

Case Number

4749

Application

Transcripts

Small Exhibits

ETC.

R-96
Denied
to come
spacing



Telegram

KA024 NSB143

NS MDA029 RS PD=MIDLAND TEX 26 122P CDT 1972 JUN 26 PM 2 12
NEW MEX OIL CONSERVATION COMM=

ELVIS A UTZ STATE OF NMEX SANTA FE NMEX=

RE CASE #4749 DOCKETT #14-72 APPLN OF HARDING OIL FOR
SPECIAL FIELD RULES INCLUDING 80 ACRE SPACING AND 80 ACRE
PRORATION UNITS. PLEASE BE ADVISED THAT PENNZOIL CO

CONCURS WITH HARDINGS REQUEST=

F CLINTON EDWARDS PENNZOIL CO.=



=#4749 #14-72 80 80.

WU 1201 (R 5-69)

Clarence Hunter

Create new pool
Appl of Harding Oil Co.
Temp rule

11420
5

57100

E.D. Shipp No 1

114200
57100

K 11 17 37 Lea Shown

11,420 - 11,452

80acre spec either 40 location
discovery allowable

Dockets Nos. 24-74 and 25-74 are tentatively set for hearing on August 21 and September 4. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - AUGUST 7, 1974

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Richard L. Stamets, Alternate Examiner:

CASE 4749: (Reopened) (Continued from the July 10, 1974, Examiner Hearing)

In the matter of Case No. 4749 being reopened pursuant to the provisions of Order No. R-4338-A, which order continued special rules for the Humble City-Strawn Pool, Lea County, New Mexico. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing.

CASE 4946: (Reopened) (Continued from the July 10, 1974, Examiner Hearing)

In the matter of Case No. 4946 being reopened pursuant to the provisions of Order No. R-4581, which order established temporary rules for the Crosby-Fusselman Associated Pool, Lea County, New Mexico. All interested parties may appear and show cause why said rules should not be rescinded.

CASE 5282: (Continued from the July 24, 1974, Examiner Hearing)

Application of Union Texas Petroleum Corporation for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Jalmat and Langlie-Mattix production in certain of its wells in the Langlie-Jal Unit Area, currently being waterflooded under authority of Commission Order No. R-4051.

CASE 5287: Application of Mobil Oil Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the N/2 of Section 12, Township 21 South, Range 26 East, adjacent to the Burton Plata-Morrow Gas Pool, Eddy County, New Mexico, to form a standard 320-acre unit to be dedicated to applicant's Federal 12 Com Well No. 1 to be drilled at a previously approved unorthodox location 660 feet from the North and East lines of said Section 12. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.



TEXAS INTERNATIONAL PETROLEUM CORPORATION

1720 WILCO BUILDING

MIDLAND, TEXAS 79701

PHONE 915-682-9741

August 2, 1974

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Dan S. Nutter

Re: Docket #4749

Gentlemen:

In the matter of the rehearing for R-4338-A, Special Field Rules for the Humble City, Strawn Field, this is to advise that Texas International Petroleum requests the continuance of 80 acre proration units. Based on production data to date from TIPCO #2 Nicholson well in the Humble City Strawn field, we can not economically justify any development on a spacing pattern less than 80 acres per well.

Respectfully,

TIPCO

Robert O. Burkett
Robert O. Burkett
Division Manager

ROB/pw

cc: James O. Justice

RECEIVED
AUG - 5 1974

CASE 5272: In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit Consolidated Oil and Gas, Inc., United States Fidelity & Guaranty Company and all other interested parties to appear and show cause why the Consolidated Oil and Gas, Inc., Price Well No. 1 located in Unit N, Section 15, Township 31 North, Range 13 West, San Juan County, New Mexico, should not be recompleted as a single-zone well or be plugged and abandoned in accordance with a Commission-approved plugging program.

CASE 5273: In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit Eastern Petroleum Corporation, United States Fidelity and Guaranty Company and all other interested parties to appear and show cause why the following wells should not be abandoned in accordance with a Commission-approved plugging program:

Castillo #1 located in Unit P, Section 35, Township 20 North, Range 7 West, McKinley County, New Mexico;

Chopup #1 located in Unit N, Section 30, Township 19 North, Range 6 West, McKinley County, New Mexico;

Chacra Mesa #1 located in Unit B, Section 14, Township 19 North, Range 7 West, McKinley County, New Mexico;

Blackjack #1 located in Unit P, Section 12, Township 21 North, Range 9 West, San Juan County, New Mexico;

Pornada #1 located in Unit H, Section 27, Township 18 North, Range 7 West, McKinley County, New Mexico.

CASE 4749: (Reopened)

In the matter of Case No. 4749 being reopened pursuant to the provisions of Order No. R-4338-A, which order continued special rules for the Humble City-Strawn Pool, Lea County, New Mexico. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing.

CASE 4946: (Reopened)

In the matter of Case No. 4946 being reopened pursuant to the provisions of Order No. R-4581, which order established temporary rules for the Crosby-Fusselman Associated Pool, Lea County, New Mexico. All interested parties may appear and show cause why said rules should not be rescinded.

CASE 5110: (Continued from January 16, 1974)

In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider the institution of gas prorationing in

CLARENCE E. HINKLE
W. E. BONDURANT, JR.
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. O. MARTIN
PAUL J. KELLY, JR.

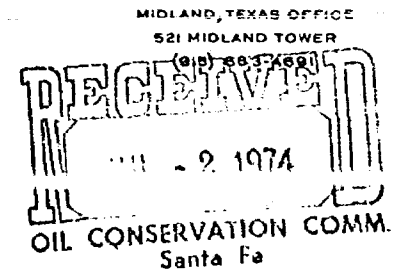
LAW OFFICES
HINKLE, BONDURANT, COX & EATON

TELEPHONE (505) 622-6510

800 HINKLE BUILDING
POST OFFICE BOX 10

ROSWELL, NEW MEXICO 88201

July 1, 1974



Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

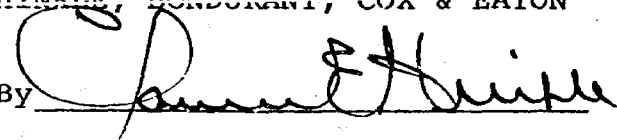
Appearing on the examiner's docket for July 10 is Case 4749 which is being reopened pursuant to the provisions of Order R-4338-A which order continued special rules for the Humble City-Strawn Pool, Lea County.

We represent Harding Oil Company who was the original proponent of the special pool rules and due to the unavailability of witnesses for Harding for both July 10 and July 24 because of vacations, please consider this as a motion on behalf of Harding to continue this case until the examiner's docket of August 7.

Yours sincerely,

HINKLE, BONDURANT, COX & EATON

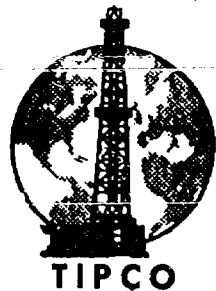
By



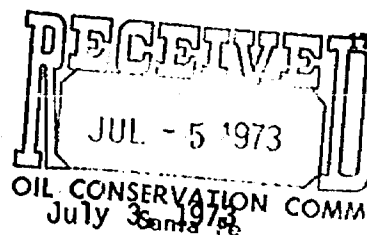
CEH:cs

DOCKET MAILED

Date 7-25-74
For Aug. 7th



TEXAS INTERNATIONAL PETROLEUM CORPORATION



1720 WILCO BUILDING

MIDLAND, TEXAS 79701

PHONE 915-682-9741

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Re: Case No. 4749
Order No. R-4338
Humble City Strawn Field
Lea County, New Mexico

Gentlemen:

This is to advise that as an operator in the Humble City Strawn Field, Texas International Petroleum Corporation petitions the retention of 80 acre proration units for each well completed from the Strawn lime in the above named field.

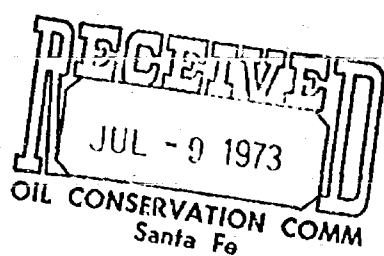
Very truly yours,

Robert O. Burkett
Division Manager

ROB:nkb

4749

James L. Farrell, operations superintendent
central division



July 5, 1973

New Mexico Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

Re: Case No. 4749-Humble City-Strawn Pool, Lea County,
New Mexico

With reference to the captioned case to be heard Wednesday,
July 11, 1973, please be informed that Mesa Petroleum Co. respect-
fully requests the examiner approve the 80-acre proration unit
currently established under the special rules and regulations for
the Humble City-Strawn Pool, Lea County, New Mexico in Order
No. R-4338.

Mesa agrees with Harding Oil Co. that 80-acre proration units are
adequate for economic drainage for this particular reservoir.

Sincerely,

A handwritten signature in cursive script, appearing to read 'J. L. Farrell'.

J. L. Farrell

JLF/tls

cc: Harding Oil Co.
Att: Mr. Lewis Bicking
408 Carillon Tower West
13601 Preston Road
Dallas, Texas 75240

DOCKET: EXAMINER HEARING - WEDNESDAY - JULY 11, 1973

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Richard L. Stamets, Alternate Examiner:

- ALLOWABLE: (1) Consideration of the allowable production of gas for August, 1973, from seventeen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico.
- (2) Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for August, 1973.

CASE 4749: (Reopened) (Continued from the June 6, 1973, Examiner Hearing)

In the matter of Case No. 4749 being reopened pursuant to the provisions of Order No. R-4338, which order established special rules and regulations for the Humble City-Strawn Pool, Lea County, New Mexico, including a provision for 80-acre proration units. All interested parties may appear and show cause why said pool should be developed on other than 40-acre units.

CASE 5019: Application of Cities Service Oil Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the S/2 of Section 14, Township 20 South, Range 28 East, Eddy County, New Mexico, to be dedicated to a well to be drilled in an undesignated Morrow gas pool at a standard location in Unit K of said Section 14. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and up to 200 percent charge for risk involved in drilling said well.

CASE 5020: Application of Belco Petroleum Corporation for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the South Salt Lake-Morrow Gas Pool, including a provision for 320-acre drilling and proration units. In the absence of objection, this pool will be placed on 320-acre spacing rather than the present 160-acre spacing.

CASE 5021: Application of Mobil Oil Corporation for an unorthodox oil well location and special pool allowable, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its proposed New Mexico "R" Well No. 9 at an unorthodox location 940 feet from the North line and 1510 feet from the East line of Section 27, Township 10 South, Range 32 East, Mescalero-Devonian Pool,

CLARENCE F. HINKLE
W. E. BONDURANT, JR.
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.

LAW OFFICES
HINKLE, BONDURANT, COX & EATON

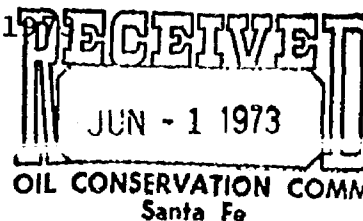
600 HINKLE BUILDING
POST OFFICE BOX 10

ROSWELL, NEW MEXICO 86201

TELEPHONE (505) 622-6510

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
(915) 683-4691

May 31, 1973



Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Re: Case No. 4749
Examiner's docket June 6, 1973

Gentlemen:

This will confirm my telephone conversation with Mr. Dan Nutter this morning in which I requested that the above case be continued until the examiner's hearing of July 11, 1973. This case was originally filed by Harding Oil Company, and Roy C. Williamson of the engineering firm of Sipes, Williamson, Runyan & Aycok, Inc. of Midland was the principal witness for Harding. Mr. Williamson has arranged his vacation for the entire month of June and therefore will not be available as a witness. It is for this reason that we requested that the case be continued.

You may treat this letter as a motion for continuance of the case until the examiner's hearing of July 11, 1973.

Yours sincerely,

HINKLE, BONDURANT, COX & EATON

By 

CEH:cs

cc: James O. Justice

cc: Roy C. Williamson

DOCKET MAILED

Date 6-28-73
for 7/11/73

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 6, 1973

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

- ALLOWABLE: (1) Consideration of the allowable production of gas for July, 1973, from seventeen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico;
- (2) Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico for July, 1973.

CASE 4982: Application of Brunson and McKnight for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Ojo Chiso Unit Area comprising 5,120 acres, more or less, of Federal and State lands in Township 22 South, Range 34 East, Lea County, New Mexico.

CASE 4983: Application of Gulf Oil Corporation for simultaneous well dedication and non-standard locations, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the simultaneous dedication of two wells to a standard 640-acre gas proration unit comprising all of Section 35, Township 21 South, Range 36 East, Eumont Gas Pool, Lea County, New Mexico, said wells being the W. A. Ramsay (NCT-A) Wells Nos. 20 and 7 at non-standard locations in the center of Units E and N, respectively, of said Section 35.

CASE 4749: (Reopened)

In the matter of Case No. 4749 being reopened pursuant to the provisions of Order No. R-4338, which order established special rules and regulations for the Humble City-Strawn Pool, Lea County, New Mexico, including a provision for 80-acre proration units. All interested parties may appear and show cause why said pool should be developed on other than 40-acre units.

CASE 4984: Application of Monsanto Company for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its Miller Federal Well No. 1 located in Unit G of Section 3, Township 21 South, Range 27 East, Eddy County, New Mexico, in such a manner as to produce gas from undesignated Atoka gas pool and from the Burton Flat-Morrow Gas Pool through the casing-tubing annulus, and tubing, respectively.

CASE 4967: (Continued and readvertised from the May 9, 1973 Examiner Hearing)

Application of John M. Etcheverry for dissolution of a standard proration unit and the creation of two non-standard proration units, Lea County, New Mexico. Applicant, in the above-styled cause, seeks

4749.

Leard. 6-28-72

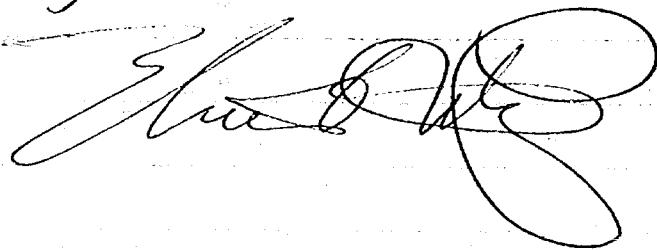
Re. 6-28-72

Grant Harding oil Co. request
for 80 Ac. spacing in the
Humble City - Strand pool

1. ~~Desable~~ spacing 330' boundary
of each rather 480'
2. Temp. 1 yr.

Findings:

1. Evidence that 80 Ac. will have
a reasonable payout.
2. That there is much evidence
that pool is substantially smaller
than 640 Ac.
3. 1 well will drain 80 Ac.
4. Other pools on this trend have
been adequately developed on
40 + 80 Ac spacing. (E. Lovington
+ NE Lovington).



use 370' as a
guide

J. R. MODRALL
JAMES E. SPERLING
JOSEPH E. ROEHL
GEORGE T. HARRIS, JR.
DANIEL A. SISK
LELAND S. SEDBERRY, JR.
ALLEN C. DEWEY, JR.
FRANK H. ALLEN, JR.
JAMES P. SAUNDERS, JR.
JAMES A. PARKER
JOHN R. COONEY
KENNETH L. HARRIGAN
PETER J. ADAMS

DALE W. EK
DENNIS J. FALK
FARRELL L. LINES
ARTHUR D. MELENDEZ

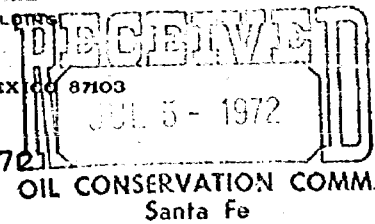
LAW OFFICES OF
MODRALL, SPERLING, ROEHL, HARRIS & SISK

PUBLIC SERVICE BUILDING
P. O. BOX 2168
ALBUQUERQUE, NEW MEXICO 87103

JOHN F. SIMMS (1885-1954)
AUGUSTUS T. SEYMOUR
(1907-1965)

TELEPHONE 243-4511
AREA CODE 505

July 3, 1972



Mr. Elvis Utz
New Mexico Oil Conservation
Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Case No. 4748, Application of Pubco Petroleum
Corporation; and
Case No. 4749, Application of Harding Oil
Company; both relating to Humble City -
Strawn Pool, Lea County, New Mexico

Dear Elvis:

At the hearing held on June 28, 1972, there was repeated reference to and testimony concerning the Pubco-Spencer & Hutson-Harding Oil Company Farmout. Since the Farmout Agreements and related documents are the best evidence of the agreement, I am enclosing a xerox copy of an executed copy of the agreement with attached exhibits referred to in the agreement and correspondence reflecting extensions and consent to the assignment to Harding Oil Company. These would have been tendered at the hearing, but at that time copies were not available.

Very truly yours,

James E. Sperling
James E. Sperling

JES:jv
Enclosures

cc: Mr. Clarence Hinkle, w/o encl.
Mr. Frank Gorham, w/o encl.

January 11, 1972

C
Spencer and Hutson
1212 Vaughn Bldg.
Midland, Texas 79701

Re: NC-294 F/O Agreement
Knowles, West Prospect
Lea County, New Mexico

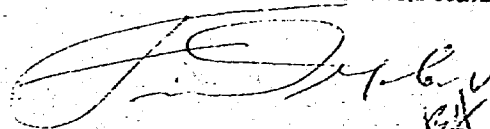
O
Gentlemen:

P
The Farmout Agreement dated November 5, 1971 provides for your commencement of re-entry operations on the initial test well in Section 11, Township 17 South, Range 37 East, Lea County, New Mexico on or before January 15, 1972. You have requested an extension of time within which to commence this well.

Y
This letter will serve as evidence of our agreement to extend the time for commencement of the above mentioned well to January 31, 1972. This extension is given with the express understanding that if said operations are not actually commenced by said extended date, Pubco may, at its election, consider the Farmout Agreement null and void. All other terms and conditions of said agreement remain as written and in full force and effect.

Sincerely,

PUECO PETROLEUM CORPORATION



Frank D. Gorham, Jr.
President

FDCJr:jaw:kh

cc: Harding Oil Co.

*Spurlock
1-26-72
per Midland*

December 6, 1971

Spencer and Hutson
1212 Vaughn Building
Midland, Texas 79701

Re: MC-294 F/O Agreement
Knowles West Prospect
Lea County, New Mexico

Gentlemen:

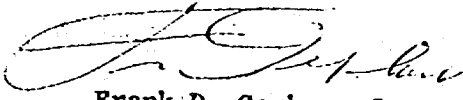
We acknowledge your letter of November 30, returning two executed copies of the captioned agreement. Although this agreement was received after the deadline date, specified therein, Pubco waives all objections it might have to the short delay and the contract may be considered to be in full force and effect pursuant to all of its other terms.

You did not provide additional information under Article 4.(C) of the letter agreement as to notices. If the assignment to be referred to hereinafter covers all of your interest, then no such additional information will be required, and notices to you will be addressed in the same fashion as depicted in this letter.

Permission is granted to assign this agreement to Harding Oil Company, 4317 Oaklawn, Dallas, Texas 75219, PROVIDED HOWEVER, they furnish written agreement to us conforming to the requirements of Article 14 of Exhibit "A" of the captioned agreement. When such arrangements are completed, we will need to be furnished additional information regarding notices. It is presumed these arrangements will be completed prior to the commencement date for the test well as specified in the captioned agreement.

Sincerely,

PUBCO PETROLEUM CORPORATION


Frank D. Corham, Jr.
President

FDG, Jr:jaw:kh

DEC 2 1971

RICHARD F. SPENCER
PETROLEUM GEOLOGIST

OSLER C. HUTSON
PETROLEUM GEOLOGIST

SPENCER HUTSON



VAUGHN BUILDING
MIDLAND, TEXAS 79701
915 - 683-2631

November 30, 1971

Pubco Petroleum Corporation
P. O. Box 869
Albuquerque, New Mexico 87103

Attention: Mr. Dale Harrison

Dear Dale:

Transmitted herewith are two executed copies of our farmout agreement concerning the West Knowles Prospect in Lea County, New Mexico. Also, enclosed please find a check for \$1,155.00 for the purchase of one wellhead and the intermediate casing in the Shipp #1 dry hole. *OK*

We are requesting permission at this time to assign this farmout agreement to Harding Oil Company in Dallas, Texas (4317 Oaklawn, 75219). Harding will commence the well as soon as possible and we will look forward to a big success. *pm*

Thank you for your cooperation.

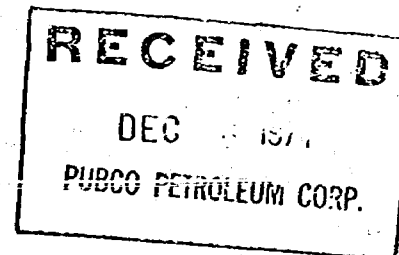
Yours very truly,

Richard F. Spencer
Richard F. Spencer

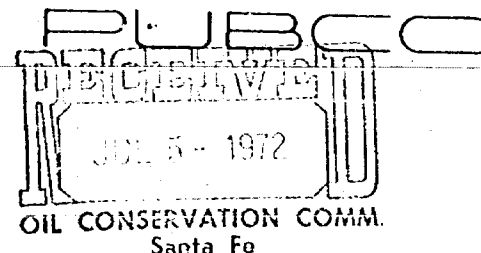
RFS:jw

cc - Harding Oil Company

*Plumbat permit
rec'd by Midland
office 3-29-72*



November 5, 1971



Spencer and Hutson
1212 Vaughn Building
Midland, Texas 79701

Re: MC-294 F/O Agreement
Knowles West Prospect
Lea County, New Mexico

Gentlemen:

Pubco Petroleum Corporation (hereinafter called Pubco) is the owner and holder of certain of the oil and gas leases described in the attached Exhibit "g", insofar as they pertain to lands described therein (hereinafter called the Contract Acreage) and this letter will confirm our agreement with you pertaining to their exploration and development in accordance with the terms and conditions hereof:

In consideration of the premises and the terms and conditions set forth in this letter, it is hereby agreed by and between the undersigned parties, as follows:

1. Test Well:

(A) Upon acceptance of this Agreement, Spencer and Hutson agrees to pay Pubco the sum of \$1,155.00 for the purchase of one wellhead and the intermediate casing in the Shipp #1 dry hole described hereinafter in more detail.

(B) On or before January 15, 1972 you, Spencer and Hutson, a partnership, (hereinafter called the "Operator") shall commence actual re-entry of the Pubco Shipp #1 dry hole located in the NE $\frac{1}{4}$ SW $\frac{1}{4}$ at 2,080 feet FWL and 2,310 feet FSL of Sec. 11-T17S-R37E, NMPM, Lea County, New Mexico (hereinafter called the Test Well) and with due dispatch and reasonable diligence continuously drill said well deeper at Operator's sole cost, risk and expense to a depth which will adequately test the stratigraphic equivalent of the Pennsylvanian Atoka sandstone (as encountered between 11,425 feet and 11,450 feet in the McAlester Fuel Co. - Toklan Royalty Test A-1 well located in Sec. 8-T17S-R38E), or to an estimated total depth of 12,000 feet whichever is the lesser, (hereinafter called "Contract Depth") subject to the further terms and conditions hereinafter. If Operator reaches Contract Depth and does not elect to attempt a completion of the Test Well at Contract Depth, if it so desires it may then plug back and attempt a completion at any lesser depth, while the rig is still on location, all at its sole cost, risk and expense. In any such event, Operator shall proceed

(REV.)

*Page 9
Exhibit g*

to complete the Test Well for the production of oil and/or gas in paying quantities, or else plug said well, all with due dispatch and reasonable diligence, free of any cost or liability to Pubco.

2. Option Wells: In the event Operator has drilled the Test Well to Contract Depth, all in the time and manner as specified in Article 1, Operator is hereby granted the right and option to drill an Option Well at a location of his choice on any 80 acre tract, other than the Test Well tract, of the Contract Acreage and earn an interest in and to the leases covering the Contract Acreage tract on which such Option Well is drilled as set forth hereinafter, provided:

(A) Within one hundred twenty (120) days after having reached the Contract Depth in the Test Well, Operator shall elect in writing whether or not it will drill the Option Well.

(B) An election to drill the Option Well must specify the location where the well is to be drilled on the Contract Acreage.

(C) If Operator earns and exercises its option to drill said well, it agrees to commence the actual drilling of the Option Well, within one hundred eighty (180) days after having reached total depth in the Test Well. Then, Operator shall drill the Option Well with due dispatch and reasonable diligence continuously to a total depth of its choice, and at its sole cost, risk and expense, subject to the terms and conditions hereof.

(D) Operator agrees to furnish Pubco a copy of its monthly production reports on each Option Well placed on production.

(E) In the event Operator drills said Option Well in the time and manner set forth above, it shall have the further option to drill a subsequent well under the same terms and conditions as required for the first Option Well; provided, however, the election to drill each subsequent Option Well shall be made within ninety (90) days after reaching Total Depth in the prior well, and each subsequent Option Well shall be actually commenced within one hundred twenty (120) days after reaching the Total Depth. Drilling of the subsequent Option Well will renew the option to drill another well, and if Operator drills each Option Well in compliance with all of the terms and conditions of this Agreement, it shall have a continuous right of development of each tract of the Contract Acreage, until all the Contract Acreage has been fully developed.

(F) It is understood and agreed however, that if Operator

(Rev.)

fails to drill any well under this Agreement in compliance with the terms and conditions of this agreement, or fails to make an election to exercise an option provided for herein in a timely manner, or else it elects not to drill an Option Well; then in any of these events, this Agreement shall terminate in its entirety (except for Operator's liability for any obligations incurred theretofore) as to the Contract Acreage tract on which such a well would have been located, and Operator shall be deemed to have released and discharged all of its options or right and title in and to all the leases and Contract Acreage yet to be earned. Operator shall execute and deliver such releases or acquittances as Pubco may require, in such an event.

3. Assignments:

(A) When Operator has furnished satisfactory evidence to Pubco, that the Test Well has been drilled in compliance with all of the terms and conditions of this Agreement, and is completed as being capable of producing oil and/or gas in paying quantities, Pubco shall promptly execute and deliver, without representation or warranty of title either express or implied, an assignment of all of Pubco's rights, title and interest in and to the oil and gas leases more particularly described in Exhibit "B", which cover, and insofar only as they cover the E $\frac{1}{2}$ SW $\frac{1}{4}$ of Section 11, T17S - R37E, Lea County, New Mexico OR ELSE, the SW $\frac{1}{4}$, or the W $\frac{1}{2}$ whichever alternative may apply so that the drillsite unit shall conform to the lawful rules, orders and/or regulations of the Conservation Commission in force at the time the Test Well is completed for production. Attached herewith and incorporated herein by this reference are three different plats, identified as Exhibit D-1, D-2, and D-3. Each plat depicts the locations described above by colored diagonal lines as well as the option acreage to be earned thereafter in so-called checkerboard fashion (all being also called the Contract Acreage herein) depending on whether the applicable spacing order is for 80, 160, or 320 acres. Application of these alternative provisions shall apply to any and all Test and Option Wells drilled pursuant to this letter agreement. Such assignment shall be subject to the following additional limitations and conditions:

Log
Completion
Report

Said assignment will be made on a form acceptable to Pubco, and be effective as of the date of re-entry on said Test Well. This assignment will be made subject to the lessors' royalty and any and all valid and existing overriding royalties, or other lease burdens or burdens on production which appear of record as of the date of this Agreement. In addition, Pubco will except and reserve unto itself in said assignment all horizons and formations lying below 100 feet below the deepest depth drilled in the Test Well.

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(B) When Operator has furnished satisfactory evidence to Pubco, that any Option Well has been drilled in compliance with all of the terms and conditions of this Agreement, and is completed as being capable of producing oil and/or gas in paying quantities, Pubco shall promptly execute and deliver, without representation or warranty of title either express or implied, an assignment of all of Pubco's right, title and interest in and to the oil and gas leases more particularly described in Exhibit "B" which cover, and insofar only as they cover the 80-acre tract, or else, the alternative tract as referred to in 3(A) above and as depicted on either Exhibit D-1, D-2 or D-3 attached hereto, of the Contract Acreage on which such Option Well has been drilled and completed.

A separate assignment will be made for each earning well, and each such assignment will be made in the same manner and subject to the same terms, exceptions and reservations as is required for the assignment which may be made for the Test Well, as specified above.

(C) Any assignment made as provided for in this Article shall describe the legal subdivision of the section of lands described in Exhibit "B" on which the earning well is located, regardless of whether such subdivision contains more or less than 80, 160, or 320 acres of land, as the case may be.

4. Other Conditions:

(A) It is distinctly understood and agreed that this Agreement is subject to the additional terms, conditions and provisions set forth in Exhibit "A", which is attached hereto and made a part hereof by this reference.

(B) In addition to any geological requirements specified in Exhibit "A";

1) Operator shall run a complete electrical survey, including:

a. Gamma Ray-Borehole Compensated Sonic log or a Gamma Ray-Sidewall Neutron log, to be conducted by a reliable logging company, from 9,163' to total depth drilled.

b. Induction-Electric log or equivalent resistivity log, to be conducted by a reliable logging company, from 9,163' to total depth drilled.

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2) In addition to the requirements for daily drilling reports and notices set forth in Exhibit "A", on weekends or holidays Operator should contact any one of the following representatives of Pubco's office:

	<u>Office</u>	<u>Residence</u>
M. E. Causey	505-842-1940	296-5872
D. E. Crowley		296-6829
J. C. Johnson		299-6029

3) All notices, other than drilling reports as required above, required in Article 6 of Exhibit "A" shall be given to one of the above named representatives at Pubco's office or at their residence.

4) In addition to the requirements of Article 6.e of the attached Exhibit "A", Operator shall take clean samples at 10 foot intervals, from 9,163 feet to total depth drilled (with the exact depth noted thereon, one set of which shall be kept for Pubco at the Test Well site.

5) Pubco shall be furnished a copy of the drilling time log made from 9,163 feet to total depth drilled.

6) If a hydrocarbon mud logging unit is used, Pubco shall be furnished one copy of daily progress log to be mailed daily; and two final prints of the hydrocarbon mud log.

(C) All notices to Operator may be sent to:

Spencer and Hutson
1212 Vaughn Building
Midland, Texas 79701

ATTN: _____
Business Phone: 915 683-2631
Home Phone: _____

(D) Pubco recognizes Operator may assign an interest in this Agreement to one or more partners. It is understood and agreed that Operator has that right, subject to the approval of partners by Pubco, and provided such other party agrees to assume its pro rata share of the

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terms, conditions and benefits of this Agreement, all as set forth in Exhibit "A" hereof. However, it is further understood and agreed that if Operator makes such an assignment to five or more parties, Pubco may, at its discretion, require such assignees to appoint a single agent who shall have full authority to receive all notices and communications required herein.

(E) In addition to the requirements regarding payment of delay rentals contained in Exhibit "A", Operator agrees to reimburse Pubco for all amounts of such rentals applicable to each tract of the Contract Acreage described in Exhibit "B", from the date Operator accepts this Agreement until a right to earn each tract of the Contract Acreage is terminated or expires or the acreage thereunder is earned by notice of completion of a well capable of production of oil and/or gas in paying quantities, whichever is the later date.

(F) Regardless of the possibility this Agreement may be terminated by one party or another for bonafide reasons, the Operator agrees to be bound to make any such payments required to be made to Pubco as specified herein without any right to a refund except due to clerical error.

This Agreement and the exhibits attached hereto and incorporated herein contain all of the terms and provisions of the Agreement of the parties hereto pertaining to the lease and lands in the Contract Acreage, and there shall be no changes, alterations or modifications thereof unless otherwise agreed to in writing by the parties hereto. If this Agreement is not duly executed by Operator and returned to Pubco on or before the 15th day of December, 1971, then and thereupon, at the option of Pubco, this Agreement together with the exhibits attached hereto shall be null and void and of no effect.

IN WITNESS WHEREOF, this Agreement is executed in multiple copies, each copy for all purposes to be deemed an original, effective

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November 5, 1971

as of the date of acceptance hereof by Operator as evidenced by the acknowledgment of its signature.

ATTEST:

PUBCO PETROLEUM CORPORATION

I. W. Armstrong
I. W. Armstrong, Asst. Secretary

By: Frank D. Gorham, Jr.
Frank D. Gorham, Jr., President

First Party

Richard F. Spencer
Richard F. Spencer

Osler C. Hutson
Osler C. Hutson

DBA Spencer and Hutson, a partnership

Second Party (Operator)

(See attached acknowledgment)

(Rev.)

LAND	SSA
PROD.	28
ACCT.	050
GEO.	ML

STATE OF Texas)
COUNTY OF Midland) ss.

BEFORE ME, Betty J. Way, a notary public, on this day personally appeared Richard J. Spence and Oscar C. Hutton, known to me (or proved on the oath of _____) to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that they executed the same for the purpose and consideration therein expressed. Given under my hand and official seal this 30th day of November, 1971.

My Commission Expires:
June 1, 1973

Betty J. Way
BETTY J. WAY - Notary Public
In And For Midland County, Texas

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) ss.

BEFORE ME, the undersigned, a notary public, in and for said County and State on this 12th day of November, 1971, personally appeared Frank D. Gorham, Jr., to me known to be the identical person described in and who executed the within and foregoing instrument of writing and known to me to be the President of Pubco Petroleum Corporation, and acknowledged to me that he duly executed the same as his free and voluntary act and deed for the uses and purposes therein expressed, and as the act of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal the day and year last above written.

My Commission Expires:
March 18, 1975.

Patricia M. Todd
Patricia M. Todd, Notary Public

EXHIBIT "A"

Attached to and made a part of that certain agreement between
PUBCO PETROLEUM CORPORATION ("Pubco") and _____, ("Operator")
Spencer and Hutson
dated November 5, 1971.

1. Titles

Upon request, Pubco shall deliver to Operator copies of relevant title material and related data in its possession pertaining to the Contract Acreage. Pubco, however, shall not be responsible for the content of such title material and data, and Pubco makes no representations or warranties as to the completeness or accuracy of such title data. Pubco shall not and does not hereby make any covenants or warranties concerning the validity or merchantability of Pubco's title to the Contract Acreage. Operator, at its sole cost, risk and expense may conduct such title examination and secure such curative material as it considers necessary, and, without cost to Pubco, it shall forthwith furnish Pubco with copies of all title opinions and curative documents obtained, whether the same are obtained prior or subsequent to the commencement of drilling operations hereunder.

2. Default

In the event Operator should either fail to commence the drilling of any test well within the time and in the manner herein provided; or having commenced the same, should it fail or refuse to drill the same to Contract Depth within the time and in the manner herein specified, or comply with all of the terms and conditions of this agreement set forth herein; then and in any such event, ~~the agreement shall terminate and all interest in the Contract Acreage shall revert to Pubco~~, and notwithstanding anything in this agreement to the contrary, this agreement, with the exception of Operator's obligations that may have accrued theretofore, as well as its obligation to release and warrant, shall ipso facto terminate in its entirety and any interest which Operator otherwise may have been entitled to earn in or to the Contract Acreage shall terminate and revert to Pubco. In the event of any such default, Operator agrees that upon demand, it will forthwith release and quitclaim to Pubco any and all interest not then earned in the Contract Acreage and under this agreement, warranting the same to be free and clear of all liens, claims, encumbrances, overriding royalties or other burdens on production caused, suffered or created by, through or under it.

3. Operations

In connection with the drilling and all other operations conducted under or pursuant to this agreement affecting the Contract Acreage, Operator shall observe and comply with the following provisions:

a. Conduct all operations strictly in accordance with the terms and conditions of the oil and gas lease covering that portion of the Contract Acreage upon which said well is being drilled.

b. Observe and comply with all applicable laws, rules, regulations and orders of all governmental authorities and agencies, and timely file all reports required by such authorities and agencies. ✓

c. Comply with the non-discrimination provisions of Paragraphs 1 through 7 of Section 202 of Executive Order No. 11246, as amended (30 Fed. Reg. 12319), unless exempted by order of the Secretary of Labor issued pursuant to Section 204 of said Executive Order No. 11246, or any similar order pertaining to the same subject matter which may be in effect

from time to time, at all times herein contemplated and during which the leases and Contract Acreage which are the subject of this agreement are subject to the application and jurisdiction thereof.

d. Conform to established oil field practices during all operations on the Contract Acreage and perform the same with due dispatch and diligence and in a good and workmanlike manner.

e. Complete each Test Well under this agreement through and including installation of adequate lease storage tanks (if an oil well) or a separator (if a gas well); or, if such test results in a dry hole after having drilled it to Contract Depth and tested it as required in this agreement, lawfully plug the well, restore and abandon the premises, and settle or make provision for the settlement of all claims for damages all within ninety (90) days from the date of commencement of actual drilling thereof (unless extended by Pubco) and free of any cost, risk, expense or liability to Pubco.

4. Substitute Wells

A. If Operator timely commences actual drilling of any Test Well on this Contract Acreage, but fails to drill said well to Contract Depth due to encountering adverse mechanical or geological conditions which are beyond its control, and which, in the opinion of a reasonably prudent operator, would make it impossible or impractical to continue operations, it shall have the right to terminate drilling said well at such point and in such event shall promptly and properly plug and abandon said well. Operator shall have no obligation to drill a substitute test well, but if it elects to do so, it shall commence, or cause to be commenced, the actual drilling of a substitute test well at an alternate location in the same 40-acre or spaced drillsite tract of the Contract Acreage, within thirty (30) days following the discontinuance of drilling operations on said Test Well, and thereafter drill said substitute well in the same manner to Contract Depth, as required for the drilling of the Test Well. Otherwise, all rights of Operator which have not then been earned in the Contract Acreage shall terminate and become null and void as to said lease and Contract Acreage which have not then been earned, subject to Operator's obligations to hold Pubco harmless from and against any and all loss, costs, liens, debts or liability incurred or created by Operator or arising out of its operations hereunder.

