GEOLOGIC MAPPING, SEDIMENTOLOGY, STRUCTURE, AND 40AR/39AR GEOCHRONOLOGY OF THE SOUTHEAST LAGUNA DEL LAJA AREA, CENTRAL ANDES, CHILE (37°30'S 71°15'W)

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Recent geologic mapping (1:20,000) of a ~100 km2 area immediately southeast of Laguna del Laja in the Andean Main Range, 600 km south-southeast of Santiago, Chile, has yielded insights into the tectonic, structural, and sedimentologic framework of the range's late Cenozoic evolution. More than 1800 m of the Cura-Mallín Formation are exposed in the study region centered at ~37°30'S 71°15'W. Interbedded volcaniclastic sandstone and mudstone, suggestive of floodplain deposition within an extensive fluvial system, characterize the lower ~1200 m of the exposed section of this formation. These strata are overlain by a 300 m thick sequence of interbedded pebble conglomerate and trough cross-bedded sandstone, interpreted as channel facies fluvial deposits. This upper sequence consists predominantly of volcaniclastic mudstone and fine-grained sandstone, again indicative of floodplain deposition. Abundant terrestrial fossil mammals, lack of lacustrine fossils, and lateral continuity of coarse-grained strata are consistent with a floodplain depositional environment; mudstone sequences, however, may reflect short-lived lacustrine deposition during periods of natural basin damming. Fourteen new 40Ar/39Ar analyses indicate that deposition of this sequence commenced prior to 19.80±0.40 Ma and continued until at least 14.50±0.50 Ma. Post mid to late Miocene folding of the Cura-Mallín Formation defines the north-south structural grain within the study region. Kilometer scale folds are east and west vergent, as well as upright, and are regionally non-cylindrical; these varying geometries are often manifested in a single fold. We interpret predominantly class 1B fold geometry (although often over tightened with class 1C geometry) as indicative of décollement thrusting. Roughly 10-12%, or 1 km, of total east-west shortening is accommodated by these folds within the study region. Folds are younger than 14.50±0.50 Ma, as the youngest exposed Cura-Mallín strata are folded and no evidence of syndepositional shortening is observed. Thus, we suggest that extensional basins persisted within this region of the Andes until at least ~14 Ma, and were followed by mid Miocene or younger shortening.