

Mamm Creek (Mesaverde) Field: Exploiting a Giant Basin-Center Resource

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ABSTRACT

The Mamm Creek gas field is a significant portion of a multi-TCFG basin-center gas play that exists in the Piceance Basin of northwestern Colorado. This play began with a nucleus of drilling in the 1980s and, principally because of modern multi-stage frac completion technology, grown to that of giant status.

Mamm Creek produces at roughly 4,500' to 7,500' (1500 m to 2500 m) depth from abundant lenticular fluvial to marine sands contained within a massive gas-saturated cell in the the Williams Fork Formation, of the Upper Cretaceous Mesaverde Group. Approximately 3000' (1000 m) thick, the Williams Fork represents deposition of countless braided streams, sourced from highlands to the west, that flowed eastward to the Cretaceous Western Interior Seaway. Reservoir units typically exhibit low porosity and very low (microdarcy) matrix permeability. Individual sands rarely correlate greater than 1000'. Analysis of various data types from the macro (seismic and magnetics) to the micro (FMI, core analysis) indicate that Williams Fork sands produce significantly when natural fracturing enhances permeability. This natural fracturing is the result of transpressional strike-slip during Laramide (Eocene) basin formation.

Multi-stage fracture stimulation and downspacing to 20 acre well density has become the standard to exploiting the Williams Fork at Mamm Creek Field. To lessen the cultural impact of the greatest gas well spacing density in Colorado (and probably the world), directional drilling also has become commonplace. The Mamm Creek Field (and the play) continues to expand, confined only by the limits of gas saturation and topography.