B. In the event a substitute well is drilled to Contract Depth in full compliance with all of the terms and conditions of this agreement which are applicable to the Test Well, the substitute well shall be considered and treated for all purposes thereafter as the required Test Well.

5. Abandonment of Drilling Operations

A. Upon completion of the drilling and testing of any Test Well on this Contract Acreage, if Operator elects to plug and abandon said well, with or without having run casing therein, it shall immediately furnish Pubco with a copy of the logs which it is required to run pursuant to the terms of this agreement, and shall so notify Pubco of its election to plug and abandon said well by telegraphic notice in the manner required in Paragraph 20 hereof. Pubco shall have twenty-four (24) hours following receipt of such notice or the required logs in Pubco's Albuquerque office, whichever is later, within which to elect to take over said well and to conduct such additional drilling, testing or completion operations thereon as it may deem advisable. If Pubco elects not to take over such well, or fails to advise Operator of its election within said twenty-four (24) hour period, then, in that event, such well shall be forthwith plugged and

abandoned by Operator at its sole cost, risk and expense and the surface of the land surrounding the subject location shall be restored as nearly as practicable to the condition in which it was found upon Operator's entry thereon, as soon as possible.

B. If Pubco elects to take over any Test Well being abandoned by Operator, all of its operations on such well following the take over shall be conducted at Pubco's sole cost, risk and liability and without any cost, risk or liability to Operator, but Pubco shall not in any way be liable for any loss, cost, risk or liability in connection with any operations conducted prior to the date Pubco has made its entrance on the subject location. Upon take over of any Test Well, Operator shall be deemed to have released and relinquished its entire right, title and interest in, to and under the Contract Acreage as to the forty (40) acre drillsite or spacing unit upon which such well is situated (whichever is the larger). Further, Operator agrees to assign forthwith to Pubco all rights and interests it may have in that portion of the leases and acreage covering the drillsite and all casing, materials and equipment in and on such well free and clear of all claims, liens, encumbrances or other burdens caused, suffered or created by, through or under Operator. Upon receipt of such conveyance, Pubco shall pay to Operator the reasonable salvage value of the casing, materials and equipment in and on said well and so conveyed to Pubco on the same basis as provided in the Accounting Procedure in the attached Operating Agreement, and thereafter Pubco shall be the sole and exclusive owner thereof, free and clear of the terms and conditions of this Agreement.

C. In the event Pubco elects to take over any test well as provided for herein, it may either employ the tools in use by Operator or it may use such other tools as it may deem desirable. If Pubco elects to use another set of tools in conducting such additional operations, then Operator shall remove or cause to be removed from the well site the set of tools then in use by it, within five (5) days after receipt of notice that Pubco intends to conduct such additional operations. However, if Pubco elects to employ the tools in use by Operator, Pubco shall assume any contractual obligations in connection with said drilling equipment and machinery and the crew which may operate it. If said equipment and machinery and the crew be those of Operator, Pubco shall pay Operator for the use thereof in accordance with the terms of contracts entered into by independent drilling contractors in the immediate area for the performance of work and services of the character to be undertaken by Pubco pursuant to such election.

6. Well Information and Testing Requirements

Pubco's representatives shall have free access to each Test Well provided for in this agreement and to all wells which may be drilled on the Contract Acreage and all records pertaining to such wells and the production therefrom including, but without limitation, access to the logs thereof at any and all times and Operator shall furnish samples, drilling reports and other information and material regarding said wells as may be requested by Pubco. As to each well to be drilled pursuant to the terms of this agreement, Operator agrees:

a. To notify Pubco at least one week in advance of the commencement of actual drilling, giving the official well name and the location of each well, with the distances and directions thereof from at least two readily identifiable survey lines;

b. Commencing with the date each well is spudded, to furnish daily drilling reports to Pubco's offices in Albuquerque by telephone (before 9:00 A.M.MST), or else by telegram or letter, as Pubco may elect, such reports to include the latest depth and status of said wells;

c. To make drillstem tests of all horizons and formations encountered which, in the opinion of Pubco, indicate the presence or possibility of commercial oil and/or gas production. In any event, as to any option well subsequently drilled under this agreement, operator shall make a drillstem test of any horizon or formation in which production has been established in the Initial Test Well.

d. To furnish Pubco with representative samples of any cores which may be taken, and have core analyses run on any and all potentially productive zones in such cores;

e. To keep the drilling mud in condition to bring representative samples to the surface and to catch, wash and dry samples at such intervals and to such depths as specified in the pre-attached agreement. ~~Operator shall also be responsible for the cost of such processing and storage of samples and shall produce a report thereon.~~ The cost of such processing and storage shall be borne by Operator;

f. To maintain a reasonable angle of deflection of the hole from the vertical; and comply with the requirements of the state in which the well is being drilled with reference to maximum permissible deviation, if any;

g. To give advance notice to Pubco at its Albuquerque office in sufficient time for it to arrange to have a representative present to witness any and all coring, testing, running of any and all logs and surveys, measuring of depth upon completion and plugging operations, and further, to give advance notice to Pubco of its intention to drill into any known producing horizon in sufficient time for Pubco to arrange to have a representative present to witness such operation, and in the event any significant show of oil and/or gas is encountered in the drilling of a well, Operator shall notify Pubco in order that it may have a representative present when such formation is penetrated and/or tested, if it so desires;

h. To furnish promptly to Pubco's Albuquerque offices, the complete reports of the results of any test conducted on said well together with reports of all surveys of the hole, however made, and to furnish said offices with one copy each of any and all core analyses, drillstem test charts and one copy each of the drilling time logs at intervals of not greater than ten (10) feet ~~from the surface to the total depth drilled,~~ or in lieu of said drilling time logs, one copy each of the geologist's chart;

i. To furnish to each of Pubco's offices one field print copy, one final copy and a sepia of all electrical well surveys and any other surveys conducted on said well including those provided for elsewhere in this agreement, as soon as the same are available.

Pubco shall have the right to receive any and all information secured by Operator in the drilling, testing, completing and producing of the wells drilled hereunder by Operator on the Contract Acreage.

7. Liens and Indemnity

A. Operator agrees that in conducting any operations on the leases subject hereto, it will not do or cause to be done any act of commission or omission which might cause any forfeiture of such leases or create any liability under Pubco's bonds covering operations thereon. In addition, Operator shall pay all bills promptly and shall not permit any liens to accrue against any of the Contract Acreage or leases, or any equipment used in connection therewith, that would in any manner jeopardize Pubco's interest and rights hereunder. Operator further agrees to indemnify and save Pubco harmless of

of and from any and all claims of any nature whatsoever in connection with operations conducted by Operator on the Contract Acreage, including but not by way of limitation, claims based on breach of express or implied covenants, and shall pay all costs and expenses of judgments against Pubco based on such claims. Further, if Pubco is named as a party defendant in any action resulting from operations conducted by Operator under this agreement, Pubco shall immediately notify Operator in order to allow it to join in such suit or action as joint defendant, and Operator shall save Pubco harmless from any cost or expense, including fees of counsel, incurred by Pubco in defending such action.

B. Notwithstanding anything to the contrary contained herein, it is specifically understood and agreed that Operator shall make settlement and pay for all damages occasioned by its operations on the Contract Acreage and shall provide Pubco with an executed copy of the Release of Damages secured from surface owners or others. With respect to any of the wells provided for in this agreement, Operator agrees to provide Pubco with an executed copy of the Release of Damages regarding such well drilled prior to the delivery of the appropriate lease assignment by Pubco.

8. Insurance

A. Before the commencement of drilling operations on the first Test Well on this Contract Acreage, Operator shall furnish Pubco with an acceptable certificate showing that it has purchased or provided the following insurance which indemnifies, protects and saves Pubco harmless:

1. Workmen's Compensation Insurance in accordance with the laws of the State in which the Contract Acreage is situated;

2. General Public Liability and Property Damage Insurance covering injuries or death of persons, with limits of not less than \$250,000 as to any one person, \$500,000 as to more than one person, \$100,000 for any property damage, resulting from any one occurrence or accident which shall cover all equipment, whether owned, leased or hired;

3. Automobile Public Liability and Property Damage Insurance covering injuries or death of persons, with limits of not less than \$250,000 per person and \$500,000 per any one accident and automobile property damage insurance with limits of not less than \$100,000 per accident which shall cover all owned and non-owned vehicles.

Operator shall maintain the above insurance protection during all operations on the Contract Acreage.

B. Further, Operator shall require all of its contractors and subcontractors to maintain Workmen's Compensation, Public Liability, Auto Liability and Property Insurance with monetary limits of not less than those specified in this paragraph during the time any operations are performed on the Contract Acreage.

9. Delay Rentals

A. Operator shall be responsible for the payment of all minimum or shut-in royalty payments charged to the Contract Acreage after the date of this agreement, and bear such expense in proportion to its ownership in the Contract Acreage.

B. If any delay rental should become due after the date of this agreement on any lease covering the Contract Acreage, Pubco shall tender such payment under the terms of the appropriate lease. Pubco shall pay the delay rentals becoming due under this agreement until the ~~attached Operating Agreement becomes effective, or until~~ this agreement is terminated. Operator agrees

to reimburse Pubco for all such rentals, regardless of when the tender may have been made. If special provision is made for rental reimbursement in the pre-attached letter, such provisions shall supersede the foregoing conditions, ~~and in the Operating Agreement hereinafter mentioned.~~ Regardless, of the applicable provisions, Operator agrees to reimburse Pubco within sixty (60) days after receiving the rental billing. If not paid by then, Pubco will notify Operator of such default in writing, and unless Operator remedies the default within thirty (30) days after receipt of such notice its interest in the applicable lease and acreage shall terminate automatically, and it shall immediately assign and convey its interest back to Pubco. Pubco shall diligently attempt to make proper payment as a matter of course, and without advance notice to Operator, but shall not be held liable to Operator in damages for the loss of any lease, or interest therein; if, through mistake or oversight, any such payment is not paid, or is erroneously paid. Any loss of any lease, or interest, resulting from a failure to pay, or an erroneous payment thereunder, shall be a joint loss, and there shall be no readjustment of interests in the remaining portion of the Contract Acreage.

C. In the event any party to this agreement desires not to pay any rental, royalty, or other such payment on any lease, or portion of lease, included herein, it shall first notify the other parties, forty-five (45) days prior to the due date given in such lease, or the date by which notice must be given to a third party under any other agreement relating hereto, whichever is the earlier date. The other parties, shall have ten (10) days after receipt of said notice with which to notify the desiring party of its election with respect thereto. Failure to respond in such manner shall constitute an election to concur with the desiring party's recommendation not to pay. In the event one party then elects to pay the rental, or other such payment, and the other does not by virtue of its original notice, then the party electing not to pay shall assign all of its interest in said lease, or portion thereof, to the other party in accordance with Article 10 of this Exhibit ~~on Section 24 of the attached Operating Agreement, if it has become effective,~~ and the party electing to pay rental shall be responsible for the payment coming due at the time the initial election was made.

D. Each Party agrees to notify the other in due course if it learns of a change in ownership of any oil and gas lease covering the Contract Acreage.

10. Surrender or Reassignment of Lease

Should Operator desire to surrender its interest in any of the leases covering the Contract Acreage ~~and there is no Operating Agreement in effect at the time,~~ it shall notify Pubco in writing, at the address herein designated, of its decision, and Pubco shall have thirty (30) days from receipt of said notice within which to elect to agree to the surrender or to take an assignment of the interest of Operator to be surrendered. If Pubco elects within said period of time to take an assignment of the interest to be surrendered, including all wells, material, and equipment which may be located thereon, as well as all of its rights in production thereafter secured; it will be assigned free and clear of all liens, claims, encumbrances or overriding royalties or other burdens on the leasehold estate and the production therefrom caused or created by, through or under Operator. Upon such assignment, Operator shall be relieved from all obligations thereafter accruing, but not theretofore accrued, with respect to the acreage assigned and the operation of any well thereon, and it shall have no further interest in said lease assigned and the equipment and production thereon and therefrom. Pubco shall pay to Operator the reasonable salvage value of the latter's interest in any wells and equipment on the assigned acreage, less the estimated cost of salvaging and the estimated cost of plugging and abandoning. Failure of Pubco to respond to such notice from Operator within the time specified shall be conclusively deemed an election not to take an assignment of the interest to be surrendered by it. In the event Pubco either expressly or impliedly elects not to take an assignment of the interest to be

surrendered by Operator as aforesaid, then the interest in the lease covering that portion surrendered as specified in its original number.

A. The terms and provisions of the attached Operating Agreement and all exhibits attached thereto as being a part of the Operating Agreement, shall become effective immediately upon the completion or abandonment of the initial Test Well provided for in this agreement in circumstances in which Operator is entitled to retain an interest in the Contract Acreage, and shall be effective as to all lands hereunder, working interests and the production therefrom to which Operator then or thereafter has an undivided interest. Said Operating Agreement is identified as Exhibit "B" attached hereto, and by this reference made a part hereof.

Upon the effective date of the Operating Agreement as provided for above, Operator shall become and be the Operator of all of the leases and lands described in Exhibit "C" which are jointly owned by the parties hereto; such leases and lands being hereinafter sometimes referred to as the "Joint Premises", or Unit Area. Except as may be herein otherwise specifically provided, the cost and expense of retaining, developing and operating said Joint Premises shall be borne by the parties hereto in the proportions that they are the owners of the Joint Premises, as set forth in the attached Operating Agreement.

B. As to any conflict between the terms and provisions of this agreement and those of said Operating Agreement, the terms and provisions of this agreement shall prevail.

12. Relationship of Parties

Notwithstanding the other terms of this agreement, and the attached Operating Agreement, it is expressly understood and agreed that the relationship of the parties hereto is that of independent contractors, and nothing in this agreement contained, expressed or implied, or any operations conducted hereunder shall create or be deemed to have created a joint venture, mining partnership, association, agency, trusteeship, or other relationship whereby any party hereto may be held liable for any lien against the other party or for the acts, either of omission or commission, of the other party hereto.

13. Contributions

All contributions, whether of dry hole and/or bottom hole money or acreage, contributed by any third party with respect to the drilling of any well on the Contract Acreage shall be owned by and become the property of the parties hereto, or their assigns, in the same proportions as they participate in the drilling of the well for which the contribution was made.

14. Consent to Assignment

~~This agreement is personal and no party shall have the right to assign or transfer~~ immediately or remotely under it shall have the right to assign or transfer any right or obligation under this agreement, or any rights, title or interests acquired under the terms of this agreement in and to the leases and lands subject hereunder, to any party without Pubco's written consent first had ~~and given~~. Any assignment made by Operator or anyone holding immediately or remotely under it following such consent by Pubco shall not be effective or valid until Pubco has been furnished with an executed copy thereof and Pubco has been furnished with an enforceable agreement whereunder the party to whom such rights are to be assigned assumes, in whole or in part, the obligations of Operator under this agreement and any assignment of rights theretofore made pertaining to the rights to be so assigned. A consent by Pubco with respect to any assignment or transfer shall not operate nor be construed as a waiver with respect to any other such subsequent assignment or transfer. Pubco agrees, however, that such consent will not arbitrarily be withheld by it.

granted by said oil and gas leases as to the mining, exploring for, drilling for and production in their respective depths (as there be any severance in this agreement), including the right to lay and maintain pipelines, water lines, dig pits, erect structures and to do and perform any and all things incident to the rights and interests of the parties hereto as otherwise provided herein. The aforesaid rights shall be exercised in such manner as not to interfere unduly with the similar rights of the other party hereto.

B. Upon notice from Operator as to its intent to commence any well on the Contract Acreage, together with its designation of the proposed location, Pubco agrees to provide Operator with its designation of operator, in such form as deemed necessary or required by law, prior to commencement of said well, so as to permit Operator entry on the appropriate leased lands for the purpose of drilling said well.

17. Drilling Within One Mile

If prior to the commencement of any Test Well provided for in this Agreement, another well is commenced at a location within one (1) mile of the location for any such Test Well, then in that event, Operator agrees to commence actual drilling operations on the well next required to be drilled hereunder within fifteen (15) days from the date such other well was commenced. Upon default of this requirement, the rights and privileges of Operator under the terms and provisions of this Agreement may be terminated and be of no further force and effect, at the option of Pubco.

18. Term

Subject to the other terms of this agreement, the same shall remain in force for the life of the oil and gas leases covering the Joint Premises and any extensions or renewals thereof, whether by production or otherwise, unless sooner terminated by mutual agreement in writing by the parties hereto.

19. Headings for Convenience

The article headings used in this agreement are inserted for convenience only and shall be disregarded in construing this agreement.

20. Notices

All notices that are required or authorized to be given hereunder, except as otherwise specifically provided herein, shall be given in writing by United States mail, Western Union telegram or telex, postage or charges prepaid, and addressed to the party to whom such notice is to be given.

A. Notices to Pubco should be sent to the two following addresses:

~~(303) Robert D. Abbott~~
Pubco Petroleum Corporation
910 Denver Center Building
1776 Lincoln Street
Denver, Colorado 80203
~~Telephone:~~
~~(303) 623-8767 (Office)~~
~~(303) 798-5950 (Residence)~~

... of ... Eastern Union ... graph Company, ...
... of ... with postage or charges prepaid.

21. Successors and Assigns

All of the terms and conditions of this agreement and the exhibits attached hereto shall be construed as, and shall constitute, covenants running with the lands and leasehold estates covered hereby and described in Exhibit "B" hereof, and shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, successors and assigns.

22. Consideration and Brokerage

The parties hereto severally covenant and agree that they have not incurred any obligation or liability, contingent or otherwise, for any broker's or finder's fees with respect to the subject matter of this agreement and that the entire consideration therefor is provided for herein.

23. Definitions

Test Well: The terms and conditions of this exhibit shall apply to all wells required to be drilled on the Contract Acreage by the pre-attached agreement. As used herein, the term Test Well shall also mean Optional Well, or Optional Wells, wherever so required to conform with the requirements of such pre-attached agreement.

Party: As used herein, shall mean the party or parties who executed the pre-attached agreement.

Contract Acreage: As used herein, shall mean the leases or the acreage, or both, as described in Exhibit B hereto, as the context of the provision requires.

Completed as being capable of producing oil and/or gas in Paying Quantities: as used herein, shall mean the running of pipe and installation of well head equipment adequate to place the well on production if flow lines were in place; 7/8ths of such production being in amounts estimated by the parties hereto to be of sufficient value so that a profit can be realized after deducting expenses of operation (calculated to conform to the attached accounting procedure), and severance or production taxes.

Pre-Attached Agreement: means the letter to which this exhibit is attached.

the following described land and gas leases insofar and only insofar as they concern and cover the tracts and subdivisions of land described thereafter and as applicable to the specified alternative by reason of existing spacing rules, orders or regulations, (also called the Contract Acreage herein), situated in Lea County, New Mexico, to-wit:

A. As to the Test Well:

(415) Lease dated August 27, 1969 from Elbert B. Shipp, et al as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 266, Page 772 of the records of Lea County

insofar and insofar only as one of the following described tracts situated in T-17S, R-37E, NMPM is concerned:

IF ON 80 ac. Spacing
Sec. 11: E $\frac{1}{2}$ SW $\frac{1}{4}$

IF ON 160 ac. Spacing
Sec. 11: SW $\frac{1}{4}$

IF ON 320 ac. Spacing
Sec. 11: W $\frac{1}{2}$

B. As to the Option Wells:

(415) Lease dated August 27, 1969 from Elbert B. Shipp, et al as lessors, being the same lease No. 415 described above

insofar and insofar only as one of the following described tracts situated in T-17S, R-37E, NMPM is concerned:

IF ON 80 ac. Spacing
Sec. 11: E $\frac{1}{2}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$,
W $\frac{1}{2}$ NW $\frac{1}{4}$
Sec. 10: W $\frac{1}{2}$ NE $\frac{1}{4}$, E. 60
ac. of SE $\frac{1}{4}$,

IF ON 160 ac. Spacing
Sec. 11: NE $\frac{1}{4}$
Sec. 10: NE $\frac{1}{4}$, S. 30
ac. of W $\frac{1}{2}$ SW $\frac{1}{4}$
Sec. 15: E. 50 ac. of
N $\frac{1}{2}$ NE $\frac{1}{4}$

IF ON 320 ac. Spacing
Sec. 10: S. 30 ac. of
W $\frac{1}{2}$ SW $\frac{1}{4}$
Sec. 15: E. 50 ac. of
N $\frac{1}{2}$ NE $\frac{1}{4}$

Sec. 15: W. 10 ac. of
E. 50 ac. of
N $\frac{1}{2}$ NE $\frac{1}{4}$

(450) Lease dated January 27, 1971 from Philip Shaw, et al as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 268, Page 911 of the records of Lea County

and insofar only as one of the following described tracts situated in T-17S, R-37E, NMPM:

IF ON 80 ac. Spacing
Sec. 13: W $\frac{1}{2}$ NW $\frac{1}{4}$
Sec. 14: W $\frac{1}{2}$ NE $\frac{1}{4}$

IF ON 160 ac. Spacing
Sec. 15: W. 30 ac. of
N $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$

IF ON 320 ac. Spacing
Sec. 15: W. 30 ac. of
N $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$

(432-A) Lease dated September 13, 1969 from Marie Jane DeVoss, et al as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 266, Page 782 of the records of Lea County; and

(432-B) Lease dated September 9, 1969 from H. Dillard Schenct, et ux as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 266, Page 784 of the records of Lea County; and

(432-C) Lease dated September 13, 1969 from Fern Cone as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 266, Page 786 of the records of Lea County; and

(432-D) Lease dated October 30, 1969 from Albuquerque National Bank as lessor, to Pubco Petroleum Corporation as lessee, recorded in Book 267, Page 17 of the records of Lea County; and

(432-E) Lease dated October 3, 1969 from Powhatan Carter, Jr., et al as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 267, Page 497 of the records of Lea County; and

(432-F) Lease dated December 12, 1969 from Minerva L. Waldron as lessor, to Pubco Petroleum Corporation as lessee, recorded in Book 268, Page 273 of the records of Lea County; and

(432-G) Lease dated December 16, 1969 from R. L. Elliott, Trustee as lessor, to Pubco Petroleum Corporation as lessee, recorded in Book 268, Page 411 of the records of Lea County; and

(432-H) Lease dated April 27, 1970 from Virginia Nickson Beers as lessor, to Pubco Petroleum Corporation as lessee, recorded in Book 269, Page 489 of the records of Lea County; and

(432-I) Lease dated April 27, 1970 from Ned Nickson, et ux as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 269, Page 445 of the records of Lea County; and

(432-J) Lease dated April 27, 1970 from Joseph Richard Nickson, et ux as lessors, to Pubco Petroleum Corporation, as lessee, recorded in Book 269, Page 447 of the records of Lea County; and

(432-K) Lease dated June 29, 1970 from Ashland Oil Corporation, Inc. as lessor, to Pubco Petroleum Corporation as lessee, recorded in Book 270, Page 11 of the records of Lea County

insofar and insofar only as some or all may apply to and concern one of the following described tracts situated in T-17S, R-37E, NMPM:

IF ON 80 ac. Spacing
Sec. 13: W $\frac{1}{2}$ NW $\frac{1}{4}$
Sec. 14: W $\frac{1}{2}$ NE $\frac{1}{4}$

IF ON 160 ac. Spacing
Sec. 14: NE $\frac{1}{4}$

IF ON 320 ac. Spacing
Sec. 14: NE $\frac{1}{4}$

(403) Lease dated June 17, 1969 from State of New Mexico as lessor, to Pubco Petroleum Corporation as lessee, recorded in Book 264, Page 879 of the records of Lea County

insofar and insofar only as one of the following described tracts situated in T-16S, R-37E, NMPM is concerned:

IF ON 80 ac. Spacing
Sec. 36: $W\frac{1}{2}NW\frac{1}{2}$, $W\frac{1}{2}NE\frac{1}{2}$,
 $E\frac{1}{2}SW\frac{1}{2}$

IF ON 160 ac. Spacing
Sec. 36: $NE\frac{1}{2}$, $SW\frac{1}{2}$

IF ON 320 ac. Spacing
Sec. 36: $W\frac{1}{2}$

(449) Lease dated March 9, 1970 from Dorothy M. Bunders, et vir as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 268, Page 909 of the records of Lea County

insofar and insofar only as one of the following described tracts situated in T-17S, R-37E, NMPM is concerned:

IF ON 80 ac. Spacing
Sec. 12: $W\frac{1}{2}NW\frac{1}{2}$, $W\frac{1}{2}NE\frac{1}{2}$

IF ON 160 ac. Spacing
Sec. 12: $NE\frac{1}{2}$

IF ON 320 ac. Spacing
Sec. 12: $NW\frac{1}{2}$

(452-A) Lease dated March 19, 1970 from Matty May Price as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 268, Page 913 of the records of Lea County; and

(452-B) Lease dated March 12, 1970 from Mildred A. Wright as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 268, Page 915 of the records of Lea County; and

(452-C) Lease dated March 12, 1970 from Laura Kaempf as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 268, Page 917 of the records of Lea County; and

(452-E) Lease dated March 12, 1970 from Neicia Mounsey as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 15 of the records of Lea County; and

(452-F) Lease dated April 3, 1970 from S. M. Parker, et ux as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 272 of the records of Lea County

(452-G) Lease dated April 8, 1970 from James R. Haynes GDN as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 276 of the records of Lea County; and

(452-H) Lease dated March 12, 1970 from W. S. Posey, et ux as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 268, Page 920 of the records of Lea County; and

(452-I) Lease dated May 4, 1970 from Thomas L. Sampson, et al as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 269, Page 180 of the records of Lea County; and

(452-J) Lease dated March 14, 1970 from Earnest L. McAtee, et ux as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 268, Page 922 of the records of Lea County; and

(452-K) Lease dated March 9, 1970 from Harrison Levy et ux as lessors to Pubco Petroleum Corp. as lessee, recorded in Book 268, Page 924 of the records of Lea County; and

(452-L) Lease dated Mar. 14, 1970 from Elizabeth R. Lamb, et vir as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 268, Page 926 of the records of Lea County; and

(452-M) Lease dated April 21, 1970 from John F. Stafford, et al as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 471 of the records of Lea County; and

(452-N) Lease dated April 18, 1970 from William B. Stafford, et ux as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 449 of the records of Lea County; and

(452-O) Lease dated April 18, 1970 from Thomas J. Stafford, et ux as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 453 of the records of Lea County; and

(452-P) Lease dated April 18, 1970 from Elizabeth S. Viseur as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 451 of the records of Lea County; and

(452-Q) Lease dated April 18, 1970 from Diana R. Glaspie, et vir as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 483 of the records of Lea County; and

(452-R) Lease dated April 20, 1970 from Cleo H. Duggar, et vir as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 481 of the records of Lea County; and

(452-S) Lease dated April 14, 1970 from Kay H. Liakos, et vir as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 479 of the records of Lea County; and

(452-T) Lease dated April 15, 1970 from Veva K. Nelson as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 477 of the records of Lea County; and

(452-U) Lease dated May 6, 1970 from Pearl B. Hendricks TR as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 475 of the records of Lea County; and

(452-V) Lease dated May 6, 1970 from First National Bank-Midland as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 473 of the records of Lea County; and

(452-W) Lease dated May 28, 1970 from Mildred M. Lindsey as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 469 of the records of Lea County; and

(452-X) Lease dated June 9, 1970 from Royalty Holding Company as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 533 of the records of Lea County; and

(452-Y) Lease dated June 8, 1970 from Daisey D. Blankenship as lessor, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 535 of the records of Lea County; and

(452-Z) Lease dated June 9, 1970 from Elmer H. Wahl, et ux as lessors, to Pubco Petroleum Corp. as lessee, recorded in Book 269, Page 537 of the records of Lea County

insofar and insofar only as some or all may apply to
and concern one of the following described tracts of
land situated in T-17S, R-37E, NMPM:

IF ON 80 ac. Spacing

Sec. 1: $W\frac{1}{2}NW\frac{1}{4}$, $W\frac{1}{2}NE\frac{1}{4}$,
 $E\frac{1}{2}SW\frac{1}{4}$, $E\frac{1}{2}SE\frac{1}{4}$
Sec. 12: $E\frac{1}{2}SW\frac{1}{4}$, $E\frac{1}{2}SE\frac{1}{4}$

IF ON 160 ac. Spacing

Sec. 1: $NE\frac{1}{4}$, $SW\frac{1}{4}$
Sec. 12: $SW\frac{1}{4}$

IF ON 320 ac. Spacing

Sec. 1: $E\frac{1}{2}$
Sec. 12: $SW\frac{1}{4}$

(452-D) Lease dated March 12, 1970 from Anemone S. Baker, et vir as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 268, Page 918 of the records of Lea County

insofar and insofar only as one of the following described tracts of land situated in T-17S, R-37E, NMPM is concerned:

IF ON 80 ac. Spacing
Sec. 12: E $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$

IF ON 160 ac. Spacing
Sec. 12: SW $\frac{1}{4}$

IF ON 320 ac. Spacing
Sec. 12: SW $\frac{1}{4}$

(433-A) Lease dated September 17, 1969 from Helen Moore Lanyi, et vir as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 267, Page 19 of the records of Lea County; and

(433-B) Lease dated September 20, 1969 from E. I. Tallal to Pubco Petroleum Corporation as lessee, recorded in Book 267, Page 21 of the records of Lea County; and

(433-C) Lease dated February 14, 1970 from AXG Oil Company as lessors, to Pubco Petroleum Corporation as lessee, recorded in Book 268, Page 408 of the records of Lea County

insofar and insofar only as one of the following described tracts of land situated in T-17S, R-37E, NMPM is concerned:

IF ON 80 ac. Spacing
- 0 -

IF ON 160 or 320 ac. Spacing
Sec. 10: NW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ N $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$

-X-

EXHIBIT "C"

Attached to and made a part of that certain agreement dated November 5, 1971, between Pubco Petroleum Corp., as owner, and Spencer and Hutson, as operator, applicable however, only and insofar only as the pricing of material and equipment, and charges for operations are concerned.

ACCOUNTING PROCEDURE (JOINT OPERATIONS)

I. GENERAL PROVISIONS

1. Definitions

"Joint Property" shall mean the real and personal property subject to the agreement to which this "Accounting Procedure" is attached.

"Joint Operations" shall mean all operations necessary or proper for the development, operation, protection and maintenance of the Joint Property.

"Operator" shall mean the party designated to conduct the Joint Operations.

"Non-Operators" shall mean the nonoperating parties, whether one or more.

"Joint Account" shall mean the account showing the charges and credits accruing because of the Joint Operations and which are to be shared by the Parties.

"Parties" shall mean Operator and Non-Operators.

"Material" shall mean personal property, equipment or supplies acquired or held for use on the Joint Property.

"Controllable Material" shall mean material which at the time is so classified in the Material Classification Manual as most recently recommended by the Council of Petroleum Accountants Societies of North America.

2. Conflict with Agreement

In the event of a conflict between the provisions of this Accounting Procedure and the provisions of the agreement to which this Accounting Procedure is attached, the provisions of the agreement shall control.

3. Collective Action by Non-Operators

Where an agreement or other action of Non-Operators is expressly required under this Accounting Procedure and if the agreement to which this Accounting Procedure is attached contains no contrary provisions in regard thereto, the agreement or action of a majority in interest of the Non-Operators shall be controlling on all Non-Operators.

4. Statements and Billings

Operator shall bill Non-Operators on or before the last day of each month for their proportionate share of costs and expenses, for the preceding month. Such bills will be accompanied by statements reflecting the total charges and credits as set forth under Subparagraph below:

A. Statement in detail of all charges and credits to the Joint Account.

B. Statement of all charges and credits to the Joint Account, summarized by appropriate classifications indicative of the nature thereof.

C. Statement of all charges and credits to the Joint Account summarized by appropriate classifications indicative of the nature thereof, except that items of Controllable Material and unusual charges and credits shall be detailed.

5. Payment and Advances by Non-Operators

Each Non-Operator shall pay its proportion of all such bills within fifteen (15) days after receipt thereof. If payment is not made within such time, the unpaid balance shall bear interest at the rate of six per cent (6%) per annum until paid.

6. Adjustments

Payment of any such bills shall not prejudice the right of any Non-Operators to protest or question the correctness thereof; provided however, all bills and statements rendered to Non-Operators by Operator during any calendar year shall conclusively be presumed to be true and correct after twenty-four (24) months following the end of any such calendar year, unless within the said twenty-four (24) month period a Non-Operator takes written exception thereto and makes claim on Operator for adjustment. No adjustment favorable to Operator shall be made unless it is made within the same prescribed period. The provisions of this paragraph shall not prevent adjustments resulting from a physical inventory of the Joint Property as provided for in Section VII.

7. Audits

A Non-Operator, upon notice in writing to Operator and all other Non-Operators, shall have the right to audit Operator's accounts and records relating to the accounting hereunder for any calendar year within the twenty-four (24) month period following the end of such calendar year; provided however, the making of an audit shall not extend the time for the taking of written exception to and the adjustment of accounts as provided for in Paragraph 6 of this Section I. Where there are two or more Non-Operators, the Non-Operators shall make every reasonable effort to conduct joint or simultaneous audits in a manner which will result in a minimum of inconvenience to the Operator.

II. DIRECT CHARGES

Subject to limitations hereinafter prescribed, Operator shall charge the Joint Account with the following items:

1. Rentals and Royalties

Delay or other rentals and royalties when such rentals and royalties are paid by Operator for the Joint Account of the Parties.

2. Labor

A. Salaries and wages of Operator's employees directly engaged on the Joint Property in the conduct of the Joint Operations, and salaries or wages of technical employees who are temporarily assigned to and directly employed on the Joint Property.

B. Operator's cost of holiday, vacation, sickness and disability benefits and other customary allowances paid to the employees whose salaries and wages are chargeable to the Joint Account under Paragraph 2A of this Section II and Paragraph 1 of Section III; except that in the case of those employees only a pro rata portion of whose salaries and wages are chargeable to the Joint Account under Paragraph 1 of Section III, not more than the same pro rata portion of the benefits and allowances herein provided for shall be charged to the Joint Account. Cost under this Paragraph 2B may be charged on a "when and as paid basis" or by "percentage assessment" on the amount of salaries and wages chargeable to the Joint Account under Paragraph 2A of this Section II and Paragraph 1 of Section III. If percentage assessment is used, the rate shall be based on the Operator's cost experience.

C. Expenditures or contributions made pursuant to assessments imposed by governmental authority which are applicable to Operator's labor cost of salaries and wages chargeable to the Joint Account under Paragraphs 2A and 2B of this Section II and Paragraph 1 of Section III.

D. Reasonable personal expenses of those employees whose salaries and wages are chargeable to the Joint Account under Paragraph 2A of this Section II and for which expenses the employees are reimbursed under Operator's usual practice.

3. Employee Benefits

Operator's current cost of established plans for employees' group life insurance, hospitalization, pension, retirement, stock purchase, thrift, bonus, and other benefit plans of a like nature, applicable to Operator's labor cost; provided however, the total of such charges shall not exceed ten percent (10%) of Operator's labor costs chargeable to the Joint Account under Paragraphs 2A and 2B of this Section II and Paragraph 1 of Section III.

4. Material

Material purchased or furnished by Operator for use on the Joint Property. So far as it is reasonably practical and consistent with efficient and economical operation, only such Material shall be purchased for or transferred to the Joint Property as may be required for immediate use; and the accumulation of surplus stocks shall be avoided.

5. Transportation

Transportation of employees and Material necessary for the Joint Operations but subject to the following limitations:

- A. If Material is moved to the Joint Property from the Operator's warehouse or other properties, no charge shall be made to the Joint Account for a distance greater than the distance from the nearest reliable supply store or railway receiving point where like material is available, except by agreement with Non-Operators.
- B. If surplus Material is moved to Operator's warehouse or other storage point, no charge shall be made to the Joint Account for a distance greater than the distance to the nearest reliable supply store or railway receiving point, except by agreement with Non-Operators. No charge shall be made to Joint Account for moving Material to other properties belonging to Operator, except by agreement with Non-Operators.
- C. In the application of subparagraphs A and B above, there shall be no equalization of actual gross trucking costs of \$100 or less.

6. Services

- A. The cost of contract services and utilities procured from outside sources other than services covered by Paragraph 8 of this Section II and Paragraph 2 of Section III.
- B. Use and service of equipment and facilities furnished by Operator as provided in Paragraph 5 of Section IV.

7. Damages and Losses to Joint Property

All costs or expenses necessary for the repair or replacement of Joint Property made necessary because of damages or losses incurred by fire, flood, storm, theft, accident, or any other cause, except to the extent that the damage or loss could have been avoided through the exercise of reasonable diligence on the part of Operator. Operator shall furnish Non-Operators written notice of damages or losses incurred as soon as practicable after a report thereof has been received by Operator.

8. Legal Expense

All costs and expenses of handling, investigating and settling litigation or claims arising by reason of the Joint Operations or necessary to protect or recover the Joint Property, including, but not limited to, attorneys' fees, court costs, cost of investigation or procuring evidence and amounts paid in settlement or satisfaction of any such litigation or claims; provided, (a) no charge shall be made for the services of Operator's legal staff or other regularly employed personnel (such services being considered to be Administrative Overhead under Section III), except by agreement with Non-Operators, and (b) no charge shall be made for the fees and expenses of outside attorneys unless the employment of such attorneys is agreed to by Operator and Non-Operators.

