

DOE/BC/14865--1

SUPPORT OF EOR TO INDEPENDENT PRODUCERS IN TEXAS

Contract No. DE-FG22-94BC14865
Prairie View A&M University
Prairie View, Texas

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Principal Investigator: Dr. K.H. Fotouh
Project Manager: Herbert A. Tiedeman
Bartlesville Project Office

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OBJECTIVES

The general objective is to assist independent producers in Texas in applying tertiary recovery technology to their oil fields. The more specific objectives are: (1) identify production problems, and present technology to overcome such problems, (2) train independent producers how to select suitable EOR techniques and implement them, (3) conduct seminars and workshops on various EOR techniques and their applications, (4) train independent producers how to use available software in the fields of EOR operations, financing, and workover jobs, (5) establish a technology transfer center to lend primarily the independent producers in Texas the needed assistance to understand and use the state of the art technology data base in their operations.

The kick-start of the project has focused on the following approaches (1) recruiting voluntary members to serve on an advisory committee for the project, (2) reaching out to possible organizations for data base information about independent producers of Texas, (3) reaching independent producers by different ways of communications , (4) conduct technical meeting with consultants, universities, and professional, (5) select topics of immediate concerns related independent producers operational problems, (6) establish a library or software resources for future use in workshops, (7) setting future schedule for seminars and workshop to assist independent producers in understanding more about their field operations.

SUMMARY OF TECHNICAL PROGRESS

1. Advisory Committee:

Eleven members were recruited to serve on the advisory committee of the project (please see attachment A). The objective of the advisory committee is to suggest, propose, and evaluate the progress of the project. Members of the committee are related to diverse sectors of the oil industry. To name a few: a. finance, b. research , c. academic institutions, and d. professional and political liaisons.

2. Organizations Related to I.P. Activities:

Several organizations have been contacted in order to establish progressive communication channels. The objective of such effort is to collect and document data-base about independent producers in Texas. Among these organizations which are familiar now with our activities are:

1. The Technology Transfer Council (PTTC) in Washington, D.C. (Ms. Deborah Rowell)
2. Texas Railroad Commission in Austin, Texas
3. Petroleum Information Center in Denver, Colorado
4. The Independent Petroleum association of America in Washington. D.C.

5. Westport Technology Center in Houston Texas (Mr. Tom Williams)
6. The crude Oil Policy Committee in Washington, D.C. (Ms. Virginia Lazenby)

Other academic and higher educational institutions on our technology resource data base are:

1. Rice University Houston, Texas (Dr. G. Hirasaki)
2. University of Texas, Austin, Texas (Dr. L. Lake and Dr. G. Pope)
3. University of Oklahoma, Norman, Oklahoma (Dr. D. Menziel)
4. University of Kansas , Lawrence, Kansas (Dr. L. Schoeling)
5. Personal contacts with Houston consultants

3. Reaching Independents:

Special efforts were exercised to collect and contact future participants of independent operators in Texas. With the help of the chairman of IPAA and others, several IP were reached. Prior to that, an introductory flyer was dispatched to the annual convention of IPAA in Phoenix, Arizona in November 1994 (see Attachment C). Next, attempt was mailing questionnaire (see attachment) to over forty candidate. Phone calls and follow-ups produced a fairly good response of their willingness to participate in the project seminars and workshops. Much more independents need to be reached, budget limitations are making it difficult to increase the level of staffing of the project.

4. Technical Meetings

Several technical meetings were conducted between the project team at Prairie View A&M University and the following organizations:

1. Rice University Chemical Engineering Faculty
2. University of Texas Petroleum Engineering Faculty
3. Westport Technical Staff
4. Independents and Chairman of IPAA

The objectives for these meetings were primarily as follows:

1. Introduce the project in-hand to every one and a presentation of the project goals was conducted by the project team.
2. Explore possibilities and contributions which can be made from these organizations towards the project goals.
3. Establish communication channels for future technical cooperations.

Other, one-on-one meetings were conducted with consultants on personal basis, to explore using their expertise in future workshops. Most of these contacts were constructive and encouraging.

