

PRAIRIE VIEW A&M UNIVERSITY

P. O. Box 397
Prairie View, Texas 77446-0397

Department of
CHEMICAL ENGINEERING

(409) 857-2427
857-2458
FAX: 857-2222

May 24, 1995

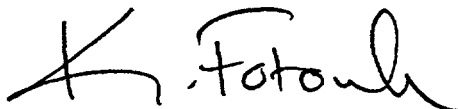
Mr. Dale A. Siciliano
Contracting Officer - D.O.E.
Pittsburgh Energy Technology Center
P. O. Box 10940
Pittsburgh, Pennsylvania 15236-0940

Subject: Second Technical Report, Grant No. DE-FG22-94BC14865

Dear Mr. Siciliano:

Please find the second technical report and attachments for the period ending 04/30/95. However, I have included most of the materials we have organized for the Horizontal Drilling Technology Workshop delivered on May 5th, 1995. Since the preparation for such course occupied a lot of our working time.

Sincerely,



Dr. K. H. Fotouh
Principal Investigator

cc: Mr. Wayne Turner
Mr. Herbert A. Tiedeman
Dr. A. El-Messidi

RECEIVED
DOE/PETC
05 JUN -1 11:15
ADMINISTRATION & ASSISTANT DIR.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

DOE/BC/14865--2

SUPPORT OF EOR TO INDEPENDENT PRODUCERS IN TEXAS

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

Contract Date: September 1, 1994
Anticipated Completion: 1/31/97
Estimated Government Award: \$196,412
Principal Investigator: Dr. K. H. Fotouh
Project Manager: Herbert A. Tiedeman
Bartlesville Project Office
Reporting Period: 1/30/95 - 4/30/95

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

2/2/97
JA

RECEIVED
JSDOE/PETO
95 JUN -1 11:15
COMMISSION & ASSOCIATE LTD.

SUMMARY OF TECHNICAL PROGRESS

1. Advisory Committee:

The first advisory committee meeting was conducted on April 18th, 1995, at Prairie View A&M University (Compaq Computer Corporation Facilities). Discussions were focused on the project objectives, and what would be the best approach to accomplish our goals, (see attachment # 1).

The diversification among the member's expertise provided valuable and in-depth considerations in the areas of: effort duplication with other organization, close coordination with available professional resources (PTTC, Tipro —), and direct participation of private sector. The idea of extending the project to higher future level was entertained and discussed, and a project extension draft was sent to the members later on for their critique. Future and frequent meeting ideas were well received unanimously.

2. Future Technical Collaboration:

Two organizations showed great interest in the project activities and progress. Namely: 1. Bureau of Economic Geology in Austin (Dr. R. A. Levey)

2. The University of Texas of the Permian Basin, Petroleum Industry Alliance
(Mr. L. Stephen Melzer).

3. The Permian Basin Petroleum Association.

Following several contacts and discussions, it was agreed to join hands and efforts to benefit the independent producers in Texas. In addition, the Petroleum Industry Alliance (PIA) in Midland will help our efforts at Prairie View A&M University in mobilizing the Permian Basin area producers of a sizable Department of Energy initiative suited for their needs.

3. Horizontal Drilling Technology:

A short course "workshop" for the independents in Horizontal Drilling Technology was designed to assist them in crossing the "double hurdles" of obtaining the financing and technology for their projects. The topics covered in this eight-hour course at Prairie View A&M University, Graduate Instruction Center is given in attachment #2. The list of attendees is given in attachment #3. Preceding this workshop, a public advertisement (nation wide) was performed as given in attachment #'s 4, 5 & 6. At the end of the course period, a questionnaire (see attachment #7) was distributed and marked by the independents to explore their future needs and interest. Evaluation of such questionnaire is underway, as well as preparation for another workshop on Reservoir Management (with special emphasis on EOR) is also being considered.

4. HBCU / DOE SYMPOSIUM:

We participated in the third annual Historically Black Colleges and Universities / Private Sector Energy Research and Development Technology Transfer Symposium in

Atlanta, between April 27th and 29th, 1995. The project was received with great enthusiasm and many questions / inquiries were exchanged. Many offered encouragement to take the project objectives to a higher level especially by DOE personnel at the symposium. In addition, the presentations of the DOE personnel were very informative and helpful for future project participation.

REVIEW OF THE MEETING ON TUESDAY APRIL 18TH, 1995

Advisory Committee Members

Dr. Larry W. Lake
Dr. Satter, Abdus
Dr. Bayat, Ghasem
Dr. David, Amiel

Prairie View A&M Project Team

Dr. Fotouh, Kamel
Dr. El-Messidi, Adel

Several topics were brought to discussion after a brief introduction of the project objectives and background. The meeting lasted for more than 2 hours, and every participant shared his ideas. A summary of the important points discussed is given below:

1. The background of Prairie View A&M University involvement in the petroleum field, the staff, number of students, and future impact by taking the lead in this project.
2. Definition of Technology Transfer Center V.V. the school, the independent producers, Texas oil industrial activities in general and Compaq facilities.
3. DOE funding, and breakdown of spending funds.
4. Different communication channels to reach not only the IPS, but also academic institution, consultants, news media and other resources.