9. Taxes

All taxes of every kind and nature assessed or levied upon or in connection with the Joint Property, the operation thereof, or the production therefrom, and which taxes have been paid by the Operator for the benefit of the Parties.

10. Insurance Premiums

Premiums paid for insurance required to be carried on the Joint Property for the protection of the Parties.

11. Other Expenditures

Any other expenditure not covered or dealt with in the foregoing provisions of this Section II, or in Section III, and which is incurred by the Operator for the necessary and proper conduct of the Joint Operations.

III. INDIRECT CHARGES

Operator may charge the Joint Account for indirect costs either by use of an allocation of district expense items plus a fixed rate for administrative overhead, and plus the warehousing charges, all as provided for in Paragraphs 1, 2, and 3 of this Section III OR by combining all three of said items under the fixed rate provided for in Paragraph 4 of this Section III, as indicated next below:

OPERATOR SHALL CHARGE THE JOINT ACCOUNT UNDER THE TERMS OF:

- ☐ Paragraphs 1, 2 and 3. (Allocation of district expense plus fixed rate for administrative overhead plus warehousing.)
- ☒ Paragraph 4. (Combined fixed rate)

1. District Expense

Operator shall charge the Joint Account with a pro rata portion of the salaries, wages and expenses of Operator's production superintendent and other employees serving the Joint Property and other properties of the Operator in the same operating area, whose time is not allocated directly to the properties, and a pro rata portion of the cost of maintaining and operating a production office known as Operator's office located at or near (or a comparable office if location changed), and necessary sub-offices (if any), maintained for the convenience of the above-described office, and all necessary camps, including housing facilities for employees if required, used in connection with the operations of the Joint Property and other properties in the same operating area. The expense of, less any revenue from, such facilities may, at the option of Operator, include depreciation of investment or a fair monthly rental in lieu of depreciation. Such charges shall be apportioned to all properties served on some equitable basis consistent with Operator's accounting practice.

2. Administrative Overhead

Operator shall charge administrative overhead to the Joint Account at the following rates, which charge shall be in lieu of the cost and expense of all offices of the Operator not covered by Paragraph 1 of this Section III, including salaries, wages and expenses of personnel assigned to such offices. Such charges shall be in addition to the salaries, wages and expenses of employees of Operator authorized to be charged as direct charges as provided in Paragraphs 2 and 8 of Section II.

WELL BASIS (RATE PER WELL PER MONTH)

Well Depth	DRILLING WELL RATE (Use Total Depth)	PRODUCING WELL RATE (Use Current Producing Depth)		
	Each Well	First Five	Next Five	All Wells Over Ten
.....
.....
.....

The cost and expense of services from outside sources in connection with matters of taxation, traffic, accounting, or matters before or involving governmental agencies shall be considered as included in the overhead rates provided for in this Paragraph 2 of Section III, unless such cost and expense are agreed upon between Operator and Non-Operators as a direct charge to the Joint Account.

3. Operator's Fully Owned Warehouse Operating and Maintenance Expense
(Describe fully the agreed procedure to be followed by the Operator.)

4. Combined Fixed Rates

Operator shall charge the Joint Account for the services covered by Paragraph 1, 2 and 3 of this Section III, the following fixed per well rates:

WELL BASIS (RATE PER WELL PER MONTH)

Well Depth	DRILLING WELL RATE (Use Total Depth)	PRODUCING WELL RATE (Use Current Producing Depth)		
	Each Well	First Five	Next Five	All Wells Over Ten
All Depths	\$600.00	\$105.00	\$95.00	\$85.00

Said fixed rate (shall) ~~shall not~~ include salaries and expenses of production foremen.

5. Application of Administrative Overhead or Combined Fixed Rates

The following limitations, instructions and charges shall apply in the application of the per well rates as provided under either Paragraph 2 or Paragraph 4 of this Section III:

- Charges for drilling wells shall begin on the date each well is spudded and terminate on the date the drilling or completion rig is released, whichever is later, except that no charge shall be made during the suspension of drilling operations for fifteen (15) or more consecutive days.
- The status of wells shall be as follows:
 - Producing gas wells, injection wells for recovery operations, water supply wells utilized for water flooding operations and salt water disposal wells shall be considered the same as producing wells.
 - Wells permanently shut down but on which plugging operations are deferred shall be dropped from the well schedule at the time the shutdown is effected. When such a well is plugged a charge shall be made at the producing well rates.
 - Wells being plugged back, drilled deeper, converted to a source or input well, or which are undergoing any type of workover that requires the use of a drilling or workover rig shall be considered the same as drilling wells.
 - Temporarily shut-down wells, which are not produced or worked upon for a period of a full calendar month, shall not be included in the well schedule, provided however, wells shut in by governmental regulatory body shall be included in the well schedule only in the event the allowable production is transferred to some other well or wells on the Joint Property. In the event of a unit allowable, all wells capable of producing will be counted in determining the charge.
 - Gas wells shall be included in the well schedule if directly connected to a permanent sales outlet even though temporarily shut in due to overproduction or failure of purchaser to take the allowed production.
 - Wells completed in multiple horizons, in which the production is not commingled down hole, shall be considered as a producing well for each separately producing horizon.
- The well rates shall apply to the total number of wells being drilled or operated under the agreement to which this Accounting Procedure is attached, irrespective of individual leases.
- The well rates shall be adjusted on the first day of April of each year following the effective date of the agreement to which this Accounting Procedure is attached. The adjustment shall be computed by multiplying the rate currently in use by the percentage increase or decrease in the average weekly earnings of Crude Petroleum and Gas Production Workers for the last calendar year compared to the preceding calendar year as shown by "The Index of Average Weekly Earnings of Crude Petroleum and Gas Production Workers" as published by the United States Department of Labor, Bureau of Labor Statistics. The adjusted rates shall be the rates currently in use, plus or minus the computed adjustment.

~~For the construction of compressor plants, water stations, secondary recovery systems, salt water disposal facilities, and other such projects, as distinguished from the more usual drilling and producing operations, Operator in addition to the Administrative Overhead or Combined Fixed Rates provided for in Paragraph 2 and 4 of this Section III, shall charge the Joint Account with an additional overhead charge as follows:~~

- Total cost less than \$25,000, no charge.
- Total cost more than \$25,000 but less than \$100,000, ____ % of total cost.
- Total cost of \$100,000 or more, ____ % of the first \$100,000 plus ____ % of all over \$100,000 of total cost.

~~Total cost shall mean the total gross cost of any one project. For the purpose of this Paragraph the component parts of a single project shall not be treated separately and the cost of drilling wells shall be excluded.~~

- The specific rates provided for in this Section III may be amended from time to time by mutual agreement between the Parties hereto if, in practice, the rates are found to be insufficient or excessive.

IV. BASIS OF CHARGES TO JOINT ACCOUNT

Subject to the further provisions of this Section IV, Operator will procure all Material and services for the Joint Property. At the Operator's option, Non-Operator may supply Material or services for the Joint Property.

1. Purchases

Material purchased and service procured shall be charged at the price paid by Operator after deduction of all discounts actually received.

2. Material furnished from Operator's Warehouse or Other Properties

A. New Material (Condition "A") the most economical base available to the operating area

- Tubular goods, two inch (2") and over, shall be priced on ~~the most economical base available to the operating area~~ ~~Chicago and Indiana Harbor~~ on a minimum carload basis effective at date of movement and f. o. b. railway receiving point nearest the Joint Property, regardless of quantity. In equalized hauling charges, Operator is permitted to include ten cents (10c) per hundred-weight on all tubular goods furnished from his stocks in lieu of loading and unloading costs sustained.
- Other Material shall be priced at the current replacement cost of the same kind of Material, effective at date of movement and f. o. b. the supply store or railway receiving point nearest the Joint Property where Material of the same kind is available.
- The Joint Account shall not be credited with cash discounts applicable to prices provided for in this Paragraph 2 of Section IV.

B. Used Material (Condition "B" and "C")

- Material in sound and serviceable condition and suitable for reuse without reconditioning, shall be classified as Condition "B" and priced at seventy-five per cent (75%) of the current price of new Material.
- Material which cannot be classified as Condition "B" but which,
 - After reconditioning will be further serviceable for original function as good secondhand Material (Condition "B"), or
 - Is serviceable for original function but substantially not suitable for reconditioning, shall be classified as Condition "C" and priced at fifty per cent (50%) of current new price.
- Obsolete Material or Material which cannot be classified as Condition "B" or Condition "C" shall be priced at a value commensurate with its use. Material no longer suitable for its original purpose but usable for

some other purpose, shall be priced on a basis comparable with that of items normally used for such other purpose.

(4) Material involving erection costs shall be charged at applicable percentage of the current knocked-down price of new Material.

3. Premium Prices

Whenever Material is not readily obtainable at prices specified in Paragraphs 1 and 2 of this Section IV because of national emergencies, strikes or other unusual causes over which the Operator has no control, the Operator may charge the Joint Account for the required Material at the Operator's actual cost incurred in procuring such Material, in making it suitable for use, and in moving it to the Joint Property, provided, that notice in writing is furnished to Non-Operators of the proposed charge prior to billing Non-Operators for such Material. Each Non-Operator shall have the right, by so electing and notifying Operator within 10 days after receiving notice from Operator, to furnish in kind all or part of his share of such Material suitable for use and acceptable to Operator.

4. Warranty of Material Furnished by Operator

Operator does not warrant the Material furnished. In case of defective Material, credit shall not be passed to the Joint Account until adjustment has been received by Operator from the manufacturers or their agents.

5. Equipment and Facilities Furnished by Operator

A. Operator shall charge the Joint Account for use of equipment and facilities at rates commensurate with cost of ownership and operation. Such rates shall include cost of maintenance, repairs, other operating expense, insurance, taxes, depreciation and interest on investment not to exceed six per cent (6%) per annum, provided such rates shall not exceed those currently prevailing in the immediate area within which the Joint Property is located. Rates for automotive equipment shall generally be in line with the schedule of rates adopted by the Petroleum Motor Transport Association, or some other recognized organization, as recommended uniform charges against Joint Property operations. Rates for laboratory services shall not exceed those currently prevailing if performed by outside service laboratories. Rates for trucks, tractors and well service units may include wages and expenses of operator.

B. Whenever requested, Operator shall inform Non-Operators in advance of the rates it proposes to charge.

C. Rates shall be revised and adjusted from time to time when found to be either excessive or insufficient.

V. DISPOSAL OF MATERIAL

The Operator may purchase, but shall be under no obligation to purchase, interest of Non-Operators in surplus Condition "A" or "B" Material. The disposition of surplus Controllable Material, not purchased by Operator, shall be subject to agreement between Operator and Non-Operators, provided Operator shall dispose of normal accumulations of junk and scrap Material either by transfer or sale from the Joint Property.

1. Material Purchased by the Operator or Non-Operators

Material purchased by either the Operator or Non-Operators shall be credited by the Operator to the Joint Account for the month in which the Material is removed by the purchaser.

2. Division in Kind

Division of Material in kind, if made between Operator and Non-Operators, shall be in proportion to the respective interests in such Material. The Parties will thereupon be charged individually with the value of the Material received or receivable. Proper credits shall be made by the Operator in the monthly statement of operations.

3. Sales to Outsiders

Sales to outsiders of Material from the Joint Property shall be credited by Operator to the Joint Account at the net amount collected by Operator from vendee. Any claim by vendee related to such sale shall be charged back to the Joint Account if and when paid by Operator.

VI. BASIS OF PRICING MATERIAL TRANSFERRED FROM JOINT ACCOUNT

Material purchased by either Operator or Non-Operators or divided in kind, unless otherwise agreed to between Operator and Non-Operators shall be priced on the following basis:

1. New Price Defined

New price as used in this Section VI shall be the price specified for New Material in Section IV.

2. New Material

New Material (Condition "A"), being new Material procured for the Joint Property but never used, at one hundred per cent (100%) of current new price (plus sales tax if any).

3. Good Used Material

Good used Material (Condition "B"), being used Material in sound and serviceable condition, suitable for reuse without reconditioning:

A. At seventy-five per cent (75%) of current new price if Material was charged to Joint Account as new, or

B. At sixty-five per cent (65%) of current new price if Material was originally charged to the Joint Account as secondhand at seventy-five percent (75%) of new price.

4. Other Used Material

Used Material (Condition "C"), at fifty per cent (50%) of current new price, being used Material which:

A. Is not in sound and serviceable condition but suitable for reuse after reconditioning, or

B. Is serviceable for original function but not suitable for reconditioning.

5. Bad-Order Material

Material (Condition "D"), no longer suitable for its original purpose without excessive repair cost but usable for some other purpose at a price comparable with that of items normally used for such other purpose.

6. Junk Material

Junk Material (Condition "E"), being obsolete and scrap Material, at prevailing prices.

7. Temporarily Used Material

When the use of Material is temporary and its service to the Joint Property does not justify the reduction in price as provided for in Paragraph 3 B of this Section VI, such Material shall be priced on a basis that will leave a net charge to the Joint Account consistent with the value of the service rendered.

VII. INVENTORIES

The Operator shall maintain detailed records of Material generally considered controllable by the Industry.

1. Periodic Inventories, Notice and Representation

At reasonable intervals, inventories shall be taken by Operator of the Joint Account Material, which shall include all such Material as is ordinarily considered controllable. Written notice of intention to take inventory shall be given by Operator at least thirty (30) days before any inventory is to begin so that Non-Operators may be represented when any inventory is taken. Failure of Non-Operators to be represented at an inventory shall bind Non-Operators to accept the inventory taken by Operator, who shall in that event furnish Non-Operators with a copy thereof.

2. Reconciliation and Adjustment of Inventories

Reconciliation of inventory with charges to the Joint Account shall be made, and a list of overages and shortages shall be jointly determined by Operator and Non-Operators. Inventory adjustments shall be made by Operator with the Joint Account for overages and shortages, but Operator shall be held accountable to Non-Operator only for shortages due to lack of reasonable diligence.

3. Special Inventories

Special inventories may be taken whenever there is any sale or change of interest in the Joint Property. It shall be the duty of the party selling to notify all other Parties as quickly as possible after the transfer of interest takes place. In such cases, both the seller and the purchaser shall be governed by such inventory.

Contract Acreage, if 160
acre spacing applies

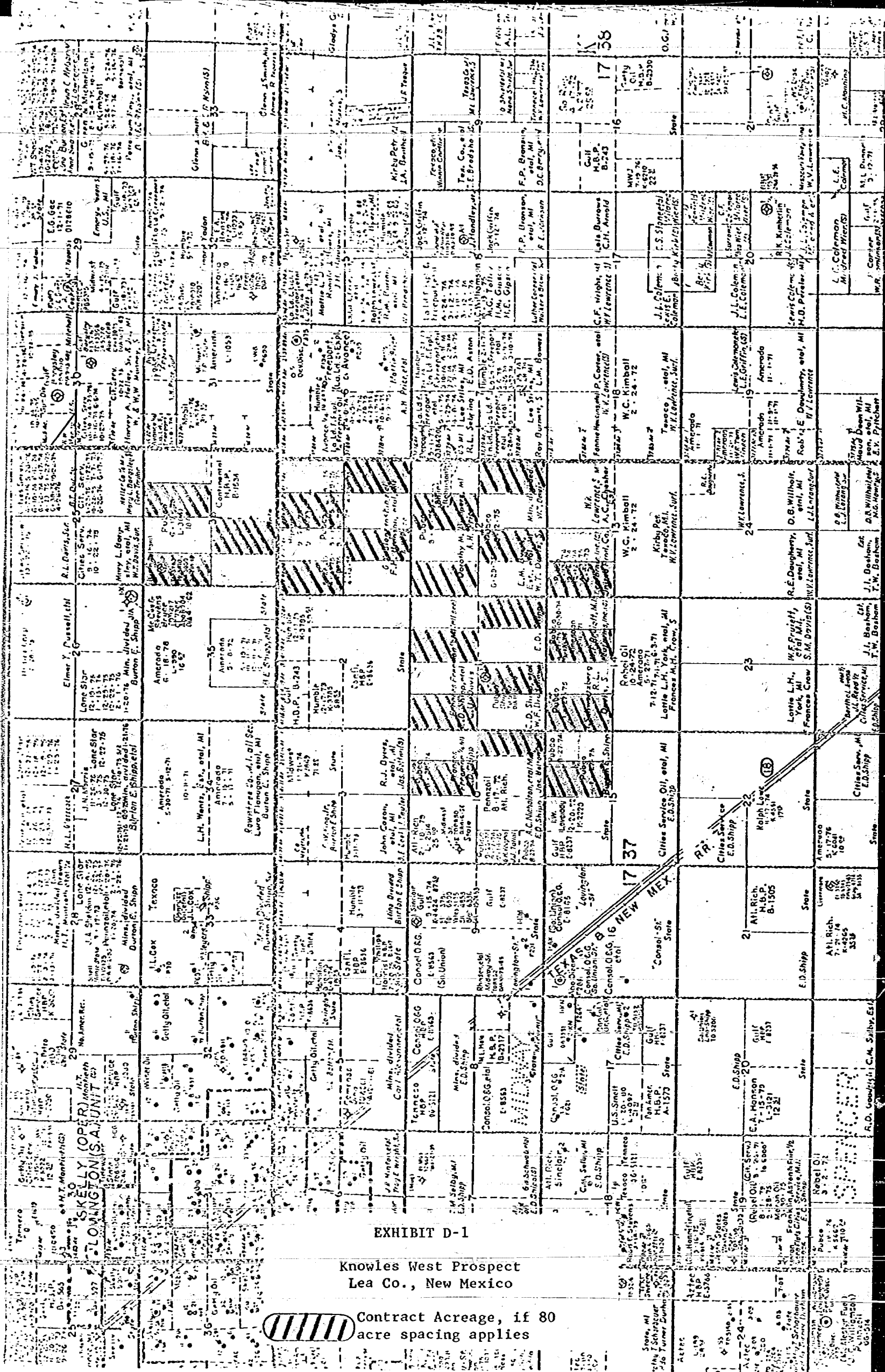


EXHIBIT D-1

Knowles West Prospect
Lea Co., New Mexico



Contract Acreage, if 80
acre spacing applies

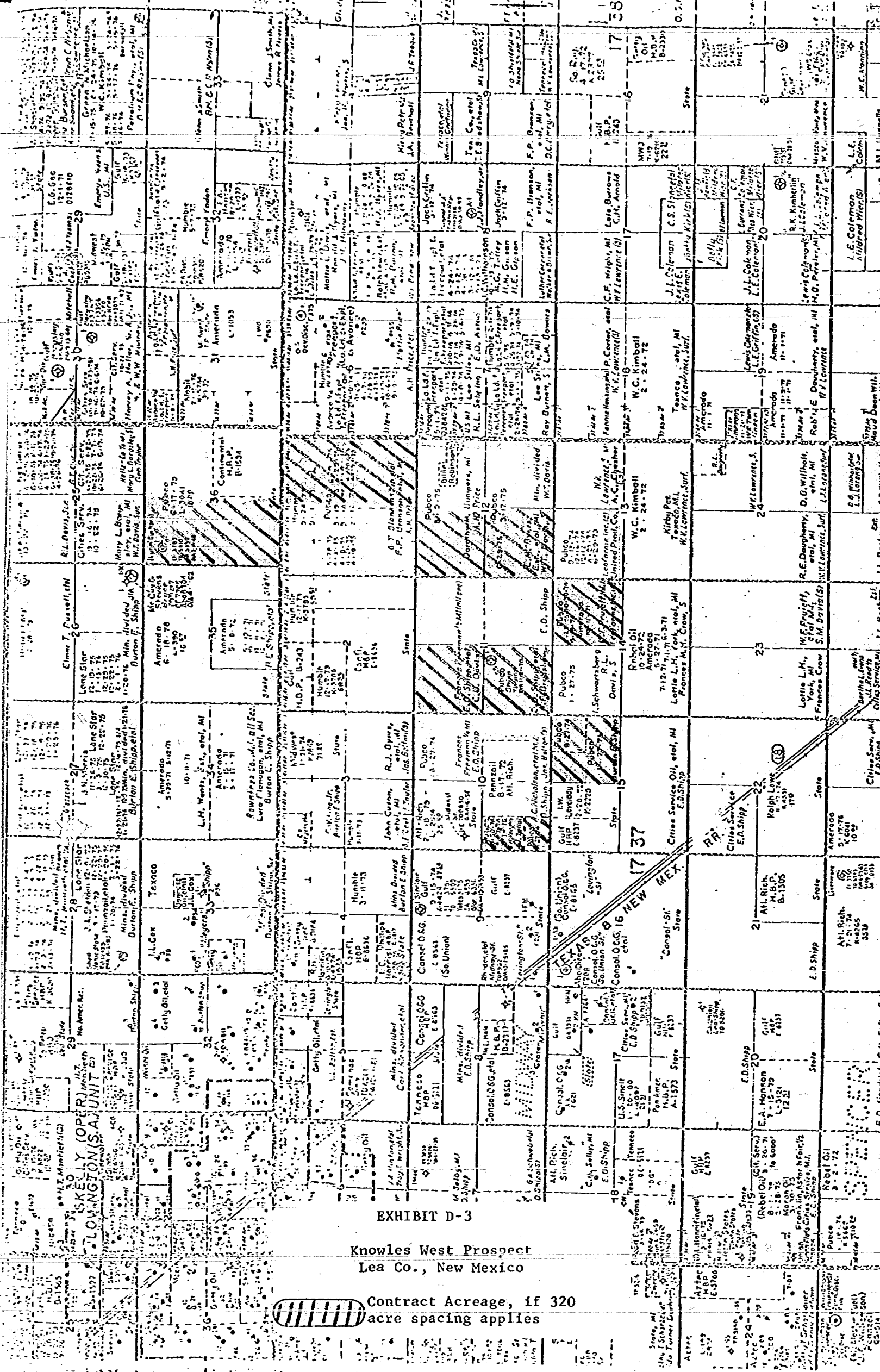
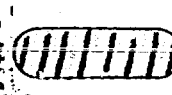
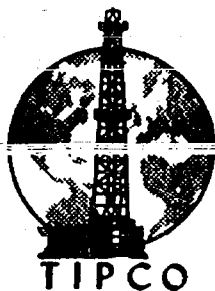


EXHIBIT D-3

Knowles West Prospect
Lea Co., New Mexico

 Contract Acreage, if 320
acre spacing applies



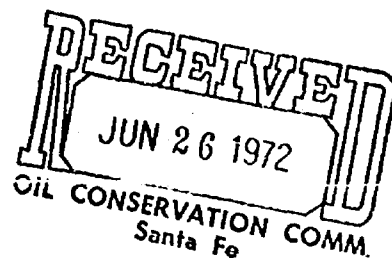
TEXAS INTERNATIONAL PETROLEUM CORPORATION

1720 WILCO BUILDING

MIDLAND, TEXAS 79701

PHONE 915-682-9741

June 23, 1972



*file - Corl
4749*

Oil Conservation Commission
of the State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Case 4749, Docket No. 14-72, Application of Harding Oil
Company for Special Field Rules Including 80 Acre Spacing
and Proration Units

Gentlemen:

This letter is to advise that Texas International Petroleum Corporation (as owner of oil and gas leases located in the SE/4 of Section 3 and the SW/4 of Section 12, T-17-S, R-37-E, Lea County, New Mexico, which are expected to be in the development area of the Harding Oil Company discovery and application) approves and supports said application of Harding Oil Company for special field rules with 80 acre spacing and proration units.

Respectfully submitted,

Robert O. Burkett
Division Manager

mab

cc: Harding Oil Company
Hinkle, Bondurant, Cox & Eaton

western union

Telegram

KA020

1972 JUN 27 AM 9:37

(1022A EDT) =

K CCF056 (AT 179CC406056) PD=WU TEST MID 1020A
EDT06/27/72 =ZCZC 01 PD MIDLAND TEX 27 900A CDT =
NEW MEX OIL CONSERVATION COMM =

SANTA FE NMEX =

RE CASE 4749 ATLANTIC RICHFIELD CO SUPPORTS THE
APPLICATION =OF HARDING FOR 80-ACRE PRORATION UNIT
IN THE HUMBLE CITY =STRAWN POOL. WE ARE OWNER OF LEASES
IN SECTION TEN = T-17S R-37E = V

W P TOMLINSON MIDLAND =

REC'D
JUN 27 1972
OIL CONSERVATION COMM.
Santa Fe

4749 80 T-17-S R-37E =

WU 1201 (R 5-69)



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

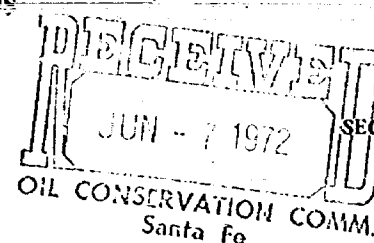
P. O. BOX 1980 - HOBBS

June 5, 1972

GOVERNOR
BRUCE KING
CHAIRMAN

LAND COMMISSIONER
ALEX. ARMijo
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR



Mr. D. S. Mutton, Chief Engineer
New Mexico Oil Conservation Commission
Post Office Box 2088
Santa Fe, New Mexico

*file in Harding
Case #
4749*

Dear Dan:

In reference to the recent completion and application of Harding Oil Company for a discovery allowable and new pool for their Shipp No. 1, located in Section 11, Township 17 South, Range 37 East, I found the following:

1. This well is completed in the Strawn formation of the Penn.
2. It is 2.9 miles from the nearest Strawn producing well which is in the East Lovington-Strawn Pool.
3. The operator's tops are based on series tops and should be as follows: Top Wolfcamp at 9730', top Penn at 10,486', top Strawn at 11,400'.
4. Required application has been submitted and is in good order.
5. A new pool has already been created for this well called the Humble City-Strawn Pool.

I recommend that a discovery allowable be given this well.

Yours very truly,

OIL CONSERVATION COMMISSION

John W. Runyan

John W. Runyan
Geologist, District I

JWR:fd



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

P. O. BOX 2608 - SANTA FE

B7501

**GOVERNOR
BRUCE KING
CHAIRMAN**

**LAND COMMISSIONER
ALEX J. ARMILLO
MEMBER**

**STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR**

July 24, 1973

Re: Case No. 4749

Order No. R-4338-A

Applicant:

OCC

Mr. Clarence Hinkle
Hinkle, Bondurant, Cox & Eaton
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

DOCKET MAILED

Dear Sir:

Date 6-27-74
for July 10th

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x

Artesia OCC

Aztec OCC

Other



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE

87501

GOVERNOR
BRUCE KING
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMijo
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

July 17, 1972

Mr. James E. Sperling
Modrall, Sperling, Roehl, Harris
& Sisk
Attorneys at Law
Post Office Box 2168
Albuquerque, New Mexico 87103

Re: Case No. 4749
Order No. R-4338
Applicant:
Harding Oil Company

DOCKET MAILED

DOCKET MAILED

Dear Sir: 6-28-73

Date 5-25-73

Enclosed herewith are two copies of the above-referenced
Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC

Other Mr. Clarence Hinkle, Mr. Sumner Buell

DOCKET MAILED

Date 5-25-73



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

I. R. TRUJILLO
CHAIRMAN

**LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER**

**STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR**

October 22, 1974

Mr. Paul Eaton
Hinkle, Bondurant, Cox & Eaton
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

Re: CASE NO. 4749
ORDER NO. R-4338-B
Applicant:
Harding Oil Company (OCC)

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC	<u>x</u>
Artesia OCC	<u> </u>
Aztec OCC	<u> </u>

Other _____

- CASE 4748: Application of Pubco Petroleum Corporation for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the Humble City-Strawn Pool, Lea County, New Mexico, including provisions for 160-acre proration units and wells to be located within 150 feet of the center of any quarter-quarter section.
- CASE 4749: Application of Harding Oil Company for a discovery allowable and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the Humble City-Strawn Pool, Lea County, New Mexico, including a provision for 80-acre proration units and for the assignment of an oil discovery allowable to its E. D. Shipp Well No. 1 located in Unit K of Section 11, Township 17 South, Range 37 East.
- CASE 4750: Application of Cities Service Oil Company for an unorthodox location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill a producing well in its Southeast Maljamar Grayburg-San Andres Unit Waterflood Project Area at an unorthodox location 1155 feet from the South line and 1385 feet from the East line of Section 29, Township 17 South, Range 33 East, Maljamar Pool, Lea County, New Mexico. Applicant further seeks a procedure whereby additional injection and production wells within the project area at unorthodox locations may be approved administratively.
- CASE 4751: Application of Sun Oil Company for pool extension, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the extension of the horizontal limits of the Lusk-Morrow Gas Pool, Lea County, New Mexico to include all of Sections 15 and 16 of Township 19-South, Range 32 East.
- CASE 4752: Application of Claude C. Kennedy for permission to flare casinghead gas, McKinley, County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Order No. R-4070, to flare casinghead gas produced by his BSK Edna Well No. 1 located in Unit F of Section 8, Township 17 North, Range 8 West, Lone Pine Dakota "D" Pool, McKinley County, New Mexico.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 4749
Order No. R-4338-B

IN THE MATTER OF CASE NO. 4749 BEING
REOPENED PURSUANT TO THE PROVISIONS OF
ORDER NO. R-4338-A, WHICH ORDER CONTINUED
SPECIAL RULES FOR THE HUMBLE CITY-STRAWN
POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 7, 1974,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 22nd day of October, 1974, the Commission,
a quorum being present, having considered the testimony, the
record, and the recommendations of the Examiner, and being
fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the sub-
ject matter thereof.

(2) That by Order No. R-4338, dated July 17, 1972,
temporary special rules and regulations were promulgated for
the Humble City-Strawn Pool, Lea County, New Mexico, including
a provision for 80-acre proration units.

(3) That by Order No. R-4338-A, dated July 23, 1973,
said temporary special rules and regulations were continued
in effect for an additional one-year period.

(4) That pursuant to the provisions of Order No. R-4338-A,
this case was reopened to allow the operators in the subject
pool to appear and show cause why the Humble City-Strawn Pool
should not be developed on 40-acre spacing units.

(5) That the evidence establishes that one well in the
Humble City-Strawn Pool can efficiently and economically drain
and develop 80 acres.

-2-
Case No. 4749
Order No. R-4338-B

(6) That the Special Rules and Regulations promulgated by Order No. R-4338 and Order No. R-4338-A have afforded and will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the oil and gas in the pool.

(7) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations promulgated by Order No. R-4338 and Order No. R-4338-A should be continued in full force and effect until further order of the Commission.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Humble City-Strawn Pool, Lea County, New Mexico, promulgated by Order No. R-4338 and Order No. R-4338-A, are hereby continued in full force and effect until further order of the Commission.

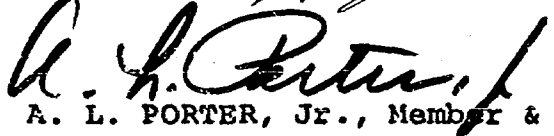
(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

I. R. TRUJILLO, Chairman


ALEX J. ARMIJO, Member


A. L. PORTER, Jr., Member & Secretary

S E A L

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 4749
Order No. R-4338

NOMENCLATURE

APPLICATION OF HARDING OIL
COMPANY FOR A DISCOVERY
ALLOWABLE AND SPECIAL POOL
RULES, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 28, 1972, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 17th day of July, 1972, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Harding Oil Company, seeks the promulgation of special rules and regulations for the Humble City-Strawn Pool, Lea County, New Mexico, including a provision for 80-acre proration units.

(3) That the applicant also seeks the assignment of an oil discovery allowable in the amount of approximately 57,100 barrels to the discovery well for said pool.

(4) That the evidence presently available indicates that the Harding Oil Company E. D. Shipp Well No. 1, located in Unit K of Section 11, Township 17 South, Range 37 East, NMPM, Lea County, New Mexico, discovered a separate common source of supply which has been designated the Humble City-Strawn Pool; that the vertical limits of said pool have been defined as the Strawn formation, and that the horizontal limits of said pool have previously been defined as the SW/4 of said Section 11.

-2-

CASE NO. 4749
Order No. R-4338

(5) That the discovery well for the aforesaid pool, E. D. Shipp Well No. 1, located in Unit K of Section 11, Township 17 South, Range 37 East, NMPM, Lea County, New Mexico, is entitled to and should receive a bonus discovery oil allowable in the amount of 57,100 barrels, based upon the top of the perforations in said well at 11,420 feet, to be assigned over a two-year period.

(6) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 80-acre spacing units should be promulgated for the Humble City-Strawn Pool.

(7) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

(8) That the temporary special rules and regulations should be established for a one-year period in order to allow the operators in the subject pool to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

(9) That this case should be reopened at an examiner hearing in June, 1973, at which time the operators in the subject pool should be prepared to appear and show cause why the Humble City-Strawn Pool should not be developed on other than 40-acre spacing units.

(10) That the horizontal limits of the Humble City-Strawn Pool should be extended to include the SE/4 of the above-described Section 11.

IT IS THEREFORE ORDERED:

(1) That the Humble City-Strawn Pool in Lea County, New Mexico, as heretofore classified, defined, and described, is hereby extended to include therein:

TOWNSHIP 17 SOUTH, RANGE 37 EAST, NMPM
Section 11: SE/4

(2) That the Harding Oil Company E. D. Shipp Well No. 1 located in Unit K of Section 11, Township 17 South, Range 37 East, Humble City-Strawn Pool, Lea County, New Mexico, is hereby authorized an oil discovery allowable of 57,100 barrels to be assigned to said well at the rate of 79 barrels per day in accordance with Rule 509 of the Commission Rules and Regulations.

-3-

CASE NO. 4749
Order No. R-4338

(3) That temporary Special Rules and Regulations for the Humble City-Strawn Pool, Lea County, New Mexico, are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
HUMBLE CITY-STRAWN POOL

RULE 1. Each well completed or recompleted in the Humble City-Strawn Pool or in the Strawn formation within one mile thereof, and not nearer to or within the limits of another designated Strawn oil pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well shall be located on a standard unit containing 80 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a governmental quarter section; provided however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit comprising a governmental quarter-quarter section or lot, or the unorthodox size or shape of the tract is due to a variation in the legal subdivision of the United States Public Land Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Secretary-Director has received the application.

RULE 4. Each well shall be located within 150 feet of the center of a governmental quarter-quarter section or lot.

RULE 5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

-4-

CASE NO. 4749
Order No. R-4338

RULE 6. A standard proration unit (79 through 81 acres) shall be assigned an 80-acre proportional factor of 6.67 for allowable purposes, and in the event there is more than one well on an 80-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

The allowable assigned to a non-standard proration unit shall bear the same ratio to a standard allowable as the acreage in such non-standard unit bears to 80 acres.

IT IS FURTHER ORDERED:

(1) That the locations of all wells presently drilling to or completed in the Humble City-Strawn Pool or in the Strawn formation within one mile thereof are hereby approved; that the operator of any well having an unorthodox location shall notify the Hobbs District Office of the Commission in writing of the name and location of the well on or before August 1, 1972.

(2) That, pursuant to Paragraph A. of Section 65-3-14.5, NMSA 1953, contained in Chapter 271, Laws of 1969, existing wells in the Humble City-Strawn Pool shall have dedicated thereto 80 acres in accordance with the foregoing pool rules; or, pursuant to Paragraph C. of said Section 65-3-14.5, existing wells may have non-standard spacing or proration units established by the Commission and dedicated thereto.

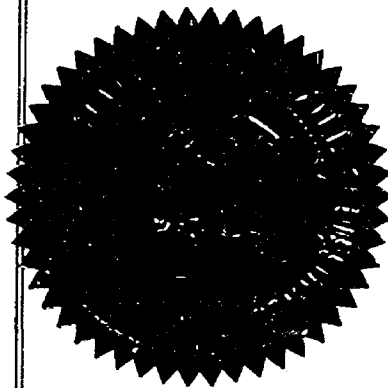
Failure to file new Forms C-102 with the Commission dedicating 80 acres to a well or to obtain a non-standard unit approved by the Commission within 60 days from the date of this order shall subject the well to cancellation of allowable. Until said Form C-102 has been filed or until a non-standard unit has been approved, and subject to said 60-day limitation, each well presently drilling to or completed in the Humble City-Strawn Pool or in the Strawn formation within one mile thereof shall receive no more than one-half of a standard allowable for the pool.

(3) That this case shall be reopened at an examiner hearing in June, 1973, at which time the operators in the subject pool may appear and show cause why the Humble City-Strawn Pool should not be developed on other than 40-acre spacing units.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

-5-
CASE NO. 4749
Order No. R-4338

DONE at Santa Fe, New Mexico, on the day and year herein-
above designated.



STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Bruce King
BRUCE KING, Chairman

Alex J. Armijo
ALEX J. ARMIJO, Member

A. L. Porter, Jr.
A. L. PORTER, Jr., Member & Secretary

S E A L

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 4749
Order No. R-4338-A

IN THE MATTER OF CASE NO. 4749 BEING
REOPENED PURSUANT TO THE PROVISIONS OF
ORDER NO. R-4338, WHICH ORDER ESTABLISHED
SPECIAL RULES AND REGULATIONS FOR THE HUMBLE
CITY-STRAWN POOL, LEA COUNTY, NEW MEXICO,
INCLUDING A PROVISION FOR 80-ACRE PRORATION
UNITS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 11, 1973,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 23rd day of July, 1973, the Commission, a
quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.

(2) That by Order No. R-4338, entered in Case No. 4749 on
July 17, 1972, special rules and regulations were promulgated for
the Humble City-Strawn Pool, Lea County, New Mexico.

