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LATE MIOCENE SEDIMENTARY ROCKS BENEATH THE CENTRAL PAJARITO PLATEAU: RESULTS FROM RECENT BOREHOLE INVESTIGATIONS

BROXTON, David, E.; VANIMAN, David; WOLDEGABRIEL, Giday; and COLE, Gregory, Hydrology, Geochemistry and Geology Group, Mail Stop T003, Los Alamos National Laboratory, Los Alamos, NM 87545, broxton@lanl.gov

Stratigraphic and geochronology studies for drill holes and outcrops yield new information about the upper Miocene depositional history of the western Espanola basin. Four informal lithostratigraphic sedimentary deposits are recognized beneath the Pliocene Puye Formation fanglomerate based on lithologic variations and age constraints.

The youngest Miocene rocks are pumice-rich volcanoclastic sediments that are about 120 m thick. They consist of well-bedded horizons of light-colored, reworked tephra-rich sedimentary deposits and subordinate primary ash and pumice falls. These deposits typically contain up to 30% subangular to rounded, poorly phyrific, rhyolite pumice lapilli admixed with 70 to 90% ash and volcanic lithic sand. Intercalated gravel and cobble beds contain subangular to subrounded porphyritic dacite, rhyolite and subordinate andesite and basalt. Eight $^{40}\text{Ar}/^{39}\text{Ar}$ ages from pumice falls within these deposits yield ages between 6.44 ± 0.46 Ma and 7.92 ± 0.60 Ma. The age and compositions of these intercalated pumice falls suggest the deposits are coeval with volcanism associated with the Bearhead Rhyolite. Oriented geophysical logs indicate the mean dip of these deposits is about 5° to the south and southwest, significantly different from the westerly dips of Miocene rocks exposed east of the Rio Grande.

River gravels occur beneath the pumice-rich volcanoclastic sediments in several drill holes. These river deposits are 10 to 30 m thick and include unconsolidated well-sorted sands and well-rounded gravels. Gravel clasts include well-rounded quartzite and metavolcanics (minor) as well as subangular to subrounded basalt, andesite, and dacite. These deposits are generally similar to the river deposits of the Totavi Lentil at the base of the Puye Formation, but they are stratigraphically lower and granite clasts are rare to absent. The occurrence of these fluvial deposits containing rounded Precambrian clasts indicate that through-going rivers were established in the western Espanola basin prior to deposition of the pumice-rich volcanoclastic sediments.

About 420-500 m of volcanoclastic sands and gravels underlie the old river gravels and pumice-rich volcanoclastic sediments. These deposits represent alluvial fans shed from the Miocene Jemez Mountains and consist of volcanic detritus of intermediate composition derived from Keres Group rocks and possibly from early Tschicoma Formation centers. The deposits are characterized by dark lithic sandstones and gravel and cobble deposits with subangular to rounded clasts. Intercalated basalts have $^{40}\text{Ar}/^{39}\text{Ar}$ ages between 8.45 Ma and 8.97 Ma. Local quartzite-rich beds in this unit may represent either interfingering with a quartzite-rich, axial river (newly proposed Hernandez Member) or reworking of older quartzite-rich gravel deposits from an unknown source area in the Jemez Mountains. The older volcanoclastic deposits overlie a thick sequence of older rift deposits that consist of silts and sands (with minor pebble beds) from both arkosic and volcanic sources. Basalts in these older fine-grained units yield $^{40}\text{Ar}/^{39}\text{Ar}$ ages of 10.9 Ma to 13.1 Ma.



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