Estimates of CO_2 Storage Capacity in Selected Oil Fields of the Northern Great Plains Region of North America

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ABSTRACT

The potential CO_2 sequestration capacities of selected oil fields in the Williston Basin, Powder River Basin, and Denver–Julesberg Basin in the northern Great Plains region of North America were estimated as part of the Plains CO_2 Reduction (PCOR) Partnership regional characterization. The estimates were developed using readily available reservoir characterization data obtained from the petroleum regulatory agencies and/or geological surveys from the oil-producing states and provinces of the PCOR Partnership region. Reconnaissance-level sequestration capacities were calculated using two methods, depending on the nature of the readily available reservoir characterization data for each field. Maximum storage capacities were estimated for reservoirs where detailed data on reservoir thickness, porosity, temperature, pressure, and water saturation were available. The storage capacity of fields for which detailed reservoir characteristics data were not available were estimated using a methodology based on original-oil-in-place values and published CO_2 flood enhanced oil recovery (EOR) performance data. The initial reconnaissance-level estimates indicate that over 1100 oil fields within the three basins have a capacity to sequester nearly 500 billion tons of CO_2, with the potential to produce 1.4 billion barrels of incremental oil through CO_2 flood EOR activities.