PENNSYLVANIAN SANDIA FORMATION IN THE SIERRA NACIMIENTO, NEW MEXICO: EVIDENCE OF TECTONISM OF THE ARM PENASCO UPLIFT

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The Lower-Middle Pennsylvanian (?late Morrowan- early Atokan) Sandia Fm. in the Sierra Nacimiento, north-central New Mexico, is characterized by distinct lateral changes in thickness and facies as a result of the ancestral Rocky Mountain (ARM) deformation. In the Sierra Nacimiento, the Sandia Fm. is thinner than at the type section in the Sandia Mountains near Albuquerque (124 m). The thickest sections (72 m) are exposed on the eastern side of the Sierra Nacimiento north of Jemez Springs (Soda Dam), where the Sandia Fm. rests on Precambrian gneiss and is composed of shale with intercalated sandstone and fossiliferous limestone containing the fusulinids Millerella, Eostaffella and Fusulinella, indicating an Atokan age. Towards the west and north the Sandia Fm. thins and is entirely siliciclastic, composed of alternating shale, siltstone and sandstone (Mesa Venado, Porter Landing, Rancho de Chaparral). North of Guadalupe Box, the Sandia Fm. overlies the Osha Canyon Fm., is 32 m thick and composed of several fluvial fining-upward cycles and a thin marine horizon at the top. The northernmost outcrops are at Resumidero east of San Pedro Peak where the Sandia Formation is approximately 13 m thick and overlain by Gray Mesa Formation. Locally, near the western and southern margin of the Sierra Nacimiento, the Sandia Formation is absent. At Log Springs near the southern end of the Sierra Nacimiento the Log Springs Fm. is unconformably overlain by thin Osha Canyon Fm. and Gray Mesa Fm., indicating phases of uplift during Late Mississippian and Early Permian time. At Coyote Flat west of Jemez and at Rio de las Vacas the basement is overlain by the Guadalupe Box Fm., an equivalent of the Atrasado Formation (late Desmoinesian-middle Virgilian). In the area of Camp Zia northwest of Cuba, the Precambrian basement is overlain by red beds of the Abo Fm., indicating that the Peñasco uplift existed there as a positive high during the entire Pennsylvanian. Thus, thickness and facies changes and the distribution of the Sandia Fm. in the Sierra Nacimiento can be attributed to ARM tectonic movements of the Peñasco uplift.

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sedimentation, stratigraphy, facies changes, tectonics, uplift, Ancestral Rocky Mountains

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