

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

Junaid Sadeque and Janok P. Bhattacharya, University of Texas at Dallas, Richardson, TX

Top Truncated Deltas in the Western Interior Seaway: An Example from Subsurface Analysis of the Turonian Wall Creek Member, Frontier Formation

A regional subsurface investigation using core data and geophysical logs has been recently initiated to test the hypothesis that the upper Turonian Wall Creek Member of the Frontier Formation in Wyoming is a top truncated delta as supported by concurrent outcrop studies.

Facies successions of the Wall Creek reveal several coarsening-upward sandstone units interspersed with thin mudstones and mud-dominated heterolithic deposits. These coarsening-upward facies successions suggest the deposition of individual delta lobes and their associated pro-delta deposits. Massive to flat-stratified sandstones culminating in ripple cross-laminated strata in these sandbodies are indicative of delta-front turbidites. Locally, ripple cross-laminated sandstones within mud couplets and reactivation surfaces suggest tidal influence. Hummocky to swaley cross-stratification accompanied by wavy beds and combined-flow ripples also indicate storms to be an important agent of sediment transport.

Ichnologically, the interpreted prodelta muds show a low abundance and diversity of stressed *Cruziana* assemblage. The individual delta-lobe sandbodies commonly show intense bioturbation by proximal *Cruziana* that transits upward into sparse *Skolithos*.

In a number of wells, the Wall Creek exhibits a sharp lower contact sporadically strewn with thin pebble lags and marked by the *Glossifungites* ichnofacies. This signifies a surface of marine erosion associated with forced regression. The regressive surface of erosion is overlain by cross-bedded clean sandstone suggesting prograding wave dominated shoreface deposits. Pebbles at the top of the Wall Creek indicate ravinement during subsequent transgression. These observations suggest that the Wall Creek may represent a complex of forced-regressive top-truncated mixed wave- and tide- influenced delta lobes.