands and Oils in Triassic Moenkopi Formation, Northern San Rafael Swell, Utah**

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Decades of research has been focused on documenting the distribution and volume of tar sand accumulations in the State of Utah, but virtually no work has been directed at understanding the genetic relationship of the correlative source rock. Likewise, very little attention has been directed at understanding the genetic relationship of the tar sands to the commercially produced hydrocarbons. This study focuses on the Northern San Rafael structural trend (Emery County) and the Triassic Moenkopi stratigraphic sequences. The results indicate a positive correlation of nearly all hydrocarbons in the Moenkopi Formation to the Mississippian-age source rock of the Great Basin. With advanced methodologies applied, these tar sand occurrences (i.e., Chute Canyon, Cottonwood Draw, North Flat Top localities) can be assigned to the upwelling organic facies generated at 0.75 to 0.85 vitrinite reflectance equivalence, analogous to the Upper Valley Field production. It is usually assumed that the subsurface Moenkopi hydrocarbons (e.g., hydrocarbons recovered from Wellington Flats 15-11-18, Tully 16-9-36D, Federal 41-33 wells) are correlative to the outcrops to the south, but a distinct change is documented. Specifically, the molecular fingerprints indicate a change to hydrocarbon generation from the slope/ramp organic facies at a higher degree of thermal stress (1.1 to 1.2 vitrinite reflectance equivalence). The commercial accumulation that is correlative along the structural trend is Grassy Trail Creek Field, which is also positively correlated to the Providence Field resources. Application of palinspastic tectonic restorations enable migration timing and vectors to be applied for understand the hydrocarbon charge responsible for these resources.