5. Topics Selection

For the design of seminars and workshops materials, several subject areas we investigated with independents and/or through our technical meetings and contacts. Among the most demanding and needed topics to be covered are subject area:

- a. EOR techniques and horizontal drilling
- b. Production Practices: premature oil production decline, early water breakthrough in waterflood projects, stimulation of production and injection wells, bacterial issues and scaling, water shutoff in gravel packed completions, and finally coning in strong water drive reservoirs.
- c. Well Design: horizontal drilling technology was the most sound request by independent operators.
- d. Completion: Pros and cons of open hole horizontal drilling completions, formation damage issues in horizontal wells, and pack completions in unconsolidated formations.

Based on previously mentioned topics, future workshops will be focused on conveying, and training the independent producers how to handle their problems to improve their oil recoveries.

6. Software Library:

In preparation for the introduction and training workshop, a number of computer software is being progressively established. These programs might be outdated in some areas and will need some modifications and upgrading as well. In addition, one or more additional project staff members might also be needed in future to secure successful educational training workshops. The list of the available software to date to be introduced are:

- 1) CHEM-2D
- 2) BOAST II
- 3) ICPM
- 4) SFPM
- 5) CFPM
- 6) GEO-EAS
- 7) Shareware programs

More attempts are underway to obtain some videotapes, and software programs through the Society of Petroleum Engineers in Dallas, Texas.

7) Future Seminars & Workshop Schedule

One seminar and two workshops will be conducted before July, 1995. The topics to be covered during these sessions will revolve around three main topics:

1. Horizontal drilling technology
2. Field problems, and workover guidelines
3. EOR processes, design, and implementation

The seminar and workshops will take place at Prairie View A&M University Graduate Center located at Compaq Computer Corporation facilities in Houston, Texas. Material preparation and other necessary advertisements are underway for the presentation of the previously mentioned topics.

ATTACHMENT A

List of Members on the Project's Advisory Committee

1. Mr. George Alcorn "IPAA Chairman" (713) 622-3800
Alcorn Exploration, Inc.
Houston, TX
2. Mr. Larry Whittington "TEXACO" (713) 954-6021
Program Manager
Chemical Oil Recovery
3. Ms. Lazenby, Virginia "COPC Chairman" (615) 244-1868
Bretagne Corp.
Nashville, TN
4. Mr. Sheffield, Scott D. "COPC V. Chairman" (915) 683-4768
Parker & Parsley Petroleum Co.
Midland, TX
5. Dr. Willie F. Trotty (409) 857-2315
Dean of Graduate Study
Prairie View A & M University
6. Dr. Larry W. Lake (512) 471-8233
University of Texas @ Austin
7. Dr. Salter, Abdus (713) 954-6154
Research Consultant
Texaco E & P Technology Center
8. Dr. Bayat, M. Ghasem (713) 546-6313
P.E. Advisor
Pennzoil Oil Co.
9. Dr David, Amiel (713) 650-3104
Sr. V.P. First Union National Bank
Houston, TX
10. Dr. Fotouh, Kamel H. (409) 857-2427
Prairie View A & M University
11. Dr El-messidi, Adel (409) 857-2427
Prairie View A & M University

Attachment B

DIRECTORY

1. Mitchell Energy & Development Corporation
(713) 377-5500
Mr. Herbert A. Lesser,
Vice President, Operation Analysis
2. Enron Oil & Gas Company
(713) 646-2458
Mr. G.E. Uthlaut
Senior Vice President, Operations
3. Apache Corporation
(713) 296-6000
Mr. H. Craig Clark
Vice President Production
4. Samedan Oil Corporation
(713) 876-6150
Mr. Richard Peneguy
Regional Manager
5. Seagull Energy Corporation
(713) 951-4700
Mr. Harold Kergosien
Vice President, Engineering & Operations
6. Anadarko Petroleum Corporation
(713) 875-1101
Mr. J.N. Seitz
Vice President, Exploration
7. Cabot Oil & Gas Corporation
(713) 589-4600
Mr. Richard Parrish
Vice President Engineering
8. Coastal Corporation
(713) 877-1400
Mr. J.D. Bullock
Senior Vice President, Exploration & Production
9. Coastal Oil & Gas Corporation

