

*The Early Triassic Moenkopi Petroleum System on the San Rafael Swell,
Central Utah*

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ABSTRACT

The Early Triassic Moenkopi Formation across central Utah is charged with oil, and it has been estimated to contain up to 60 million barrels of oil in-place per square mile. On the San Rafael Swell (SRS) Anticline in Emery and Carbon counties, the Moenkopi is a giant, breached oil accumulation with oil saturated rocks at the surface, production between 4,000 and 6,000 ft in the subsurface, and numerous oil shows that extend to 9,000 ft down-dip of the outcrop. Three members of the Moenkopi, the Torrey, Sinbad and Black Dragon, are mixed siliciclastic and carbonate intervals, and all contain hydrocarbons that are likely sourced from the Mississippian Delle Phosphatic Member of the Woodman Formation in the Sevier Thrust Belt to the west. On the northern plunge of the SRS, the Moenkopi produces 40-gravity oil from Grassy Trail Field, home to some of the first horizontal drilling in the U.S. Between 2012 and 2014, Whiting Oil & Gas Corporation drilled and cored three Moenkopi tests on the northern plunge and western flank of the SRS and established 45-gravity oil production in a one-mile horizontal well located 1,500 ft down-plunge from Grassy Trail Field in a mappable sandstone reservoir. While the Moenkopi is unconventional in the sense that there is no down-dip water leg to the regional accumulation and the reservoir properties generally prohibit vertical production, there are challenges to broad, repeatable horizontal resource play application for hydrocarbon extraction.