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### **Origin of Dolomite in Loessitic Paleosols of the Lower Permian Abo/Tubb Units, Northeastern New Mexico**

Lower Permian Abo/Tubb strata of northeastern New Mexico (subsurface) comprise 30 -120 m of fluvial and eolian deposits, containing numerous dolomitic paleosols. If this dolomite formed pedogenically, it represents a rare and significant example of dolomite precipitation at ambient conditions. Dolomite within the Abo/Tubb interval occurs in discrete horizons displaying independent evidence for pedogenesis (root traces, slickensides, peds, circumgranular cracks) and forms rhizoliths, and discrete or coalesced nodules (<1-9 cm diameter). These horizons appear to be pedogenic carbonate accumulations (Bk horizons) but all of the carbonate is dolomite. The dolomite predominantly (>90%) is associated with nodules and rhizoliths. It is micritic to sparitic (<20 to 200 $\mu$ m), cloudy, inclusion-rich, and locally appears spheroidal. Nodules are common, both displacing and encasing host sediment. Within fluvial strata, conglomeratic lags consist of intraclasts of dolomitenodules presumably reworked from penecontemporaneous soils. Preliminary analysis of the nodular dolomite by Kessler (1999) indicated slightly calcic compositions (average, Ca<sub>(51)</sub> Mg<sub>(49)</sub>), average trace-element concentrations of 3200 ppm Mn and 1500 ppm Fe, and presence of saline fluid inclusions in the coarser sparry phases. Minor amounts (<10%) of dolomite cement reduce pores (root molds); this dolospar is clear and locally exhibits apparent meniscus fabrics. Although morphological characteristics of much of the dolomite appear pedogenic, precipitation from shallow groundwater and recrystallization of a calcitic precursor is possible. We are currently acquiring petrographic, geochemical, and fluid-inclusion data to help discern the origin of the dolomite. If pedogenic, it could reflect peculiar climatic and geochemical conditions in western equatorial Pangea.