Mr. R.D. Erskine
Senior Vice President, Production

10. Halbouty Michel T, Energy Co.
(713) 622-1130
Mr. Doyle W. McClennen
Vice President, Drilling Production
11. Hunt Oil Company
(214) 978-8000
Mr. Ted Autry
Vice President, North American Production
12. Kerr- McGee Corporation
(713) 591-3100
C.E. Nath
Vice President
13. Koch Oil Co.
(713) 651-0741
Mr. Tom Lunlum
Vice President
14. Louisiana Laud & Exploration Co.
(713) 957-6400
Mr Ernest J. Leidner
Vice President, General Manager, Houston Division
15. Mabee Petroleum Corpration
(713) 870-2121
Mr. T.M. Botts
Vice President, Operations
16. Maxus Energy Corporaion
(214) 953-2000
Mr. Mike Forrest
Senior Vice President
17. Meridian Oil Inc.
(713) 831-1600
Mr. R.K. Hebert
Senior Vice President, Operations
18. Mosbacher Energy Co.
(713) 546-2500
Mr. Walter M. Glasgow
Vice President Production
19. Newfield Exploration Co.
(713) 847-6000
Mr. Joe B. Foster
Chairman, CEO
20. Oxy USA
(713) 840-7100
Mr. R.W. Brewer
Vice President

21. Panhandle Eastern Corporation
(713) 627-5400
Mr. J.B. Hipple
Senior Vice President, CFO

22. Phoenix Oil & Gas, Inc.

23. POGO Producing Co.
(713) 297-5000
Mr. Sammie M. Shaw
Vice President Operations

24. Quintana Petroleum Corporation
(713) 651-8600
Mr Patrick Riley
Executive Vice President, Production

25. Santa Fe Energy Resources, Inc.
(713) 783-2401
Mr. H.L. Boyt
Senior Vice President, Production

26. Sonat Exploration Co.
(713) 940-4000
Mr. Thomas M. Myers
Corporate Director of Operations

27. Nuevo Energy Co.
(713) 650-1246
Mr. Mitchael D. Watford
President, COO

28. Swift Energy Co.
(713) 874-2700
Mr. James M. Kitterman
Senior Vice President, Operations

29. Nasser Oil & Gas, Inc.

Mr. A. M. Nasser
President

30. CODA Energy Inc.
(214) 692-1800
Mr. J.W. Spencer
Vice President, Operations

31. Amerada Hess Corporation
(713) 658-9770
Mr. R.J. Smith
Vice President, U.S. Exploration

32. Meridian Oil Inc.
Mr. Randy Mundt, Sr. V.P.
5051 Westhiemer Blvd.
Houston, TX 77051

33. Westland Oil Development Corporation
Mr. Eddy Scott, President
P.O. Box 3651
Conroe, TX 77305

34. Quintana Petroleum Corporation
Mr. Mike Trotter
Operations Manager
P.O. Box 3331
Houston, TX 77253

List of Personal Contacts with Independent Operators

1. Mr. Pat Stewart (817) 771-1121
2. Mr. Rick Stewart (713) 579-7029
3. Mr. Steve Getz
4. Mr. George Burris
5. Mr. Judd Hereford
6. Mr. James Sisemore (409) 560-0399
7. Mr. Calvin Myers
8. Mr. Jim Connor
9. Mr. Rex Stever
10. Mr. Joseph Dowood (713) 468-1737

SUPPORT OF E.O.R.
TO
INDEPENDENT PRODUCERS
IN TEXAS

AT
PRAIRIE VIEW A & M
UNIVERSITY

**D.O.E. FUNDED PROJECT TO SERVE THE
INDEPENDENT PRODUCERS IN TEXAS.**

**COLLEGE OF GRADUATE STUDIES AND RESEARCH, AND DEPARTMENT OF
CHEMICAL ENGINEERING.**

**PRAIRIE VIEW A & M UNIVERSITY
P.O. BOX 2553
PRAIRIE VIEW, TEXAS 77446-2553**

**(409) 857-2427 / 4166 PHONE
(409) 857-2222 FAX**

YOU KNOW IT'S THERE...

BUT DO YOU KNOW HOW TO GET IT?

YOU KNOW THERE IS THREE TIMES AS MUCH OIL STILL DOWN THERE AS HAS BEEN RECOVERED...

BUT DO YOU KNOW IT CAN BE TAPPED?

