

Woodford Shale, Surface Gamma Ray Measurements and Applications to Subsurface Interpretations

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Natural gamma ray data measured from surface outcrop exposures can be applied to subsurface log data to assist and enhance formation interpretations. The Woodford Shale outcrops at several locations along the north and south margins of the Arbuckle Mountains, in the Ardmore Basin to the south, in the Arkoma Basin and the Ozark Uplift of eastern Oklahoma. On outcrop the shale is mostly thin fissile organic rich beds with occasional silicious beds that are slightly thicker. The thickness of the Woodford varies from less than 50 feet to more than 250 feet across the region. For discussion purposes the Woodford Shale is considered to be from the first gamma ray value greater than 150 API units to the last value greater than 150 API units. Hand held spectral gamma ray measurements of the Woodford Shale outcrops in southern Oklahoma have been made by several researchers from Oklahoma State University and the U.S. Geological Survey. Two wells near the outcrop measurement locations were selected to compare the subsurface gamma ray curves to the surface data. Several characteristics on the curves appear to be present on both the surface and subsurface data.