Southwest Regional Partnership on Carbon Sequestration - Phase II Field Demonstrations

Aneth Oil Field, Southeastern Utah: Demonstration Site for Geologic Sequestration of Carbon Dioxide

by

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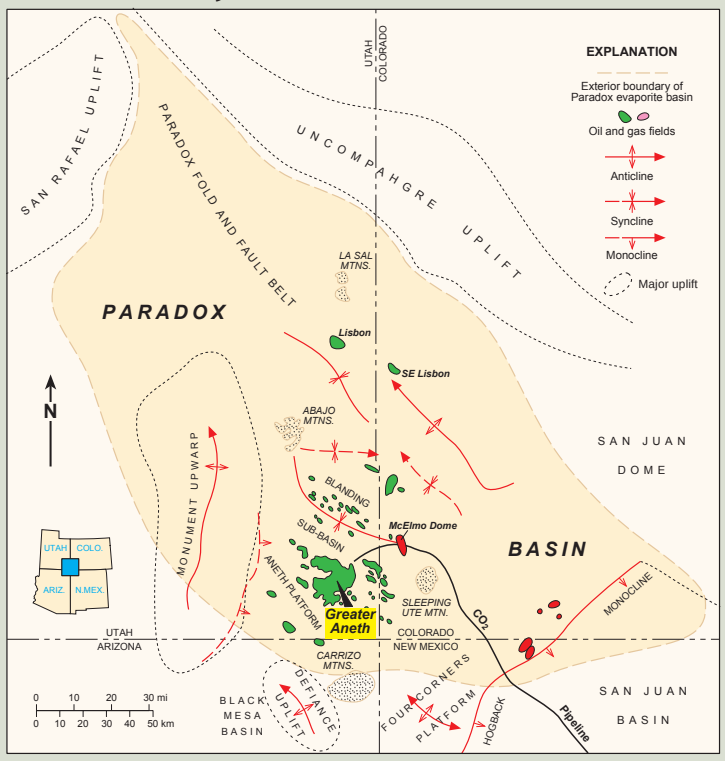
ABSTRACT

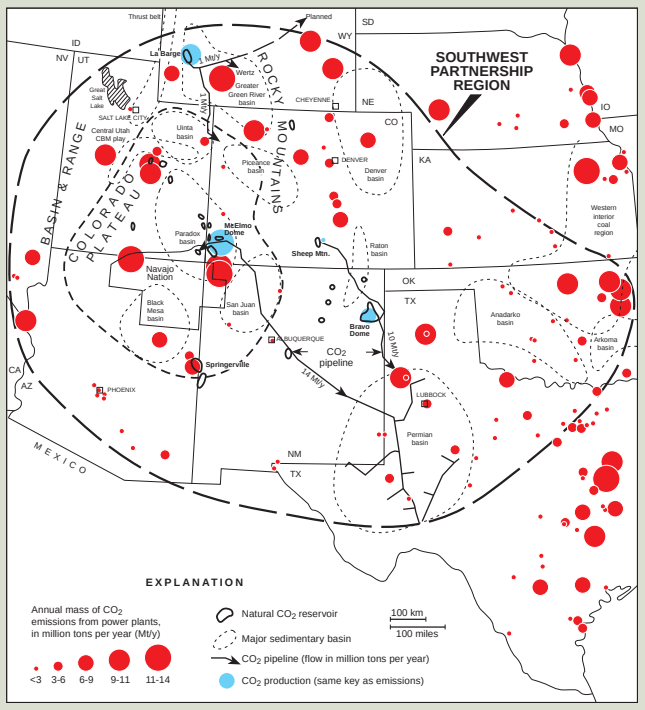
Aneth oil field, Utah's largest oil producer, has produced over 440 million barrels of oil. Located in the Paradox Basin of southeastern Utah, Aneth is a stratigraphic trap, with fractures and minor faults. Because it represents the archetype oil field of the western U.S., Aneth was selected to demonstrate combined enhanced oil recovery (EOR) and CO_2 sequestration under the auspices of the Southwest Regional Partnership on Carbon Sequestration, sponsored by the U.S. Department of Energy. This paper provides an overview of this sequestration demonstration site and how its geology will affect sequestration operations and engineering strategies.

The Aneth field demonstration will take place in the 66-km^2 Aneth Unit, operated by Resolute Natural Resources and Navajo Nation Oil & Gas Co., Inc. The primary reservoir is the Pennsylvanian Paradox Formation. Production has declined by 50% over the past 20 years in spite of waterflood and horizontal drilling projects. However, the Aneth Unit has produced 149 million barrels of the estimated 450 million barrels of oil in place - a 33% recovery rate. The large amount of remaining oil, combined with a nearby CO_2 pipeline, makes the Aneth Unit ideal to demonstrate both CO_2 storage capability and EOR by flooding the reservoir with the CO_2. The Southwest Partnership will conduct extensive monitoring to track the movement and fate of injected CO_2; risk mitigation, optimization of measurement-mitigation-verification (MMV) protocols, and effective outreach and communication are additional critical goals of the test. The planned CO_2 flood will begin in late-2006, at the rate of 400 tons/day (25 million cubic feet of gas per day [MMCFGD]).

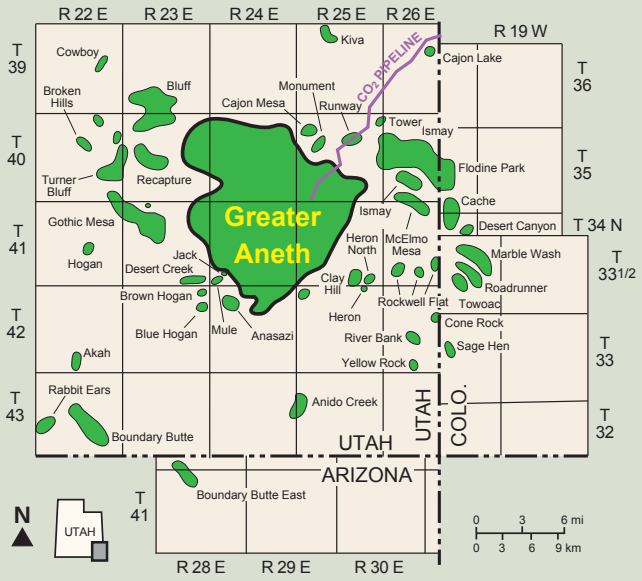
Location of the Paradox Basin and Major Oil and Gas Fields



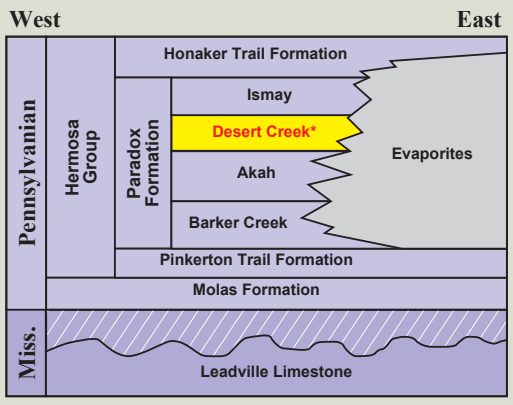
CO_2 Sources, Sinks, & Pipelines



Location of Greater Aneth and Surrounding Oil Fields, Paradox Basin



Pennsylvanian Stratigraphy of the Paradox Basin



*Reservoir Unit at Greater Aneth field