

INFLUENCE OF BASIN SUBSIDENCE ON FACIES IN THE UPPER CRETACEOUS LANCE FORMATION, EASTERN WIND RIVER BASIN, WYOMING

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ABSTRACT OF ORAL PRESENTATION

Facies analyses of the Maestrichtian Lance Formation in two areas of the Wind River Basin indicate deposition in fluvio-deltaic environments. The facies architecture of the fluvial deposits in the upper Lance Formation (Figure 1) are strongly influenced by Laramide basin subsidence.

The lower Lance in the basin center contains strata deposited in a prograding delta along a low-energy shoreline. Delta-front deposits are overlain by cyclic, interdistributary bayfill sequences and distributary channels and floodplains representing lower and upper delta plain facies respectively. The upper Lance in the basin center consists of thick layers of lacustrine shale and overbank deposits associated with anastomosing river systems. Electric-log cross-sections indicate that these fine-grained facies are confined to the central basin area. This suggests that basin subsidence was outstripping sediment input causing the formation of basin-axis lakes and causing the streams near the basin center to anastomose. continued subsidence of the basin resulted in the accumulation of thick sequences of predominantly muddy floodplain and lacustrine sediments in the basin axis.

The Lance on the southern basin margin consists of strata deposited in a large, fine-grained, low-sinuosity river system. Cross-bedding indicates that these rivers initially flowed east towards the Lewis Sea but were later diverted northward into the subsiding basin trough.

The Lance Formation produces oil and gas from several fields in the eastern half of the Wind River Basin. Tectonic processes influenced fluvial architecture across the basin which, in turn, affected the geometry of the reservoirs. These processes also may have influenced the source rock kerogen-type which has had the effect of making production sourced from the Lance Formation more gas-prone along the southern basin margin and more oil-prone in the basin center..

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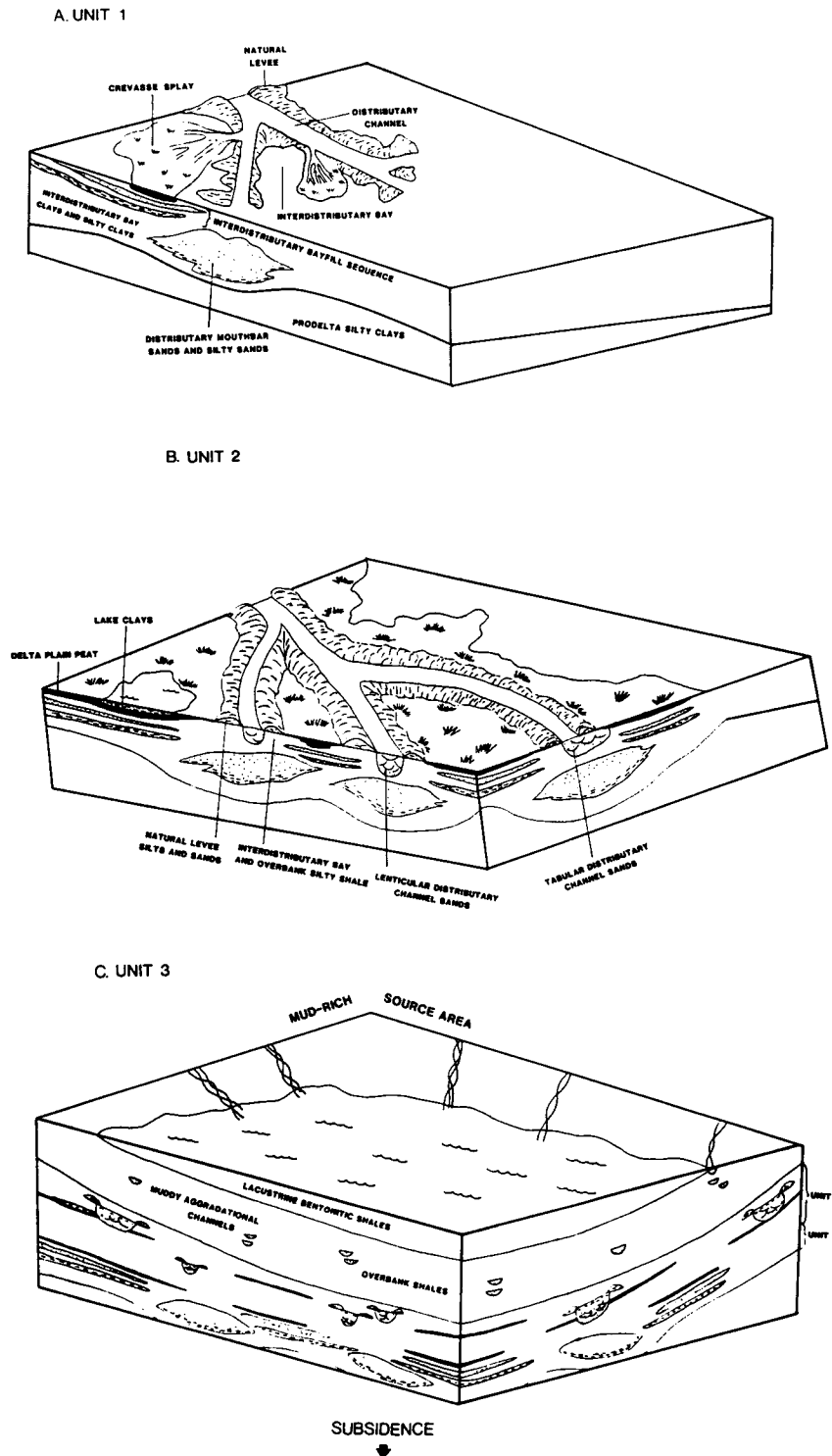


Figure 1. Lance Formation depositional sequence model: A) Prograding delta deposition along low-energy shoreline; B) Delta-front deposits are overlain by upper deltaic and distal fluvial sediments; C) Accumulation of lacustrine and over-bank deposits.