(3) That this case was reopened pursuant to Order No. R-4338
to allow all interested parties to show cause why the subject pool
should not be developed on other than 40-acre proration units.

(4) That the special rules and regulations promulgated by
Order No. R-4338 should be extended for an additional one year
period in order to prevent the possibility of economic loss
resulting from the drilling of unnecessary wells, and in order to
allow the operators in the subject pool additional time in which
to gather information concerning the reservoir characteristics of
the pool.

-2-

Case No. 4749
Order No. R-4338-A

(5) That this case should be reopened at an examiner hearing in July, 1974, at which time the operators in the subject pool should appear and show cause why the Humble City-Strawn Pool should not be developed on other than 40-acre proration units.

IT IS THEREFORE ORDERED:

(1) That the special rules and regulations governing the Humble City-Strawn Pool, promulgated by Order No. R-4338, shall remain in full force and effect for an additional period of one year.

(2) That this case shall be reopened at an examiner hearing in July, 1974, at which time the operators in the subject pool shall appear and show cause why the Humble City-Strawn Pool should not be developed on other than 40-acre proration units.

(3) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



I. R. Trujillo
I. R. TRUJILLO, Chairman

Alex J. Armijo
ALEX J. ARMILLO, Member

A. L. Porter Jr.
A. L. PORTER Jr., Member & Secretary

S E A L

ac/



HARDING OIL COMPANY

August 22, 1972

New Mexico Oil Conservation Commission
Conference Hall
State Land Office Building
Santa Fe, New Mexico

Attention: Ida Rodriguez
Secretary to Director

Dear Ms. Rodriguez:

Enclosed I am returning the Transcript of Hearing for Case Numbers 4748 and 4749. Thank you for forwarding this to us for our review. Your assistance is very much appreciated.

Yours very truly,

Charles F. Harding Jr.
Charles F. Harding, Jr.
Vice President

CFHjr:jc

Enclosure

4317 OAK LAWN
DALLAS, TEXAS 75219
(214) 526-8935
CABLE: HARDINGDAL

dearnley, meier & associates

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
OIL CONSERVATION COMMISSION CONFERENCE ROOM
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
Wednesday, July 11, 1973

IN THE MATTER OF:

In the matter of Case
No. 4749 being reopened
pursuant to the provisions
of Order No. R-4338, which
order established special
rules and regulations for the
Humble City-Strawn Pool, Lea
County, New Mexico, including
a provision for 80-acre proration
units.

Case No. 4749

BEFORE: Daniel S. Nutter
Examiner

TRANSCRIPT OF HEARING

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1 MR. NUTTER: We will now resume with Case Number
2 4749.
3 MR. CARR: Case 4749, in the matter of Case No. 4749
4 being reopened pursuant to the provisions of Order No.
5 R-4338, which order established special rules and
6 regulations for the Humble City-Strawn Pool, Lea County,
7 New Mexico, including a provision for 80-acre proration
8 units.
9 MR. HINKLE: Clarence Hinkle, Hinkle, Bondurant,
10 Cox & Eaton, Roswell, appearing on behalf of Harding Oil
11 Company. We have one witness and 7 exhibits. We would
12 like to have the witness sworn.
13 ROY WILLIAMSON,
14 was called as a witness, and after being duly sworn according
15 to law, testified as follows:
16 MR. HINKLE: Here is a copy of the exhibits.
17 DIRECT EXAMINATION
18 BY MR. HINKLE:
19 Q State your name and residence.
20 A I'm Roy Williamson. I live in Midland, Texas.
21 Q You are a petroleum engineer?
22 A Yes, I am.
23 Q Are you a member of an engineering firm in Midland?
24 A Yes. I am President of Sipes, Williamson, Runyan &
25 Aycock, Inc.

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1 Q Have you previously testified in this case in the hearing
2 which was held over a year ago?

3 A Yes, I did.

4 Q You were the principle witness at that time?

5 A That is correct.

6 Q Have you made a study of the area which is involved
7 recently to bring all the information up to date?

8 A Yes, I have.

9 Q Are your qualifications as a petroleum engineer a matter
10 of record with this Commission?

11 A Yes, they are.

12 MR. HINKLE: Are the qualifications acceptable?

13 MR. NUTTER: Yes, sir. They are.

14 Q Have you prepared or has there been prepared under your
15 direction certain exhibits for introduction in this case?

16 A Yes.

17 Q Refer to Exhibit Number 1 and explain what this is and
18 what it shows.

19 A Exhibit Number 1 is a structure map on the top of the
20 Strawn pay in the Humble City-Strawn Pool in Lea County,
21 New Mexico. Shown on this map are not only the Strawn
22 completions but other completions from other zones in the
23 area.

24 I'll point out that the circles colored in green are
25 the Strawn completions. In orange are the Atoka

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1 completions. The blue is the Yaso Bank completion and
2 the red is a Wolfcamp completion.

3 These are shown mainly for a matter of information
4 although this Hearing is concerned only with the Strawn
5 formation. I might also point out that the ownership map
6 or it's now shown as Mesa was Pupco a year ago; and through
7 a merger Mesa has acquired the Pupco interest in this
8 area.

9 Q Now, the previous rules were adopted for the Humble
10 City-Strawn Pool and only covered the Strawn; is that
11 right?

12 A That's correct.

13 Q Now, what wells have been completed since the original
14 hearing?

15 A Well, in the Section 11, the Harding Oil Company Shipp
16 Number 1, of course, was the discovery well in this field.
17 And the Mesa Shipp Number 2 was drilled at that time and
18 North of the Shipp Number 1, the Shipp Number 3 which
19 was a dry hole since that time in the Southeast.

20 MR. NUTTER: What formations did that well touch,
21 Mr. Williamson?

22 THE WITNESS: Number 3?

23 MR. NUTTER: Yes, sir.

24 THE WITNESS: It tested the Strawn.

25 MR. NUTTER: Did it test any of these other formations

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1 also?

2 THE WITNESS: They did not test them, no. They were
3 not productive. Harding drilled the Shipp Number 4 which
4 is in the Southeast portion of Section 11, and it was
5 not productive in the Strawn but was productive in the
6 Atoka. Tipco in the Southwest quarter of Section 12
7 drilled a Byers Number 1 which was completed as an Atoka
8 well.

9 Back to the West in Section 10, Tipco drilled a
10 Nicholson Number 1 Well, completed it in the Yeso. Harding
11 then drilled the Number 5 Well which is a Strawn well.

12 Going on back to the East, Mesa drilled the Number 4
13 which is a Wolfcamp well. Only recently North of the
14 Tipco Nicholson Number 1, Harding drilled a dry hole on
15 the Number 6. The Strawn there was nonproductive as were
16 the other zones.

17 And then below Tipco Number 1 is the Tipco Nicholson
18 Number 2 which is currently completing in the Strawn to
19 the best of my information. I have no completion data
20 at this time.

21 Q (By Mr. Hinkle) That has just recently been completed?

22 A Right, very recently. I don't think it has been
23 potentialled. At least, I have no information indicating
24 that it has.

25 Q Now, refer to Exhibit 2 and explain what it shows.

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1 A Okay. Exhibit Number 2 is a log of the oil producing
2 rate versus time for the Harding Oil Company Shipp Number
3 1 Well. We also have the gas production shown here, and
4 I have extrapolated the present decline trend to determine
5 the remaining reserves for this well.

6 As I'll discuss later on, the total ultimate recovery
7 from this well based on the cumulative production to date,
8 and the extrapolation of this decline curve indicates an
9 ultimate recovery of around 211,870 barrels of oil.

10 Q Now, refer to Exhibit 3 and explain this.

11 A Exhibit 3 is a similar plot for the Harding Oil Company
12 Shipp Number 5 Well. As you can see, it's a very new
13 well. It only went on production in February of this year.
14 There is not sufficient data to make any extrapolation of
15 remaining reserves.

16 Q Now, refer to Exhibit 4 and explain that.

17 A Exhibit Number 4 is a similar type plot for the Mesa
18 Petroleum Company Shipp Number 2. This well as of this
19 date was not exhibiting any decline in the producing rate
20 and is exhibiting a constant producing rate. Therefore,
21 no extrapolation could be made of the production at this
22 time.

23 Q Now, have you made any volumetric calculations of oil
24 reserves in connection with any of the wells?

25 A Yes, I have, for the Harding Oil Company Shipp Number 1;

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1 and those data are shown on Exhibit Number 5. These are
2 the same data that were shown in our original Hearing
3 approximately a year ago, and it shows an average porosity
4 of 80 percent, water saturation of 30, estimated recovery
5 of 20 percent, formation volume factor of 1.675 net feet
6 of pay of 46.

7 It gives us a recoverable oil per acre foot of
8 52 barrels. Assuming then the 80-acre drainage they
9 anticipate that these wells are draining, this gives us
10 an ultimate recovery of 191,360 barrels which we can see
11 agrees very well with the production decline curve
12 extrapolation.

13 Q Refer to Exhibit 6 and explain what this shows.

14 A Exhibit 6 is a plot of the bottomhole pressure versus
15 cumulative oil production for the Harding Oil Company
16 Shipp Number 1. When this reservoir was discovered, it
17 was undersaturated. It shows a rather sharp decline.
18 The bubble point is 3200 points. The two recent pressures
19 which are a result of the pressure after reaching the
20 bubble point extrapolate to an ultimate recovery of
21 approximately 210,000 barrels assuming an abandonment
22 bottomhole pressure of 250 pound.

23 So utilizing the data from the decline curve, the
24 volumetric calculation and the bottomhole pressure
25 extrapolation, we have an ultimate recovery in the

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1 neighborhood of 200,000 barrels, which in my opinion proves
2 that we are draining approximately 80 acres of the
3 reservoir.

4 Q Now, have you made an economic study of what would happen
5 if this field were developed on 40-acre spacing rather
6 than 80?

7 A Exhibit Number 7 is the economics of drilling and completing
8 a Strawn well. Now, we have estimated the drilling and
9 completion costs of \$320,000; and the oil price, gas
10 price, the taxes are the various factors that go into the
11 economics of a well.

12 And utilizing these factors, we come up with a figure
13 of 101,266 barrels of oil will require to pay out the
14 drilling, completion and operation of a well to this pay.
15 So we have shown that we are recovering approximately
16 200,000 barrels of oil from 80 acres. Therefore, if we
17 were drilling on 40 acres, we would have a situation that
18 would result in a little more than a pay-out of the
19 original cost.

20 Q It would not hardly justify economically the drilling of
21 wells on the 40-acre basis?

22 A No. It certainly wouldn't.

23 Q What is your recommendation to the Commission with respect
24 to retaining the special pool rules that have been
25 adopted?

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1 A I recommend that we retain the special field rules at
2 80-acre spacing and retain them on a permanent basis.

3 Q In your opinion, will this be in the interest of
4 conservation, the prevention of waste, and protect
5 correlative rights?

6 A Yes, it would.

7 MR. HINKLE: I believe that there is a letter in the
8 files of the Commission from the Mesa Oil Company.

9 MR. CARR: That's right.

10 MR. HINKLE: I'd like to indicate in the record what
11 this shows.

12 MR. NUTTER: We will get to that in a minute, Mr.
13 Hinkle.

14 MR. HINKLE: I'd like to offer into evidence Exhibits
15 1 through 7.

16 MR. NUTTER: Applicant's Exhibits 1 through 7 will
17 be admitted into evidence.

18 MR. HINKLE: That's all of the Direct.

19 MR. NUTTER: Are there any questions of Mr.
20 Williamson?

21 CROSS-EXAMINATION

22 BY MR. NUTTER:

23 Q Mr. Williamson, in effect, the only thing we have to show
24 here, the only thing we have here to show the drainage
25 on 80-acre spacing is the comparison of your production

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1 decline curve with your calculated reserves under 80
2 acres, and that's not inclusive by any means. How would
3 you account for the fact that if we look at your plat,
4 Exhibit Number 1, we see that a 40-acre offset to the
5 north of this well was a dry hole. A 40-acre offset
6 to the West of it was a dry hole in the Strawn, and the
7 only two wells that offset each other and are productive
8 from the Strawn are 40-acre offsets, being the Number 1
9 and the Number 2? Do you have any pressure information
10 that shows that we are getting any kind of communication
11 beyond the 40-acre line?

12 A No, sir. I might mention this: I do not have a complete
13 data on the Mesa Number 4 Well. They apparently felt
14 like they would have had a completion there. They
15 perforated the pipe; and I understand they had some
16 mechanical problems that precluded them from completing;
17 but the Mesa feels like, in discussing with them, that they
18 could have made a well there without mechanical problems.

19 We do not have any other pressure information other
20 than we have shown in the past pressure. We had an
21 identical pressure between the Harding Shipp 1 and the
22 Mesa Number 2.

23 Q Was that introduced in the first Hearing?

24 A Yes. That was in the first Hearing. Now, we have
25 testified before, and I think it is fairly a matter of

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1 the record, that this is a fairly erratic reservoir. It's
2 a stratigraphic trap. It has very little relationship to
3 structure as evidenced by the fact that the Number 6 Well
4 was a dry hole and structurally it should have been a good
5 well.

6 So the only thing we can go on reliably is, of course,
7 our volumetrics; and unless additional pressure data are
8 taken, we have no other data to support the fact that
9 we are draining 80 acres; but the log interpretation,
10 the bottomhole pressure cumulative data, and the
11 performance data do agree very strongly I feel. And it
12 does indicate we do have 80-acre drainage.

13 Q Well, you would agree with me, wouldn't you, maybe you
14 won't, but on your Exhibit Number 2 there you are
15 extrapolating a production decline curve based on a
16 rather limited band of performance as far as that goes,
17 and any error of just a couple of degrees could make a
18 considerable difference in the volume of oil?

19 A Well, I agree. Being the only data we had, that's what
20 we had to use; and, of course, that's why I went to the
21 pressure data on this well which I feel --

22 Q There have been no pressure interference tests conducted
23 or anything like that?

24 A No, sir. There have not been.

25 Q And no comparison of original pressures with subsequent

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1 pressures of wells drilled except during the first hearing
 2 when Wells Number 1 and 2 pressures were compared?
 3 A Right. Of course, the pressure in the Number 5 Well was
 4 somewhat lower than the original pressure in the Number 1
 5 Shipp Well. And this might indicate some drainage there.
 6 Q Do you have any pressure information available on the
 7 Number 5 when it was completed?
 8 A Let's see. I believe I do. The Shipp Number 5 on June
 9 the 4th of 1973 recorded a maximum pressure of 2,388 pounds.
 10 Q What was the initial bottomhole pressure of the Number 1?
 11 A And the Number 1 was considerably above that. The
 12 bottomhole pressure of the Number 1 was 4,807 psig.
 13 So I think we could infer the drainage had occurred. Of
 14 course, the Number 4 Well in the middle of May clouded
 15 that somewhat.
 16 Q Now, at what point on this Exhibit Number 6 of bottomhole
 17 versus cumulative production would this pressure on the
 18 Number 5 well have been taken? What comparable point?
 19 A Okay. June of '63.
 20 Q You might have a date even for this last pressure that
 21 you show on Exhibit Number 6.
 22 A Right. I do. I think that will probably tie it in fairly
 23 closely. Well 3 agrees very closely. The pressure, the
 24 last pressure shown is the Shipp Number 1 of 1,035 pounds
 25 taken 6-4-73.

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1 Q That was taken the same date this other pressure was
2 run then?

3 A Right, on the same date.

4 Q Well, let's go on down from 4800 to 1035. The new
5 pressure in the Number 5 is 2388?

6 A Right. So the inference there could be of drainage, of
7 course, from the Number 1; or if it's a separate
8 stratigraphic trap, it could be of a different pressure.

9 Q Yes, I see that.

10 MR. NUTTER: Are there any further questions of
11 Mr. Williamson? He may be excused. Do you have anything
12 further, Mr. Hinkle?

13 MR. HINKLE: That's all.

14 MR. NUTTER: Do you have any correspondence?

15 MR. CARR: Mr. Examiner, the Commission has received
16 two letters related to this case. One is from a Mr.
17 J. L. Farrell, "Please be informed that Mesa Petroleum
18 Company respectfully requests the examiner approve the
19 80-acre proration unit currently established under the
20 special rules and regulations for the Humble City-Strawn
21 Pool, Lea County, New Mexico in Order No. R-4338."

22 "Mesa agrees with Harding Oil Company that 80-acre
23 proration units are adequate for economic drainage for
24 this particular reservoir."

25 We also have a letter from Texas International

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1 Petroleum Corporation signed by Mr. Robert O. Burkett.

2 "This is to advise that as an operator in the Humble
3 City Strawn Field, Texas International Petroleum Corporation
4 petitions the retention of 80 acre proration units for
5 each well completed from the Strawn lime in the above
6 named field."

7 MR. NUTTER: Is there anything further for Case
8 Number 4749? If not, we will take the case under
9 advisement.

* * * * *

11 STATE OF NEW MEXICO)
12) ss
13 COUNTY OF BERNALILLO)

14 I, JANET RUSSELL, a Certified Shorthand Reporter, in
15 and for the County of Bernalillo, State of New Mexico, do
16 hereby certify that the foregoing and attached Transcript of
17 Hearing before the New Mexico Oil Conservation Commission
18 was reported by me; and that the same is a true and correct
19 record of the said proceedings to the best of my knowledge,
20 skill and ability.

21 *Janet Russell*
22 CERTIFIED SHORTHAND REPORTER

23 I do hereby certify that the foregoing is
24 a complete record of the proceedings in
the Examiner hearing of Case No. 4749
heard by me on 7/11, 19 73

25 *[Signature]*, Examiner
New Mexico Oil Conservation Commission

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I N D E X

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WITNESSPAGE

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ROY WILLIAMSON

4

Direct Examination by Mr. Hinkle

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Cross Examination by Mr. Hinkle

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E X H I B I T S

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OFFEREDADMITTED

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Applicant's Exhibit #1

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Applicant's Exhibit #2

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Applicant's Exhibit #3

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Applicant's Exhibit #4

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Applicant's Exhibit #5

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Applicant's Exhibit #6

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Applicant's Exhibit #7

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Applicant's Exhibit #8

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Applicant's Exhibit #9

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Applicant's Exhibit #10

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dearnley, meier & mc cormick

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
OIL CONSERVATION COMMISSION CONFERENCE ROOM
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
June 6, 1973

EXAMINER HEARING

IN THE MATTER OF:

In the Matter of Case No.
4749 being reopened pursuant
to the provisions of Order No.
R-4338, which order established
special rules and regulations for
the Humble City-Strawn Pool, Lea
County, New Mexico, including a
provision for 80-acre proration
units.

Case No. 4749

BEFORE: Richard L. Stamets
Examiner

TRANSCRIPT OF HEARING

1 MR. STAMETS: Call next Case 4749 (reopened). In
2 the matter of Case No. 4749 being reopened pursuant to
3 the provisions of Order No. R-4338, which order established
4 special rules and regulations for the Humble City-Strawn
5 Pool, Lea County, New Mexico, including a provision for
6 80-acre proration units.

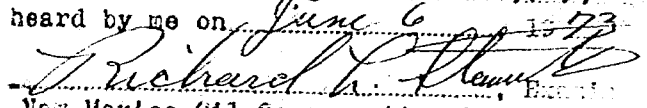
7 We have received a request from the Applicant that
8 this case be continued until June 27, and it will be
9 so continued.

10 * * * * *

1 STATE OF NEW MEXICO)
2) ss
3 COUNTY OF BERNALILLO)

4 I, JANET RUSSELL, a Notary Public, in and for the
5 County of Bernalillo, State of New Mexico do hereby certify
6 that the foregoing and attached Transcript of Hearing before
7 the New Mexico Oil Conservation Commission was reported by
8 me; and that the same is a true and correct record of the
9 said proceedings to the best of my knowledge, skill and
10 ability.

11 
12 NOTARY PUBLIC

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22 I do hereby certify that the foregoing is
23 a complete record of the proceedings of
24 the Examiner hearing of Case No. 4749
25 heard by me on June 6, 1973

New Mexico Oil Conservation Commission

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

Hearing Date AUGUST 7, 1974TIME: 9 a.m.

NAME	REPRESENTING	LOCATION
Paul Kator	Hinkle, Lindquist et al	Roswell
Ray C. Williamson Jr.	Sizes, Williamson & Aycock Inc. for HARDING OIL CO + MESA PETROLEUM CO.	Midland, Tex.
JAMES O. JUSTICE	HARDING Oil Company	DALLAS, TX.
Jim Sperry	Marshall Sperry et al	Midland
John Seavey	Mobil Oil Corp	SANTA FE
Tom Kellahan	Kellahan & Fox	Midland Tex
Arthur W. Schmidt	Rep. Union Texas Petr (Schlumberger well service)	Midland, Texas
Richard Blackwell	Consult. Geol. — Union Texas Petr.	Midland, Texas
Victor T. Ryan	Continental Oil Co	Hotchkiss
G. L. Hansel	Pecos Irrigation	Carlsbad
Paul Gunning	Jimmy Chish & Copple	Roswell
Dick Beveridge	Western Reserves Oil Co	Midland

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 7, 1974

EXAMINER HEARING

IN THE MATTER OF:)

Case No. 4749 being)
reopened pursuant to the)
provisions of Order No.)
R-4338-A, Humble City-)
Strawn Pool, Lea County,)
New Mexico.)

Case No. 4749

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil
Conservation Commission:

Thomas Derryberry
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant:

Paul W. Eaton, Jr., Esq.
HINKLE, BONDURANT, COX &
EATON
Hinkle Building
Roswell, New Mexico

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MR. NUTTER: The hearing will come to order, please.

The first case this morning will be number 4749.

MR. DERRYBERRY: Case 4749, in the matter of Case Number 4949, being reopened pursuant to the provision of order number R-4338-A, which order continued special rules for the Humble City-Strawn Pool, Lea County, New Mexico.

MR. EATON: Paul Eaton, Hinkle, Bondurant, Cox & Eaton, representing Harding Oil Company and Mesa Petroleum Company and I have two witnesses.

MR. NUTTER: Will you have them stand and be sworn, please?

(THEREUPON, the witnesses were sworn.)

ROY C. WILLIAMSON, JR.

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. EATON:

Q Would you please state your name and residence and by whom you are employed?

A I am Roy C. Williamson, from Midland, Texas. I am President of the consulting firm of Sipes, Williamson & Aycock, Inc.

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WILLIAMSON-DIRECT

Page.....4

Q Mr. Williamson, have you previously testified before this Commission?

A Yes, I have.

Q And in what capacity?

A As an engineering witness.

Q And have you previously testified before the Commission in connection with this matter?

A Yes, I have.

Q And have you prepared or had prepared certain exhibits for introduction?

A Yes.

Q Please refer to what has been marked for identification as Exhibit Number One and state what that exhibit is?

A Exhibit Number One is a thickness map, an iso type map, on the gross Strawn interval for the Humble City-Atoka-Strawn field in Lea County, New Mexico.

The contours shown are the isopack thicknesses and wells are shown and are color-coded as to zone of completion.

The wells that we will be concerned with are the ones colored blue, which are the Strawn completion and there are five of these.

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Q On the exhibit there are seven yellow eighty-acre tracts. Will your testimony concern those tracts?

A No, sir, it will not.

Q All right. Now, Mr. Williamson, please refer to what has been marked for identification as Exhibit Number Two, and state what that exhibit portrays?

A Exhibit Number Two depicts certain data from the Strawn wells in the Humble City Strawn field.

The left-hand column identifies the operator and the wells and the next column is the initial date of production. Then, we have bottom hole pressure, ultimate oil recoveries and recovery per acre foot and net pay thickness calculated for each well. The purpose of this data is to indicate that the reservoir is performing such that drainage is occurring on eighty acre spacing.

I might point out that the Harding Shipp No. 1 was the initial well in the Strawn field. It had an initial bottom hole pressure of four thousand eight hundred and seven pounds.

The Mesa Petroleum Shipp No. 2 was completed one month later and had bottom hole pressure of thirty thousand four hundred and seventy-three pounds.

The Harding Shipp No. 5 was completed in February

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of '73, and it had an initial pressure of three thousand eight hundred and seventy-one pounds.

The TIPCO Nicholson No. 2 was completed 7-73, and with pressure of three thousand thirty-two pounds.

The Harding Oil Company Shaw No. 1 was completed in March of '74, and it had three thousand five hundred and fifty-five pounds.

I might also point out that there are several dry holes in the Strawn indicated in section fifteen of 37 east, 17 south. The Mesa No. 5 Shipp was a dry hole in the Strawn. To the east, one location, the Harding No. 1 Schwartzburg was a failure in the Strawn.

Q That was in section fourteen?

A Section fourteen of 37-17. Also in section eleven north of the Harding No. 1 Shipp there is a dry hole. In section ten of 37-17 there is a dry hole north of the TIPCO No. 1 Nicholson.

MR. NUTTER: And those both were tested to the Strawn?

A Yes. I might also point out that even though these other wells are completed to various intervals, being the Wolfcamp, Atoka, and the Yeso, they also were failures in the Strawn.

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WILLIAMSON-DIRECT

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Completion was either attempted or the formation was not sufficient to attempt completion. So therefore, they can really be considered failures in the Strawn.

The Strawn formation is generally, the accumulation is found in stratigraphic nature, and as you can see it is reasonably erratic and completions are offset by dry holes.

On this one dry hole back in section ten, out to the west of the TIPCO No. 2 Nicholson, is the TIPCO No. 3 Nicholson.

But the initial bottom hole pressure data indicates to me that communication does exist between these wells.

The anomalous situation is that in section eleven the PUBCO, or really Mesa, it was drilled by PUBCO, but of course PUBCO is owned by Mesa, the No. 4 Shipp was a failure in the Strawn and yet drainage seems to have occurred across this location as indicated by the pressure in the No. 5 Shipp of thirty-eight hundred pounds which is some thousand pounds below the Harding No. 1 Shipp. So, there must be some path of communication and this could be a localized situation in the Strawn as to why the Shipp No. 4 was a Strawn failure.

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WILLIAMSON-DIRECT

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Going on to the ultimate oil recovery, the Harding Shipp No. 1 and the Mesa Shipp No. 2 are depleted in the Strawn and the Shipp No. 1 has produced approximately one hundred and sixty-four thousand barrels. The Shipp No. 2 has produced approximately a hundred and ninety-nine thousand barrels.

The Harding Shipp No. 5 is still producing and it is on a decline that can be extrapolated and the ultimate expected from this well is one hundred and twenty-nine thousand barrels.

The TIPCO Nicholson No. 2 is also on a decline that can be extrapolated and it will produce approximately eighty thousand barrels.

The next column shows the calculated recovery in barrels of oil per acre foot from each well which takes into account porosity and water saturation and formation volume factor for each well and the last column shows the net pay in thickness calculated from the location of these wells.

At the bottom of the exhibit, number one shows the ultimate oil recovery from the four wells, total five hundred and seventy-one thousand six hundred and five barrels.

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WILLIAMSON-DIRECT

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I might mention that the Harding Shaw No. 1 is producing in the Strawn. It is not declining. It is producing at a constant rate and I was not able to get a performance derived ultimate so I did not include it in these calculations.

Number two at the bottom of the exhibit calculates the drainage area by dividing the ultimate oil recovery by the forty-eight barrels per acre feet times thirty-six point seven five net feet indicating an average drainage area for the four wells of three hundred and twenty-four acres or eighty-one acres per well.

So, by observing the pressure history and the volume metric calculations of the area, that would contribute to the amount of oil that we can pin down that can be produced from the four wells. I conclude that drainage is substantiated on an eighty acre unit.

Q (Mr. Eaton continuing.) Mr. Williamson, do you know whether or not Mesa Petroleum Company is interested in further drilling of this area?

A Yes, sir. The Mesa personnel that I have visited with have indicated that they are interested in pursuing additional development in this area but only if eighty acre spacing is maintained. This will give them the economics

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WILLIAMSON-DIRECT
-CROSS

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they must have to develop this somewhat erratic reservoir.

Q Based then upon your familiarity with the reservoir, and particularly your Exhibit Number Two, you are of the opinion that the Strawn will efficiently and effectively drain eighty acres?

A Yes, I do.

MR. EATON: No further questions of Mr. Williamson.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Williamson, what is the current rate of production on the three wells that are producing now?

A The Shipp No. 5 for May produced eighteen hundred and fifty barrels of oil. The TIPCO Nicholson No. 2 for May produced two thousand and fifty barrels. These are approximate and is read from a curve. And the Harding Shaw for May produced ten thousand six hundred and ninety-eight barrels.

MR. NUTTER: Thank you. Are there any further questions of Mr. Williamson? You may be excused.

(THEREUPON, the witness was excused.)

Do you have anything further, Mr. Eaton?

MR. EATON: One more witness, Mr. Justice.

JAMES O. JUSTICE

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JUSTICE-DIRECT

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called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. EATON:

Q State your name please and where you live?

A My names is James O. Justice and I live in Dallas, Texas.

Q And by whom are you employed, Mr. Justice?

A Harding Oil Company.

Q And what is your position with the Harding Oil Company?

A Chairman of the Board and Chief Executive Officer.

Q Have you previously testified before this Commission in connection with the first hearing on the field rules for the Humble City-Strawn Pool?

A Yes, sir, I have.

Q Do you have a statement which you would like to make to the Commission which has been marked as Exhibit Three?

A Yes, I do.

Q Would you please proceed with that?

A This is a statement to the New Mexico Oil Conservation Commission, Docket Number 4749, August Seven,

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1974, special field rules for the Humble City-Strawn field.

Background. Under a farm-out agreement with Mesa Petroleum Company, Harding Oil Company has been developing this field with the participation of Texas International Petroleum Company. To date, Harding has drilled six wells, four producers and two dry holes.

Three of the producers are completed in the Strawn, and one in the Atoka. The accumulative production on the producers to May the first, 1974, ranges from a low of sixteen thousand one hundred and sixty-two barrels to a high of one hundred and fifty-six thousand two hundred and forty-six barrels.

Recent developments. During 1973, Harding drilled two wells and so far in 1974 it has drilled two wells with a third scheduled for spudding this month. All of these wells have or will test the Atoka formation.

Future plans. Under the farm-out agreement, seven eighty acre tracts remain to be earned. Due to the uncertain nature of the geology in this field, the sequence of drilling each of these locations is contingent upon the results of previous drillings.

An example of this rationale is our decision to abandon the location in the west half of the northeast quarter

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of section fourteen, as a result of geological data gained from the two dry holes to the west in the east half of the northeast quarter of section fifteen and the west half of the northwest quarter of fourteen and Mesa No. 5 Shipp and Harding No. 1 Schwartzburg.

Based upon drilling results and performance history it is the judgment of the Harding Oil Company that this field does not economically justify development on forty acre spacing.

Formation characteristics appear to be such that one well will adequately drain eighty acres thereby avoiding underground waste.

Drilling results to date likewise indicate that correlative rights are better protected on eighty acre spacing than they would be on forty acre spacing due to the rather unpredictable nature of the petroleum bearing formation.

Conclusion. It is our conclusion that the trade-off between correlative rights and sound economics will best be served by continuing eighty acre spacing for that field.

That concludes my prepared statement.

Q Mr. Justice, this Exhibit Number One testified to

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JUSTICE-DIRECT

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by Mr. Williamson, reflects seven yellow-colored eighty acre tracts.

Are those the eighty acre tracts which you have mentioned in your statement just now?

A Yes, that is correct.

Q Which will be earned by Harding if you proceed to drill those properties?

A That is correct and our proposed location for the next well to be spudded this month is shown on that exhibit.

Q In section twelve?

A Yes, sir, in the west half of the northwest quarter.

Q Do you have anything to add, Mr. Justice?

A No, sir, I have nothing further.

MR. EATON: Pass the witness.

MR. NUTTER: I have no questions. Are there any questions of this witness? Thank you, Mr. Justice, you may be seated.

(THEREUPON, the witness was excused.)

MR. EATON: That concludes our case and we offer into evidence Exhibits One, Two and Three.

MR. NUTTER: Harding's Exhibits One, Two and Three will be received into evidence.

(THEREUPON, Applicant's Exhibits Numbers

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One, Two and Three were admitted into evidence.)

MR. NUTTER: Do you have anything else, Mr. Eaton?

MR. EATON: No, sir.

MR. NUTTER: Does anyone have anything they wish to offer in Case Number 4949?

MR. DERRYBERRY: Mr. Examiner, the Commission has received a letter from Robert O. Burkett who is the Division Manager of Texas International Petroleum Corporation and reads as follows:

In the matter of the rehearing for R-4338-A, special field rules for the Humble City-Strawn field, this is to advise that Texas International Petroleum requests the continuance of the eighty acre proration units based on the production data to date on the TIPCO No. 2 Nicholson well in the Humble City-Strawn Pool we cannot economically justify any development on a spacing pattern less than eighty acres per well.

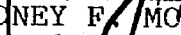
MR. NUTTER: Is there anything further in Case 4749?

We will take the case under advisement.

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STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, SIDNEY F. MORRISH, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.


SIDNEY F. MORRISH
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4749 heard by me on 8/7, 19 74.

[Signature], Examiner
New Mexico Oil Conservation Commission

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 10, 1974

EXAMINER HEARING

IN THE MATTER OF:

Case No. 4749 being reopened
pursuant to the provisions of
Order No. R-4338-A, which order
continued special rules for the
Humble City-Strawn Pool, Lea County,
New Mexico.

CASE 4749

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil	Thomas Derryberry, Esq.
Conservation Commission:	Legal Counsel for the Commission
	State Land Office Building
	Santa Fe, New Mexico

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MR. NUTTER: We will call next Case 4749.

MR. DERRYBERRY: Case 4749 in the matter of Case 4749 being reopened pursuant to the provisions of Order No. R-4338-A, which order continued special rules for the Humble City Strawn Pool, Lea County, New Mexico.

Mr. Examiner, we have a letter here from Mr. Clarence Hinkle, Attorney for the Applicant and it states as follows: (Reading) Appearing on the Examiner's Docket for July 10th is Case No. 4749 which is being reopened pursuant to the provisions of Order No. R-4338-A, which Order continued special pool rules for the Humble City-Strawn Pool, Lea County, New Mexico. We represent Harding Oil Company who is the original proponent of the special rules and due to the unavailability of witnesses for Harding for both July 10th and July 24th because of vacations, please consider this as a motion on behalf of Harding to continue this Case until the Examiner's Docket of August 7. (End of reading.)

MR. NUTTER: Case No. 4749 will be continued until the Examiner Hearing scheduled to be held at this same place at 9 o'clock A.M., August 7, 1974.

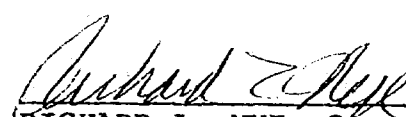
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STATE OF NEW MEXICO)

; ss.

COUNTY OF SANTA FE)

I, RICHARD L. NYE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.


RICHARD L. NYE, Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4747 heard by me on 7/10, 1974.


Examiner
New Mexico Oil Conservation Commission

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
CONFERENCE HALL, STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

June 28, 1972

EXAMINER HEARING

IN THE MATTER OF:

Application of Pubco Petroleum
Corporation for Special pool rules,
Lea County, New Mexico.

CASE NO. 4748

a n d

Application of Harding Oil Company
for a discovery allowable and
special pool rules, Lea County, New
Mexico.

CASE NO. 4749

BEFORE: Elvis A. Utz
Examiner

TRANSCRIPT OF HEARING

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1 MR. UTZ: Case 4748.

2 MR. HATCH: The Application of Pubco Petroleum
3 Corporation for special pool rules, Lea County, New Mexico.
4 I think we need a decision as to whether we are going to
5 hear these cases at the same time, Case 4748, the Application
6 of Pubco, and Case 4749, the Application of Harding Oil.

7 MR. HINKLE: Clarence Hinkle of Hinkle, Bondurant
8 and Christy, Roswell, New Mexico, appearing on behalf of
9 Harding Oil Company. We would like to enter our appearance
10 in Cases 4748 and 4749, and we have no objection to
11 consolidating the Cases for the purpose of taking testimony.

12 MR. BUELL: Sumner Buell of Montgomery, Federici,
13 Andrews, Hannahs and Morris, I would like to enter my appearance
14 on behalf of H. L. Brown, Jr.

15 MR. SPERLING: James Sperling of Modrall, Sperling,
16 Roehl, Harris and Sisk, Albuquerque, appearing on behalf of
17 Pubco Petroleum Corporation in Cases 4748 and 4749. We have
18 no objection to the consolidation of the two Cases for the
19 purpose of testimony.

20 MR. UTZ: In absence of objection, Applications
21 4748 and 4749 will be consolidated, for the purpose of
22 testimony.

23 MR. HATCH: I have a question that I would like
24 Mr. Hinkle, Mr. Sperling and Mr. Buell to review for a
25 moment before we proceed.

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1 In the Affidavit of Publication for Case 4749, there
2 was something left out. The pool name is the principal thing
3 that was left out.

4 MR. HINKLE: I don't think that makes a whole lot
5 of difference, it is identified by Township and well
6 identification.

7 MR. HATCH: I am not disturbed about it, but I
8 don't know about you or Mr. Sperling.

9 MR. HINKLE: Jim, the pool name is the only thing
10 left out, the Township and Range and discovery well are all
11 identified.