A combined program plan, based on previous topic and advise, will comprise of the follow-up by the project team at Prairie View A&M University.

1. Identify who are our competitors, and avoid duplication of effort. That includes in state as well as out of state organizations.
2. Prepare an advance list of what the project can offer to IPS. Identify the scope, technology, economics, and communication avenues.
3. Set-up a time table to foresee objectives.
4. Do survey about Independent needs especially in Texas. Reach Tipro, DOE, PTTC Texas A&M agriculture extension Service and others.
5. Keep the member of the Advisory Committee up dated with the project progress.

At the same time, Industry is going to look into the following:

1. Bringing some small EOR project which need be identified, analyzed, and probably be a demonstration pilot project in the future.
2. Critique the project future extension draft.
3. Discuss with their organization the possibilities of future joint cooperaton with Prairie View A&M University team, as well as,

The meeting was adjourned after 12:00 a.m., and the enthusiasm for future meeting was shared among the group.

RECEIVED
UNIVERSITY OF TEXAS
APR 19 1995
11:15
LAW & ASSOCIATES L.P.

Horizontal Drilling and Completions
Sponsored Through Prairie View A&M University
May 5, 1995

Morning

Introduction

Terms and Definitions
Technique Applications
Key Planning Considerations

Bottomhole Assembly Tools
Mud Motors
Deflection Devices
Surveying Methods

Architectural Styles and Tooling
Ultra-Short Radius Laterals
Short Radius Laterals
Medium Radius Laterals
Long Radius Laterals
Multi-Lateral Wellbores

Afternoon

Drilling Considerations

Bits
Drilling Fluids and Hole Cleaning
Well Control
Drillstring
Surface Equipment
Casing
Formation Evaluation

Completion Considerations

Options
Cementing
Perforating
Stimulation

Producing Operations

Downhole Equipment
Artificial Lift

HORIZONTAL DRILLING WORKSHOP

May 5, 1995

<u>NAME</u>	<u>AFFILIATION</u>	<u>PHONE #</u>
1. BARKLEY, John B	Reverts Corporation Mercantile Tower, MT 167 Corpus Christi, TX 78477	(512) 882-7201 (Ofc) (Fax)
2. BERGMAN, Owen L.	Independent Box 748 Groveton, TX 75845	(408) 642-1534 (Ofc) (Fax)
3. CONNOR, Jim C.	Reverts Corporation Mercantile Tower, MT 167 Corpus Christi, TX 78477	(512) 882-7201 (Ofc) (Fax)
4. COX, David	American Energy	(Ofc) (Fax)
5. EL-SHISHTWI, Farouq	Service Technology 9827 Gold Cup Way Houston, TX 77065	(713) 469-7271 (Ofc) (Fax)
6. GEYER, Nelson	Sunrise Resources 8405 Alameda Drive Norman, OK 73071	(713) 329-7611 (Ofc) (Fax)

HORIZONTAL DRILLING WORKSHOP

May 5, 1995

<u>NAME</u>	<u>AFFILIATION</u>	<u>PHONE #</u>
12. YANG, Jung H.	Chevron, U.S.A. P. O. Box 36366 Houston, TX 77236	(713) 561-3967 (Ofc) (Fax)
13. EL-MESSIDI, Dr. A.	Prairie View A&M University Department of Chemical Engineering P. O. Box 2553 Prairie View, TX 77446	(409) 857-2427/4166 (Ofc) (409) 857-2222 (Fax)
14. FOTOUH, Dr. Kamel H.	Prairie View A&M University Department of Chemical Engineering P. O. Box 2553 Prairie View, TX 77446	(409) 857-2427/4166 (Ofc) (409) 857-2222 (Fax)
15. TROTTY, Dr. Willie F.	Prairie View A&M University Office of Graduate School & Research P. O. Box 2355 Prairie View, TX 77446	(409) 857-2315 (Ofc) (409) 857-4521 (Fax)

ANNOUNCEMENT

Independent Oil Producers in Texas

Directional Drilling Workshop will be held at Prairie View A&M University, Graduate Research Center, May 5, 1995 from 8:00 A.M. to 5:00 P.M. The address of our facilities is Building 20525 at Compaq Computer Corporation Facilities in Houston, SH249, Suite no. 100. All Texas independent oil producers are cordially invited to participate, free of charge. Please call and/or fax Dr. K.H. Fotouh or Dr. A. El-Messidi at (409) 857-4166, (409) 857-2222 to reserve your seat. The workshop is a project funded by DOE at Prairie View A&M University. Your attendance is very important, and lunch and refreshments will be provided at no charge to you.

