

The Use of Iodine Surface Geochemistry to define Pennsylvanian Sandstone Channels and Arbuckle Reservoirs in Eastern Kansas

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Cherokee Basin and Forest City Basin located in Eastern Kansas has undergone successful exploitation for conventional petroleum reservoirs early in history of the oil industry and is considered a mature area. Several significant fields were found that produce from Pennsylvanian fluvial and marine sandstones and Mississippian and Arbuckle carbonates. Most of these reservoirs were found utilizing random drilling, trendology or subsurface geology. Except for the west side of this area, seismic has been almost never used. There are large areas between the existing fields that have remained relatively unexplored and lightly drilled. Recently there has been a resurgence in drilling activity as a result of coal bed methane exploitation. Because these potential pays are either penetrated or defined by coal bed methane drilling, surface geochemistry provides an inexpensive approach to define conventional petroleum targets. The concept of surface geochemistry is defined by the theory of vertical migration that states that petroleum hydrocarbons leak through the seal rock above a reservoir and migrate vertically from depth to the surface. The migrating hydrocarbons passing through the soil section cause a variety of reactions, decreases and increases in various elements and compounds. One of these elements that increase in anomalous amounts in the soil is iodine. Iodine has a unique relationship with petroleum and generally does not accumulate in large amounts otherwise. Examples of successful iodine survey integrated with seismic and subsurface geology will be presented.