TWENTIETH QUARTERLY PROGRESS REPORT

TITLE:

THE UTILIZATION OF THE MICROFLORA INDIGENOUS TO AND PRESENT IN OIL-BEARING FORMATIONS TO SELECTIVELY PLUG THE MORE POROUS ZONES THEREBY INCREASING OIL RECOVERY DURING WATERFLOODING

COOPERATIVE AGREEMENT NUMBER:
DE-FC22-94BC14962--22

RECIPIENT:
Hughes Eastern Corporation
403 Towne Center Boulevard Suite 103
Ridgeland, MS 39157

DATE OF REPORT:
January 20, 1999

AWARD DATE:
January 1, 1994

ANTICIPATED COMPLETION DATE:
June 30, 1999

GOVERNMENT AWARD:
(Current Year DOE Share)

PROGRAM MANAGER:
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REPORTING PERIOD:
Oct. 1, 1998 - Dec. 31, 1998

US/DOE Patent Clearance Provided on 1/13/99 by Mark Dvorscak DOE Chicago Field Office

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OBJECTIVE

The objective of this work is to demonstrate the use of indigenous microbes as a method of profile control in waterfloods. It is expected that as the microbial population is induced to increase, that the expanded biomass will selectively block the more permeable zones of the reservoir thereby forcing injection water to flow through the less permeable zones which will result in improved sweep efficiency.

This increase in microbial population will be accomplished by injecting a nutrient solution into four injectors. Four other injectors will act as control wells. During Phase I, two wells will be cored through the zone of interest. The core will be subjected to special core analyses in order to arrive at the optimum nutrient formulation. During Phase II, nutrient injection will begin, the results monitored, and adjustments to the nutrient composition made, if necessary. Phase II also will include the drilling of three wells for post-mortem core analysis. Phase III will focus on technology transfer of the results. It should be pointed out that one expected outcome of this new technology will be a prolongation of economical waterflooding operations, i.e. economical oil recovery should continue for much longer periods in the producing wells subjected to this selective plugging technique. Results from work under DOE Contract No. DE-AC22-90BC14665 will be incorporated as appropriate.

SUMMARY OF TECHNICAL PROGRESS

Phase I. Planning and Analysis (9 months)

All work in Phase I has been successfully completed.

Phase II. Implementation (45 months)

All work in Phase II has been successfully completed.

Phase III. Technology Transfer (12 months)

This is the second quarter of the technology transfer phase of the project.

During this quarter the following activities were carried out.

- A presentation was made to the 1998 Annual Meeting of the Southern Great Lakes Local Section of the Society for Industrial Microbiology which was held in Kalamazoo, MI on October 10, 1998 by L.R. Brown. Topic: Microbial Enhanced Oil Recovery.

- A presentation was made to the Los Angeles Basin SPE Section New Technology And Environmental Forum held on October 21, 1998 by L. R. Brown on the topic "The Hughes Eastern Corporation/DOE Microbial Project." A. A. Vadie participated in the discussion phase of the program. Prior to the meeting, an informal roundtable discussion was held with personnel from Tidelands Oil Production Co. in Long Beach, CA.

- A Petroleum Technology Transfer Council workshop was held on November 4, 1998 in Jackson, MS and presentations were made by Dr. Lewis R. Brown, Dr. A.Alex Vadie and James O. Stephens on the MEOR project in North Blowhorn Creek Unit.

- An article on the Hughes Eastern Corporation - MSU-DOE project appeared in the November 1998 issue of Core, a publication of the Water Resources Research Institute.

- A presentation to the Permian Basin Chapter-Society of Petroleum Engineers has been scheduled for February 11, 1999 in Midland, TX. The presentation will be made by J.O. Stephens, L.R. Brown, and A.A. Vadie.

- A presentation to the Society of Petroleum Engineers Rocky Mountain Regional Meeting has been scheduled for May 1999. Topic: "The Anatomy of a Microbial Oil Recovery Project" to be presented by J.O. Stephens, L. R. Brown and A. A. Vadie.

- Plans are being made to make a presentation at the 1999 Oil and Gas Conference to be held in Tulsa, OK on June 28-30, 1999.