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**Controls on Prolific Gas Production from Low-Permeability Sandstone Reservoirs in Basin-Centered Regions:
Implications from the Rocky Mountain Region for Resource Assessment, Prospect Appraisal, and Risk Analysis**

Low-permeability, basin-centered gas systems (LPBCG) are projected by some to be a major source of natural gas supply for at least the next two decades. Recent resource estimates for the Greater Green River Basin alone suggest in-place resources of between approximately 3,000 and 5,000 TCF gas and a "presently recoverable" resource of between 17 and 100 TCF. Resource projections for adjacent Rocky Mountain basins are equally impressive. It has been widely suggested that LPBCG systems deserve consideration as a unique type of petroleum system. We suggest, that while these systems have a number of unusual attributes that distinguish them from more conventional oil and gas systems, this uniqueness reflects the low-permeability structure of the reservoir rock and does not imply, nor require, a paradigm-shift in terms of hydrocarbon systems. Examination of the Greater Green River Basin (more than 50 fields examined) indicates more than 90% of the presently recoverable resource occurs in low-permeability, but conventional traps. We conclude that LPBCG accumulations are best viewed as an end-member within well-understood petroleum systems and should be evaluated in a manner similar to, and consistent with conventional hydrocarbon systems.

The key distinction between conventional hydrocarbon systems and LPBCG systems lies in an understanding of pore-geometry and multi-phase permeability, particularly effective permeability at varying degrees of water saturation. Successful exploitation of gas resources within these LPBCG systems requires a focused, deliberate effort that fully integrates the unique petrophysical nature of these reservoirs with all elements of petroleum systems analysis, particularly an understanding of trap-related elements. Failure to recognize these essential elements of low-permeability reservoirs has led to a misunderstanding of the risks associated with basin-centered gas plays and a significant over-estimation of available resource levels.