

**Correlation of outcrop and subsurface strata (Wichita Albany Group, Leonardian/Artinskian)
in Central Texas using gamma-ray log data.**

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Measurement of natural gamma radiation was performed at several outcrops of the Wichita Albany Group (Elm Creek, Jagger Bend and Bead Mountain Limestones) near Albany, Texas. Data was collected using a handheld scintillometer with the intent of correlating outcrop and subsurface strata with the Elm Creek as the main focus of study. Measurement of spectral gamma-ray data, that is of the three components separately, was not performed since the available subsurface well gamma-ray logs from the research area displayed only total counts (in standard API units). The total gross measured section through this portion of the Wichita-Albany Group was approximately 470 ft. from localities spaced across a 5 mile interval. Net footage of 255 ft. was actually measured, with the “covered” shale sections accounting for the difference.

Correlations between outcrop lithologic logs and the outcrop gamma-ray logs are readily apparent. When compared with open hole logs from a nearby well, the Breck Operating “Merrick Davis 18”, gamma-ray correlation within the Bead Mountain Limestone is easily made. Unfortunately the Elm Creek and Jagger Bend intervals do not exhibit thick sections of alternating shales and limestones so detailed correlation with open hole logs through these parts of the section was more problematic. However, wells drilled and logged in extremely close proximity (<0.5 mile) to the surveyed sections enabled correlations to be performed. The surface elevation of one well was essentially the same as the base of the gamma-ray survey of the Jagger Bend interval. Alignment of the measured lithologic sections and outcrop gamma-ray curves allows correlation between surface data and the subsurface well log. After the nature of the Elm Creek gamma-ray profile was fully realized, it became apparent that detailed correlations utilizing data only from Elm Creek outcrops would be extremely difficult. Further attempts at directly correlating subsurface data to surface gamma-ray profiles from other localities were abandoned.