PROJECT facts

DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

OIL recovery PROGRAM

REVITALIZING AGING OIL FIELDS IN SOUTH TEXAS — A PROJECT BY THE UNIVERSITY OF TEXAS AT AUSTIN

PRIMARY PROJECT PARTNER
University of Texas at Austin
Bureau of Economic Geology
Austin, TX

FOSSIL ENERGY PROGRAM
Oil Recovery Field Demonstrations

MAIN SITES
Austin, TX

T-C-B & Rincon Fields
Jim Wells & Starr Cos., TX

TOTAL ESTIMATED COST
$3.3 million

COST SHARING
DOE - $1.65 million
Non-DOE - $1.65 million

Project Description

With Department of Energy support, the University of Texas is devising strategies that might prolong the economic life of oil reservoirs in south Texas that are at risk of premature abandonment. Frio sandstones, typical of many oil U.S. reservoirs, have produced nearly 1 billion barrels of oil, yet still contain about 1.6 billion barrels of potentially recoverable oil.

This remaining oil, however, is locked in very complex reservoirs. Much of the oil is contained in isolated, unconnected pockets, with little drainage between the compartments. Producers have traditionally operated by drilling closely spaced wells in a uniform pattern, an expensive approach since some of the wells do not find new oil-bearing compartments.

More than half of these reservoirs have been abandoned, even though large amounts of oil remain. In an intensive effort to prevent more from being abandoned, University of Texas Bureau of Economic Geology researchers have collected data—seismic images, temperature, pressure, and fluid chemistry—and developed models of the reservoir strata between wells to reveal compartments that have been missed or bypassed.

Reservoirs that have the greatest potential for untapped compartments and new pools have been targeted in the T-C-B field in Jim Wells County and Rincon field in Starr County. A geological model has been developed to predict the structure of the reservoirs. The results of the studies and a description of the methods used have been published and presented at workshops and field trips. Operators in the fields are beginning to use the results to open their wells into previously untapped reservoirs.

Program Goal

Maintaining access to the nation's oil wells is a principal goal of the DOE's Oil Program. Once abandoned, the oil is lost to future production. If kept open, available technologies could be applied to significantly increase production of oil remaining in those reservoirs.

In this project, University of Texas researchers are developing methods to locate isolated compartments of unproduced oil. The project is designed to demonstrate the economic advantages of using improved technology to provide optimal well placement. By drilling in the most promising areas to contact remaining unproduced oil, production can be increased, and the fields kept operating and accessible for application of future recovery technologies to the estimated 1.6 billion barrels remaining in the Frio sandstone reservoirs.

DE-FC22-93BC14959

Project Partners

THE UNIVERSITY OF TEXAS, BUREAU OF ECONOMIC GEOLOGY
Austin, TX
- Reservoir Characterization

CONOCO, INC.
Midland, TX
- Field data

MOBIL EXPLORATION AND PRODUCING U.S., INC.
Dallas, TX
- Field data

Revitalizing Aging Oil Fields in South Texas — A Project by the University of Texas at Austin

Project Benefits

More than half the south Texas Frio oil reservoirs have been abandoned, and more are threatened, because of declining production in adverse economic conditions. Difficult production problems resulting from complexities in the oil reservoir strata are being examined by University of Texas scientists in an effort to overcome those barriers to production. The researchers are applying improved methods of obtaining data about the makeup of the oil-containing rocks and are modeling the information to predict where isolated and bypassed zones of oil remain in the reservoir. Drilling patterns are being designed to effect optimal contact with the oil zones that will provide producers with more efficient and cost-effective operations.

Results and technologies developed in this project have been supplied to the industry through six presentations at technical conferences and in nine publications. Results and products include (1) an analysis of original oil in place, produced oil, remaining mobile oil, and residual oil resources in the Frio fluvial-deltaic sandstone oil play; (2) a description of the distribution of porosity, initial water saturation, residual oil saturation, net pay thickness, reservoir area, and oil gravity and viscosity for reservoirs in the play; (3) description of the methods used to analyze and describe the reservoirs; and (4) a model to predict reservoir structure. Transfer of these products to operators in the play will result in less expensive, but more accurate, characterization studies that will improve the profitability of recompletions and infill wells leading to increased oil production and decreased well abandonment.

CONTACT POINTS

Noel Tyler
University of Texas at Austin
Bureau of Economic Geology
Austin, TX
Phone: (512) 471-1534
FAX: (512) 471-0140

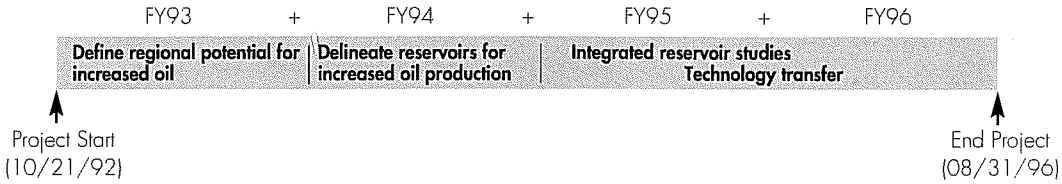
Edith C. Allison
U.S. Department of Energy
Bartlesville Project Office
Bartlesville, OK
Phone: (918) 337-4390
FAX: (918) 337-4418
e-mail: eallison@bpo.gov

Cost Profile (Dollars in Millions)

	Budget Period 1 (10/21/92 – 12/31/94)	Budget Period 2 (12/31/94 – 08/31/96)
Department of Energy*	$0.82	$0.83
Private Sector Partners	$0.82	$0.83

* Obligated Funding

Key Milestones



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