

# **Quaternary Gas in Northern Alberta: Drift/Glacial Sediment Characteristics and Geometry**

John G. Pawlowicz\*, Tim Berezniuk and Mark M. Fenton  
Alberta Geological Survey, Alberta Energy and Utilities Board  
4th Floor, 4999 – 98 Avenue, Edmonton, AB, T6B 2X3  
john.pawlowicz@gov.ab.ca

## **ABSTRACT**

Recent years have seen an increased level of exploration for shallow gas in Northern Alberta. One such area, the Sousa gas field near High Level has been producing gas from thick Quaternary sediments since 1998, but other areas with similar geology are present throughout Northern Alberta. The last major geological events to modify the present-day landscape were the multiple glacial advances and retreats during the Quaternary. These left a drift cover which in part masks both the broad uplands and deep channels of the preglacial drainage systems.

Major buried valleys are present throughout Northern Alberta with drift thickness accumulations of over 200 m. Many contain preglacial fluvial sediments near their base that are overlain by tills or glaciolacustrine clays separated by fluvial sediment. The fluvial sediments commonly are sands and gravel of either preglacial or glacial age. The tills are characteristically clay rich because the source material derived from erosion by the glaciers was from the underlying Cretaceous-aged shale bedrock.

The drift in general consists of alternating fluvial sequences, which can form aquifers and/or gas reservoirs, and interbedded till and glaciolacustrine layers that form aquitards and/or cap rocks. The Alberta Geological Survey is conducting a multiyear program of mapping the bedrock topography and drift thickness of Northern Alberta at 1:250,000 scale, and characterizing the drift sediments to eventually provide a basis for developing a stratigraphic framework throughout the area. However data are already available for some of the areas in the central and northwestern part of the region.