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INTRABASINAL ARCHITECTURE OF THE SOUTHERN ÉSPANOLA BASIN

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Recent geologic mapping, examination of well cuttings, high-resolution aeromagnetic data, and other available geophysical data have refined our understanding of the general structure within the southern Española Basin. Our focus for this presentation is on the intrabasinal faults and folds within the basin, many of which coincide with aeromagnetic lineaments. In places, these intrabasinal faults appear to profoundly influence groundwater flow and aquifer compartmentalization (Johnson et al., 2004). North of the Santa Fe River, the general structure is that of a west-tilted half-graben, bounded on the west by the Pajarito fault zone near Los Alamos. Within the half-graben are numerous extension-related structures of interest. Midway across the basin, northwest of Tesuque Pueblo, there is a significant west-facing monocline with an interpreted 1000-1500 m of structural relief. This monocline is cut by numerous faults of variable displacement, and continues to the north into what Kelley (1978) referred to as the Barrancos monocline and to the south as a series of typically west-down, *en echelon* and anastomosing faults. We propose calling this structure the Barrancos fault system because it is continuous with the Barrancos monocline to the north. Faults bound the eastern margin of the basin as well, but appear to have relatively minor offset during rift tectonic activity. In addition to the Barrancos fault system, numerous west- and east-down faults are present basinward from the mountain front. West-down faults are locally coincident with west-facing monoclines. The area south of the Tesuque–Santa Fe drainage divide is generally referred to as the Santa Fe embayment. Here, the general geologic structure is that of a north-northeast-plunging syncline. The eastern limb of the syncline is cut by normal faults of unknown offset. Many of these faults have been mapped at the surface but some are inferred entirely from the aeromagnetic data. In many cases, aeromagnetically inferred faults coincide with mapped fault segments. This reflects a convergent evolution of both field mapping and interpretation of the aeromagnetic data during our collaboration on this project. In some cases the aeromagnetically interpreted structures are offset from the mapped faults. This discordance is likely due either to a higher contrast of magnetic properties at depth (perhaps indicating subsurface fault geometry) or due to multiple fault strands that were unrecognized on the surface.