An Innovative Horizontal Drilling Program Opens a New Exploration Play in Admire (Permian) Reservoirs of the Northern Denver Basin, Nebraska

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An innovative approach to oil and gas exploration may result in unexpected but beneficial results. Such is the situation with a recent horizontal drilling program initiated in the Nebraska Panhandle to exploit the hydrocarbon potential of the lower Wolfcampian Admire "C" of the northern Denver Basin.

The zone exhibits relatively uniform thickness and continuity over a large portion of the Alliance Basin, reflecting baselevel rise and fall symmetrical brining cycles in an intermittently restricted basin affected by glacial-eustatic sea-level changes. Reservoir development is variable, with the best reservoirs developed in dolomitized packstones associated with shoaling cycles. The reservoir consists of intercrystalline and separate-vug pore types that exhibit permeabilities of less than 25 md. An engineering review of the completion practices in the zone determined that it is a depletion-drive reservoir, and that structural position does not affect water influx. A horizontal program therefore was initiated to increase wellbore permeability height without regard for structural position.

Although the horizontal drilling venture did not result in economically viable hydrocarbon production, it did demonstrate that a large continuous hydrocarbon accumulation covering an area of up to 5,400 square miles (13,986 sq km) is present in the Admire "C". With relatively shallow drilling depths of 7,500–8,500 feet (2,286–2,592 m), this low-permeability, pervasively oil-saturated reservoir currently is poised for the development of an innovative technology to recover its extensive oil resources.

Geoscience for the 21st Century
Edited by D. F. Merriam: Transactions of the Am. Assoc. Petroleum Geologists Midcontinent Section Meeting (Wichita, KS), 1999