PROJECT facts

DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

OIL recovery PROGRAM

DEMONSTRATING BETTER TECHNOLOGY FOR KANSAS OIL PRODUCERS — THE UNIVERSITY OF KANSAS PROJECT

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

FOSSIL ENERGY PROGRAM
Oil Recovery Field Demonstration

MAIN SITES
Savonburg Field
near Chanute, KS

Stewart Field
near Garden City, KS

TOTAL ESTIMATED COST
$5.8 million

COST SHARING
DOE - $2.0 million
Non-DOE - $3.8 million

DE-FC22-93BC14957

Project Description

The University of Kansas Center for Research is demonstrating methods that Kansas producers can use to keep aging oil fields in production. Most small, independent Kansas stripper well operators do not use improved technology that could help cut costs and increase production.

In many Kansas fields, for example, waterflooding—injecting water to move oil to a producing well—is hindered by permeable zones or fractures that divert water flow away from the oil. Solids in the water can clog wells. Oil zones have been bypassed. Some fields have not had good reservoir management.

The Kansas team is conducting two field projects for DOE to demonstrate the use of polymers to control water flow; drilling "infill" wells and horizontal wells to improve waterflood efficiency; better reservoir management, including water cleanup; and computer simulations to design better recovery processes.

At the eastern Kansas Savonburg field, an air flotation water clean-up system was implemented to improve water quality for waterflooding. Techniques for wellbore clean-up have been used and transferred to local service companies for use in completions of shallow wells in eastern Kansas. Following computer simulation in the western Kansas Stewart field that indicated waterflooding to be feasible, construction of a waterflood plant was begun. Technology transfer of results to independent operators is being conducted.

Project Goal

One of DOE's principal Oil Program goals is maintaining access to wells in marginal fields for the application of existing and developing oil recovery technologies that can reduce operating costs and increase production. To forestall abandonment, which threatens a large proportion of U.S. domestic wells, DOE is supporting the project to demonstrate technologies that can keep fields operating. DOE has particularly targeted the smaller independents, who are providing an increasingly large share of U.S. oil production, but who generally do not have the resources or staff to conduct research on their own.

The University of Kansas researchers are demonstrating that available and developing technologies can lower oil field operating costs and increase production. At the Savonburg field, a system for removing impurities from water significantly reduced the need for costly cleaning out of wellbores clogged with mineral deposits. This technology, along with better reservoir management practices, improved operational economics so that the field could remain in production and maintain access to its 300,000 barrel oil reserve. Applying these techniques to other Kansas and midcontinent reservoirs will add significantly to the U.S. domestic oil resource, providing beneficial impact on local, state and national economies.

Project Partners

JAMES E. RUSSELL PETROLEUM COMPANY
Abilene, TX

NORTH AMERICAN RESOURCES
Denver, CO

Demonstrating Better Technology for Kansas Oil Producers — The University of Kansas Project

Project Benefits

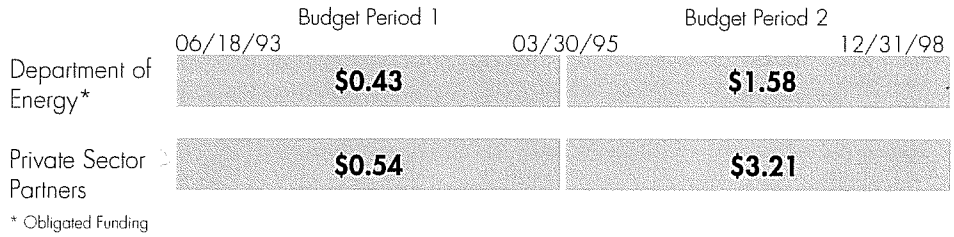
Many small, independent oil companies have few resources for capital investment, and lack both information about technology that could improve production and the expertise to apply it. The University of Kansas project is an effort to make Kansas producers more aware of potentially useful technologies and to demonstrate how to apply them in actual oil field operations.

Examples of such technologies include: the use of polymer gels to divert water to previously "unswept" areas of a reservoir to improve waterflooding, a technique that has been in use since the 1950's; improved filtering and adjusting of water chemistry to control solids in the water that plug injection wells; placing additional wells—including horizontal wells—to tap oil-bearing zones that have been bypassed can extend the producing life of many fields; computer simulation using commercially available, easy-to-use computer programs provides the improved understanding of reservoir conditions needed to design and implement these techniques; and, in many fields, simply recommending proper energy usage and optimal equipment can substantially reduce operating costs.

By implementing these and other technologies, the University of Kansas project has considerable potential to prolong the economic life of many fluvial-dominated deltaic sandstone fields in Kansas. This geologic category was ranked as one of the Department's highest priorities because it includes a large oil resource that is in danger of being abandoned unless better technology is applied to increase production.

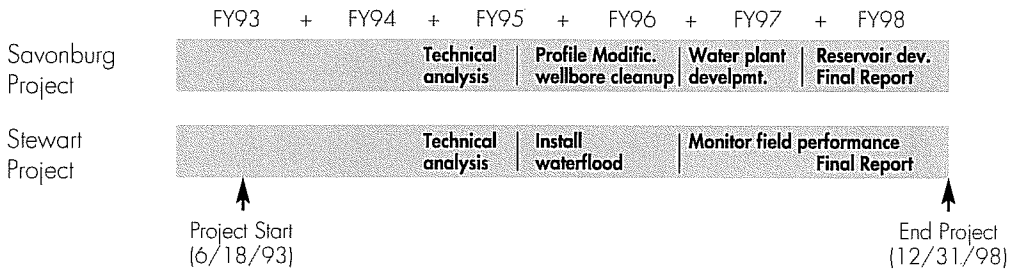
A major emphasis of the Kansas project will be the collaboration of University scientists and engineers with oil operators and service companies in Kansas and in many other U.S. oil-producing regions with similar reservoir types. An extensive technology transfer effort will be undertaken to inform other operators of the results of the demonstration projects. Application of the recommended technologies will allow many operators to continue operating and maintain access to important oil reserves, as did Russell Petroleum in the Savonburg field.

Cost Profile (Dollars in Millions)



* Obligated Funding

Key Milestones



Note: Operations could be extended beyond FY98 depending upon availability of funding and private sector willingness to cost-share additional testing.

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