QUARTERLY TECHNICAL PROGRESS REPORT
(28th Quarter)

**ADVANCED OIL RECOVERY TECHNOLOGIES FOR IMPROVED
RECOVERY FROM SLOPE BASIN CLASTIC RESERVOIRS,
NASH DRAW BRUSHY CANYON POOL, EDDY COUNTY, NM**

DOE Cooperative Agreement No. DE-FC-95BC14941

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Date of Report:	September 30, 2002
Award Date:	September 25, 1995
Anticipated Completion Date:	September 24, 1998 - Budget Period I June 30, 2004 - Budget Period II
Award Amount for Current Fiscal Year:	\$2,017,435
Award Amount for Budget Period II:	\$5,013,760
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Contracting Officer's Representative:	Dan Ferguson
Reporting Period:	July 1, 2002-September 30, 2002

US/DOE Patent Clearance is not required prior to the publication of this document.

OBJECTIVE

The overall objective of this project is to demonstrate that a development program-based on advanced reservoir management methods-can significantly improve oil recovery at the Nash Draw Pool (NDP). The plan includes developing a control area using standard reservoir management techniques and comparing its performance to an area developed using advanced reservoir management methods. Specific goals are (1) to demonstrate that an advanced development drilling and pressure maintenance program can significantly improve oil recovery compared to existing technology applications and (2) to transfer these advanced methodologies to oil and gas producers in the Permian Basin and elsewhere throughout the U.S. oil and gas industry.

SUMMARY OF TECHNICAL PROGRESS

This is the twenty-eighth quarterly progress report on the project. Results obtained to date are summarized.

Geology and Engineering

The production database was updated through July 2002. This data was added to the history of each well to update the decline curves and to project ultimate recoveries as well as to assess the effects of interference and production strategies.

Nash Draw #36 Completion

Evaluation of the completion, stimulation, and production testing and analysis of the Nash Draw #36 horizontal well is continuing. The "H-2" zone completed from 6333-49 ft continues to flow. As of September 30, 2002 the zone has cumulative production of 41,464 BO, 78 MMCFG, and 9111 BW and production rates are 190 BOPD, 400 MCFGD and 27 BWPD.

The reservoir simulation model is proving to be a good match to the actual production, as shown in Figure 1. The actual produced gas volume appears higher than predicted, but after comparing the field volumes to the actual purchased volumes the field volumes are 30% to 40% to high. Purchased volumes plus fuel usage are much closer to the predicted gas volumes.

When the "H-2" zone stops flowing the retrievable bridge plug will be removed and production from the toe zone and the "H-2" zone will be commingled and tested.

Gas Processing and Injection

The study and preliminary design have indicated the cost of the gas plant to be \$957,000 and the cost of compression to be \$1,000,000. These estimates may have as much as 25% variance depending on the availability of equipment. The economics of processing the gas at Nash Draw

to recover liquids and reinject lean gas for pressure maintenance will now be evaluated.

Workovers

Three workovers, to add additional pay zones, were performed on the Nash Draw #1, Nash Draw #15 and #20 wells. The work is summarized in the following table:

Well	Interval	Increase in Oil, BOPD	Increase in Gas, MCFD	Increase in Water, BWPD
1	5750-56 ft, 5477-80 ft	10	17	25
15	6276-79 ft	33	80	10
20	6254-57 ft, 5497-5509 ft, 5319-31 ft Completed W.O. 9-23-02	Testing	Testing	Testing

3-D Seismic

The permitting of the 3-D seismic survey for the north end of the Nash Draw Unit is completed and the acquisition will start on or about November 1, 2002.

Nash Draw #33

The design of the next deviated-horizontal well has been completed and drilling is scheduled for mid October. The Nash Draw #33 will be drilled from a surface location located 10' FSL & 175' FWL of section 12-T23S-R29E. The BHL will be at 2250' FWL & 2650' FSL of section 11-T23S-R29E.

The toe of the well will develop a seismic anomaly in the "L" zone as shown in Figure 2. This well will be drilled parallel to the #36 well and approximately 2000 feet southwest.

The preliminary well design will be to drill a 17 1/2" hole to 400 ft and set 13 3/8" casing. A 11 in. hole will be drilled to 3,100 ft and 8 5/8 in. casing will be set. A 7 7/8 in. hole will be drilled below the 8 5/8 in. casing and the wellbore kicked off at 3150 ft with a build rate of 3.5°/100 ft to 28.47°. The 28.47° deviation will be maintained to 6550 ft MD where the deviation will be increased by 12°/100 ft. until the wellbore is horizontal at a measured depth of 6,800 ft. Horizontal drilling will continue for 2,114 feet. The BHL is projected to be located 4152.3 ft from the surface location at a bearing of 309.48°. A 3-D view of the proposed wellbore path is shown in Figure 3.

The well plan for the #33 well has been modified based on the problems encountered while drilling the #36 well. The problems and the remedy are presented in the following table:

	<u>Nash Draw #36 – Problem</u>	<u>ND #33 - Solution</u>
1	A keyseat was created due to a change in direction at the first kick off point at 3150 ft.	A deviation survey will be run at 2500 ft. and steering tools will be used to T.D. the intermediate hole with the orientation in a northwesterly direction.
2	Sufficient weight was not available at the bit to drill effectively.	Heavy weight drill pipe will be used below the drill collars to transfer weight to the bit.
3	Due to the abrasive nature of the sands the drill bits were worn out of gauge in a short period of time.	A new bit design will be tried that has a diamond coating to protect the gauge.

Technology Transfer

Disseminating technical information generated during the course of this project is a prime objective of the project. A summary of technology transfer activities during this quarter is outlined below.

Internet Homepage: Preparing to be updated.

“Reducing Exploration Risk with the Fuzzy Expert Exploration Tool”, was presented at Eastern New Mexico University Roswell on September 17, 2002.

Figure 1. Nash Draw #36 actual production versus simulator production.

Figure 2. 3-D seismic "L" Zone amplitude map showing #33 target area.

Figure 3. Nash Draw #33 wellbore path.