

## **Stromatolitic Carbonate Buildups of the Basal Akah Salt Interval, Western Paradox Basin**

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Within the deeply incised canyon of southeastern Utah's San Juan River, six stromatolite carbonate buildups are exposed in the lower Akah interval of the Middle Pennsylvanian, (Desmoinesian) Hermosa Group of the western Paradox Basin. The buildups appear in 5-20 m thick sequences above and below regional unconformities within the Akah Interval of the Paradox Formation (Gianniny 1995). Restricted circulation leading to elevated salinity conditions may have controlled buildup composition on this low relief shelf margin. Following this highstand buildup phase, evaporates were deposited several kilometers to the northeast during lowstand. Above the depositional shelf edge, parasequences and sequences in this section of the upper shelf Akah show a shallowing-upward trend with a coarsening-upward carbonate facies, grading from mudstones to boundstones and grainstones.

These lower Akah buildups appear to trend northeast-southwest; this orientation is possibly due to inherited topography from older Barker Creek chaetoid and phylloid algal bioherms and biostromes, which could have created topographic highs localizing mound growth. Akah buildups can be observed in offset stacks or satellites around the Barker Creek buildups. Alternately, the orientation of the buildups perpendicular to the regional basin shelf and evidence of mound growth prograding to the west as a result of dominant east to west currents, suggests that the buildups may have developed due to tidal currents or trade-wind-driven waves.

Mound facies, like the facies trend locally, coarsen upward from wackestone to grainstone dominated by encrusting foraminifera, ramose bryozoans, ostracods, brachiopods, and peloids. The top of the buildups are draped by a prograding bryozoans-rich grainstone, which is truncated on top of several of the buildups by a siliciclastic-rich mudstone, marking the regional unconformity. The dominant mound-core facies are alternating cm scale thrombolytic-textured, peloid-rich grain and boundstones with encrusting foraminifera occurring more than any other fauna. Thin section scale microbial fabrics appear exclusively in these thrombolytic facies as micritic crusts binding peloids and as micritic rims around grain clusters. The thrombolytic texture is common in thin section, while stromatolitic laminae are more distinguished in hand samples on a cm scale.