

**IMPROVED OIL RECOVERY IN MISSISSIPPIAN CARBONATE RESERVOIRS
OF KANSAS - NEAR TERM -- CLASS 2**

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The University of Kansas Center for Research Inc.

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Objectives

The objective of this project is to demonstrate incremental reserves from Osagian and Meramecian (Mississippian) dolomite reservoirs in western Kansas through application of reservoir characterization to identify areas of unrecovered mobile oil. The project addresses producibility problems in two fields: Specific reservoirs target the Schaben Field in Ness County, Kansas, and the Bindley Field in Hodgeman County, Kansas. The producibility problems to be addressed include inadequate reservoir characterization, drilling and completion design problems, non-optimum recovery efficiency. The results of this project will be disseminated through various technology transfer activities.

Project Status

The project began in September of 1994, and will run through 1998.

Project Description

At the Schaben demonstration site, the Kansas team will conduct a field project to demonstrate better approaches to identify bypassed oil within and between reservoir units. The approach will include:

- Advanced integrated reservoir description and characterization, including integration of existing data, and drilling, logging, coring and testing three new wells through the reservoir intervals. Advanced reservoir techniques will include high-resolution core description, petrophysical analysis of pore system attributes, and geostatistical analysis and 3D visualization of interwell heterogeneity.
- Computer applications will be used to manage, map, and describe the reservoir. Computer simulations will be used to design better recovery processes, and identify potential incremental reserves.
- Comparison of the reservoir geology and field performance of the Schaben Field with the previously described by slightly younger Bindley Field in adjacent Hodgeman, County.
- Drilling of new wells between older wells (infill drilling) to contact missed zones;

- Demonstration of improved reservoir management techniques, and of incremental recovery through potential deepening and recompletion of existing wells and targeted infill drilling.

The project is an effort to make Kansas producers more aware of potentially useful technologies and to demonstrate in actual oil field operations how to apply them. For many producers, especially independents, such information is important for continued production. A major emphasis of the Kansas project will be collaboration of University scientists and engineers with the independent producers and service companies operating in the state. An extensive technology transfer effort will be undertaken to inform other operators of the results of the project. In addition to traditional technology transfer methods (e.g., reports; trade, professional, and technical publications; workshops; and seminars) a public domain relational database and computerized display package will be made available through the Internet and other means of digital access.

Summary of Technical Progress

General Overview.--Progress is reported for the period from 1 July 1995 to 30 September 1995. Work in this quarter has continued to concentrate on reservoir characterization (Task 1.2), with the continuation of initial technology transfer efforts (Task 1.3). The second well was successfully drilled, cored, logged, and tested. The remaining well should be drilled during the next quarter. Work on reservoir characterization (Task 1.2) is progressing, and related technology transfer has been initiated and should accelerate into 1996.

Task I.1 - Acquisition and Consolidation of Available Data (Target Completion Date: 4/2/95). Delayed Completion (12/30/95).

Summary of work in last quarter.--Acquisition and consolidation of existing geologic, digital log, and production data is complete.

After protracted permitting and scheduling problems, the second of three new wells was drilled during the quarter. The #1 Foos "A-P" Twin was spud on 8/4/95 and completed on 9/1/95. Daily drilling and completion reports are attached. An excellent core was recovered along with a good log suite and test information. The cores from both new wells have provided valuable new insight into the Mississippian reservoir at Schaben Field. The new cores will be examined in detail and compared with previously existing cores from both Schaben and Bindley fields. Included in the detailed examination will be minipermeameter work. Ritchie Exploration as operator is pushing to expedite the permitting and drilling for the last well. Subject to hole conditions and tool availability we are still working on running a magnetic resonance imaging log (MRI) in the remaining well.

Summary of planned work for next quarter.-- The completion of this task has continued to be delayed by a contentious operator, but only one well remains and should be drilled this quarter.

Task I.2 - Reservoir Characterization (Target Completion Date: 3/3/96).

Summary of work in last quarter.--During the last quarter we have concentrated on generating a detailed geologic reservoir characterization for the northern part of the Schaben Field (in and around 30-19S-21W). Geologic reservoir characterization work has used both the "pseudoseismic" technique and the computer workstation to recognize and map small faults and complex stratigraphic geometries within the reservoir units. This work is being integrated with the data from the new wells, and with analysis of engineering data. The work is nearly complete and will form the basis for an initial reservoir simulation for Schaben Field.

Summary of planned work for next quarter.-- Analysis of data from the remaining new well along with development of a descriptive reservoir model will continue. Engineering analysis and initial simulation efforts are underway and preliminary results should be available during the coming quarter.

Task I.3 - Technology Transfer (Target Completion Date: 8/4/96).

Summary of work in last quarter.-- Technology transfer continues to increase and should be well underway in the first and second quarters of 1996. Presentations are scheduled for the Platform Carbonates Workshop to be held in Norman, Oklahoma (3/96), and for the Carbonate Reservoir Session at the national AAPG meeting (5/96).

Summary of planned work for next quarter.--An additional presentation and workshop will be prepared for a Northern Midcontinent-PTTC conference on exploration and development tools tentatively scheduled for the first half of 1996. A manuscript for the "pseudoseismic approach" is nearly complete and will be submitted. We will continue our work with Kansas operators on application of the technologies developed as part of the Class II project.