12 MR. SPERLING: I have no objection to proceeding.

13 MR. HINKLE: I have none.

14 MR. UTZ: Cases 4748 and 4749 have been called.
15 Mr. Speling, how many witnesses do you have?

16 MR. SPERLING: Two.

17 MR. UTZ: How many witnesses do you have, Mr.
18 Hinkle?

19 MR. HINKLE: Three.

20 MR. UTZ: Will all five witnesses stand and be
21 sworn at this time?

22 (Whereupon, five witnesses were sworn simultaneously
23 by Mr. Hatch.)

24 MR. UTZ: You may proceed when you are ready,
25 Mr. Sperling.

dearnley, meier & mc cormick

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1216 FIRST NATIONAL BANK BLDG. EAST, ALBUQUERQUE, NEW MEXICO 87108MARION CAUSEY,

was called as a witness and, having been already duly sworn,
testified as follows:

DIRECT EXAMINATIONBY MR. SPERLING:

Q Would you please state your name?

A Marion Causey.

Q By whom are you employed and in what capacity?

A I am employed by Pubco Petroleum Corporation and my
present position is Permoan Basis Exploration Manager
in Midland, Texas.

Q How long have you held that position?

A Since the first of the year.

Q Have you ever, on any previous occasion, testified before
the New Mexico Oil Conservation Commission so that your
qualifications are a matter of record?

A No, I have not.

Q Would you please give us a brief resume of your
education and professional training and experience
relative to the position you hold?

A I have a Bachelor of Science Degree in geology from the
University of Southern Mississippi; I have a M.S. Degree
in geology from the University of Tennessee. I was
employed by Phillips Petroleum Company as a petroleum
geologist from 1957 to 1962, primarily working in

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1 exploration of the Permian Basin in the southeastern
2 New Mexico area. I was employed from 1962 until 1968
3 by Mobil Oil Corporation as an exploration geologist
4 primarily working in southeast New Mexico.

5 From 1968 until the present time, I have been
6 employed by Pubco Petroleum Corporation. I am a member
7 of the American Association of Petroleum Geologists.

8 Q Now, Mr. Causey --

9 MR. SPERLING: Are Mr. Causey's qualifications
10 accepted?

11 MR. UTZ: Yes, they are.

12 Q (By Mr. Sperling) Mr. Causey, would you please now
13 refer to what has been marked as Exhibit 1 in this Case,
14 Case 4743, and explain briefly the purpose of that
15 Exhibit and what it is designed to show?

16 A Exhibit 1 is a scale of one inch to two thousand feet,
17 which is indicated on the map, and is outlined as the
18 proposed Humble City-Strawn Pool area comprising
19 Sections 6, 7, 18, in Township 17 South, Range 38 East;
20 and Sections 1, 2, 3, 10, 11, 12, 13, 14, 15, in
21 Township 17 South, Range 37 East.

22 We have also designated on the map, the Lovington
23 East and Lovington Northeast pools.

24 Also marked on the Exhibit is the discovery well
25 of the Humble City-Strawn Pool, the Harding Oil Company

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1 Number 1 well.

2 Exhibit 1-A is a geological cross-section which
3 has been indicated on Exhibit 1 by two red lines,
4 designated B to B' and A to A'. Represented on this
5 Exhibit is the electric logs and the radioactive logs
6 of the stratigraphic section on datum from the top and
7 middle of the Pennsylvanian-Strawn. The scale of this
8 map is a vertical scale of one inch to 100 feet and a
9 horizontal scale of twelve inches equaling one mile --

10 MR. UTZ: Why don't you give us the datum?

11 A (Continuing) This is not a structural section, this
12 is my interpretation of the Lovington East and the
13 Lovington Northeast Strawn area and the discovery well,
14 the Harding Oil Company Number 1 Shipp. The discovery
15 well is producing from limestone of the Pennsylvanian-
16 Strawn at an average depth of approximately 1,450 feet.
17 I believe the Humble City-Strawn Pool is producing from
18 a stratigraphic trap which resulted from a bank or a
19 reef buildup within the Strawn.

20 Referring back to Exhibit 1-A, within the area
21 mapped, I believe there are three different Pennsylvanian-
22 Strawn banks or reefs producing.

23 I have designated these banks as Strawn Bank B',
24 Strawn Bank B and Strawn Bank C.

25 The red on the cross-section indicates the producing

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1 interval in each well in this zone. Designated as the
2 Strawn B' and colored in green on both cross-sections,
3 I believe is the prevalent zone which produces in the
4 Humble City-Strawn field.

5 This cross-section which started with the State
6 Shell Monty Number 1 in Section 14, Township 16 South,
7 Range 36 East, was a dry hole which penetrated the
8 Strawn.

9 The Southwest Production Corporation Monty
10 State C in Section 24, Township 16 South, Range 36 East,
11 was completed from the Strawn and has since been
12 abandoned with an accumulated production of 4,114 barrels
13 which was produced from 7/14/69.

14 The next well is the Monty State Number 2 in
15 Section 19, Township 16 South, Range 37 East and it is
16 also producing from the Strawn. These two wells are
17 producing from the Strawn at the B' bank.

18 The Tidewater Monty B Number 1 in Section 19,
19 Township 18 South, Range 37 East is still producing from
20 what I have designated the Strawn Bank C and has an
21 accumulative production of 325,156 barrels of oil and
22 was completed 3/26/53 and is still producing.

23 The Getty Oil Corporation Monty D Number 1 in
24 Section 18, Township 16 South, Range 37 East, is a
25 dry hole.

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1 The Pennzoil United State C Number 2 in Section 17,
2 Township 16 South, Range 37 East, was completed from
3 what I believe to be the middle bank, or the Strawn
4 Bank B. This was completed on 6/25/69 and up to 5/1/72
5 had an accumulative production of 286,215 barrels of
6 oil.

7 These are the wells I have used on the cross-section,
8 the A to A' cross-section.

9 On the B to B', starting with the first well, the
10 Amerada Petroleum State LC Number 1, in Section 1,
11 17 South, 36 East, was a dry hole.

12 The Skelly Oil Corporation Taylor Number 6 in
13 17 South, 37 East, was a dry hile in the Strawn.

14 The Tidewater Oil State B Number 1 in Section 5,
15 17 South, 37 East, was completed from the Strawn Bank
16 B' and had an accumulative total production of 60,297
17 barrels of oil. It has been abandoned.

18 The Tidewater Baton Number 1 in Section 5, 17
19 South, 37 East, was completed 3/3/52 and is abandoned
20 and produced only 58,751 barrels of oil from the Strawn
21 Bank B'.

22 The Tidewater State Number 1 in Section 4,
23 Township 17 South, Range 37 East, was completed 8/29/51,
24 and is abandoned. The total accumulated production was
25 19,647 barrels of oil. It was also completed in the

1 Strawn Bank B'.

2 The Tidewater Oil Company State Eugene Number 1 D
3 in Section 32, 16 South, 37 East, was completed from
4 what I believe to be both the Strawn B' and the Strawn
5 Bank C. It perforated both banks and has a total
6 accumulative production of 420,765 barrels of oil and
7 is still producing.

8 The last log on the cross-section B to B' is
9 the Shell Oil Company State Number 1 in Section 28,
10 16 South, 37 East. This well was a dry hole.

11 If I could refer you now to Exhibit 1 again, the
12 solid blue contour line on this Exhibit represents the
13 lower and middle Strawn as was designated on the cross-
14 section A to A' and B to B'. The isopach was contoured
15 at 250 foot intervals and the green isopach contours
16 represent the isopach of what I have designated as the
17 Strawn Bank B'. It is also contoured at 250 foot
18 intervals.

19 This isopach does not represent a net porosity and
20 does not indicate that all portions of the Strawn B'
21 along the trend as mapped would be porous and permeable.
22 I do feel that the limits of the green outline represent
23 this bank or reef trend across the area mapped.

24 Along the trend that we have mapped, we should
25 anticipate and expect separate carbon buildups of porous

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1 permeable rock and I believe this is the case in the
2 area under consideration.

3 I believe the Humble City-Strawn Pool is producing
4 from the same bank as the Lovington East field, but it
5 is separate carbon buildup.

6 The discovery well in the Humble City-Strawn Pool,
7 the Harding Oil Company Shipp number 1, was some 287 feet
8 structurally lower than the edge well of the Lovington
9 East field, the Tidewater State U Number 1 located in
10 Section 4, Township 17 South, Range 37 East. I
11 might also point out on Exhibit 1 that the values on
12 the map underlined in green beside each control point,
13 represent the thickness of the mapped Strawn Bank B'
14 interval. The blue beside each control point represents
15 the thickness of the isopach of the lower and middle
16 Strawn interval.

17 Q Mr. Causey, I take it from what you have said, that you
18 feel there is a separation between the Lovington East
19 field and the Humble City-Strawn Pool; is that your
20 conclusion?

21 A That is correct.

22 Q Even though the wells from both of the areas may be
23 producing from what you have designated as the Strawn
24 B' Bank?

25 A That is correct.

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1 Q Now, does the fact that the wells which are located
2 in the Lovington East Pool which you have referred to
3 and which you have shown on your cross-section and which
4 are abandoned, support that conclusion in view of the
5 recent production encountered in the Humble City-Strawn
6 Pool?

7 A Yes, I think that is correct.

8 Q Now, do I understand from the configuration of the
9 contour line which runs across the Humble City-Strawn
10 Pool, that you have concluded that that is the limit
11 of possible Strawn production from the area or is there
12 the possibility that these other members that you have
13 identified may indicate production to the north?

14 A I believe that we have the possibility of production
15 from the north. Presently there are two producing wells
16 within the Humble City-Strawn Pool developing production
17 from other Strawn zones which I have designated as the
18 Strawn Bank B and the Strawn Bank C to the north.

19 I think this is substantiated by the production in
20 the Lovington Northeast and the Lovington East Pool
21 area where we pick up these two zones as they move to
22 the north edge of the Strawn B' Bank trend. So I feel
23 that we could establish production to the north of the
24 trend as outlined.

25 Q Do you have anything else to comment on insofar as

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Exhibits 1 and 1-A are concerned?

A I believe that's all that I have -- there is a specific point I would like to bring out in summary. I believe there are three different banks or reefs within the Pennsylvanian-Strawn formation in the mapped area. The Humble City-Strawn Pool and the Lovington East Strawn Pools are producing from separate stratigraphic controlled traps within the Strawn B' zone. This is evidenced by the Strawn structural position of the Humble City-Strawn Pool relative to the Lovington East Pool.

Only one well is still being produced by pumping in the Lovington East Pool, as compared to two in the Humble City-Strawn Pool.

The proposed pool outlined, I believe, is a reasonable outline which allows for shifting of the primary Strawn Bank trend plus the possible development within additional Strawn zones.

In my opinion, 160 acre spacing will not lead to unnecessary dry holes as compared to 80 acre spacing because of the flexibility within 160 acre spacing units as proposed by Pubco.

The Lovington East Pool was, for all practical purposes, drilled on 160 acre spacing with a minimum of dry holes and considering the fields within southeast New Mexico, specifically the Husk field, were developed

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1 on 160 acre spacing and, in my opinion, the character
2 of the rock encountered in the area indicates that one
3 well will adequately drain 160 acres.

4 Q In that connection, Mr. Causey, let me call your
5 attention to the Lovington East area and those three
6 wells that you included in your cross-section, two of
7 which are within Section 5 and one being in Section 4.
8 Those wells actually appear to be drilled on 160
9 acre spacing; is that correct?

10 A That is correct, for all practical purposes, they were.

11 Q And they have produced to abandonment?

12 A That is correct.

13 Q Let me know refer you to Exhibit 1-B, what is the purpose
14 of this Exhibit?

15 A Exhibit 1-B is a reduced copy of the logs on the Harding
16 Oil Company Shipp Number 1, in Section 11, Township
17 17 South, Range 37 East, and a porosity log of the Pubco
18 Shipp Number 2. This Exhibit shows the Strawn section
19 encountered in these two wells, and our correlation
20 of the Strawn B' Bank relative to the top of the Strawn
21 middle and lower sections and the top of the Pennsylvanian-
22 Atoka.

23 Q Does Exhibit 1-B correspond scale-wise with the logs
24 shown on Exhibit 1-A?

25 A Yes, it is approximately the same scale as the

1 cross-section, A to A' and B to B' for comparison
2 purposes.

3 Q Do you have anything else, Mr. Causey, at this time?

4 A That's all.

5 MR. SPERLING: That is all the testimony we have
6 from this witness right now.

7 * * * * *

8 CROSS-EXAMINATION

9 BY MR. HINKLE:

10 Q Mr. Causey, I notice that you have labeled Exhibit 1-A
11 as a stratigraphic cross-section, now, is it your
12 position that this entire area is stratigraphic and not
13 dependent on structure?

14 A I believe the Strawn is primarily stratigraphically
15 controled.

16 Q Now, you have labeled here three different Strawn
17 banks, the Strawn Bank B', the Strawn Bank B, and the
18 Strawn Bank C, are those stratigraphic traps within the
19 stratigraphic Strawn area?

20 A I believe that they are, although I have not mapped
21 in detail in terms of trends, bank trends, of the Strawn
22 B and Strawn C banks. All evidence, however, indicates
23 that they are.

24 Q In your opinion, is there communication between these
25 banks?

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- 1 A In general, I would say no, however, I will qualify
2 that by saying that one well in Section 32, Township 16
3 South, Range 37 East, was drilled and completed from
4 the Strawn B' and the Strawn C Bank. It is possible in
5 a case such as this, that those two banks could be
6 in communication.
- 7 Q Each bank could be a separate pool, you might say?
- 8 A Yes, I believe, in a general sense, they are.
- 9 Q Generally, they probably would be?
- 10 A Yes.
- 11 Q Now, you can go from one bank to another and you could
12 have a dry hole offsetting another one; could you not?
- 13 A That is correct.
- 14 Q Are you apt to have more dry holes in 160 acre spacing
15 than you would have in 80 acre spacing?
- 16 A If we look at the analogy that we have in the Lovington
17 East pool, I think we can say from that development that
18 that pool on 160 acre spacing was not more risky than
19 it would have been on 80 acre spacing.
- 20 Q Is that your opinion of this area, the Humble City-Strawn
21 area?
- 22 A Yes, it is.
- 23 Q Now, referring to Exhibit Number 1, you have outlined
24 the proposed Humble City-Strawn Pool?
- 25 A Yes.

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- 1 Q What control did you figure for the boundaries of this
2 pool?
3 A Well, I think it is obvious that only drilling is
4 going to determine the exact boundaries of the field.
5 Q These are just arbitrary boundaries that you have
6 drawn?
7 A This interpretation was based on the one discovery
8 well which was drilled and has held up reasonably well
9 to date. We feel that these are approximately correct,
10 but this outline would allow minor shifting of the bank
11 either to the north or the south as the field is developed.
12 Q Well, with the trend that you have shown here, your
13 best chance at production is within the dotted green
14 lines, the broken lines (indicating)?
15 A With the information that we have today, but we realize
16 that it can shift.
17 Q Have you made any reservoir studies of the area at the
18 present time?
19 A No, I have not.
20 MR. SPERLING: We have a witness that has.
21 Q (By Mr. Hinkle) Now, if the Commission were to approve
22 160 acre spacing, the Number 1 Well in Section 11 which
23 is in the SW/4 would have the SW/4 dedicated to that
24 well; is that right?
25 A Yes, that is correct.

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- 1 Q And the SE/4 would be dedicated to your well?
- 2 A That is correct.
- 3 Q Now, you are drilling, as I understand it, a well which
- 4 is indicated in the NW/4; is that right?
- 5 A That is correct.
- 6 Q What is the other location there, the location of the
- 7 Harding well?
- 8 A This is Harding's second location (indicating).
- 9 Q This is going to result in a 40 acre location, you
- 10 might say, at the present time; is it not?
- 11 A As it is spaced at the present time, on these four
- 12 wells, it would be (indicating).
- 13 Q What is the exact location of your well Number 2, which
- 14 is located in the SE/4 of Section 11?
- 15 A The Pubco Number 2 Shipp is located 2,130 feet from the
- 16 east line and 1,980 feet from the south line.
- 17 Q 1,980 feet from the south line?
- 18 A Correct.
- 19 Q Now, if you had located that in the center of the NW of
- 20 the SE/4, it would be 660 feet from the east-west line
- 21 of that quarter; would it not?
- 22 A Would you repeat that?
- 23 Q If your Number 2 well had been located in the center of
- 24 the NW of the SE/4 of Section 11, it would have been 660
- 25 feet from the east line of the quarter Section, would it

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1 not have been?

2 A Yes, I believe that is correct.

3 Q Now, since you located it where you did -- you located
4 it 150 feet farther west to get closer to the Number 1
5 Well; did you not?

6 A Well, in the absence of any established pool spacing
7 rules, we went on the 40 acre state-wide spacing.

8 Q You got as close as you could to the discovery well;
9 is that right?

10 A Yes, basically, that is right.

11 Q Isn't the same true of your well that you are drilling
12 now in the NW/4 of Section 11, you got as close as you
13 could there too; did you not?

14 A Yes, I believe we did. Yes, that is correct.

15 Q Now, are you going to have a plat here?

16 MR. SPERLING: Yes.

17 Q (By Mr. Hinkle) At the time you located these two
18 wells, did you have in mind wider spacing than 40 acres?

19 A Yes, we did.

20 Q Why did you locate -- why didn't you step out and
21 locate it farther away if you thought one well would
22 drain 160 acres?

23 A Well, I think we took the course of action that most
24 people would take in that, without established pool
25 rules, we moved it as close as we could to the

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- 1 discovery well until such time as spacing rules could
2 be established.
- 3 Q Now, if the Commission should approve 160 acre spacing
4 in this area, and as I understand it, you are asking for
5 permission to drill in any 40 acre component of 160
6 acres; is that correct?
- 7 A That is correct.
- 8 Q Would that not result in the same situation that you
9 have here? You have four wells located together, as
10 you go to the next area, aren't you apt to have your
11 offset wells in the same way?
- 12 A That is possible, but you would also, of course, have
13 160 acres to drain.
- 14 Q It might depend somewhat on the ownership of the acreage;
15 would it not?
- 16 A Well, it would probably depend on numerous factors.
- 17 Q But you might have this reoccur?
- 18 A This is possible.
- 19 Q It is a possibility?
- 20 A Yes.
- 21 Q So you have four wells together and that would mean
22 you would step out considerably and it could mean if
23 you stepped out that far, that you might get a dry
24 hole because of the stratographic situation?
- 25 A Certainly anytime you drill a well you run the risk of

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1 getting a dry hole, but the flexibility within 160
2 acre spacing would give you -- I think it would reduce
3 your dry hole risk when the field is developed and we
4 obtain more datum to determine the next location.

5 MR. HINKLE: Do you have a witness that will refer
6 to core analyses?

7 MR. SPERLING: Yes.

8 MR. HINKLE: I think that's all.

9 MR. UTZ: Any further questions?

10 (No response.)

11 * * * * *

12 CROSS EXAMINATION

13 BY MR. UTZ:

14 Q Mr. Causey, I have one or two questions.

15 This large -- or heavy dotted green line, do you
16 consider that to be the trend of the Strawn zone
17 throughout the three pools?

18 A That is correct, that is my interpretation of the
19 Strawn Bank B'.

20 Q Would you give me the control information?

21 A All right, starting in Section 11 of Township 17 --

22 Q Why don't you just limit yourself to the area in
23 question -- well, go ahead and give me whatever you want.

24 A In Section 11, Township 17 South, Range 37 East, we
25 have two control points. In Section 6 of 17 South, 38

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1 East, we have four control points. Those are the
2 control points in the approximate SE/4 of the map area.

3 Q Can you give me anything over in the area of 17 South,
4 36 East?

5 A Yes, we have one well in Section 36, excuse me, Section
6 1 of 17 South, 36 East. It is the extreme western well
7 on our B' cross-section.

8 Q What Section?

9 A Section 1. There are also three control points in
10 Section 12 of Township 17 South, Range 36 East. The
11 control points are circled with larger circles and the
12 values underlined in green are the values of the thickness
13 of the B'.

14 There is also a control point in Section 6 of 17
15 South, 37 East.

16 Q Did you give me one for Section 33?

17 A Section 33 of 16 South, 37 East is not deep enough, it
18 has not been penetrated to the Strawn.

19 Q So you are a little short in control in the areas of
20 Sections 33 and 32, all the way down to Section 6 of
21 17 South, 37 East?

22 A Would you repeat that area again?

23 Q Well, beginning in Sections 32 and 33 of 16 South,
24 37 East, the north boundaries of your control. I mean
25 your green line goes over to Section 6 of 17 South,

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1 37 East. You are a little short in control at that
2 point; aren't you?

3 A Yes.

4 Q Now, I believe they were called blue, I'm a little
5 color-blind, obviously, because they look more green
6 to me. I think on your contour surrounding Section 11,
7 that your control on that isn't too good. Is that your
8 control on the wells in Section 11?

9 A That is correct, but I might point out that the
10 interpretation of the Bank B' was projected at greater
11 than 50 feet and in this location, we encountered the
12 discovery well at 64 feet and the Pubco Number 2 was
13 encountered at 35 feet.

14 Q Both these wells are only completed in your B' zone?

15 A That is correct.

16 Q The one that you designated as B'?

17 A Right.

18 Q Were the other zones tested?

19 A We did not have any pore spaces at equivalent intervals
20 of the other two banks of the zone.

21 MR. UTZ: Does anyone have any further questions?

22 * * * * *

23 CROSS-EXAMINATION

24 BY MR. HINKLE:

25 Q In your previous testimony, Mr. Causey, you indicated

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1 that the wells which were drilled in Sections 4 and 5
2 could be considered as being on 160 acre spacing. Now,
3 isn't it true also that that is a perfect location for
4 80 acre spacing because each one is located at the west
5 end of 80 acres?

6 A That is correct, but also, the spacing between them
7 would have to be taken into consideration.

8 Q Is it not true then that they could be either?

9 A That is correct, but for practical purposes and drainage
10 purposes, I believe 160 acres would be more applicable.

11 Q You indicated in your last testimony that you used the
12 wells in Section 11, the discovery well and the well
13 Pubco has drilled, for your control. Now, isn't it
14 true that you gave this same geological map to the
15 Harding Oil Company, or the individual that you gave
16 this information out to, and they drilled a well on the
17 strength of this geology?

18 A That is correct, they drilled on this interpretation.

19 Q So, actually, these wells were not used as control
20 points in preparing this plat?

21 A In the original interpretation, that is correct.

22 MR. HINKLE: I might say that our Exhibits are
23 substantially the same as this and they were obtained from
24 Pubco.

25 MR. UTZ: It was mentioned, on Cross-Examination,

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1 - that the area was farmed out by Pubco, is the farm-out
2 on an 80 acre checkerboard?

3 MR. SPERLING: That, as yet, is undetermined. There
4 seems to be some ambiguity in the contract.

5 MR. HINKLE: We will have some testimony on that.

6 MR. UTZ: Any further questions?

7 (No response.)

8 MR. UTZ: The witness may be excused.

9 (Witness excused.)

10 * * * * *

11 CHARLES SANDERS,

12 was called as a witness and, having already been duly sworn,
13 testified as follows:

14 DIRECT EXAMINATION

15 BY MR. SPERLING:

16 Q Please state your name.

17 A Charles Sanders.

18 Q Where do you live, Mr. Sanders?

19 A Albuquerque.

20 Q By whom are you employed and in what capacity?

21 A I am employed by Pubco Petroleum Corporation as a
22 petroleum engineer.

23 Q Have you, on any previous occasion, testified before the
24 Commission so that your qualifications as a petroleum
25 engineer, are a matter of record?

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1 A No, I have not.

2 Q In that event, would you please briefly outline your
3 education and professional training and experience
4 qualifying you as a petroleum engineer?

5 A I graduated from Texas Technology College in 1950 with
6 a B.S. in Petroleum Engineering. Subsequently I worked
7 for three years for the Texas Pacific Coal and Oil
8 Company in the north-central Texas area and later as
9 assistant division manager for the same company. I
10 then worked for sixteen years in west Texas and northwest
11 New Mexico as a reservoir engineer.

12 Q Are you a registered professional engineer?

13 A In the State of Texas, yes.

14 Q How long have you been with Pubco?

15 A For three years.

16 Q Are you familiar with the area which is the subject of
17 this Application, Mr. Sanders?

18 A Yes, I am.

19 Q Would you please refer to what has been identified as
20 Exhibit 2, please? Tell us what that Exhibit is.

21 A Exhibit 2 is a land ownership map of the proposed
22 Humble City-Strawn Pool and the surrounding area. It
23 primarily shows the land ownership of the proposed pool
24 and also shows a partial outline of the Lovington East
25 field.

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1 Q And, of course, shows the two wells located within the
2 proposed Humble City-Strawn Pool area that have been
3 completed?

4 A Yes, sir, including the Number 3 Shipp -- the Pubco
5 Number 3 Shipp which is now being drilled in the NE of
6 Section 11.

7 Q Now, would you refer, please, to what has been marked
8 as Exhibit Number 3 and tell us the purpose of that
9 Exhibit and what it shows?

10 A Exhibit 3 is a tabulation of the well and completion
11 data for the two wells now existing in the Humble City-
12 Strawn Pool, the Harding Oil and Gas Company Shipp Number
13 1 and the Pubco Petroleum Corporation Shipp Number 2.
14 The location of the Harding well is 2,060 feet from the
15 west line and 2,310 feet from the south line in 17 South,
16 37 East, Section 11.

17 The Pubco Petroleum Corporation Shipp Number 2 is
18 2,130 feet from the east line and 1,980 feet from the
19 south line of Section 11.

20 The total depth of the Harding well is 11,643
21 feet and the total depth of the Pubco well is 11,685.

22 The next significant figure is the completion
23 dates and these are March 9th for the Harding Shipp Number
24 1 and June 10th, 1972 for the Pubco Shipp Number 2.

25 The perforated intervals for the two wells are

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1 shown. The Harding well perforation is to an interval
2 of 32 feet and the Pubco well to 26 feet. The Harding
3 Oil and Gas Company Shipp Number 1 had a potential
4 originally, of 286 barrels of oil per day with a gas-oil
5 ratio of 1,000 and a flowing tube pressure of 16.

6 The well's repotential on April 18, 1972, was
7 624 barrels of oil with a gas-oil ratio of 1,098 and
8 a flowing tube pressure of 55.

9 On June 10, 1972, it was producing 2,758 barrels
10 of oil per day with a GOR of 1,662 and a flowing tube
11 pressure of 700 pounds.

12 The oil gravity is essentially the same in both
13 wells, approximately 45 degrees API. The net pay of
14 the Harding well was 34 feet and the net pay of the
15 Pubco was 30 feet.

16 The average porosity which we determined on the
17 Harding well was 5.1 percent and 6.30 percent for the
18 Pubco Number 2. The permeability was not determined
19 for the Harding well and in the Pubco Shipp Number 2,
20 it averaged 20 millidarcys.

21 The water saturation was determined to be 25 percent
22 in both wells.

23 The reservoir pressure was 4,800 PSI in the Harding
24 Well and 3,743 PSI in the Pubco well.

25 Q Would you refer to Exhibit 4 now and explain what it shows?

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A Exhibit Number 4 is a gamma-ray neutron log run on the Pubco Shipp Number 2. On the left side of the log we see the top of the Strawn and the middle lower zone at 11,425 feet. The left-hand corner of the top shows the Atoka at 11,664 feet.

The interval between is referred to as the Strawn limestone.

The vertical column on the left side is the depth column interval for the Pubco Shipp Number 2. The significant factor on this test was the rate of production which flowed and there was no water recovered.

The shut-in bottom hole pressure was 7,633 and the final maximum pressure was 3,473 which was reached in ten minutes and continued at 3,473 for the remainder of the 90 minute shut-in test.

At the bottom of Exhibit 4, we show the porosity scale for the sidewall neutron porosity log on a standard scale. We have used this scale in determining the net amount of pay in the Pubco well.

In the upper interval, we have a net pay of 11,430 feet down to 11,453 feet, or a total of 23 feet in which that maximum porosity was reached.

In the lower interval, we had 7 feet from 11,463 to 11,470. The total amount of net pay therefore, was 30 feet and the average log porosity was determined to

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1 be 6.30 percent or 189 porosity feet.

2 I would like to point out, at this time, that
3 we will refer to the analysis data later, but the core
4 analysis showed a net pay of 29.1 feet with an average
5 of 6.0 porosity. The log porosity at the same interval
6 calculated 5.92 percent, so we do have real close
7 agreement between the log porosity and the core
8 proosity.

9 Q Anything else on Exhibit 4 at this time?

10 A I believe that's all.

11 Q Now, referring you to what has been marked as Exhibit 4-A,
12 would you explain what that is?

13 A Exhibit 4-A is a gammaray neutron log run on the
14 Harding Oil and Gas Company Shipp Number 1 Well. The
15 left side of the gammaray is the top of the Strawn
16 which is 11,430 feet and the top of the Atoka. The
17 zone was perforated at 11,420 to 11,452. The rectangular
18 box represents the drill stem test from 11,420 to 11,475.
19 The maximum shut-in bottom hole pressure on the test was
20 4,800 PSI which we assumed to be the original sealed
21 bottom hole pressure.

22 Q And the pressure confirms your tabulation as shown on
23 Exhibit 3 of the initial bottom hole pressure?

24 A Yes, sir.

25 In the lower left-hand corner, you will find the

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1 porosity scale which was found to be correlative with
2 the core porosity and the porosity that was used in
3 determining the net feet of pay for this well. This
4 scale was not used because we felt it gave an
5 unrealistic porosity value, so the other scale was
6 used and it was determined that there was 28 feet of
7 net pay within the perforated interval and 6 feet of
8 net pay below the perforated interval for a total of
9 34 feet of net pay with an average porosity of 5.1
10 percent, or 173.4 porosity feet.

11 Q Any other comments on Exhibit 4, at this time?

12 A I might point out that if the standard porosity scale
13 had been used, the average porosity would have been
14 3.6 percent.

15 Q Will you refer to Exhibit Number 5 now, and tell us
16 what it represents?

17 A Exhibit 5 is the bottom hole pressure for the field
18 versus the field's accumulated production. The vertical
19 scale on the left-hand side is the bottom hole pressure
20 and this represents the total production from the field
21 from both wells.

22 I should point out that there is very little
23 production represented by this graph attributable to the
24 Pubco well because it was completed at a point where
25 the arrow is shown on the graph.

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- 1 Q The middle of the graph?
- 2 A Yes.
- 3 Q The vertical arrow pointing upward?
- 4 A Yes. Point Number 1 in the upper left-hand corner
- 5 represents the original bottom hole pressure of 4,800 PSI
- 6 which was taken from the drill stem test of the Harding
- 7 Number 2.
- 8 With the buildup of pressure in the Harding well,
- 9 the pressure reached 4,185 PSI in two hours, and 4,188
- 10 PSI in 12 hours, and continued at 4,188 PSI for the
- 11 remainder of the 48 hour test.
- 12 Point Number 3 was taken May 15, 1972 and showed
- 13 an accumulated production of 23,233 barrels of oil.
- 14 This represented all that had been produced from the
- 15 Shipp Number 1.
- 16 On the Pubco Shipp Number 2, the pressure obtained
- 17 was 3,473 PSI and the maximum pressure was obtained in
- 18 10 minutes on the chart and continued at 3,473 PSI for
- 19 the remainder of the test and that was the maximum
- 20 pressure obtained..
- 21 Point Number 4 was taken June 15, 1972, at a point
- 22 of 38,475 barrels of oil which represented accumulated
- 23 production. This pressure point recorded a maximum
- 24 bottom hole pressure of 3,035 PSI and it was reached
- 25 in 12 minutes. The pressure of 3,035 continued for the

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1 remainder of the 12 hour shut-in period.

2 Point Number 4 included 2,662 barrels of oil
3 produced from the Pubco Shipp Number 2 during the
4 completion procedure.

5 On the bottom of the Exhibit is a map of both of
6 the wells. At the center of the circle is the Harding
7 Shipp Number 1 and at the edge of the circle is the
8 Pubco Shipp Number 2. This shows the distance between
9 the two wells as being 1,120 feet.

10 In my opinion, it is logical to infer from the
11 graph that effective drainage did occur over this distance
12 of 1,120 feet. From the circle the radius we obtained
13 was an area of 90.4 acres which, in our opinion,
14 represented that the well will drain at least 90.4 acres.

15 So, in conclusion, I would like to make these
16 points. One, that there was a severe pressure loss of
17 1,767 pounds in the Pubco Shipp Number 2 which resulted
18 primarily from the production from the Harding Shipp
19 Number 1. Number two, that communication apparently
20 exists in the Strawn formation between these two wells.

21 Number three, that the shape of the curve is the
22 shape of a normal pressure decline curve. Number four,
23 that we have here effective drainage in excess of
24 1,020 feet -- or in excess of 90.4 acres.

25 I would like to point out, at this time, that while

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1 we were completing our well on June 10, 1972, we started
2 flowing our well at a rate of 758 barrels of oil per
3 day with a tube pressure of 700 PSI. At the same time,
4 the Harding Shipp Number 1 had a pressure of 700 PSI.
5 The next morning, the Harding pumper came over to our
6 rig where we were working and asked us if we had any
7 idea what happened to the well. We asked him what
8 happened and he said it lost 50 pounds of pressure
9 overnight. After we checked the pressure, we knew the
10 pressure had declined from 700 pounds to 650 pounds
11 overnight.

12 Of course, our reply to this was that we had
13 completed our well and it was draining oil from the
14 same formation.

15 Q Anything else at this time, with reference to Exhibit 5?

16 A I believe that's all.

17 Q Now, if you will refer to what has been marked as
18 Exhibit 6 and explain what that is.

19 A Exhibit 6 is a report from Core Laboratories, Inc. on
20 the core analysis of the cores cut from the Pubco Shipp
21 Number 2. The first core is from 11,440 to 11,481 and
22 core number 2 is from 11,481 to 11,491. The report
23 gives an analysis on the interval from 11,440 to 11,491.

24 The second sheet of this Exhibit is a summary
25 of their findings. You will notice there that it is

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1 indicated that there is 21.9 feet of pay which was
2 included in the averages for the pay porosity and this
3 21.9 feet occurred at an interval of 11,440 to 11,467.
4 The top ten feet of the pay zone was not cored and the
5 average porosity over 21.9 feet was determined to be
6 6.0 percent. As I pointed out previously, the average
7 sidewall neutron porosity over the cored pay interval
8 was 5.92 percent.

9 The other significant factor I would like to point
10 out is the calculated maximum gas drive recovery of 30
11 barrels an acre-foot. When we received the report, we
12 felt this was low and after doing some calculations,
13 on 80 acres, we were definitely concerned enough to take
14 bottom hole pressures of the formation and have the
15 samples analyzed at the laboratory and this will be our
16 next Exhibit.

17 Q You are referring to Exhibit Number 6-A?

18 A Yes, sir.

19 Q If you will explain that, please.

20 A Exhibit Number 6-A is a summary of the reservoir
21 sample analyses performed by Core Laboratories, Inc.
22 The well was sampled and this bottom hole sample was
23 obtained at a mid-point in the pay zone at a depth of
24 11,449 feet on June 19, 1972. At that point, the
25 bottom hole pressure was 3,033 PSI and the accumulated

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1 field production, 38,475 barrels of oil. This summary
2 presents the comparison between 80 acre spacing and
3 160 acre spacing utilizing the data from the fluid samples
4 and also from the previous core analyses. The first
5 figure shows an average porosity of 6.3 percent. This
6 was determined from the sidewall neutron porosity log
7 that I have previously mentioned. The next figure I
8 would like to point out is the 25.0 percent average
9 interstitial water saturation percentage. I will now
10 skip down to the 16.76 percent ultimate oil recovery,
11 percentage of oil in place.

12 These two figures, the 25 percent for the average
13 interstitial water saturation and the 16.76 percent
14 for ultimate oil recovery were calculated using the
15 pressure data and the curves from the Strawn limestone
16 reservoir. We felt these were applicable and by these
17 and using the fluid data obtained from our Shipp Number
18 2 Well and the bottom hole samples, these factors were
19 determined.

20 The oil formation volume was determined to be
21 1.642 and the original oil in place for 160 acre spacing
22 was 1,071,568 barrels of oil.

23 For 80 acre spacing it was 535,783 barrels of oil.

24 The ultimate recovery for 160 acre spacing was
25 179,630 barrels and for 80 acre spacing it was 89,815

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1 barrels. The ultimate oil recovery on barrels per
2 acre-foot was determined to be 37.4 in each case.

3 The ultimate gas recovery was 953,577 MCF for
4 160 acre spacing and 476,788 MCF for 80 acre spacing.

5 The total primary producing life for 160 acre
6 spacing was 11.8 years and for 80 acre spacing it was
7 5.9 years. The primary producing life was taken from
8 the economic limits of barrels of oil per day from the
9 reservoir and a pressure of 500 PSI to arrive at that
10 figure.

11 In arriving at the figure, it was assumed that
12 productivity would decline in accordance with the effect
13 of increasing reservoir gas saturation or oil permeability.

14 I have reviewed all of the Core Laboratory reports
15 and determined them to be accurate and correct.

16 Q Now, based upon this information, do you think -- you
17 just said that you determined them to be accurate and
18 correct?

19 A Yes.

20 Q Based upon this information, do you think the volumetric
21 calculations are correct?

22 A Yes.

23 Q As reflected on Exhibit 7?

24 A That's right. Exhibit 7 shows the computation of the
25 recoverable oil reserves from the Humble City-Strawn Pool

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1 using the basic data as used in the computations

2 already presented and established. The average porosity
3 used was 6.30 percent which was the porosity found on the
4 Pubco well with an average net pay of 30 feet. The
5 water saturation was 25 percent and the recoverable
6 factor 16.76 percent.