YOU KNOW THAT TEXAS PRODUCES MORE ENERGY THAN ANY OTHER STATE...OVER 25% OF U.S. DAILY OIL PRODUCTION, AS WELL AS 25% OF U.S. RECOVERABLE RESERVES...

BUT DID YOU KNOW THE U.S. GOVERNMENT NOW SUPPORTS INDEPENDENTS WHO WANT TO BRING UP THAT LAST DROP?

HERE'S HOW!!

Please answer the following questions, and mail it to us A.S.A.P. to:

**EOR Project
Dept. of Chemical Engineering
Prairie View A & M University
P.O. Box 2553
Prairie View, TX 77446-2553**

_____ Yes, I would like to take advantage of programs offered by the DOE / PVAMU Center.

_____ I would like to attend a free one day seminar. The best month for me to attend would be _____.

_____ I would like to attend a free two day workshop. The best month for me to attend would be _____.

_____ I would like to work with you to see how I might apply EOR in my fields.

Name _____

Company Name _____

Address _____

Phone Number _____

*** Team members at Prairie View A & M University:**

A. El-Messidi, Ph.D., P.E., Project Manager

K. Fotouh, Ph.D., P.E., Principal Investigator

Attachment D

Request for Cooperative Project Participation with Prairie View A&M University DOE Project

Short Term Goals: Assist independent producer, identify and resolve their oil production problems through a transfer of ideas, applications, methods, processed, and information about equipment and financing. The results of this phase will be reflected in sustaining and/or increasing present production rate, Moreover, reducing the rate well abandonment (for marginal & stripper well) in the near term.

Long Term Goals: Establishing a technology transfer center for Texas independent producer where it can serve them in so many different ways. To name a few: 1. Introduce the concept of EOR methods as primary tool for future oil production operations. What are the different methods, how and where it can be applied , how to design, money resources and constraints, risk involved and how to minimize it, and finally how lucrative are the financial and technological rewards.

2. Development of a two way communication channel between independent producers and research institutions, service companies, universities research consultants, financial institutions, and DOE.

It has never been done before in the State of Texas , but it can be done now only with your cooperation, and at no cost to you except your participation.

Request for Introductory Information for Future Consideration

Operator's Name:

Brief Statement of common problems encountered in day to day operations (in general)

Specific Field Data for possible production enhancement project

Field:

Lease Name:

County, State:

Environmental Constriants:

I. Statement of Problem (use extra sheet if necessary)

Data Available:

Geological Maps & Type of Structure
Representative Core Data
Water Analysis
Monthly Oil & War Production Rate
Monthly Injection Date (if applicable)
Electrical Logs
Completion Information
Number of Active Wells (P & I)
Number of Abandoned Wells

Reservoir Description:

Formation:
Type:
Depth:
Thickness (Net Pay Thickness):
BHT:
BHP:
Connate Water Saturation:
Original Oil Saturation:
Est. Present Oil Saturation:
Oil Gravity:
Oil Viscosity @ BHT:
f.v.f.
Reservoir Mechanism:
Porosity:
Permeability (Rel. Perm.):
Variation:
Conformance Factor (if available):
Gas Compressibility:
Gas Deviation Factor:

Primary Recovery Summary

Development of Surface Area, Acre
Well Spacing, Acre
Number of Wells (producers & abandoned)
Year of Discovery
Years of Development
Type of producing drive
Reason for well Abandonment
Peak rate of primary production BOPD
Primary Decline Rate, %/yr.
Actual Recovery, STB
% of original oil in place

Secondary Recovery Summary

Has the field been waterflooded or produced by other secondary means?
If so, please answer the following:

Year secondary method was initiated:
Type:
Development Surface Area, Acres
Well Spacing, Acres
Number of Wells (original, injectors, producers, and abandoned)
Reasons for abandonment
Total injection volume
Total recovery to date (including primary)
Residual Oil Saturation, %

Relative Perm. (Endpoint Data)

K_{rw}

K_{ro}

K_{rg}

Mobility ratio

Tertiary Recovery Summary (if any)

Has an EOR process been implemented?

Type of Process:

Status:

Release of Information

Please express your willingness to release or not the attached information. However, if there are restrictions that you need to impose on partial release only, please indicate that.

Brief Summary on Company Resources (Professionals), who will participate in the project:

MASTER RECORD REPORT

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<950> ABSTRACT

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