Facies Heterogeneity and Petrography of the Downdip Evaporitic Wedges in the Akah Interval of the Pennsylvanian Paradox Basin

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This outcrop-based research compares and contrasts the facies associations of down-dip evaporitic wedges of the late Carboniferous Akah interval (Moscovian) along the east and west margins of the Paradox basin in southwestern Colorado and southeastern Utah. These wedges contain shallow-marine carbonates, organic-rich dolomites, and evaporites being deposited along the margin of a temporarily restricted, rapidly subsiding basin subject to episodic desiccation and flooding. The stratigraphic sequences and down-dip restricted geometries in each locale are generally similar, yet the facies are encased by siliciclastic deltaics on the tectonically active eastern margin, and shallow water carbonates on the western side ramp margin. On both sides of the basin, laminated organic-rich dolomite and gypsum underlie large packages of massive and laminated gypsum deposits. Associated with these evaporites, are microbial, dolomitic packstones that include oomoldic coated grains on the west and oncolites on the east. Facies from both sides characterize a restricted, organic-rich, shallow subaqueous, evaporative shoreline environment. The deposits in the western lowstand wedge are in the same sequence as stromatolitic buildups located 10 miles to the west on the shallow shelf. Such facies exhibit characteristics similar to the modern intertidal and supratidal sabkha settings in Abu Dhabi, U.A.E., the modern intertidal salina settings in the West Caicos Islands, lagoonal settings of the Holocene along the Red Sea, and salinas of the late Triassic Abu Ruweis Formation in Jordan.