

The Role of Basaltic Magmatism in the Evolution of the Cambrian Southern Oklahoma Aulacogen: Geochemical and Isotopic Constraints on the Mafic Rocks in the Arbuckle Mountains, OK

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The presence of surficial mafic igneous rocks in the Arbuckle Mountains of southern Oklahoma are limited to Cambrian-aged diabase dikes, that most likely resulted from the initial stages of continental rifting related to the formation of the Southern Oklahoma Aulacogen. A 1982 drill test in the region penetrated thick packages of basaltic lava flows interlayered with silicic intrusive bodies and volcanics. These basaltic lava flows became the first described subsurface mafic rocks in the Arbuckle Mountain region. Mafic lava flows have since been discovered in other wells throughout the Arbuckle Mountain region. This project will use geochemical and thin section analyses on four wells in the region (Hamilton Brothers #1-18A Turner Falls, Pan-Am Williams D-2, Pan-Am Jarman 1-19, Pan-Am Newberry 1) to provide first-order petrogenetic constraints on basaltic volcanism in southern Oklahoma, to better understand their tectonic significance, and provide stratigraphic constraints for petroleum exploration.