7 The formation volume factor of the original bottom
8 hole pressure was 1.642. The calculations show the
9 original recoverable oil in barrels per acre-foot and
10 according to the formula it was determined to be 37.4
11 barrels of oil per acre-foot which, of course, is the
12 same figure that the Core Laboratories determined.

13 Q Based upon the computation which you have just gone
14 through relating to recoverable oil, did you then make
15 a study of the economics with reference to the proposed
16 spacing units, that is, with respect to 80 acre spacing
17 and 160 acre spacing?

18 A Yes, I did.

19 Q And that study is reflected on Exhibit 8?

20 A That is correct.

21 Q Would you explain that, please?

22 A Exhibit 8 is a tabulation of the economics for the
23 Humble City-Strawn Pool, comparing 80 acre spacing to
24 160 acre spacing. Under revenue for an average well,
25 an 80 acre well would produce 89,815 barrels of oil,

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1 a figure which has already been established, at \$3.56
2 per barrel plus 476,793 MCF of gas per well at \$0.25
3 per MCF.

4 We included the gas economics in the computation
5 because Phillips is now laying gas lines to the lease
6 and contracts have been signed and gas sales should
7 begin sometime within the next week.

8 So, this came up to a total revenue under 80
9 acre spacing of \$438,938.

10 Under 160 acre spacing, the average well would
11 produce 179,630 barrels of oil per well at \$3.56 per
12 barrel plus 953,577 MCF of gas for a total revenue of
13 \$877,877. Subtracting the royalty and taxes, we have
14 a total revenue under 80 acre spacing per well of
15 \$325,472. Under 160 acre spacing, we have a total of
16 \$653,946.

17 The next item is expenses, which is self-explanatory.
18 Total expenses on an 80 acre well would be \$295,400 and
19 for a 160 acre well, the total expenses would be \$330,800.

20 The next item is the net profit resulting from
21 subtracting the total expenses from the total revenue
22 and the net profit for an 80 acre well would be \$30,072
23 and for a 160 acre well it would be \$320,146.

24 The profit to investment ratio, is 0.12 on 80 acre
25 spacing and 1.27 on 160 acre spacing.

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1 Down at the bottom of the Exhibit is a note that
2 the analysis does not consider any dry holes that may
3 be drilled. Estimated dry hole cost if \$162,000.

4 On the basis of these calculations, a producer on
5 160 acre spacing will support two dry holes while it
6 will take five times the net profit on 80 acre spacing
7 to support one dry hole.

8 I would like now to refer back to Exhibit 1 in
9 connection with our economics and I will state again for
10 the purpose of comparison, that the rate of recovery
11 for 80 acre spacing is calculated at 89,815 barrels,
12 while the recovery for 160 acre spacing was calculated
13 at 476,788 barrels.

14 If you would refer to Exhibit 1, the wells are
15 colored in green to the NW of the Pubco Well and the
16 Harding Well. In Sections 4, 5, and 6 of Township 17
17 South, Range 37 East, versus the wells in Section 5 in
18 the NW corner, shows the total recovery from the B'
19 zone, the same zone that the Harding and Pubco wells are
20 in, to be 60,297 barrels. This won't appear on your
21 graph because our draftsman forgot it.

22 The next well in Section 5, in the NE/4 of Section
23 5, shows a total of 58,751 barrels of oil recovered.

24 The next well in the NW/4 of Section 5 shows a total
25 recovery of 19,647 barrels of oil. These three wells

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1 have all been plugged and abandoned.

2 The well in the SE/4 of Section 32 shows an ultimate
3 recovery of 421,768 barrels. This ultimate recovery
4 was calculated from extrapolation of production history.
5 However, it has to be pointed out that recovery from the
6 well is from both the B' and the C zone, so we do not
7 feel that it is really comparative with the B zone
8 wells, further up on the map.

9 In Section 31, close to the center, we have a well
10 there in the NW/4, in the SE corner of the NW/4, which
11 had produced a total of 17,040 barrels of oil before it
12 was abandoned. Then, about two miles north, in Section
13 19, 37 East, 16 South, in the SW/4 of the Section, we
14 have a well which produced over 100,000 barrels from
15 the B' zone. The well produced a total of 132,597
16 barrels of oil. This well is still producing at a rate
17 of 7 barrels a day.

18 To the left of that, just across the Section line
19 in Section 24, 36 East, 16 South, this well produced a
20 total of 4,115 barrels of oil from the B' zone. North
21 of that, in Section 18, the SE/4 of Section 18, we have
22 a well which is still producing 29 barrels of oil per
23 day.

24 My point here is we have only one well producing
25 from the B' zone which has produced in excess of 100,000

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1 barrels of oil. This would indicate that these would
2 be economic failures in as much as one well on 80 acre
3 spacing would produce, as we have calculated, 89,815
4 barrels of oil. It is easy to see how four good wells
5 would be required to support one dry hole and these
6 other wells I have been talking about, must be economic
7 failures.

8 In conclusion, I would like to make three points.
9 First, it is our opinion that one well will effectively,
10 efficiently, and economically drain 160 acres. Two,
11 it is my opinion that 160 acre spacing will permit the
12 drilling of economic wells whereas we have presented
13 information here establishing the fact that 80 acre
14 spacing will result in the drilling of unnecessary and
15 uneconomic wells. Three, it is my opinion that 160 acre
16 spacing development of the Humble City-Strawn reservoir
17 will insure the operators that they can obtain profits
18 even though some dry holes will undoubtedly result,
19 regardless of the spacing which may be chosen.

20 Q Do you have anything further, Mr. Sanders?

21 A No, sir.

22 MR. SPERLING: I would like to offer our Exhibits
23 1 through 8.

24 MR. UTZ: Exhibits 1 through 8 will be entered
25 into the record of this case.

1 (Whereupon, Pubco's Exhibits 1 through 8
2 were entered in evidence.

3 MR. SPERLING: I have nothing further.

4 * * * * *

5 CROSS-EXAMINATION

6 BY MR. HINKLE:

7 Q Mr. Sanders, I refer you to your Exhibit Number 5, I
8 don't believe that you testified how long your well
9 Number 2 was shut-in at point number 4. Do you know
10 how long it was shut-in?

11 A Yes, 12 hours.

12 Q Now, in connection with Exhibit 5, I believe you said
13 that this showed a severe pressure loss?

14 A Yes, sir.

15 Q And that this indicated good drainage between the
16 two wells?

17 A That is correct.

18 Q Isn't it also indicative of a limited reservoir?

19 A Naturally, any reservoir is limited.

20 Q I mean a small reservoir. Doesn't it indicate that this
21 is a small reservoir rather than a large reservoir?

22 A Such could be an indication, however, it also, as I
23 believe our testimony has indicated, shows that this
24 is an extremely permeable section in the vicinity of our
25 well and your well and that such permeability gives real

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- 1 good pressure communication between the wells whereas
2 in a real tight reservoir, often times you reach 90
3 to 95 percent bottom hole pressure within the first
4 100 feet from the well bore under producing conditions.
5 Q well, you had this pressure drop when you located your
6 Number 3 well, did you not?
7 A No.
8 Q You didn't have it at all?
9 A No, sir.
10 Q You knew it was dropping when you drilled the Number 2
11 well?
12 A Yes, we had access to Harding information.
13 Q But you didn't take that into consideration in
14 locating your well as close to the Number 1 well as you
15 did?
16 A No. I think, as Mr. Causey pointed out, the geology
17 of the situation required that in a new area we locate
18 as close to production as possible within the limits
19 of the statutes of the State.
20 Q Referring to your Exhibit Number 8, your economic study,
21 now, doesn't this study that you have made in comparing
22 80 acre spacing to 160 acre spacing, take into consideration
23 or assume that this is a large reservoir?
24 A Well, the only assumption we made here is that a 160
25 acre well would have the full 160 acres to develop

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1 porosities of the qualities we have shown.

2 MR. HINKLE: I think that's all I have.

3 MR. UTZ: Any further questions?

4 (No response.)

5 MR. UTZ: The witness may be excused.

6 (Witness excused.)

7 MR. UTZ: Does that conclude your Case, Mr. Sperling?

8 MR. SPERLING: Yes.

9 MR. UTZ: You're on, Mr. Hinkle.

10 * * * * *

11 RICHARD F. SPENCER,

12 was called as a witness and, having been already duly sworn,
13 testified as follows:

14 DIRECT EXAMINATION

15 BY MR. HINKLE:

16 Q Will you state your name, residence, and occupation?

17 A My name is Richard Spencer, I live in Midland, Texas,
18 and my occupation is an independent consulting geologist.

19 Q Have you previously testified before the New Mexico
20 Oil Conservation Commission?

21 A No, I have not.

22 Q Would you state, briefly, your educational background
23 and experience as a geologist?

24 A I am a graduate geologist of Texas Tech. I have 14 years
25 experience, including working with Pan American Petroleum.

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1 I am a certified petroleum geologist.

2 Q What companies have you been with prior to becoming
3 an independent consulting geologist?

4 A Well, I stated Pan American, Forester, and I have been
5 self-employed for a year and a half.

6 Q Are you familiar with this area under consideration?

7 A Yes.

8 Q And the pools in the vicinity?

9 A Yes.

10 Q The NE and East Lovington pools?

11 A I am very familiar with them.

12 Q And have you made studies of the well information
13 available in connection with this?

14 A Yes, my partner and I worked the area in some detail
15 sometime after the Pubco Shipp Number 1 bottomed at
16 9,162 feet. After that well was bottomed, my partner
17 and I went to the Pubco Corporation, Oil Corporation, to
18 seek a farm-out because we felt this area was quite
19 representative of the Strawn and other zones.

20 MR. HINKLE: Are the witness' qualifications
21 acceptable?

22 MR. UTZ: Yes, they are.

23 Q (By Mr. Hinkle) Have you prepared, or has there been
24 prepared under your direction, certain Exhibits in this
25 Case?

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1 A That is correct.

2 Q And they have been marked?

3 A Yes.

4 Q Referring you to Exhibit 1, what does that show?

5 A Exhibit 1, as you can see before you Mr. Examiner, is
6 just a regional map. This map shows the outlined fields
7 with the Permian Basin area stratigraphically located.

8 Q Referring you to Exhibit 2, will you explain what that
9 is?

10 A Exhibit 2 is an isopach map of the B' Strawn facies. This
11 is the same zone Mr. Causey referred to earlier, I am
12 referring to the cross-section on the wall.

13 Q What Exhibit is that?

14 A That is Exhibit 3. We concur completely as to the
15 stratigraphic breakdown of the Strawn formation and
16 this map, Exhibit 2, represents the facies of the B'
17 Strawn within the local area. I might just point out
18 that the wells we have designated on the map, the
19 green designations, represent those wells that have
20 penetrated and have produced from the B' Strawn. The
21 blue designations are wells that have penetrated and
22 produced from the B Strawn bank facies. The orange
23 represents wells produced from the C bank facies.

24 The map is contoured on 25 foot contour intervals.

25 And the map also shows the location of the leases in

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1 in and around the Harding Shipp discovery well in
2 Section 11.

3 Also on this map, is shown an 80 acre checkerboard
4 on all the acreage Pubco has a leasehold interest within
5 the immediate area.

6 I will point out initially that in the SW/4 of
7 Section 11, where the discovery well is located, the
8 Harding Shipp Number 1 well, this well was penetrated
9 from 9,162 feet which was the total depth Pubco reached
10 in this well. This well was deepened from that point
11 down to a depth of 11,861 feet into the Atoka.

12 Under our contract arrangement, farm-out arrangement,
13 we were to deepen this test to a depth where we would
14 be 100 feet below the depth drilled and the acreage was
15 to be designated to the unit, whatever that unit would
16 happen to be, if it was 80 acres, it would be 80 acres.

17 On completion of the initial well, we would have
18 the option to drill a second test and all continuous
19 development would be on a 120 day continuous development.

20 Now, we are here today to set up -- to talk about
21 special pool rules for the Humble City-Strawn Pool
22 including provisions for 80 acre units and assignments
23 of all discovery allowables for the Shipp Well Number
24 1 located in unit K of Section 11, Township 17 South,
25 Range 37 East, Lea County, New Mexico.

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1 This pool arrangement on 80 acre spacing would
2 be similar to the Lovington NE and Lovington East field.

3 Q They are on 80 acre spacing; are they not?

4 A This is correct. In our initial discussions with
5 Pubco, this was taken into consideration and it was
6 felt that these would be the probable field rules for
7 the Humble City-Strawn pool.

8 Q Did your farm-out agreement provide for 80, 40, 160
9 acre spacing, whatever spacing unit was determined by
10 the Oil Conservation Commission?

11 A This is correct.

12 Q But the checkerboard which you show on Exhibit 2 indicates
13 the checkerboard prevailing under the farm-out agreement,
14 if the checkerboard showed 80 acre spacing and the Oil
15 Conservation Commission approved 80 acre spacing; is that
16 right?

17 A That is correct.

18 Q Now, I believe you said that you agreed with the cross-
19 section which Pubco has presented, it is the same as you
20 are presenting here?

21 A Yes.

22 Q Do you, by these different zones, indicate this is a
23 separate stratigraphic trap within the Strawn formation
24 or that there is communication between these two zones?

25 A In focusing our attention now on Exhibit 3 and Exhibit 4,

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1 they are exactly the same wells as Mr. Causey showed
2 on his cross-section with exactly the same designations.

3 I do definitely agree with Mr. Causey in that this is
4 a Strawn formation here. There are probably -- more
5 likely there is vertical separation between each of the
6 stratigraphic units, the B', B, and C, although these
7 units occur within two to three hundred feet intervals,
8 and were, more than likely, deposited under similar
9 environment. What we are saying here -- reaching back
10 here to Exhibit Number 2, you can see that these zones
11 are very erratic, of a very erratic nature, both
12 horizontally and vertically and you can see by the
13 blue designation on the map over here, that the B bank
14 facies is coming back to the south and west. This facies
15 disappears -- doesn't disappear, but the rock
16 characteristics change and you can see a number of dry
17 holes that have been affected in Sections 16, 17, and
18 20 in 16 South, 37 East, and the wells down here in
19 Section 19 and Section 24.

20 What I am saying here, is that each one of these
21 units, each one of these stratigraphic units, right in
22 here, affect the individual stratigraphic trap with no
23 particular emphasis being placed on the present day
24 structure.

25 The 160 acre spacing brought out by Pubco more than

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likely would have caused some of these zones not to be drained. As you can see from the dry holes in Sections 19 and 20, the three producing zones within the total Strawn unit are independent of one another. In essence, what I am saying, is that the Strawn being deposited from the same environmental deposition, does have, within it, individual stratigraphic traps that are very erratic and very difficult to find and this is why Pubco came so close to the initial discovery well. You can pick up new zones, productive, stratigraphic zones, that come and go over a very short period of time.

For instance, in the cross-section, A and A', between these two wells, the well right here (indicating) produces from B' facies and this well (indicating) produces from the C facies. These two wells are only 2,550 feet apart and it is very possible with 160 acre spacing, that one of those zones may have been missed, especially the C zone.

Q You could have a situation where, if you had 160 acre spacing, you might have one producing well and a good part of the 160 acres might be barren or have no production at all?

A Absolutely. You can see this in Section 20, 16 South, 37 East. Section 20's producing well is located down in the SW/4 of Section 20 and that particular well is

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1 producing from the B facies and it is surrounded by
2 dry holes. There are dry holes in Sections 29, 30,
3 19, and the one in Section 20. That particular well
4 has produced over 900,000 barrels of oil on 160
5 acre spacing and it is possible that that 900,000 barrels
6 of oil might have been missed.

7 Now, granted, this is not in the same zone and it
8 may be within 25 or 30 feet from the producing interval
9 of the Harding Shipp Well, but it is in the same suite
10 of rock deposits and under the same depositional
11 environment which we hope to find productive in the
12 general area of the discovery well.

13 Q I believe you mentioned previously, that your partnership
14 is Spencer and Hudson and you mentioned the fact that
15 you secured the farm-out from Pubco, what is your
16 relationship to the Harding Oil Company?

17 A Our relationship has been that we are geologists, and
18 we generate drilling prospects for companies such as
19 Harding. We have a good working relationship with
20 Harding. We offer consultation advice which we have
21 done from time to time over the last year, and this is
22 basically our relationship, primarily that of a
23 consultant.

24 Q You have made a deal with Harding Oil Company to
25 develop this area on the acreage you will obtain as a

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1 farm-out?

2 A From our farm-out agreement which was consummated on
3 November 5, 1971, with the Pubco Corporation. We later
4 got approval from the Pubco people to reassign our
5 rights to the Harding Oil Company and Harding assumed
6 our obligations and reentered this well and fulfilled
7 our obligations that we had under the contract.

8 Q So they are going ahead and performing in accordance
9 with the contract?

10 A This is correct.

11 Q Do you have anything else that you would like to
12 discuss?

13 A I would just like to point out, from a geological
14 standpoint here, that you can see, as I pointed out
15 before, in the SE/4 of Section 11, Pubco's two wells,
16 are as close as they legally can be. Also, they are
17 drilling the Number 3 well up in the NW/4 and our Number
18 2 well is in the NW/4.

19 This means there are four wells clustered together
20 and any well that would be drilled beyond these four
21 wells would be a considerable step out with 160 acre
22 spacing. Backing up to the well in Section 19, how
23 hazardous that would be as to picking up these individual
24 zones that might be carrying substantial amounts of oil.
25 We might not find these zones as a result of this wide

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1 step out and I believe that is primarily what I would
2 like to say here. There is no real basis on which to
3 say how large this field will be. From a geological
4 standpoint there is no immediate control over this
5 immediate area, the only point of control we have is
6 in Section 8 and these wells back here (indicating) in
7 the Lovington East pool.

8 In Section 11, we had one point of control with the
9 Pubco Number 2 well and because of the geological and
10 engineering datum that was withheld from us, there was
11 no way of telling just how large the pool might be.

12 The datum certainly points out the risk factor by
13 the nature of the deposition of the two cross-sections.
14 These show this is a risky area and there are zones
15 that likely could be missed by wide spacing in the area.

16 Q If the geological information as shown in Exhibit 2 is
17 correct, it would be a limited field as far as the area
18 extending to the north and south; would it not?

19 A This is true. Referring back to Pubco's map, you will
20 recall that the area went beyond the zero isopach line
21 and their configuration was not exactly the same as ours.
22 However, there was no way of telling how large the
23 field might be. However, it is our hope that with proper
24 development, we will be able to pick up these other
25 zones, these other thin zones that could be very

1 elusive and hard to find and that oil may be missed on
2 any other spacing arrangement.

3 MR. HINKLE: That's all I have on Direct.

4 MR. UTZ: Any questions?

5 * * * * *

6 CROSS-EXAMINATION

7 BY MR. SPERLING:

8 Q Mr. Spencer, would you indicate which of the three
9 areas that you have referred to, B, B' and C, appear
10 to have the greatest areal extent insofar as your
11 studies have shown?

12 A The greatest areal extent as far as continuity is
13 concerned is B', by virtue of the wells colored in green,
14 but as far as reserves of one well, the one located down
15 here (indicating) surrounded by dry holes is out of the
16 C zone. It has produced in excess of 900,000 barrels.

17 From a reserve standpoint, the blue would be the
18 greatest and this well could have easily been missed on
19 a 160 acre basis.

20 Q Did you consider development of the East Lovington Pool
21 on 160 acre spacing risky?

22 A I suspect that 80 acre spacing would have developed and
23 drained what they would have on 160 acres.

24 Q Do you know what did develop and drain?

25 A Well, this will come in further testimony.

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- 1 Q Have you made calculations which would indicate to you
2 the area extent which would be necessary to produce
3 900,000 barrels?
- 4 A No, but that will come, I believe, in later testimony.
- 5 Q Do you have an opinion as to the areal extent around
6 the Getty-Monty Number 1?
- 7 A The only thing I could show you here would be the
8 development pattern around these wells appear in
9 Sections 17, 16, 20 and 23. These are producing wells
10 with one dry hole.
- 11 Q Wouldn't you have to have an area greater than 160 acres
12 in order to justify that volumetric production?
- 13 A It would depend on the vertical extent.
- 14 Q Have any studies that you have seen or datum that you
15 have seen, indicated the vertical extent of any of these
16 zones?
- 17 A You can certainly see from this (indicating) that this
18 area could easily have been missed.
- 19 Q Do you feel the drilling area is in excess of 160 acres
20 here (indicating)?
- 21 A I couldn't say.
- 22 Q At least 160 acres?
- 23 A At least 80 and maybe 160 at most.
- 24 Q Now, you have referred to the farm-out agreement between
25 Pubco and your partnership, isn't it true that the

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1 agreement contemplated not only 80 acre spacing, but
2 also 160 acre spacing and as high as 320 acres?

3 A This is correct.

4 Q So we are not talking about contract provisions, limiting
5 the acreage to 80 acres?

6 A That's correct. We initially talked with Orin Crane
7 and he was later replaced by Dale Harrison and we talked
8 about 80 acre spacing in these two fields, however, we
9 felt it would not be good business to draw up a contract
10 that would not include 160 and 320 acre spacing.

11 Q You were really talking about 160 acres, were you not?

12 A No, we weren't. We could not have been talking about
13 160 acres. Based on what you see up here (indicating)
14 we didn't rule it out up here (indicating).

15 Q You spoke about the difficulties in finding these other
16 possible producing zones within the Strawn and the
17 possibility of missing them on a 160 acre basis; isn't
18 that true? From a volumetric standpoint, isn't it true
19 that you might have geological success so far as locating
20 one of these was concerned and, at the same time, have
21 economic disaster?

22 A This is very true, but I think in answering that
23 question, if you look at the Pubco development, you will
24 see the proximity to this well here definitely points
25 out they considered the economic potential of the area,

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1 but certainly considered the risks involved here, and
2 also, the other advantages in the way of additional
3 zones, that I tend to believe extend out of this area.
4 Q Do you think 160 acre spacing eliminates the development
5 of these other zones?

6 A I think it would be hazardous with 160 acre spacing. We
7 feel that the dry hole here (indicating) would have
8 prohibited us and Pubco from developing other locations
9 such as these (indicating). In Section 16, you will see
10 the dry hole in the SW/4, and then again in Section 19
11 you will see a dry hole in the SW/4, then again in
12 Section 30 in the NE/4, and then again in Section 29 in
13 the NW/4.

14 Any one of these dry holes might have prohibited
15 additional drilling in the area and I tend to think that
16 if additional dry holes had been drilled, some of these
17 additional wells might never have been developed and
18 that would have slowed the Strawn development in the
19 area.

20 Q Do you have an opinion as to whether or not one well
21 in this area as it is presently completed within the
22 Humble City Pool would drain in excess of 80 acres?

23 A No, I really don't. I believe our engineer will testify
24 to that.

25 MR. SPERLING: That's all I have.

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1 MR. UTZ: Any other questions?

2 MR. HATCH: There has been, I believe, reference
3 made to 80 acre spacing in the East Lovington Pool, I am
4 not sure that is correct.

5 Would you have any exception to the Examiner
6 studying compression records to see what the correct spacing
7 is in the East Lovington Pool?

8 MR. HINKLE: I would certainly recommend that.

9 MR. UTZ: We will take administrative notice.

10 (Witness excused.)

11 * * * * *

12 ROY C. WILLIAMSON,

13 was called as a witness and, having been already duly sworn,
14 testified as follows:

15 DIRECT EXAMINATION

16 BY MR. HINKLE:

17 Q Would you state your name and residence?

18 A I am Roy C. Williamson, Jr., president of Bailey,
19 Sipes & Williamson, of Midland, Texas.

20 Q Have you been employed by the Harding Oil Company as
21 a consultant in this case?

22 A Yes, I have.

23 Q Have you previously testified before the Oil Conservation
24 Commission?

25 A I have.

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1 Q And have your qualifications as a petroleum engineer
2 been accepted as a matter of record?

3 A Yes, my qualifications are a matter of record with the
4 Commission.

5 Q Have you, since your employment, made an independent
6 study of the Humble City-Strawn Pool?

7 A Yes, sir.

8 MR. HINKLE: Are the witness' qualifications
9 acceptable?

10 MR. UTZ: Yes, they are.

11 Q (By Mr. Hinkle) Have you prepared or has there been
12 prepared under your direction, certain Exhibits for
13 introduction in this case?

14 A Yes, sir, there have been.

15 Q Referring you to Exhibit Number 5, would you explain what
16 this shows?

17 A Exhibit 5 shows the logs from the four wells that were
18 pointed out in Exhibit Number 2. These are located in
19 Sections 16, 17, 20, and 21 of Township 16 South, Range
20 37 East. Mr. Spencer has referred to the fact that the
21 wells in Sections 16, 17, and 20 are producing from the
22 Strawn section, and the well in Section 21 is a dry
23 hole.

24 I would like to direct your attention to Exhibit
25 Number 5 which shows the perforated intervals of pay

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1 development for the three producing wells. We can see
2 here that the State C Number 2, which is in Section 17,
3 has a perforated interval. These are all neutron
4 porosity logs. The well in Section 16 is perforated.

5 The well in section 20 has a longer perforated
6 interval and pay zone.

7 In Section 21, which was the dry hole, we see
8 that the pay has failed to develop and this, again, just
9 points out the fact that we do have very rapid change
10 in porosity and permeability development over very
11 short distances in this field.

12 The three wells that are producing are all producing
13 in excess of 200,000 barrels of oil as of the first
14 of 1972. I might point out that the well in Section 24,
15 is rather spotty with an accumulative production of
16 4,115 barrels of oil. The well in Section 19, the
17 Clinton-Monty State Number 1 shows 113,000 barrels which
18 again, shows the rapid change in the producing
19 characteristics over very short distances. In Section
20 20, we have the Getty well, which has been referred
21 to before and which has produced over 900,000 barrels
22 of oil.

23 Right to the west of it, we have a dry hole and
24 to the SW of it another dry hole. The nearest producer
25 in Section 19, is rather spotty and has produced about

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1 15,000 barrels of oil as of the first of the year.

2 Calling your attention down to the Lovington East
3 field, in Section 4 of Township 17, South, Range 37
4 East, we have the Getty State U Number 1 that has
5 produced about 15,000 barrels of oil before being
6 temporarily abandoned and plugged back to the Paddock.

7 In Section 32, we have the Getty State P Number 1
8 which has produced 419,000 barrels of accumulated
9 production as of the first of the year.

10 So we can see that we could have very marked
11 changes in our porosity and permeability development and
12 these wells also exhibited producing characteristics
13 that were very close, one to the other.

14 Q Referring you to Exhibit Number 6, would you explain
15 what that is?

16 A Exhibit Number 6 is a copy of the acoustic log on the
17 Shipp Number 1 well. I have depicted sections here that
18 include what has been determined to be pay sections at
19 short, perforated intervals.

20 I have shown here, and it's a little hard to see,
21 but I have assumed the minimum porosity below which
22 production will not occur as being 4 percent.

23 In other words, we have a 4 percent porosity cut-off
24 line and the average porosity line as exhibited by the
25 sonic log, is approximately 4.8 percent. We understood

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1 that Pubco had cored their Number 2 Shipp, but the
2 information was not available to us, so I needed to make
3 some calculations utilizing porosities that were a little
4 more representative because I felt this one here was
5 low.

6 I utilized the sidewall neutron logs, mainly because
7 they were the best logs available, and they were
8 porosity logs from the wells in Sections 16, 17, and
9 20.

10 In analyzing these logs, I arrived at an average
11 porosity of approximately 8 percent which was used in
12 my calculations. I see now, from the datum that this
13 was probably high by some 25 percent.

14 Q I refer you now to Exhibit Number 7, will you explain
15 that?

16 A Exhibit 7 is a comparison of the reserves calculated
17 by the volumetric method. The fluid samples on this
18 well indicate a bubble point of 2893,000 pounds and
19 an accumulative production of 10,090.

20 On Exhibit 7, bottom hole pressure was again
21 measured and was found to be 4,188 pounds and from
22 eliciting data from the fluid analyses, we were able to
23 determine the formation volume factor that was initially
24 representative of the oil formation and was representative
25 of a pressure of 4,188 pounds.

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1 Utilizing the simplified version above the bubble
2 point I was able to calculate from available data, the
3 amount of stock tank oil originally in place in the
4 reservoir. The figure was calculated to be 741,609
5 barrels of oil. Without having better datum, I just
6 assumed for estimation purposes, that the recovery
7 would be approximately 20 percent and Pubco has shown
8 it to be 15.67 percent, I believe.

9 I might point out two things that might alter the
10 calculations of reserves. It is very possible that, in
11 view of the fact we do have bugular porosity we should
12 have matrix porosity due to the fact that the pressure
13 buildup has been so rapid.

14 It is my feeling that the rapid pressure buildup
15 is probably occurring from the bugular porosity of the
16 reservoir and the pressure measured here probably is
17 pressure contribution from the bugular porosity of the
18 reservoir, as opposed to the matrix porosity.

19 So, if we had a longer shut-in pressure, we
20 might show that the pressure drop was not quite as
21 severe as we have observed here.

22 Also, the fact that we have bugular porosity, I
23 think our recovery factor could possibly be somewhat
24 higher than the standard 20 percent. I think the datum
25 indicates that we have a very limited reservoir and

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1 indicates that this field is right in line with what
2 we have seen in the Lovington East and Lovington North-
3 east fields where those reservoirs have indicated that
4 they are somewhat limited in size.

5 Referring back to Exhibit Number 1, I think reference
6 has been made to the three wells in Sections 6, 5 and
7 4 of 17 South, 37 East. These wells are essentially
8 drilled on 160 acre spacing and the well recoveries
9 shown indicate to me, that they are not draining the
10 acreage. We don't know what they are draining because
11 they are all uneconomical wells so it is immaterial
12 whether they are on 40, 80 or 160 acre spacing.

13 They are not draining a very large area and just
14 because you have water spacing, it doesn't mean you can
15 generate more reserves. So I think we need to look at
16 the basic requirements in view of the reservoir
17 characteristics.

18 Referring back to Exhibit Number 7, I think that
19 I mentioned before that the sonic log on the Shipp Number
20 1 indicated 4.8 porosity and the average porosity from
21 Pennsylvanian oil wells, was about 8 percent. I felt
22 8 percent was near right, but was probably high; but
23 on the other hand, 4.8 was low. Anyway, that was the
24 number I utilized on my calculations.

25 Again, I estimated the recovery of stock tank oil

1 to be placed at 20 percent. Utilizing the original
2 formation volume factor, I made a volumetric calculation
3 of oil in place per acre foot and found it to be 52
4 barrels of oil per acre foot.

5 My calculations of the net pay from the sonic
6 log of the Shipp Number 1 well was substantiated not only
7 by the log, but from the time log which indicated that
8 we do have rock that is more easily drillable here for,
9 I would suppose, greater porosity.

10 I determined from this 46 feet of net pay and I
11 then calculated the recoverable barrels of oil on an
12 80 acre basis and on a 40 acre basis. On a 40 acre
13 basis, the total was 95,000 barrels and on 80 acres,
14 191,000 barrels.

15 Now, if we assume that the average porosity in the
16 area of the Shipp Number 1 well is approximately 25
17 percent too high, and that would be indicated by the
18 Pubco data, that would reduce the 80 acre drainage by
19 25 percent and put it at 150,000 barrels which agrees
20 with the 148,000 barrels figure.

21 So this data indicates that we are dealing with
22 a reservoir that might not be bigger than 80 acres
23 to start with. I hope, for the sake of the operators,
24 that it proves to be larger, but the data on hand to
25 date does not indicate that it should be larger.

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1 We could take the 80 acre total and multiply
2 by two and show we would get 400,000 barrels by draining
3 160 acres, but I think the data that has been calculated
4 indicates that we do not have a reservoir that big.

5 I would say that it doesn't really matter and
6 that it is immaterial if you don't have a reservoir
7 larger than 80 acres, you couldn't expect to drain an
8 area larger than 80 acres.

9 Q Is that all you have in connection with Exhibit 7?

10 A I believe so.

11 Q Referring you to Exhibit Number 8, would you explain
12 that?

13 A Exhibit 8 is a study of the economic development. In
14 arriving at item number 1, we utilized \$3.44 per barrel
15 of oil and \$0.22 per MCF of gas. I utilized an average
16 of 1,000 cubic feet per barrel of oil, which is probably
17 a little low.

18 I estimated taxes and operating costs and ran this
19 out mathematically and showed that to pay out for the
20 drilling and preliminary tests, the taxes and operating
21 costs, it would require approximately 90,000 barrels
22 of oil.

23 If we reduced our average porosity to 6 percent
24 instead of the 8 percent, it would show that on 40 acre
25 spacing it would be uneconomical.

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1 On 80 acre spacing, I think we probably have a
2 reasonable prospect, we certainly would get our money
3 back, plus some more and changes are that we might
4 develop more reserves by means of two things. One, the
5 recovery might be greater than 20 percent and this
6 would be a major thing that I think we might see. And,
7 also, the pressure that we have measured might be a
8 little higher than we think, at least this is my
9 opinion. Of course, if the pressure is higher, we should
10 show more oil in place.

11 Now, I might mention that the pressure taken in
12 the Shipp Number 1 was after production of some 10,900
13 barrels of oil. At that time, calculations should have
14 been made as to what the volumetric oil in place should
15 have been.

16 Q Do you have any comments with respect to any of the
17 Exhibits introduced by Pubco?

18 A I might make a comment on Exhibit Number 5, their
19 Exhibit Number 5. Again, I believe the location of
20 their well Number 3 would probably be just about on
21 this line (indicating), I'm not sure of that though.

22 This would indicate it would be sharing the
23 drainage area that the Harding Number 1 is sharing and
24 which would indicate that we now have essentially three
25 wells which might be sharing recoverable reserves of

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1 150,000 barrels of oil.

2 Q What conclusions have you come up with as a result of
3 your studies in this area?

4 A It is my conclusion that 80 acre proration units would
5 be preferable in developing the field because of the
6 erratic nature of the porosity and permeability. This
7 erratic nature would cause risks in getting dry holes
8 and these risks would escalate very rapidly on 160 acre
9 space outs.

10 The rapid changes would not only affect drainage,
11 but actual pay development. We have said that these
12 wells, in this area, do change very rapidly and we have
13 seen where a well will recover a lot of oil right next
14 to a dry hole.

15 The communication between the Harding well and
16 the Pubco well is obviously very good and I think that
17 the risk that is inherent in this reservoir was exhibited
18 by Pubco in its desire to drill their well as close to
19 the discovery well as they could get.

20 With the risks involved in this reservoir, I
21 probably would have done just what they did, get as close
22 to the producer as I could because I don't want to drill
23 a dry hole. I would rather share the reservoir with
24 someone than get a dry hole.

25 Q Do you have any further conclusions?

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1 A You have good rock development in the reservoir and
2 the economics of 80 acre spacing will be very adequate.
3 If you did not have good rock development the fact
4 you drilled on 160, or 320 acre spacing would not help
5 you economically because, with poor rock development,
6 you are not going to be able to drain a very large area
7 anyway.

8 Q Is it your opinion, then, that the adoption of temporary
9 80 acre spacing will be in the interest of conservation,
10 of hydro carbons and the prevention of underground
11 waste?

12 A Yes, sir.

13 Q Would adopting 160 acre spacing protect correlative
14 rights?

15 A I would say no, because you might miss, completely miss,
16 the development of a porosity or permeability zone.

17 Q Do you have anything else that you would like to add?

18 A I think that possibly the Exhibit of Pubco, Pubco's
19 Exhibit Number 5, that indicated bottom hole pressure
20 that we do see that apparently the pressure is beginning
21 to turn or curve and this could possibly indicate that
22 we are seeing some pressure coming out from the matrix
23 of the reservoir which might support the fact that we
24 have a little higher pressure than we think we do, I
25 certainly hope so, because that would mean there would

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1 be more reserves to be produced.

2 MR. HINKLE: We would like to offer Exhibits 1
3 through 8.

4 MR. UTZ: Exhibits 1 through 8 will be entered
5 into the record of this case.

6 (Whereupon, Harding's Exhibits 1 through 8
7 were entered in evidence.)

8 MR. UTZ: Any questions?

9 * * * * *

10 CROSS-EXAMINATION

11 BY MR. SPERLING:

12 Q Mr. Williamson, referring again to Exhibit Number 2,
13 I believe it is, and the three producing wells that
14 you referred to and the one dry hole which are in the
15 Lovington Northeast Pool area, do you have an opinion
16 as to the extent of the area that those wells are
17 draining and have drained?

18 A Yes, I have. Look at this (indicating) and it is my
19 opinion that those wells are very capable of obtaining
20 a production that they had exhibited from 80 acre
21 spacing.

22 Now, this line will show what the pay interval is.
23 In other words, there has not been sufficient testing
24 in those wells to indicate how far the pay zone extends
25 below the pore formation.

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1 So, by referring to Exhibit 5, we can see the
2 perforated intervals are in the top of the indicated
3 porosity zone.

4 In considering the volume of oil produced from some
5 of those that have been drilled on 80 acres -- well, I
6 think the highest -- well, I don't think we are looking
7 for 900,000 barrels -- naturally, we will be looking for
8 it.

9 Q Even on 160 acre spacing, it could occur?

10 A What about 160 acres?

11 Q It could occur on 160 acre spacing?

12 A Oh, yes.

13 Q Now, if this -- if your conclusion concerning the extent
14 of this reservoir as possibly being confined to 80 acres
15 is true, should not the next step be taken in order to
16 confirm whether it is or not?