Prairie View A&M University is determined to be a technology transfer hub for the Independent Producers in Texas.

REGISTRATION FORM

Prairie View A&M University
Directional Drilling
May 5, 1995 8:00 a.m. to 5:00 p.m.
Prairie View A&M University Graduate Center
(Compaq Computer Corp. Facilities, map included)

Please complete form, detach, and return to:

Dr. K.H. Fotouh / Dr. A. El-Messidi
Prairie View A&M University
Department of Chemical Engineering
P.O. Box 2553
Prairie View, Texas 77446-2553

Phone: (409) 857-2427/4166
Fax: (409) 857-2222

Name: (Last) _____ (First) _____ (M.I.) _____

Nickname: (for badge) _____

Affiliation: _____ Phone: () _____
Fax: () _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Workshop is being offered free of charge to Texas Independent Oil Producers. Please register by/ or before April 15, 1995.

If you have a disability that requires special services, please check here <input type="checkbox"/>

Attachment #6

ADVERTISEMENTS

1. Oil and Gas Journal
Mr. Brian Nessen
Houston Office

2. P T T C Internet
Mr. Rusty Wood
Washington, D. C

3. Bureau of Economic Geology
Dr. Raymond A. Levey
Austin, Texas

May 5, 1995

Questionnaires : To be completed at the end of the session, for future workshop planning.

A. PRODUCTION

Waterflood Operations:

- ☐ Waterflooding
- ☐ Water Conformance
- ☐ Water-handling
- ☐ Water Separation / Quality
- ☐ Salt water Disposal

Chemical Applications:

- ☐ Use of Chemicals
- ☐ Corrosion/ Scale/ Parrafin

Stimulation:

- ☐ Acidizing and Fracturing
- ☐ Cementing/ Squeeze Jobs
- ☐ Formation Damage

Lifting:

- ☐ Lifting Techniques
- ☐ Inefficient Beam Pumps
- ☐ High-water Rate Production

Data:

- ☐ Management of Data
- ☐ Case Histories
- ☐ Production Data

Property:

- ☐ Property Evaluation
- ☐ Completions
- ☐ Use of Seismic

Property:

- ☐ Plugging Rules for Shut-in Wells

B. RESERVOIR

Hydrocarbon Recovery:

- ☐ Tertiary Recovery
- ☐ Single-Well Enhanced Recovery
- ☐ Fracture Stimulation

Reservoir Information:

- ☐ General Data
- ☐ Reservoir Characterization
- ☐ Overlooked Pay Zones
- ☐ Reservoir Stimulation
- ☐ Reservoir Management
- ☐ Access to Reservoir Simulators and Computer Software
- ☐ Reservoir Lithology
- ☐ Reserve Estimates

Formation Characteristics:

- ☐ Fractures
- ☐ Formation Damage
- ☐ Volumetrics (or others)
- ☐ Channeling Problems
- ☐ Interwell Channeling Detection

Formation Plugging Problems:

- ☐ Paraffin
- ☐ Scale
- ☐ Sand
- ☐ Others

C. DRILLING

Drilling:

- ☐ Selection of Well Profile / Casing Program
- ☐ Mechanical Problems
- ☐ Drillstring Design and Tubular Selection
- ☐ Casing Design Considerations
- ☐ Drilling Fluids and Cuttings Transport

Completions:

- ☐ Planning
- ☐ Equipments
- ☐ Perforation Program
- ☐ Stimulation

Well Logging:

- ☐ Logging Programs
- ☐ Coiled Tubing
- ☐ MWD (Measurement While Drilling)
- ☐ Log Interpretation

Well Test Analysis:

- ☐ Test Program
- ☐ Duration of Flow Regimes
- ☐ Wellbore Storage Effects
- ☐ Skin Effects

D. REGULATION

Federal Issues:

- ☐ Impact of EPA
- ☐ Environmental Liability and Compliance
- ☐ Handling Environmental Issues
- ☐ Ground-water Protection
- ☐ Oil Pollution Act of 1990
- ☐ Clean Air Act
- ☐ Surface Damage Act
- ☐ Toxic Chemical List
- ☐ Cost/ Benefit of Environmental Issues
- ☐ NORM

State Issues:

- ☐ Tax inequities

Regulatory Production Parameters:

- ☐ Produce or Plug (cost)
- ☐ Barriers to Secondary (Tertiary) Recovery Operations
- ☐ Allowables

Regulatory Records:

- ☐ Record Keeping
- ☐ Appropriate Authority
- ☐ Compliance Checklist
- ☐ Contact for Emergencies
- ☐ Chain of Liability
- ☐ Paperwork Clarification