

**AAPG Annual Convention  
Salt Lake City, Utah  
May 11-14, 2003**

M. Royhan Gani and Janok Bhattacharya, University of Texas at Dallas, Richardson, TX

**Bed-Scale Facies Architecture of an Ancient Delta Lobe Deposit of the Wall Creek Member, Central Wyoming, U.S.A**

Although deltas have long been of human interest for petroleum exploration, there are a very few works dealing with bed-scale facies architecture of deltaic deposits. The Present study deals with the Wall Creek Member exposed at the Raptor Ridge in central Wyoming. Among the six parasequences exposed at the Raptor Ridge, the topmost parasequence (PS-6) is the target sandbody. A detailed analysis emphasizing facies, shales, bedding/bounding surfaces, paleocurrent, and concretions, along with traditional vertical logging, has been carried out along depositional dip continuously for 300m of the exposed cliff face. Facies succession shows upward gradation from laminated muddy silt, to heterolithic strata, to massive to flat stratified sandstones cut by channelized sandstone and overlain by HCS, and finally to cross-bedded sandstone. PS-6 has been interpreted as gradational-based, upward-coarsening, mixed-influenced delta lobe capped by a ravinement surface. Cross-bedding in the middle of the succession shows dominant flood tidal component, whereas those at the top are mostly either riverine or ebb dominated. Delta front clinof orm (4 degree dip) dips in the same direction of the dominant paleocurrent (~ 165 degree). Bedding diagram of the cliff face illustrates different orders of bounding surfaces demarcating various types of architectural elements. Broadly, distal distributary channel elements alternate with mouthbar growth elements with the development of laterally traceable downlap, onlap, reactivation, and lateral accretion surfaces. Thin bedsets of deltafront turbidites underlies the channel elements. Bar progradation phases are punctuated by thin interval of reworked sands transported landward by flood tidal current.