17 A If we determine this from subsequent pressures, I,
18 personally, if I were an operator spending my money,
19 wouldn't drill another well anywhere here before I got a
20 large pressure buildup. I feel it is a greater risk
21 stepping out on a 160 acre basis because you are very
22 likely to miss part of the reservoir these wells are
23 producing from.

24 This well was not taken to the Strawn zone by Pubco,
25 obviously they did not feel the well justified going any

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- 1 deeper to the Strawn.
- 2 Q I believe you already reduced your volumetric calculations
- 3 some 25 percent?
- 4 A Yes.
- 5 Q Now, in arriving at your net pay figure, how did you
- 6 conclude there were 46 net feet of pay when there seems
- 7 to be an indication of a maximum of 34 feet?
- 8 A I took all the net pay above the 4 percent porosity
- 9 cut off which was confirmed by the log on the Shipp
- 10 Number 1.
- 11 Q Would you consider this core information to be more
- 12 reliable?
- 13 A I would suppose it would be, yes.
- 14 Q What kind of scale did you use for the 4 percent cut off
- 15 in porosity?
- 16 A What kind of scale?
- 17 Q Yes, porosity scale.
- 18 A I calculated the matrix velocity for the reservoir and
- 19 used the time equivalent equation to calculate what 4
- 20 percent would be.
- 21 Q Now, if I understood your testimony correctly, I believe
- 22 you suggested temporary 80 acre spacing. What exactly
- 23 do you mean by that?
- 24 A Well, as I understand it --
- 25 MR. HINKLE: That is what the Application is for,

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1 temporary.

2 Q (By Mr. Sperling) Well, are you suggesting the
3 possibility that, at some time in the future, this be
4 expanded to 160 acre spacing?

5 A I have no feel for that, as far as I am concerned,
6 permanent 80 acre spacing rules could be adopted.

7 Q Do you think that Pubco's Exhibit 5 shows that the
8 Harding well is draining in excess of 80 acres?

9 A It shows 90.4 acres.

10 Q Do you agree with that?

11 A If we assume the reservoir is homogeneous within the
12 circle, yes. If it is not homogeneous, we could have a
13 limited reservoir that is smaller than 90.4 acres.

14 Q But you don't have any evidence of that?

15 A No, there is none in existence.

16 Q Did your studies indicate the presence of fractures
17 insofar as these zones are concerned in the Strawn and
18 possible communication between them?

19 A I have no data as to fracture conditions in the
20 reservoir, perhaps the core analysis would show it.

21 Q Mr. Williamson, on your Exhibit Number 2, I notice you
22 have a location shown to indicate your Number 2 well
23 in Section 11?

24 A Yes.

25 Q What are your plans as to the drilling of that well?

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1 A I will defer that to the operator.

2 MR. HINKLE: The next witness will cover that.

3 Q (By Mr. Sperling) Do you know about the Pubco well
4 drilling, the well just to the north of your location?

5 A I was told that it was around 9,000 feet, that's all
6 the information I have had to date.

7 MR. SPERLING: I have no further questions.

8 MR. UTZ: Any other questions?

9 (No response.)

10 MR. UTZ: If not, the witness may be excused.

11 (Witness excused.)

12 * * * * *

13 JAMES JUSTICE,

14 was called as a witness and, having been already duly sworn,
15 testified as follows:

16 DIRECT EXAMINATION

17 BY MR. HINKLE:

18 Q State your name, residence and position, please.

19 A My name is James O. Justice; my residence in in Dallas,
20 Texas; and I am chairman of the board and chief executive
21 officer of Harding Oil Company.

22 Q What is the relationship between Harding Oil Company
23 and the Spencer and Hudson partnership?

24 A We have a consulting arrangement and we work with them
25 on a number of different prospective drilling opportunities

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1 and took from them, at their recommendation, the
2 Pubco farm-out that had been made to them previously in
3 November of last year.

4 Q And you have assumed responsibility for complying with
5 the Pubco contract?

6 A Yes.

7 Q And Harding Oil Company deepened the Pubco well and
8 made the discovery?

9 A Right, there was a good opportunity from three standpoints,
10 one, the potential of the reservoir; two, the opportunity
11 for developing acreage significant to us, and third,
12 the opportunity for return.

13 Q State, briefly, how the Harding Oil Company is operated.

14 A Basically we obtain prospects from consulting geologists
15 of which Spencer and Hudson are major contributors. We
16 offer these through an investing public.

17 Q Have you given notice to the public company of your
18 attention of drilling the Number 2 well in the time
19 provided by the farm-out agreement?

20 A Yes.

21 Q What procedure are you following?

22 A Shortly after completion of the Shipp Number 1 well
23 we prepared our S-10 registration and submitted it to
24 the Security and Exchange Commission for their review.
25 There is a 120 day clause associated with this and we

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1 recognized that because of the time this would be
2 difficult to achieve.

3 Q Have you filed with the Security and Exchange Commission,
4 a plat or plans for development not only of the Number
5 2 well, but of the acreage in general?

6 A Yes, in our initial registration with the Security and
7 Exchange Commission, we filed for the development of the
8 acreage on 80 acre spacing if it were oil and 320
9 spacing if it were gas.

10 This action was taken by us not only from the
11 recommendations of the consulting geologists, but also
12 on our own house investigation. We felt that, as a
13 result of examining the area, from the way it drilled
14 and the way it drained, that producing on 80 acres
15 presented the optimum kind of spacing for the area. It
16 was on that judgment and on that basis that we went
17 ahead with the 80 acre proposition.

18 Q Now, if the Commission should approve 160 acre spacing,
19 would this be difficult for you concerning your
20 Application with the Security and Exchange Commission?

21 A There would be several adverse effects, a significant
22 time delay would be associated with it, and it would
23 require refinancing.

24 It would also require changing the ground rules
25 under which the offers would be made. This would be a

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- 1 difficulty not only with the Security and Exchange
2 Commission, but I think it would put our contract in
3 jeopardy so far as our ability to meet the time require-
4 ments of the contract are concerned.
- 5 Q Do you have any intention after drilling the Number 2
6 well, of drilling additional wells in the area?
- 7 A Yes, we have applied -- we have made application to drill
8 two additional wells. These applications are being held
9 pending the outcome of this hearing.
- 10 Q Can you tell the locations of those wells?
- 11 A The locations are shown on Exhibit 2, and they are
12 designated the numbers 3 and 4 wells. There's one to
13 the east and one to the northwest.
- 14 Q And, if 80 acre spacing is adopted, you intend to
15 proceed on the basis outlined and drill these wells?
- 16 A Yes, that is correct.
- 17 Q From all the information which has been available to
18 you and from employing consulting firms, have you formed
19 any conclusions as to how the area should be developed?
- 20 A Yes.
- 21 Q From a conservation standpoint?
- 22 A Yes. First of all, we feel the original assessment
23 and conclusions have been confirmed.
- 24 Secondly, we feel that it would be in the interest
25 of our investors to continue on 80 acre spacing.

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1 Third, we feel that in the interest of conservation,
2 it will effectively and efficiently drain the acreage
3 based again on the assessments obtained from the
4 consulting engineers.

5 Fourth, we feel that it will also preserve the
6 correlative rights of others in the area, that 160 acre
7 spacing, in our view, would jeopardize.

8 Q Have you any objections, or any favorable comments from
9 any operators in the area concerning your Application for
10 80 acre spacing?

11 A We have gotten letters of support from several people in
12 the area; Mr. H. L. Brown, Atlantic Richfield, and
13 I think, probably one other who may have communicated
14 by telegram or letter supporting 80 acre spacing.

15 Q Are these from owners who have acreage in the area that
16 are supporting your Application?

17 A Yes, sir.

18 Q Do you have anything further?

19 A Nothing other than -- I realize these business aspects
20 are not really germane to the Commission's deliberations,
21 nonetheless, I wanted to take the opportunity to point
22 them out because, in our perspective, they are
23 significant factors that influence our operations. We
24 feel that from a business aspect there is good and
25 sufficient reason for continuing on 80 acre spacing for

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1 the reasons that have been outlined here today and
2 which support our initial judgment in making this
3 particular arrangement.

4 MR. HINKLE: We understand there have been letters
5 or telegrams sent to the Commission.

6 MR. HATCH: There is a telegram from Pennzoil, a
7 telegram from Atlantic Richfield, both in support of Harding's
8 Application. There is also a letter from Texas Independent
9 Petroleum supporting Harding Oil Company's Application.

10 MR. HINKLE: I believe that's all we have.

11 MR. UTZ: I would like to ask a question in regard
12 to the Number 2 well. How much longer do you have to get
13 the approval of the Security and Exchange Commission to
14 complete the well?

15 THE WITNESS: We have made application and expect
16 comment this week from them.

17 MR. UTZ: Any other questions?

18 * * * * *

19 CROSS-EXAMINATION

20 BY MR. SPERLING:

21 Q Did you have separate registration for each of these
22 prospects, Mr. Justice?

23 A We have filed separately on the first and second, on
24 the subsequent ones, we might not.

25 Q What are the economic risks to Harding under your

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1 arrangement?

2 A We have economic risks in terms of the cost of the
3 acreage that we are dealing with here, along with the
4 initial acquisition risk. We have legal fees and risks
5 in terms of meeting our contract obligations. Some of
6 the risks are more than economic.

7 Q Well, assuming the cost of the well to be \$300,000, how
8 much of that represented investment by Harding?

9 A I can't give you the precise figure off the top of my
10 head, but our investment in that would be a small
11 percentage of the total investment.

12 Q What is your participation in production?

13 A We will participate in production by less than 20
14 percent.

15 Q So, in effect, the wells are being paid for by your
16 investors?

17 A Yes.

18 Q And you receive a 20 percent interest without a
19 substantial investment in the cost of drilling the well;
20 is that a fair statement?

21 A I think that's a fair statement, yes.

22 Q Referring to the contract and the acreage that you have
23 under the Pubco farm-out, you have a double number of
24 locations available to you on 80 acre spacing -- or to
25 your investors, than you would have on 160 acre spacing?

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1 A I haven't counted them up, but it seems logical to say
2 that.

3 MR. SPERLING: I think that's all I have.

4 MR. UTZ: Any other questions?

5 (No response.)

6 MR. UTZ: If not, the witness may be excused.

7 (Witness excused.)

8 MR. UTZ: Does that complete your case?

9 MR. HINKLE: That concludes our case.

10 MR. UTZ: Any statements?

11 MR. BUELL: On behalf of H. L. Brown, Jr., we would
12 like to support the Harding Application and oppose the Pubco
13 Application.

14 On the 80 acre spacing, we feel it would be prudent
15 to require drilling either in the SE/4 Quarter or the NE/4
16 Quarter of any section.

17 MR. UTZ: The northeast?

18 MR. BUELL: The NE and the SW, I'm sorry.

19 MR. UTZ: Anything further?

20 MR. SPERLING: I would like to say just briefly,
21 Mr. Examiner, that we feel that the data which is based on
22 reliable information and not on speculative data which was
23 presented concerning the reservoir, certainly supports the
24 Application of Pubco for 160 acre spacing.

25 While it is true that there are only two wells

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1 presently drilled and completed in the pool, the information
2 which is available at this time from the standpoint of
3 reservoir information is much more abundant than in any other
4 two well fields I have ever seen before. I think this
5 information shows conclusively that it would be economically
6 prudent to develop this field on 160 acre spacing.

7 MR. HINKLE: The well was deepened on information
8 given to Harding by Pubco which showed on its face that this
9 was possibly a very limited area. It has been brought out
10 here in testimony, that drilling in the Strawn area in the
11 vicinity of the northeast and east areas have been very
12 erratic and it is clear that this is a stratigraphic formation
13 or pool and that you can have a dry hole right next to a
14 producer.

15 I think that in summing up all the evidence together
16 that has been introduced by both sides, would indicate that
17 it is a limited reservoir and I think that Roy Williamson's
18 testimony shows very definitely that he wouldn't even advise
19 an operator to drill another well if the pressure continues
20 to drop. I don't think the Commission can assume here that
21 the reservoir has sufficient development to justify 160 acre
22 spacing, at this time.

23 So I believe the thing to do at this time would be
24 for the Commission to adopt temporary 80 acre spacing rules on
25 the basis of one year and to take a look and see what develops

1 because it has been indicated that there are going to be
2 several other wells drilled in the meantime.

3 MR. SPERLING: The obvious answer to that is, you
4 can't undrill wells that are already drilled.

5 MR. UTZ: Any other statements?

6 (No response.)

7 MR. UTZ: If not, the case will be taken under
8 advisement.

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1 STATE OF NEW MEXICO)
) SS
 2 COUNTY OF BERNALILLO)

3 I, RICHARD E. MCCORMICK, a Certified Shorthand Reporter,
 4 in and for the County of Bernalillo, State of New Mexico,
 5 do hereby certify that the foregoing and attached transcript
 6 of Hearing before the New Mexico Oil Conservation Commission
 7 was reported by me; and that the same is a true and correct
 8 record of the said proceedings to the best of my knowledge,
 9 skill and ability.

10
 11 *Richard E. McCormick*
 12 CERTIFIED SHORTHAND REPORTER
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I do hereby certify that the foregoing is
 a complete record of the proceedings in
 the hearing on Case No. 474849
 held by me on June 28, 1972.
Richard E. McCormick
 New Mexico Oil Conservation Commission

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<u>E X H I B I T S</u>			
<u>APPLICANT'S</u>	<u>OFFERED</u>	<u>ADMITTED</u>	
<u>PUBCO PETROLEUM CORPORATION</u>			
Exhibit 1	6	42	
Exhibit 1-A	7	42	
Exhibit 1-B	14	42	
Exhibit 2	26	42	
Exhibit 3	27	42	
Exhibit 4	28	42	
Exhibit 4-A	30	42	
Exhibit 5	31	42	
Exhibit 6	34	42	
Exhibit 6-A	35	42	
Exhibit 7	37	42	
Exhibit 8	38	42	
* * * * *			
<u>HARDING OIL COMPANY</u>			
Exhibit 1	47	71	
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Exhibit 3	47	71	
Exhibit 4	49	71	
Exhibit 5	60	71	
Exhibit 6	62	71	
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HARDING OIL COMPANY

Statement to the New Mexico Oil Conservation Commission

Docket No. 4749

August 7, 1974

Special Field Rules For The
Humble City Strawn Field

Background

Under a farmout agreement with Mesa Petroleum Company, Harding Oil Company has been developing this field with the participation of Texas International Petroleum Company. To date Harding has drilled six wells, four producers and two dry holes. Three of the producers are completed in the Strawn and one in the Atoka.

Cumulative production on the producers through May 1, 1974 ranges from a low of 16,162 barrels to a high of 156,246 barrels.

Recent Developments

During 1973, Harding drilled two wells and so far in 1974, it has drilled two wells with a third scheduled for spudding this month. All of these wells have or will test the Atoka formation.

Future Plans

Under the farmout agreement, seven 80-acre tracts remain to be earned. Due to the uncertain nature of the geology in this field, the sequence of drilling each of these locations is contingent upon the results of previous drilling. An example of this rationale, is our decision to abandon the location in the west half of the northeast quarter of Section 14 as a

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Harding EXHIBIT NO. 3
CASE NO. 4749

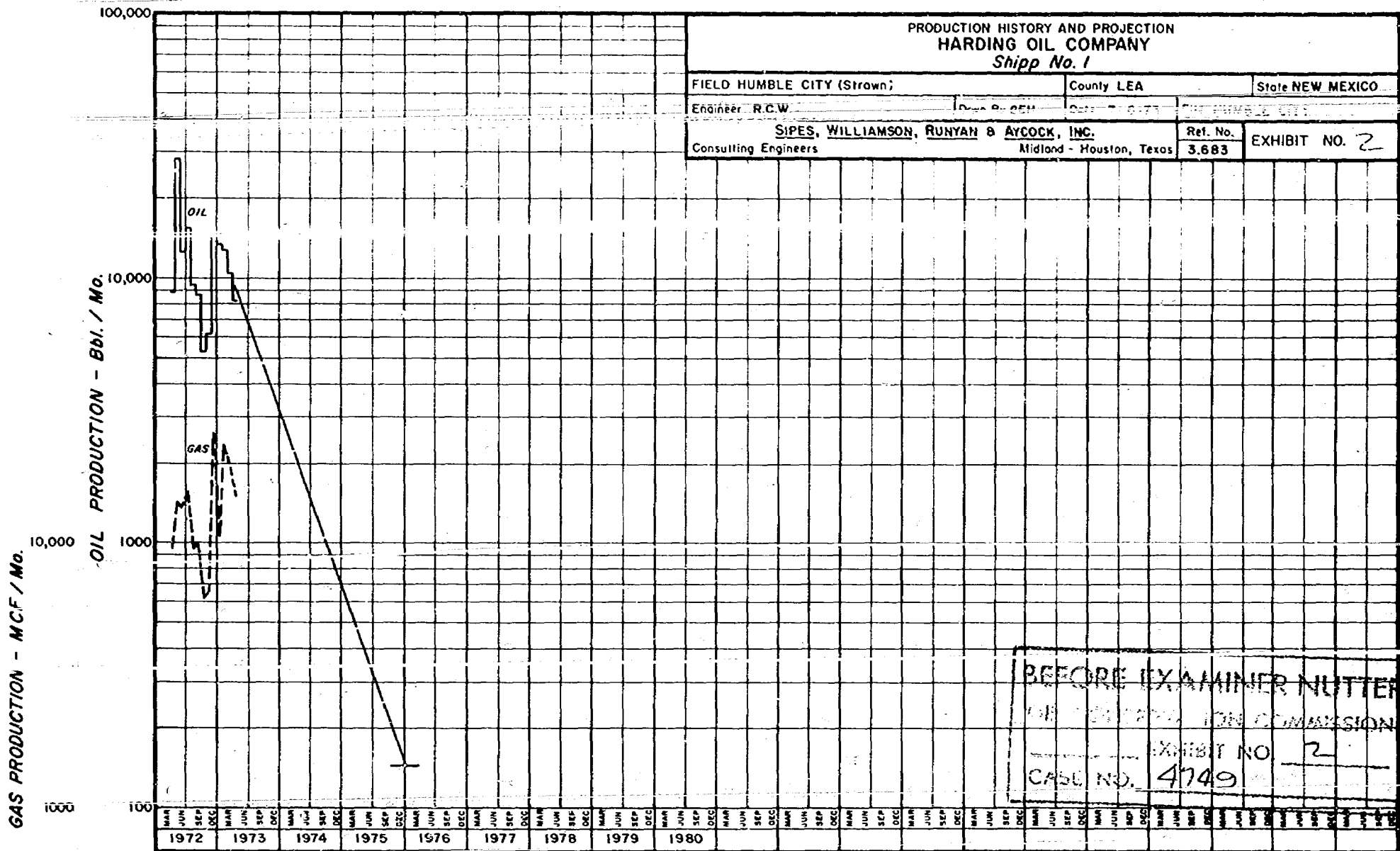
8-7-74

result of geological data gained from the two dry holes to the west in the E/2, NE/4 of Section 15 and the W/2, NW/4 of 14, Mesa No. 5 Shipp and Harding No. 1 Schwartzberg.

Based upon drilling results and performance history, it is the judgment of Harding Oil Company that this field does not economically justify development on 40-acre spacing. Formation characteristics appear such that one well will adequately drain 80-acres, thereby, avoiding underground waste. Drilling results to date likewise indicate that correlative rights are better protected on 80-acre spacing than they would be on 40-acre spacing, due to the rather unpredictable nature of the petroleum bearing formations.

Conclusion

It is our conclusion that the trade off between correlative rights and sound economics will be best served by continuing 80-acre spacing for this field.



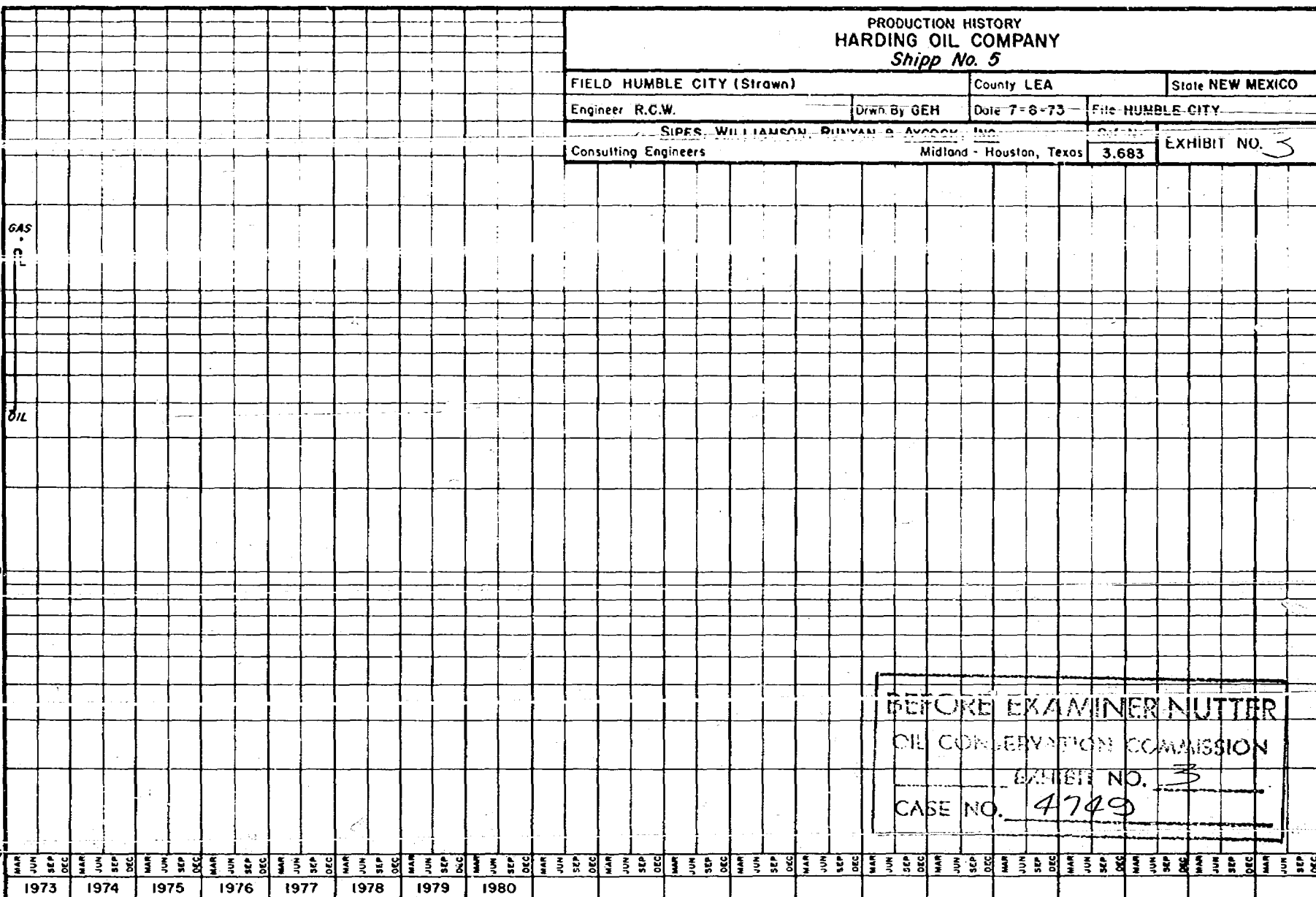
GAS PRODUCTION - MCF / Mo.
OIL PRODUCTION - Bbl. / Mo.

100,000

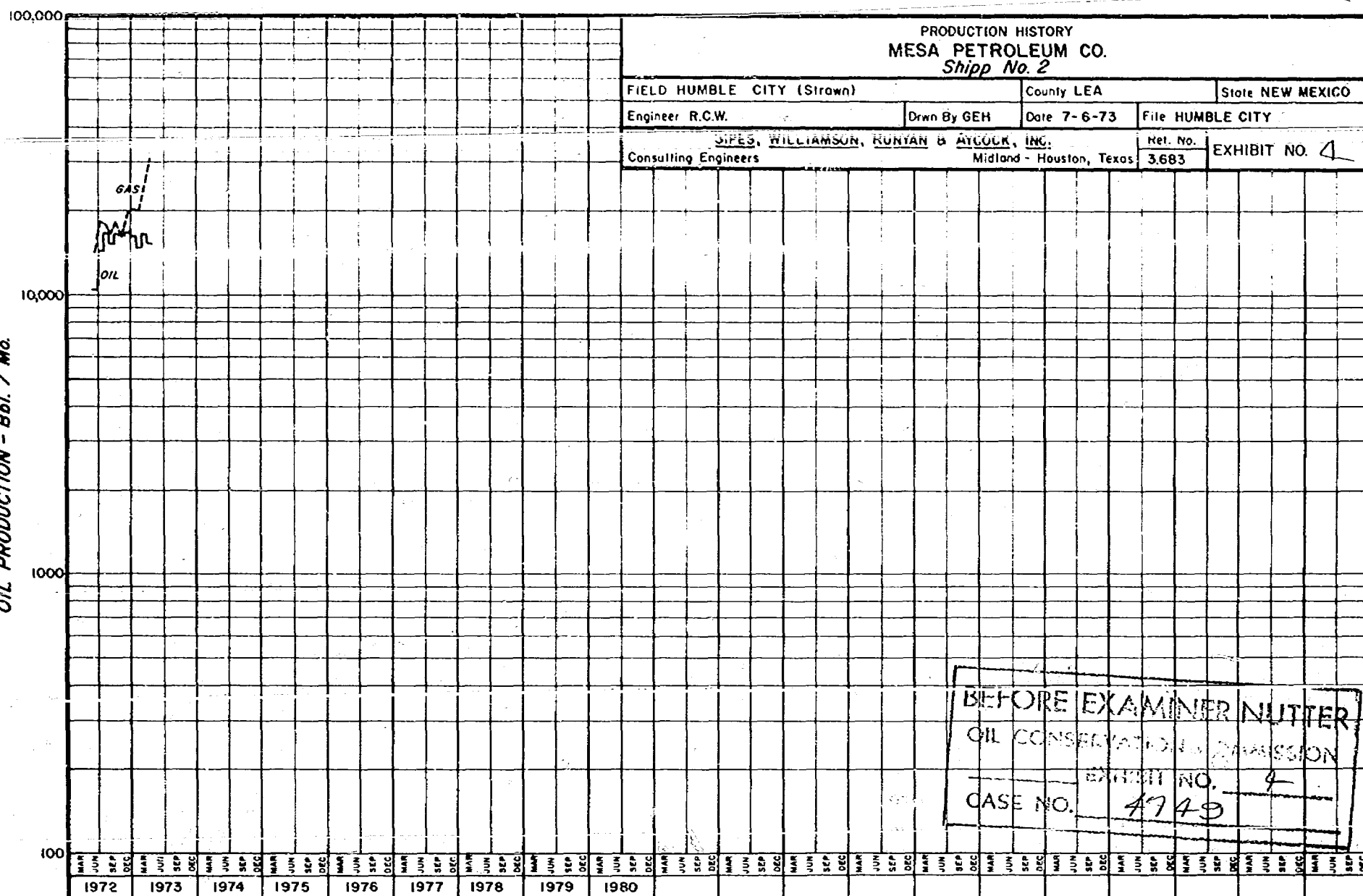
10,000

1,000

100



GAS PRODUCTION - MCF / Mo.
OIL PRODUCTION - Bbl. / Mo.



VOLUMETRIC CALCULATIONS OF OIL RESERVES

HARDING OIL COMPANY - SHIPP #1

HUMBLE CITY (STRAWN) FIELD

LEA COUNTY, NEW MEXICO

- | | |
|------------------------------------|-------|
| 1. Average ϕ , % (from logs) | 8 |
| 2. Water Saturation, % (from logs) | 30 |
| 3. Estimated Recovery of BSTOIP, % | 20 |
| 4. Original FVF, RB/STB | 1.675 |
| 5. Net Pay, Feet | 46 |
| 6. Recoverable Oil Per Acre-Foot = | |

$$\frac{(7758 \text{ B/AF})(\text{Porosity})(1 - \text{SW})(\text{Percent Recovery})}{\text{FVF}}$$

$$= \frac{(7758 \text{ B/AF})(.08)(1 - .30)(.20)}{1.675} = 52 \text{ BO/AF}$$

7. Recoverable Oil Per 80 Acres, BBL:

$$(80 \text{ ac})(46 \text{ feet})(52 \text{ BO/AF}) = 191,360$$

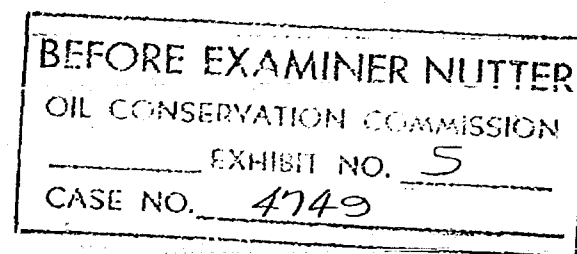
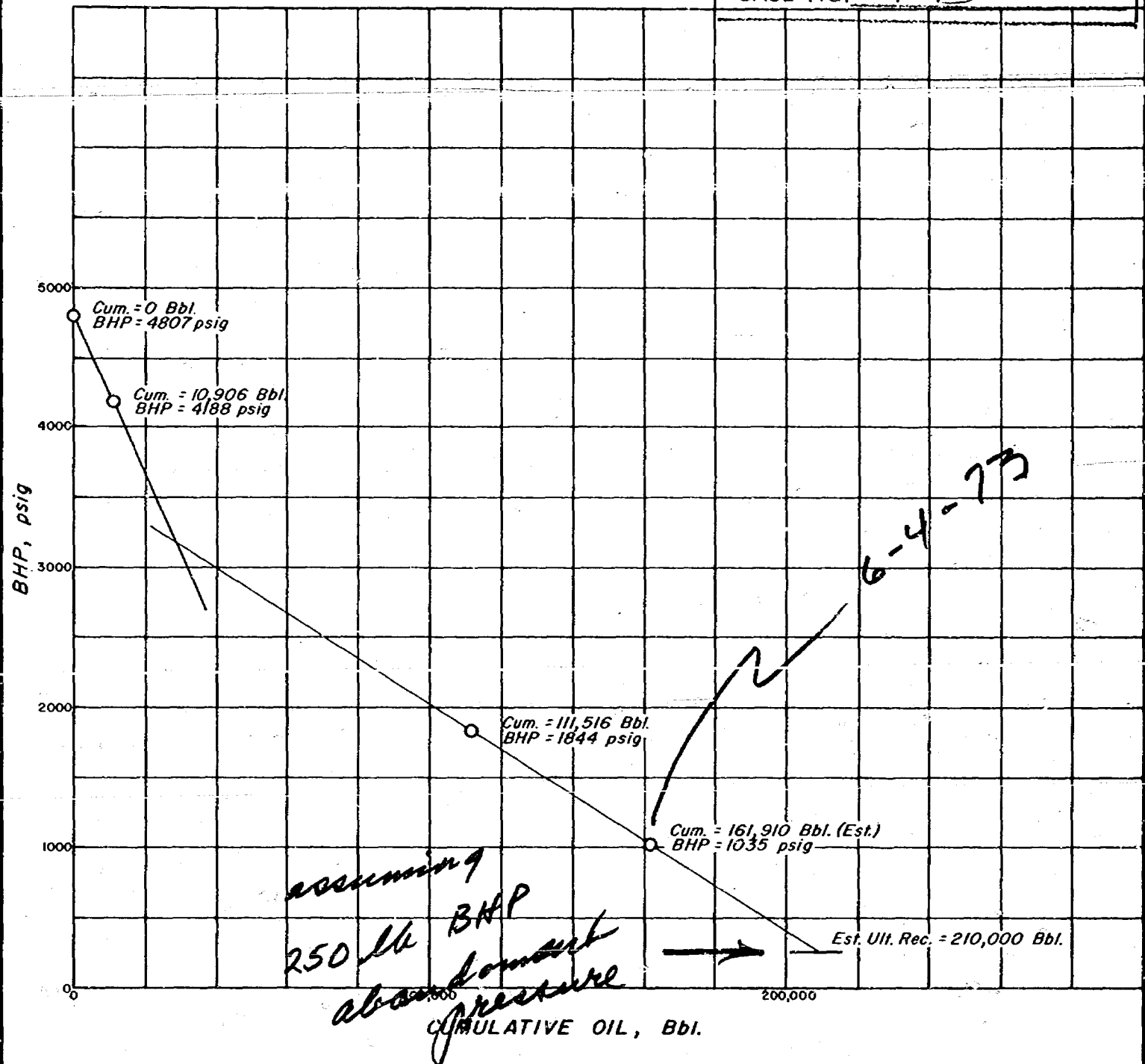


EXHIBIT NO. 5

BEFORE EXAMINER NUTTER

EXHIBIT NO. 6
CASE NO. 4749

BHP vs. CUMULATIVE OIL PRODUCTION

HARDING OIL CO. - SHIPP NO. 1

FIELD HUMBLE CITY (Strawn)			County LEA		State NEW MEXICO	
Engineer R. C. W.		Drwn. By Del	Date 7-6-73	File HUMBLE CITY		
<u>SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.</u>				Ref. No.	EXHIBIT NO. 6	
Consulting Engineers		Midland - Houston, Texas		3.683		

ECONOMICS OF DRILLING AND COMPLETING A STRAWN WELL

HUMBLE CITY (STRAWN) FIELD

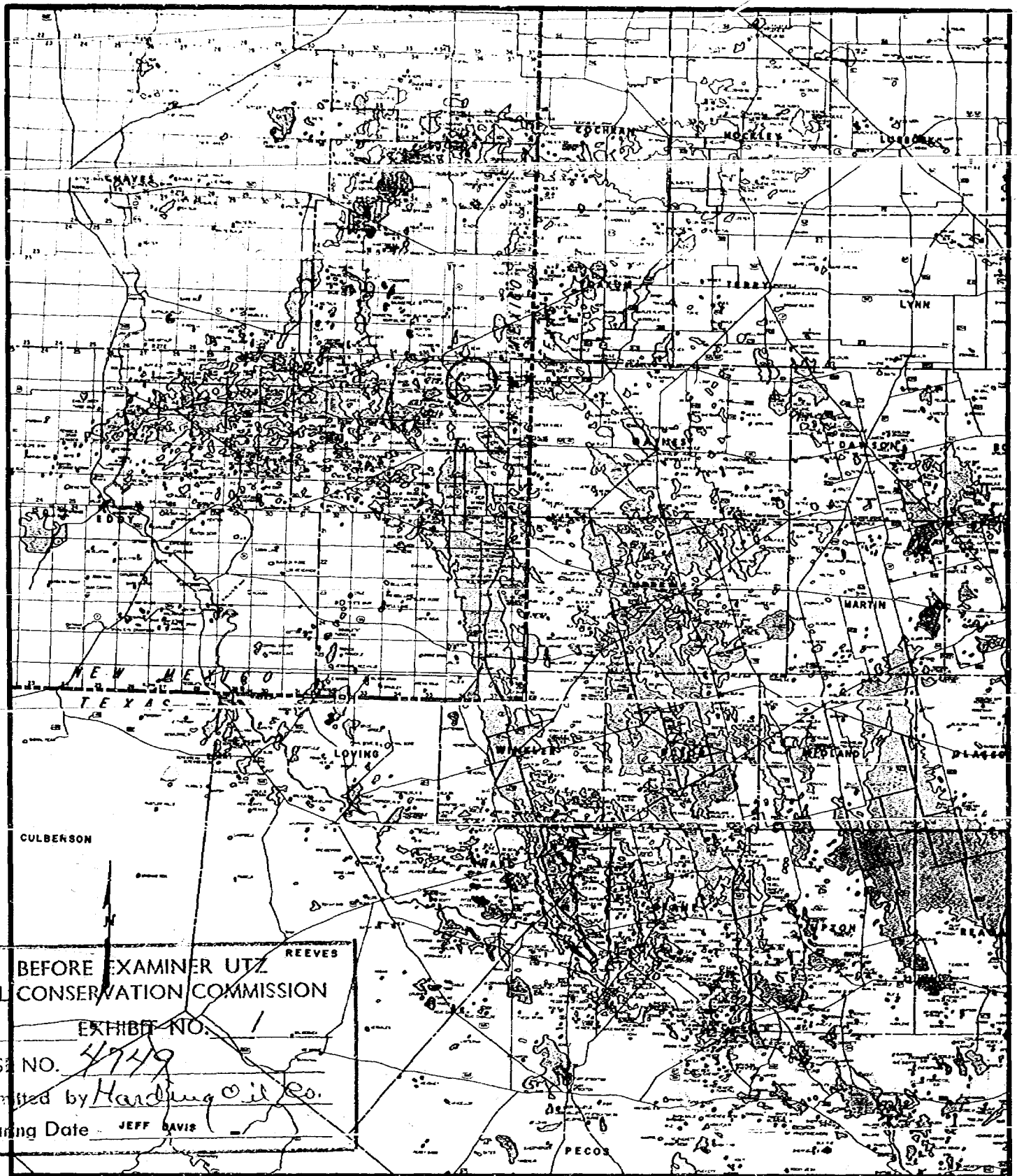
LEA COUNTY, NEW MEXICO

1. Drilling and Completion Cost, \$	320,000
2. Oil Price, \$/BBL	4.16
3. Gas Price, \$/MCF	0.22
4. Severance and Ad Valorem Taxes, %	5.4
5. Revenue interest for 100% of Working Interest, decimal	0.75
6. Estimated Operating Costs, \$/BBL Oil	0.10
7. Barrels of oil required to pay out D&C costs after severance and ad valorem taxes and operating costs:	

$$\frac{\$320,000}{\left[\left(\$4.16/BO + (2 \text{ MCF/BO}) (\$0.22/\text{MCF}) \right) .946 \right] 0.75 - \$0.10/BO} = 101,266 \text{ BO}$$

