

Exploration Assessment of Tight Gas Plays, Northeastern British Columbia

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ABSTRACT

Tight gas reservoirs in British Columbia are characterized by sub-economic reservoir characteristics, commonly with permeabilities of less than 0.1 md. They are widespread, but can be assigned to three geographic regions: 1) Deep Basin; 2) Foothills, and 3) Northern Plains.

Most tight gas reservoirs are found in the Deep Basin, where stacked Mesozoic sandstones and conglomerates are gas-saturated, abnormally pressured, and lack downdip water contacts. In the Foothills, tight gas reservoirs include carbonates and clastics at various stratigraphic levels, where structural deformation has produced extensive natural fracturing. In the northern Plains, laterally continuous carbonate sheets are gas-saturated, and contain subtle natural fractures which can be exploited by horizontal drilling.

Optimal exploration and exploitation strategies vary among the three regions. In the Deep Basin, “sweet spots” of conventional reservoir quality are stratigraphic targets; little production to date is from true tight gas sands. In the Foothills, advanced structural mapping and high-definition seismic target structures where deformation has enhanced reservoir quality. In the northern Plains, advanced drilling and completion technologies are employed in large drilling programs which optimize economies of scale.