

## **PETROGRAPHIC AND SUBSURFACE ANALYSIS OF LOWER PENNSYLVANIAN SANDSTONES IN RUSSELL COUNTY, VIRGINIA**

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Lower Pennsylvanian strata in the Central Appalachian Basin have been proposed as possible sites for CO<sub>2</sub> sequestration due to their geographic location, structural placement and depth. Determining the regional context and continuity of crucial mineralogic characteristics through petrographic, thermal, and geochemical means will further establish the value of the prospective units to CO<sub>2</sub> sequestration. The proposed study will evaluate sandstone units on the southeastern margin of the preserved Central Appalachian Basin as potential reservoirs by: (1) assessing the primary and secondary porosity of sandstone bodies by contrasting their primary and diagenetic mineralogy using samples from a continuous core; and (2) undertaking subsurface mapping to construct a 3D framework for sandstone bodies and associated mudstones and coals.

This project centers on the DOE M2 core in Russell County, Virginia, a 2200 ft deep core that intersects each of the major lithologies in the lower Pennsylvanian. Subsurface stratigraphic correlation will utilize both gamma-ray and bulk-density well log data sets to form a lithologic framework for 25 km around the key core site. Thin-section point-counting will be supplemented by microprobe and cathodoluminescence to corroborate mineral abundances. Published and unpublished fluid inclusion and vitrinite reflectance analyses from the core will link the data to the burial history.