AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003

Rick Allis[1], Tom Chidsey[1], Craig Morgan[1], Joe Moore[2], Stephen White[3] (1) Utah Geological Survey, Salt Lake City, UT (2) Energy and Geoscience Institute, Salt Lake City, UT (3) Industrial Research Limited, Lower Hutt, New Zealand

Geological Storage of CO_2 Beneath the Southern Rocky Mountains—Colorado Plateau Region

The Southern Rocky Mountains—Colorado Plateau region presents unusual scientific opportunities for studying the effects of geological storage of CO_2. An abundance of oil and natural gas fields, as well as natural CO_2 fields, proves the existence of reservoirs and seals in the sediments that are suitable for long-term gas storage. The widespread occurrence of near-surface coal measures has resulted in large coal-fired power plants being collocated in the same region. The six largest power plant sites are point sources of 100 million tonnes/year of CO_2, and four natural CO_2 fields produce over 30 million tonnes/year mostly for enhanced oil recovery. Structures near to these power plants, as well as the produced natural CO_2 fields could provide storage for significant volumes of CO_2 separated from power plant flue gases.

We report on the latest findings from a multi-disciplinary study using the natural CO_2 fields as analogues for long term CO_2 storage. The frequent presence of stacked reservoirs in these systems and obvious outflow of CO_2-rich fluids in the vicinity of two known CO_2 areas suggests that it is unrealistic to expect total containment of CO_2. Local containment in a domal or stratigraphic trap may also not be a requirement for long-term storage. Dipping or undulating reservoir structures that are not laterally confined may actually be preferable because of the opportunity for long flow paths and a long time scale that promotes permanent sequestration of injected CO_2, either as a mineral or dissolved in groundwater. Results of two-dimensional, two-phase reactive transport modeling of CO_2 injection into a dipping sedimentary sequence beneath a large power plant in central Utah will be presented.