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TIGHT GAS SAND EXPLOITATION: LINKING GEOSCIENCE TO ENHANCE OPERATIONS, Siberia Ridge Field, Wyoming

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Abstract:

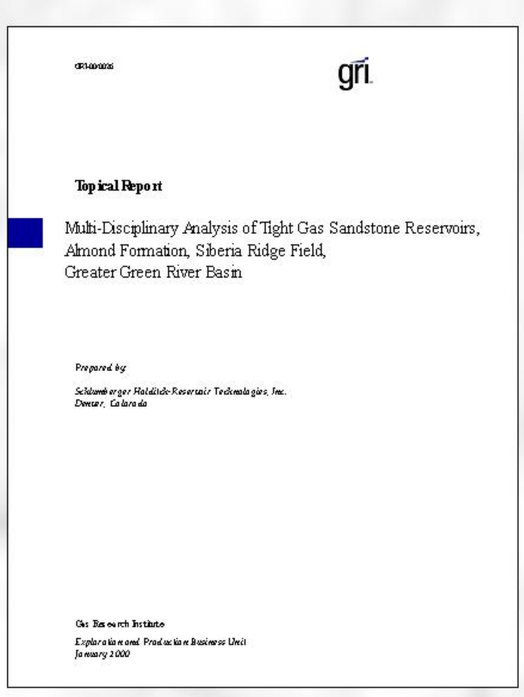
The Siberia Ridge Field Reservoir Characterization study is based on full-field geoscience, petrophysical and engineering analyses including the results of a cooperative research well. This Gas Research Institute funded study provides insight into mechanisms controlling gas production in Siberia Ridge Field, southwestern Wyoming. The purpose of the study was to characterize the Almond Formation (Cretaceous) to better understand controls on productivity and to compile this information for analogous tight-gas sandstone reservoirs.

Geological facies analysis, petrophysical data, and seismic attribute data were mapped with production data to determine productive trends. Coherency analysis was used to determine the location of significant linear features. The combination of depositional, petrophysical, and structural data revealed areas of better petrophysical properties that generally indicated better production. This was apparent even within a small range of reservoir quality.

With average reservoir porosity ranging from eight to ten percent and matrix permeability in the micro-darcy range, the role of natural fractures to productivity was of particular interest. FMI and core data were used to characterize the natural fracture system. Natural fracture density was influenced more by lithology than lineament proximity or increased intersections resulting from wellbore deviation. Rather than providing increased conductivity to natural gas, natural fractures were found to provide increased relative permeability to deeper Almond water.

Specific completion practices were evaluated with geological and petrophysical data to determine relationships to gas production. Results indicated that completion practices were critical to well performance.

Enhanced reservoir understanding can improve drilling, completion and production practices, ultimately affecting well economics by decreasing risk and increasing recoverable reserves.



GRI-00/0035

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Topical Report

Multi-Disciplinary Analysis of Tight Gas Sandstone Reservoirs, Almond Formation, Siberia Ridge Field, Greater Green River Basin

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Exploration and Production Business Unit
January 2000

Acknowledgments:

GTI (formerly Gas Research Institute), BP-Amoco, The Discovery Group, GeoQuest ICS, and Schlumberger Holditch-Reservoir Technologies

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