ty—Late Pennsylvanian, post-Wolfcamp–pre-Leonard, post-Triassic–pre-Late Jurassic, pre-Cretaceous, and post-Paleocene.

Early structural exploration along the southeast Powder River basin rim resulted in several oil and gas discoveries, notably Lance Creek field with pay zones of Cretaceous, Jurassic, Permian, and Pennsylvanian ages. Recent exploration has resulted in stratigraphic discoveries in Cretaceous and Pennsylvanian rocks. This rather sparsely drilled area appears to have excellent potential for additional stratigraphic traps in Cretaceous and Pennsylvanian sandstones.

HENDRY, H. E., G. N. SUTHERLAND, and S. J. C. WING, Univ. Saskatchewan, Saskatoon, Sask.

Relations Between Sedimentary Facies and Diagenesis in Frenchman Formation (Maestrichtian) of Southern Saskatchewan

The Frenchman Formation of southern Saskatchewan is a fluvial deposit which ranges in thickness from only a few meters to over 70 m in a distance of about 50 km. The detritus was derived from the Cordillera mainly on the west and southwest. The rocks and sediments of the Frenchman Formation are arranged in fining-upward sequences, typically with the following arrangement of sedimentary facies from bottom to top of each sequence: large-scale trough cross-bedding in medium to coarse-grained silty sand; trough cross-bedding with individual sets topped by ripple lamination or parallel-laminated silt with plant remains; ripple cross-lamination in fine sand and silt; parallel-laminated fine-grained silty sand or alternating sand and carbonaceous material; interbedded purple, green, and silty clays. Single sequences are up to 40 m thick. The sands are interpreted as channel-fill deposits and the clays as overbank deposits; the ratio of channel to overbank deposits ranges from 0.2 to 5.3. Where exposures permit and the formation is thick enough, sand bodies can be traced for up to 4 km. However, some sands clearly are lenticular and persist in outcrop for less than 1 km. Many parts of the Frenchman sands are cemented with calcium carbonate and the distribution of the cement shows a close relation to the sedimentary facies. In the coarse-grained sands with large-scale cross-bedding, patterns of cementation have been influenced strongly by the anisotropy of permeability; preferred directions of cement development are parallel with the trough axes of cross-bedding and parallel with the dip of foresets in cross-bedding, and cementation in such zones commonly occurs to the extent that an expanded fabric has developed. In the finer grained sands and silts, development of cements is related principally to the overall direction of bedding, and cements are concentrated in spheroidal concretions whose planes of maximum projection parallel the bedding.

HOBDAY, DAVID K., and DAWN G. MCKALIPS, Bur. Econ. Geol., Austin, Tex.

Nonmarine Depositional Environments and Uranium Exploration in Lower Cretaceous Antlers Formation, North Texas

Detailed geologic and geochemical investigations of the Sherman quadrangle for the National Uranium Resource Evaluation (NURE) program have included fluvial deposits of the Antlers Formation which are exceptionally well exposed in cliffs along the shores of Lake Texoma, Grayson County, Texas. These deposits accord with the classical mixed-load, meandering-river model, with erosively based pebbly sandstones grading upward into silty sandstones and carbonaceous mudstones with sporadic lignitic material. Lateral-accretion bedding of presumed point-bar origin is inclined at angles up to 10°. Thickness of these lateral accretion units permits estimates of channel depth of as much as 12 m. Distinct channel forms, some of which are clay filled, are up to 100 m wide, but substantially lower estimates of channel width are obtained from dimensions of the point-bar stratification. Flanking and overlying the in-channel sands are inclined levee deposits, chutes and chute bars, proximal to distal crevasse splays, and organic-rich backswamp clays.

Preliminary radiometric analyses show low to very low readings for the major channel sands, with a general trend of increasing radioactivity with decreasing grain size, decreasing bed thickness, and increasing organic content. Thus the most distal, or sediment-starved, overbank facies composed of dark laminated clays and lignites show the highest values. These analyses indicate substantial local epigenetic enrichment, but the deposits encountered to date are too small to be considered a potential resource.

JACKSON, TIMOTHY J., and FRANK G. ETHRIDGE, Colorado State Univ., Fort Collins, Colo., and ALV D. YOUNGBERG, Dept. Energy, Laramie, Wyo.

Flood-Plain Sequences of Fine-Grained Meander-Belt System, Lower Wasatch and Upper Fort Union Formations, Central Powder River Basin, Wyoming

Models of fine-grained meander-belt systems generally emphasize the coarser sandstone facies of channel origin and neglect the relatively fine-grained overbank sediments of the flood plain. This emphasis is unfortunate because of the volumetric importance of the flood-plain sequences in many ancient stratigraphic successions such as the Tertiary coal and uranium-bearing rocks of the northern and central Rocky Mountain and Great Plains provinces. An appreciation of the processes of formation, and lateral and vertical successions of these deposits can provide valuable information for mining and reclamation activities.

Macroscopic and microscopic studies of 18 continuous cores through the lower Wasatch and upper Fort Union Formations in a 4-sq mi (10 sq km) area of southeastern Campbell County, Wyoming, allow recognition of six flood-plain environments associated with point-bar sequences. These flood-plain sequences, recognized on the basis of primary and secondary sedimentary structures, presence and type of bioturbation, organic content, and presence or lack of preferred vertical and lateral successions, include lacustrine, lacustrine delta fill, well-drained and poorly drained swamps, crevasse splay, levee, and abandoned channel. Recognition