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A New Take on the Volcano-Tectonic Framework of the Northern Sierra Blanca Volcanics, Sacramento Mountains, New Mexico

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The Sierra Blanca Volcanics form a large (620 km²) Late Eocene-Oligocene volcanic field in the northern Sacramento Range of south-central New Mexico. These flows and related intrusions, including the Lincoln County porphyry belt, constitute part of the New Mexico alkaline igneous belt. Recent (2024-2025) high resolution aeromagnetic and radiometric data were collected in this region funded by the Earth Mapping Resources Initiative (MRI) program as a collaborative effort between the US Geological Survey and the New Mexico Bureau of Geology and Mineral Resources. Aeromagnetic survey data enable significant new observations of the volcano-tectonic framework of the northern Sacramento Mountains and relationships to mineral resources. Survey results reveal the extent and geometry of a wide range of known and previously unknown intrusions including the Rialto and Bonito Lake stocks and widespread, variably oriented dikes. A ring structure on the northwestern end of the mountains may reflect km-scale folding of basal volcanic strata (related to the Sierra Blanca Basin) or possibly a subvolcanic ring structure/caldera, with radial dikes emanating from this area. The Bonito Lake stock appears to be divided into northern and southern halves that are separated by the apparent eastward extension of the Bonito Lake fault, with distinctly different magnetic character of the two halves. The northern half is defined by a magnetic low in the center surrounded by a magnetic high. The southern half is defined by a relative magnetic high, but with lower amplitudes on the northern margin. The new data suggests there is the potential for previously unknown base and precious metals endowments as well as critical minerals in the Nogal-Bonito (as well as Schelerville) mining districts. The geological and geophysical data that support these observations and hypotheses will be presented.