Regional Depositional Analysis Upper Permian "Yates" Gas Sands, Permian Basin, Texas

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The Upper Permian sequence sandstone, siltstone, clay, anhydrite and dolomites know as the Yates Formation may be the proverbial ”sleeping giant”, covering a large portion of Gaines, Andrews, Terry and Yoakum Counties in west Texas. Comprised of aeolian sands deposited within an evaporate sequence, the detailed lithology, petrophysical properties and aerial productivity are poorly understood. To date, over 312 BCF of high nitrogen Yates gas has been produced from these four counties. Proration units range in size from 40 to 640 acres with individual gas well accumulations of up to 7 BCF. Remaining recoverable gas could be three or four times current cumulative production emphasizing the importance of this widely misunderstood reservoir.

Tops for the several Yates sands and markers were correlated for over 4000 wells producing structure and gross isopach maps. Analysis of the gross sand packages indicate thickening of individual zones as sands are shed eastward off the Central Basin Platform into the Midland Basin. Sand packages can be correlated for over 2500 square miles. Detailed core analysis has resulted in an understanding of the Yates pay sands which has led to the development of a proprietary petrophysical technique that estimates the relationship between phi-h and EUR within the Robertson Yates Trend in Gaines County.

Historically, in many areas of the Permian Basin, Yates gas has been considered “trash gas” because of its high nitrogen content. However, recent technology coupled with operational efficiency and higher gas prices have made exploration and development of Yates gas economically attractive. Nitrogen content of the Yates gas is variable and ranges up to 33% in the subject area with relatively low btu (960) content. However, once nitrogen is extracted, btu content of the remaining gas increases to approximately 1200 resulting in significant liquids value.