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What Lies Beneath Deep Horizons Such as the Ellenberger?

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In many areas of the western Texas and New Mexico region, there remain many unanswered questions about the deep structure beneath key horizons that have seldom been penetrated by exploratory drilling. Specifically in West Texas and Eastern New Mexico, the Ellenberger Formation, and its stratigraphic equivalents, is such a horizon. The Cambrian was a time of extension and magmatism over much of the southwest. This tectonic activity was related to the break-up of a supercontinent and produced an environment conducive to the formation of sedimentary basins. These basins could be typical graben structures or pull-apart structures. In the late Proterozoic, there were also several episodes of rifting that produced sedimentary accumulations. These basins are exposed in the Grand Canyon region where their bounding faults were reactivated to produce Laramide monoclines. The eastern extent of these basins is unknown, but there are Precambrian exposures in the Franklin Mountains that appear to have been deposited in rift basins. In West Texas and Eastern New Mexico, the Precambrian basement contains prominent sequences of reflectors. In some cases, this reflectivity is demonstrably due to interlayered volcanics that are about 1.35 billion years old. However, there are broad regions where this reflectivity may be due at least in part to sedimentary strata. Even in the late Paleozoic, the formation of the Ancestral Rocky Mountains produced a great deal of deformation that is still poorly understood. Basins formed during this time are presently being explored in New Mexico. These situations are reminders of the potential for deep gas plays in many areas of the southwest.