PROJECT facts

DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

OIL recovery PROGRAM

IMPROVED OIL RECOVERY IN CARBONATE RESERVOIRS OF KANSAS

PRIMARY PROJECT PARTNER
University of Kansas Center for Energy Research
Lawrence, KS

FOSSIL ENERGY PROGRAM
Oil Recovery Field Demonstration

MAIN SITE
Schaben Field
Ness Co., KS
Bindley Field
Hodgeman Co., KS

TOTAL ESTIMATED COST
$3.2 million

COST SHARING
DOE - $1.6 million
Non-DOE - $1.6 million

DE-FC22-93BC14987

Project Description

In this Department of Energy Class II Oil Recovery Field Demonstration Project, the University of Kansas and its partners are demonstrating cost effective technologies that could boost oil production from the many aging Kansas Shallow Shelf Carbonate (SSC) reservoirs.

The project addresses oil production problems in two Kansas fields, Schaben Field (Ness County) and Bindley Field (Hodgeman County), including inadequate knowledge of the reservoir, drilling and completion design, and less-than-optimal recovery efficiency.

The researchers will demonstrate how advanced analysis and imaging techniques provide increased knowledge of the reservoir strata and fluid flow to assist in identifying bypassed oil zones. This information is used in computer simulations to achieve more efficient reservoir management, identify additional reserves, and design improved recovery processes. Existing wells are being recompleted and deepened, and new "infill" wells drilled between existing wells to contact missed zones. The reservoir geology and field performance of the two fields will be compared to assess the relative merits of each operation.

A major emphasis will be collaboration of scientists and engineers with independent producers and service companies operating in the state. An extensive technology transfer effort will be undertaken to inform other midcontinent region operators of the results of the project.

As of early 1996, acquisition and consolidation of geologic, well, and production data have been completed and the data entered into a database management and analysis system. Two of the three proposed wells have been completed and tested. A PC-based computer program (PfEFFER), developed to analyze rock properties and geologic data, is available to operators and requires only rudimentary computer expertise.

Program Goal

A principal goal of the Department of Energy's Oil Program is prolonging the productive life of the nation's older, marginal oil fields. Application of existing recovery technologies can lower costs, increase production, and maintain access to the wells for application of developing technologies that can provide further improvements in production efficiency and cost reduction.

The University of Kansas is demonstrating the use of detailed reservoir information and improved reservoir management techniques to design optimal recovery strategies. Dissemination of these technologies to Kansas operators will foster their application to other midcontinent area fields. A 10% increase in production could provide recovery of nearly a half million additional barrels of oil from the project fields alone. Nearly 1200 shallow shelf carbonate wells in Kansas that produce 2.75 million barrels per year are targets for similar improvement, as are many other similar fields throughout the Northern Midcontinent region.

Project Partners

UNIVERSITY OF KANSAS CENTER FOR ENERGY RESEARCH
Lawrence, KS

KANSAS GEOLOGICAL SURVEY
Lawrence, KS

TERTIARY OIL RECOVERY PROJECT
Lawrence, KS

RITCHIE EXPLORATION, INC.
Wichita, KS

Improved Oil Recovery in Carbonate Reservoirs of Kansas

Project Benefits

The project fields are representative of Shallow Shelf Carbonate reservoirs. Approximately 300 oil fields producing from these reservoirs in eleven Kansas counties have cumulative oil production of 104 million barrels. Three-quarters of these fields are still active and currently produce 2.75 million barrels of oil per year from 1,195 wells. The resource is dominantly still young, with half of the fields being discovered after 1970.

It has been demonstrated that additional oil can be recovered through recompletion of existing wellbores in the field demonstration sites. Further incremental reserves are anticipated through infill drilling. It is reasonable to expect that full implementation of the demonstrated reservoir management strategies in these fields will recover an incremental 5-10% of present cumulative production. This could result in up to 470,000 barrels of incremental oil being recovered from the two demonstration sites.

To date, the project's technology transfer efforts have provided useful and cost-effective technologies to Kansas producers, and it is expected that the project will have a commercial impact on Schaben Field over the next two years in terms of new incremental reserves. Furthermore, the commercial impact of technologies being developed by the project (such as the Pseudoseismic computer program, PfEFFER) is already occurring at the demonstration fields and other fields in Kansas. Twelve companies, in addition to Ritchie Exploration are already using PfEFFER.

CONTACT POINTS

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Cost Profile (Dollars in Millions)

	Budget Period 1 (09/16/94 – 09/15/96)	Budget Period 2 (09/15/96 – 09/15/98)
Department of Energy*	$0.7	$0.9
Private Sector Partners	$0.7	$0.9

* Obligated Funding

Key Milestones

FY95 + FY96	FY96 + FY97	FY97 + FY98
Study reservoir data, drill wells	Technology transfer activities	Operate, monitor fields, improve wells, drill new wells continue technology transfer activities in region

Project Start (09/16/94) — End Project (09/15/98)

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