BEFORE EXAMINER NUTTER	
OIL CONSERVATION	MISSION
EXHIBIT NO.	7
CASE NO.	4749

EXHIBIT NO. 7



BEFORE EXAMINER UTZ	
OIL CONSERVATION COMMISSION	
EXHIBIT NO. 1	
CASE NO.	4749
Submitted by	Harding Oil Co.
Hearing Date	JEFF DAVIS

AREA MAP

EXH. 1

BAILEY, SIPES, WILLIAMSON & RUNYAN, INC.		Ref. No.	FIGURE NO. 1
Consulting Engineers	Midland - Houston, Texas		

COMPARISON OF RESERVES
CALCULATED BY THE MATERIAL BALANCE METHOD
AND BY THE VOLUMETRIC METHOD

I. Material Balance Calculations:

- | | |
|---|----------|
| 1. Original Bottom Hole Pressure, psig | 4,807 |
| 2. Bubble Point Pressure, psig | 2,893 |
| 3. BHP at cumulative production of 10,906 BO, psig | 4,188- |
| 4. N_p , barrels of oil | 10,906- |
| 5. B_{oi} , RVB/STB at 4,870 psig | 1.675- |
| 6. B_o , RVB/STB at 4,188 psig | 1.7000 ~ |
| 7. Neglecting rock and water compressibilities, the Material Balance equation for production above the bubble point is: | |

$$\frac{N_p}{N} = \frac{B_o - B_{oi}}{B_o}$$

8. Re-arranging:

$$N = \frac{(N_p)(B_o)}{B_o - B_{oi}} = \frac{(10,906 \text{ BO})(1.7000 \text{ RVB/STB})}{(1.7000 \text{ RVB/STB} - 1.675 \text{ RVB/STB})}$$

$N = 741,608$ Barrels of Stock Tank Oil Originally in Place

- | | |
|--|---------|
| 9. Estimated recovery of BST00IP, % | 20 |
| 10. Therefore $(741,608 \text{ BST00IP})(.20) =$ Barrels of Oil Recoverable from the Reservoir | 148,322 |

II. Volumetric Calculations:

- | | |
|---|-------|
| 1. Average ϕ calculated from Harding Oil Company Shipp No. 1, % | 4.8 |
| 2. Average ϕ calculated from Pennzoil United, Inc. State 16 No. 1 and State C No. 1 and No. 2, % | 8 |
| 3. S_w , % (Calculated from log resistivity) | 30 |
| 4. Estimated Recovery of BST00IP, % | 20 |
| 5. Original FVF, RVB/STB | 1.675 |

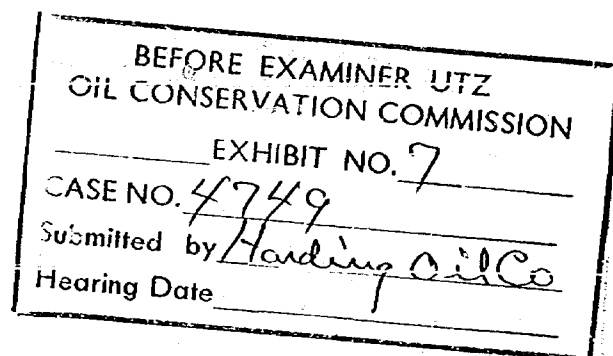


EXHIBIT NO. 7
Page 1 of 2

*Use of Material
Approved to
for S.T.*

COMPARISON OF RESERVES
CALCULATED BY THE MATERIAL BALANCE METHOD
AND BY THE VOLUMETRIC METHOD
Page 2 of 2

6. Recoverable oil per acre-foot =

$$\frac{(7,758 \text{ B/AF})(\text{Porosity})(1 - S_w)(\text{Per Cent Recovery})}{\text{Original FVF}}$$

Using the 8 per cent porosity value:

$$\frac{(7,758 \text{ B/AF})(.08)(1 - 0.30)(.20)}{1.675} = 52 \text{ BO/AF}$$

7. Net Pay, feet

46

8. Recoverable barrels of oil per 40 Ac. (46 ft. Net Pay) (52 BO/AF) 95,680
per 80 Ac. (46 ft. Net Pay) (52 BO/AF) 191,360

BAILEY, SIPES, WILLIAMSON & RUNYAN, INC.
1100 V & J TOWER MIDLAND, TEXAS 79701
R. C. WILLIAMSON, JR. P.E./kp 6-26-72

EXHIBIT NO. 7
Page 2 of 2

ECONOMICS OF DEVELOPMENT

1. Estimated Drill and Complete Cost, \$	225,900
2. Oil Price, \$/Barrel (Before Severance and Ad Valorem Taxes)	3.44
3. Gas Price, \$/MCF (Before Severance and Ad Valorem Taxes)	0.22
4. Average GOR, Cubic feet/Barrel of Oil	1,000
5. Revenue Interest for Acreage Earned by Harding	0.75
6. Severance and Ad Valorem Tax (Estimated), %	5.4
7. Operating Costs (Estimated), \$/Barrel of Oil	0.10
8. Barrels of Oil Required to Payout Drill and Complete Costs, After Severance and Ad Valorem Taxes and Operating Costs:	
$\frac{\$225,900}{(\$3.44 + \$0.22)(.946)(.75) - 0.10}$	= 90,477

BAILEY, SIPES, WILLIAMSON & RUNYAN, INC.
1100 V & J TOWER MIDLAND, TEXAS 79701
R. C. WILLIAMSON, JR. P.E./kp 6-26-72

EXHIBIT NO. 8

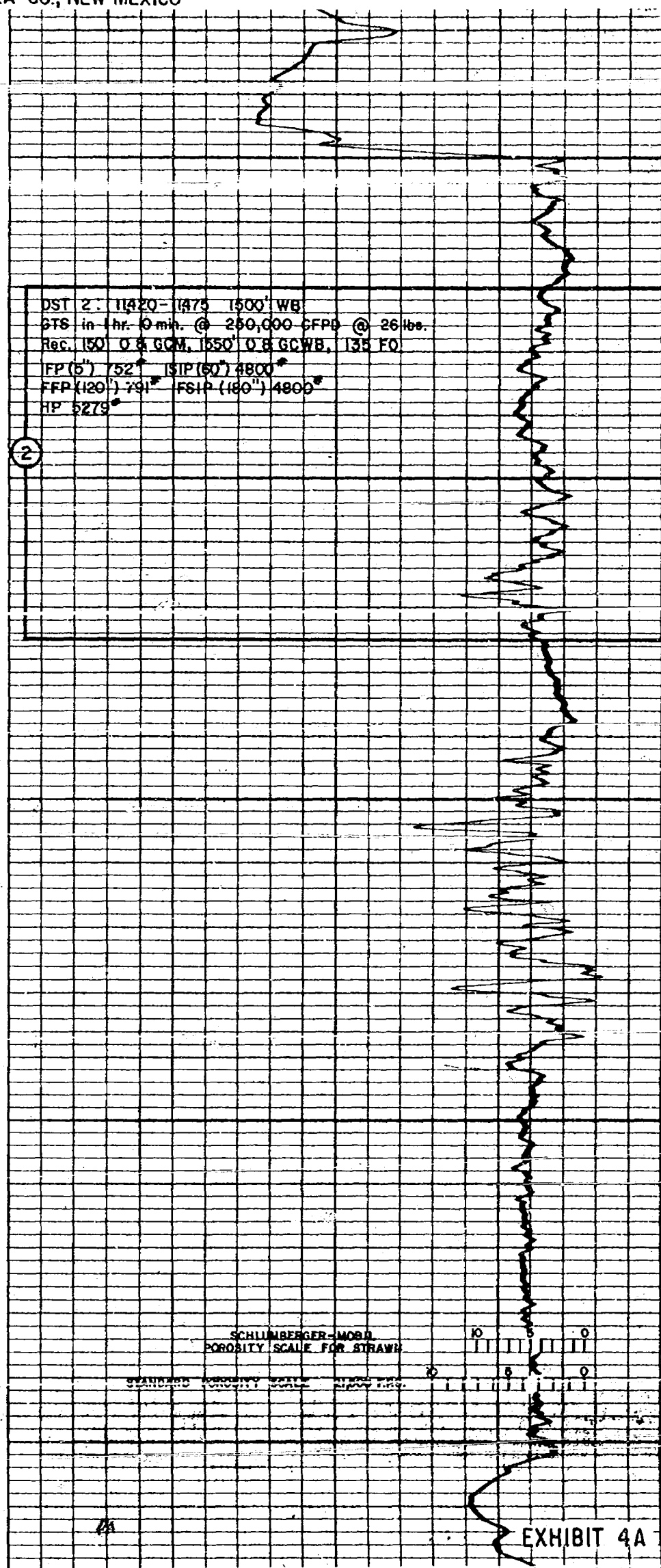
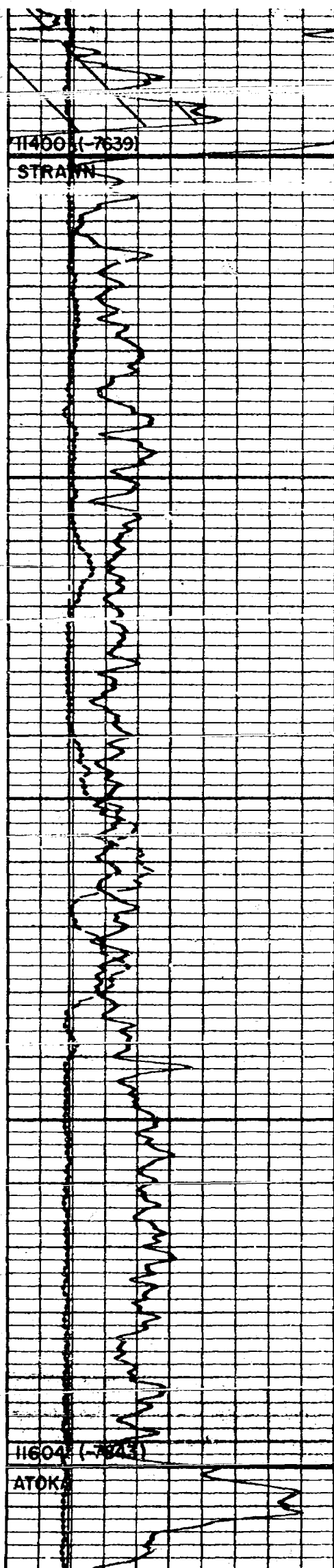
BEFORE EXAMINER UTZ	
OIL CONSERVATION COMMISSION	
EXHIBIT NO. <u>8</u>	
CASE NO. <u>4749</u>	
Submitted by <u>Harding Oil Co</u>	
Hearing Date _____	

HARDING OIL CO.

Shipp No. 1

Sec. II T17S R37 E

LEA CO., NEW MEXICO

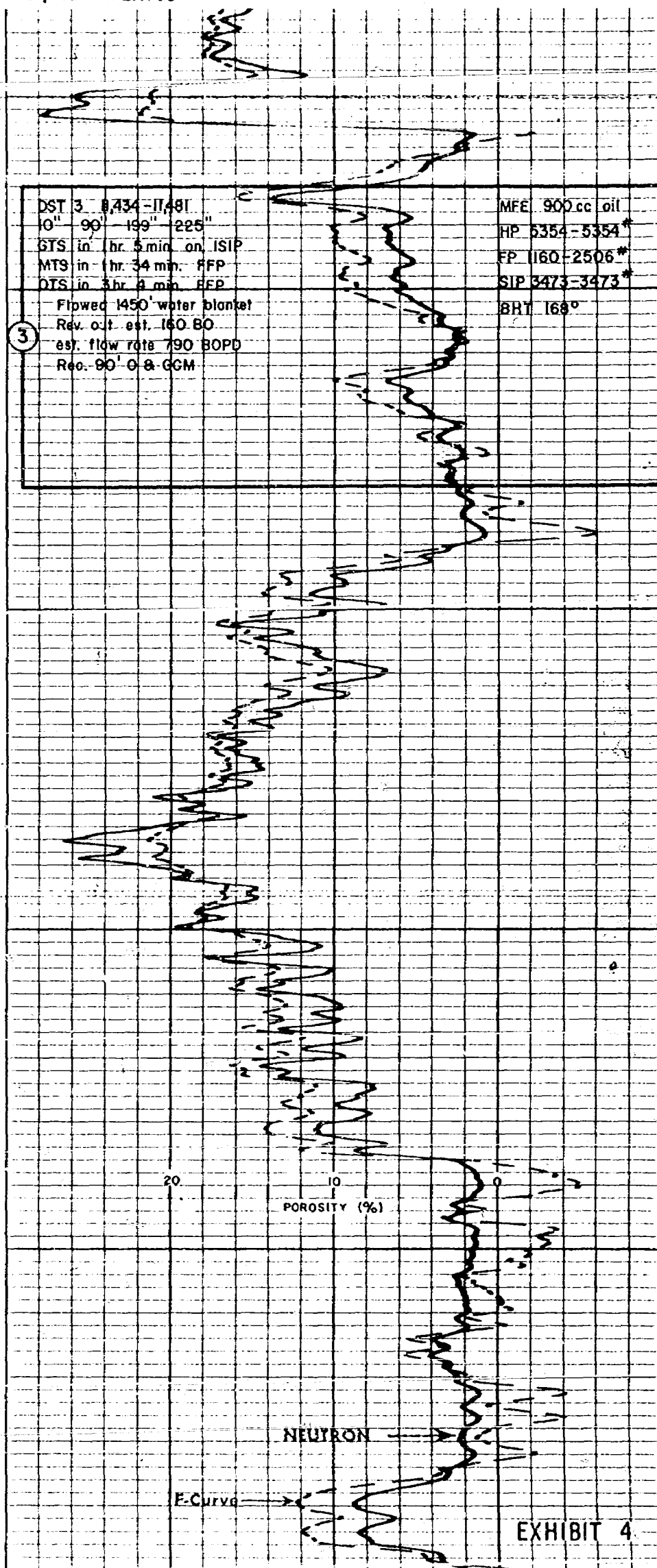
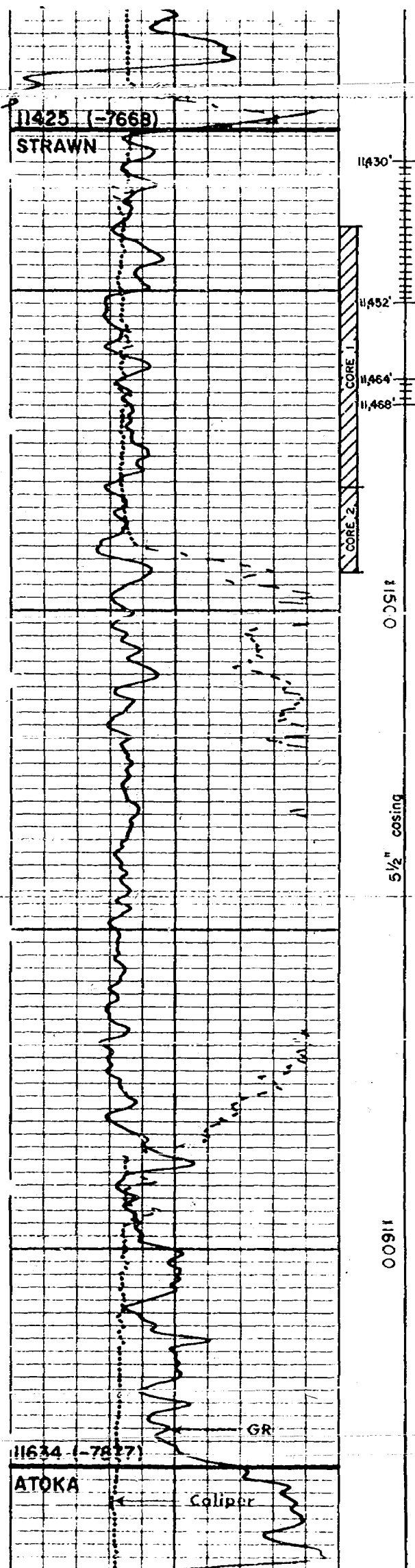


PUBCO PETROLEUM CORP.

Shipp No. 2

Sec. II T17S R37E

LEA CO., NEW MEXICO



DST 3 11434-11481

10" 90' 199" 225"

GTS in 1 hr 5 min on ISIP

MTS in 1 hr 34 min FFP

OTS in 3 hr 8 min FFP

Flowed 1450' water blanket

Rev. out est. 160 BO

est. flow rate 790 BOPD

Rec. 90' O & GCM

MFE 900 cc oil

HP 5354-5354*

FP 1160-2506*

SIP 3473-3473*

BHT 168°

POROSITY (%)

NEUTRON

E-Curve

EXHIBIT 4

WELL AND COMPLETION DATA
HUMBLE CITY-STRAWN POOL

1. Company and Well	<u>Harding O&G Shipp #1</u>	<u>Pubco Petroleum Corp. Shipp #2</u>
2. Location of Well (Sec. 11-17S-37E)	2080' FWL & 2310' FSL	2130' FEL & 1980' FSL
3. Total Depth	11,673'	11,685'
4. Top of Strawn Limestone (Middle-Lower)	11,400' (-7639)	11,425' (-7668)
5. Top of Pay	11,420' (-7659)	11,430' (-7673)
6. Completion Date	March 9, 1972	June 10, 1972
7. Perforated Interval	11,420-11,452'	11,430-452' & 11,464-468'
8. Treatment	2,000 gals. acid	5,000 gals. acid
9. Initial Potential, BOPD	286	758
Choke Size	10/64"	24/64"
GOR	1000	1662
FIP	1600	700
FCP	Pkr.	Pkr.
Oil Gravity, °API	45	45
10. Net Pay	34'	30'
11. Average Porosity	5.1%	6.30%
12. Permeability	--	20 md.
13. Water Saturation	25%	25%
14. Reservoir Temperature	165° F	168° F
15. Initial Reservoir Press.	4800 psi	3473 psi

11,420'
57100

EXHIBIT 3

EXHIBIT NO. _____

CALCULATION OF DRAINAGE AREA

HUMBLE CITY (STRAWN) FIELD, LEA COUNTY, NEW MEXICO

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION

Harding EXHIBIT NO. 2CASE NO. 4749

8-7-74

Operator Well	Date of Initial Prod.	Initial BHP psia	Ultimate Oil Recovery		Calc. Rec. BO/AF	Net Pay Thickness Ft.
			(Depleted) BBLs	Decline Curve		
Harding Oil Company Shipp No. 1	5-72	4,807	163,826	---	52	46
Mesa Petroleum Company Shipp No. 2	6-72	3,473	199,003	---	41	33
Harding Oil Company Shipp No. 5	2-73	3,871	---	129,135	46	41
TIPCO Nicholson No. 2	7-73	3,032	---	79,641	53	27
Harding Oil Company Shaw No. 1	3-74	3,555	---	---	---	---
			362,829	208,776	192	147
					Avg. = 48	Avg. = 36.75

1. Ultimate Oil Recovery From 4 Wells = 362,829 BBL + 208,776 BBL = 571,605 BBL

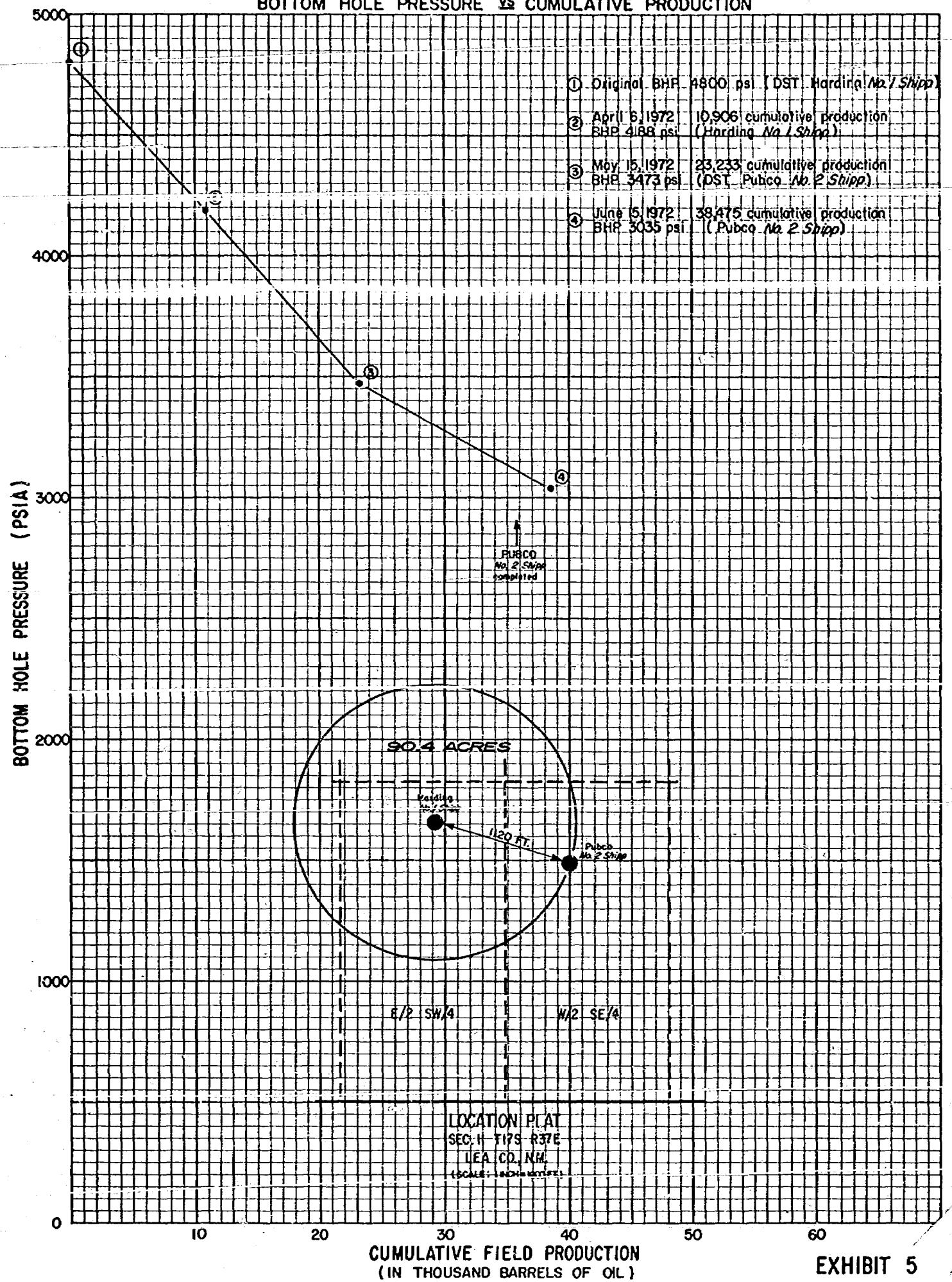
2. Drainage Area = $\frac{571,605 \text{ BBL}}{(48 \text{ BO/AF})(36.75 \text{ Net Ft.})} = 324 \text{ Ac} \div 4 \text{ Wells} = 81 \text{ Ac/Well}$

SIPES, WILLIAMSON & AYCOCK, INC.
 1100 GIBBS TOWER WEST MIDLAND, TEXAS 79701
 ROY C. WILLIAMSON, JR., P. E./lm 8-7-74

EXHIBIT NO. _____

HUMBLE CITY - STRAWN POOL

BOTTOM HOLE PRESSURE VS CUMULATIVE PRODUCTION



CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

June 2, 1972

Pubco Petroleum Corporation
P. O. Box 869
Albuquerque, New Mexico 87100

Attention: Mr. J. C. Johnson

Subject: Core Analysis
Shipp No. 2 Well
Wildcat
Lea County, New Mexico
Location: Sec. 11-T17S-R37E

Gentlemen:

Diamond coring equipment and water base mud were used to core the subject well. The cores were sampled by a representative of Core Laboratories, Inc., under the direction of an employee of Pubco Petroleum Corporation. The analysis was performed in our Midland laboratory. Results of the analyses are presented in tabular and graphical forms on the attached Coregraph.

Strawn formation analyzed between 11,440 to 11,492 feet is interpreted to be oil productive where sufficiently permeable. Average core analysis values and theoretical maximum recoverable oil estimates, calculated from estimated original reservoir fluid characteristics, have been prepared and are presented on page one of this report.

We sincerely appreciate this opportunity to serve you.

Very truly yours,

Core Laboratories, Inc.

R S Bynum
R. S. Bynum (R)
District Manager

RSB:AB:dl

1 cc. - Addressee

1 cc. - Mr. M. E. Causey

Pubco Petroleum Corporation
Midland, Texas 79701

EXHIBIT 6

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

Page 1 of 1 File WP-3-3465
Well Shipp No. 2

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Strawn 11,440.0-11,492.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	50.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	52.9
FEET OF CORE INCLUDED IN AVERAGES	21.9	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE (c)	34
AVERAGE PERMEABILITY: MILLIDARCYs Max.: 20	✓	OIL GRAVITY: °API (e)	45
90° : 10		ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL (e)	1000
PRODUCTIVE CAPACITY: MILLIDARCY-Feet Max.: 438		ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL (e)	1.58
90° : 219			
AVERAGE POROSITY: PER CENT	6.0		
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	3.8	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	234

Calculated maximum solution gas drive recovery is 30 barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is 48 barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

FORMATION NAME AND DEPTH INTERVAL:

FEET OF CORE RECOVERED FROM ABOVE INTERVAL		AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	
FEET OF CORE INCLUDED IN AVERAGES		AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	
AVERAGE PERMEABILITY: MILLIDARCYs		OIL GRAVITY: °API	
PRODUCTIVE CAPACITY: MILLIDARCY-Feet		ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY: PER CENT		ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE		CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	

Calculated maximum solution gas drive recovery is barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

(c) Calculated (e) Estimated (m) Measured (*) Refer to attached letter.

These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc., and its officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

CORE LABORATORIES, INC.



Petroleum Reservoir Engineering

COMPANY PUBCO PETROLEUM CORPORATION

FILE NO. WP-3-3465

WELL SHIPP NO. 2

DATE 5-24-72

ENGRS. BOONE

FIELD WILDCAT

FORMATION STRAWN

ELEV. 3757' KR

COUNTY LEA

STATE NEW MEXICO

DRLG. FLD. WATER BASE MUD

CORES DAIMOND 4 1/4"

LOCATION 2130' FEL 1980' FSL NW/4 SE/4, SEC 11-T17S-R37E

REMARKS SAMPLED AS DIRECTED BY CLIENT

COMPLETION COREGRAPH

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted) but Core Laboratories, Inc. and its officers and employees assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

SAND



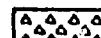
LIMESTONE



CONGLOMERATE



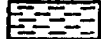
CHERT



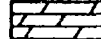
ANHYDRITE



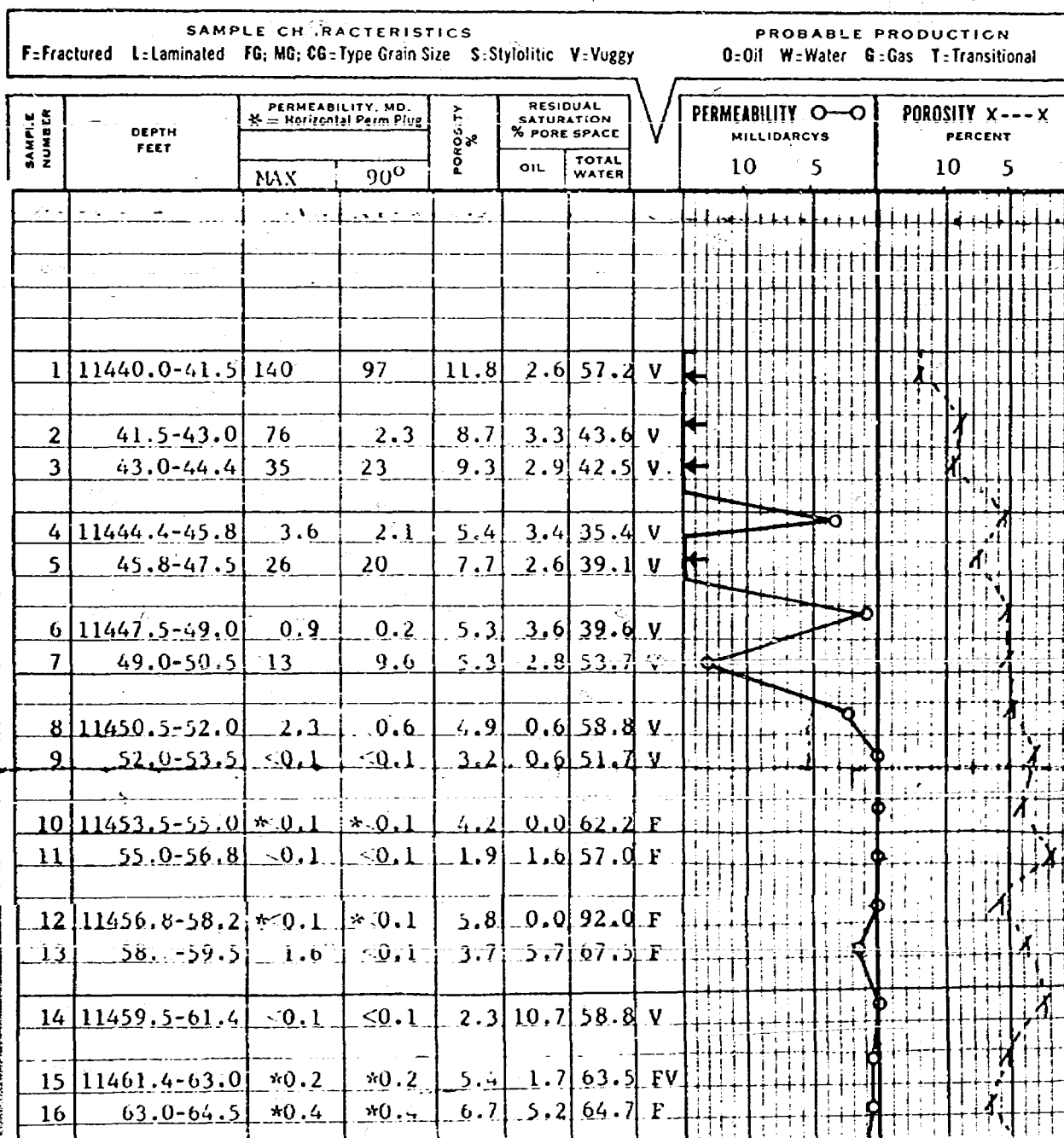
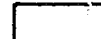
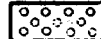
SHALE



DOLOMITE



COOLITES



17	11464.5-66.0	0.8	0.6	4.5	7.1	54.1	FV
18	66.0-67.5	3.6	0.5	5.2	1.0	57.2	
19	11467.5-69.3	*0.1	*0.1	4.3	4.2	62.7	V
20	11469.3-71.1	<0.1	<0.1	1.8	5.1	61.2	F
21	71.1-72.5	0.4	0.3	4.9	5.4	66.2	V
22	11472.5-73.8	0.9	<0.1	3.6	7.8	58.0	FV
23	73.8-75.2	<0.1	<0.1	2.1	4.9	68.0	
24	75.2-76.3	0.1	<0.1	1.9	6.5	59.2	F
25	76.3-77.5	<0.1	<0.1	3.3	1.5	72.2	F
26	11477.5-79.0	<0.1	<0.1	3.0	4.9	77.2	F
27	11481.0-82.7	<0.1	<0.1	2.8	4.2	76.7	
28	11482.7-84.5	<0.1	<0.1	2.1	0.0	79.7	STY
29	11484.5-86.2	<0.1	<0.1	2.6	3.5	86.3	
30	11486.2-88.0	<0.1	<0.1	2.5	2.8	76.8	F
31	11491.0-92.0	<0.1	<0.1	1.3	0.0	52.8	

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering
DALLAS, TEXAS 75207

June 22, 1972

REPLY TO BOX 4937
MIDLAND, TEXAS
79701
625-7.1

Pubco Petroleum Corporation
P. O. Box 869
Albuquerque, New Mexico 87101

Attention: Mr. Charles Sanders

Gentlemen:

In accordance with your request we have performed a depletion drive study of the Strawn oil reservoir available to your Shipp Well No. 2, Lea County, New Mexico. Two cases of reservoir drainage per well were investigated: 80 acre and 160 acre. A summary of basic data and study results is presented below:

	<u>80 Acre Case</u>	<u>160 Acre Case</u>
Avg. Porosity, Pct.	6.3	6.3
Avg. Oil Permeability, Md.	5.3	5.3
Avg. Interstitial Water Sat., Pct.	25.0	25.0
Avg. Net Productive Thickness, Ft.	30.0	30.0
Oil FVF at 4800 psig, Vol/Vol	1.642	1.642
Oil FVF at 2835 psig (BP), Vol/Vol	1.707	1.707
Original Oil in Place, STB	535,783	1,071,568
Original Oil in Place, Bbl/Ac. Ft.	223	223
Ultimate Oil Recovery, Pct. of Oil in Place	16.76	16.76
Ultimate Oil Recovery, STB	89,815	179,630
Ultimate Oil Recovery, Bbl/Ac. Ft.	37.4	37.4
Ultimate Gas Recovery, MSCF	476,788	953,577
Total Primary Producing Life, Yrs.	5.9	11.8

Certain assumptions were made in the performance of the two cases. It was assumed that the average reservoir thickness, rock and fluid properties exhibited by the Shipp No. 2 would be constant throughout the two drainage areas considered. Also, it was assumed that the reservoir would produce under the primary influence of a solution gas drive mechanism to an abandonment reservoir pressure of 500 psig. To arrive at the producing life it was assumed that productivity would decline in accord with the effects of increasing reservoir gas saturation on relative oil permeability.

We are enclosing copies of our computer output pertaining to core data grouping and averaging and the two cases of depletion drive material balance. Table II of the material balance for each area case presents the time-rate calculation results.

EXHIBIT 6A

UNITED STATES CANADA SOUTH AMERICA EUROPE AFRICA AUSTRALIA ASIA

Pubco Petroleum Corporation
June 23, 1972
Page No. 2

If you have any question regarding this study or require additional assistance in this regard, please do not hesitate to call.

Very truly yours,

CORE LABORATORIES, INC.



C. K. Osborn,
Division Engineer

CKO:wjy
Enclosures

RECOVERABLE OIL RESERVES
HUMBLE CITY-STRAWN POOL

BASIC DATA

	<u>Log</u>	<u>Core</u>
Average Porosity - Harding Shipp #1	5.10%	--
Average Porosity - Pubco - Shipp #2	6.30%	6.00%
Assumed Average Porosity, Field	6.30%	
Average Feet of Pay, h	30'	
Water Saturation	25%	
Recovery Factor	16.76%	
FVF @ original BHP 4800 psi	1.642	

VOLUMETRIC CALCULATION

$$\text{Original Recoverable Oil, Bbls/Ac-Ft} = \frac{7758 \phi (1-S_w)}{(FVF)} \times (RF)$$

$$\frac{(7758) (0.063) (0.75)}{1.642} \times (0.1676) = 37.4 \text{ Barrels Oil Per Acre Foot}$$

Where,

- ϕ = Fractional porosity of rock
- S_w = Interstitial water saturation, fraction of pore space
- h = Vertical feet of net pay
- FVF = Formation volume factor, barrels oil at original reservoir conditions per barrel stock tank oil at normal surface conditions.
- RF = Recovery factor, fractional part of original oil in place recoverable by solution gas drive mechanism.

ECONOMICS FOR
HUMBLE CITY-STRAWN POOL
LEA COUNTY, NEW MEXICO

	<u>80-Acre Spacing</u>	<u>160-Acre Spacing</u>
<u>Revenue For Average Well</u>		
80-acre - 89,815 barrels oil per well @ \$3.56	\$ 319,741	\$
476,788 MCF per well @ \$0.25	<u>119,197</u>	
	\$ 438,938	
160-acre - 179,630 barrels oil per well @ \$3.56		639,483
953,577 MCF per well @ \$0.25		<u>238,394</u>
		\$ 877,877
Less Royalty @ 18.75%	82,301	164,602
Less Taxes @ 7.1%	<u>31,165</u>	<u>62,329</u>
Total Revenue	<u>\$ 325,472</u>	<u>\$ 650,946</u>
<u>Expense</u>		
Drilling, Completion, Tank Battery	\$ 230,000	\$ 230,000
Pumping Equipment	30,000	30,000
<u>Operating Cost</u>		
80-acre - 5.9 years @ \$6,000	35,400	
160-acre - 11.8 years @ \$6,000		<u>70,800</u>
Total Expense	<u>\$ 295,400</u>	<u>\$ 330,800</u>
Net Profit	<u>\$ 30,072</u>	<u>\$ 320,146</u>
Profit to Investment Ratio	0.12	1.27

NOTE: The analysis does not consider any dry holes that may be drilled. Estimated dry hole cost is \$162,000.

One (1) producer on 160-acre spacing will support two (2) dry holes.

Five plus (5+) producers on 80-acre spacing will be required to support one (1) dry hole.

EXHIBIT 8

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 1
CASE NO. 4749

R-37-E

Mesa

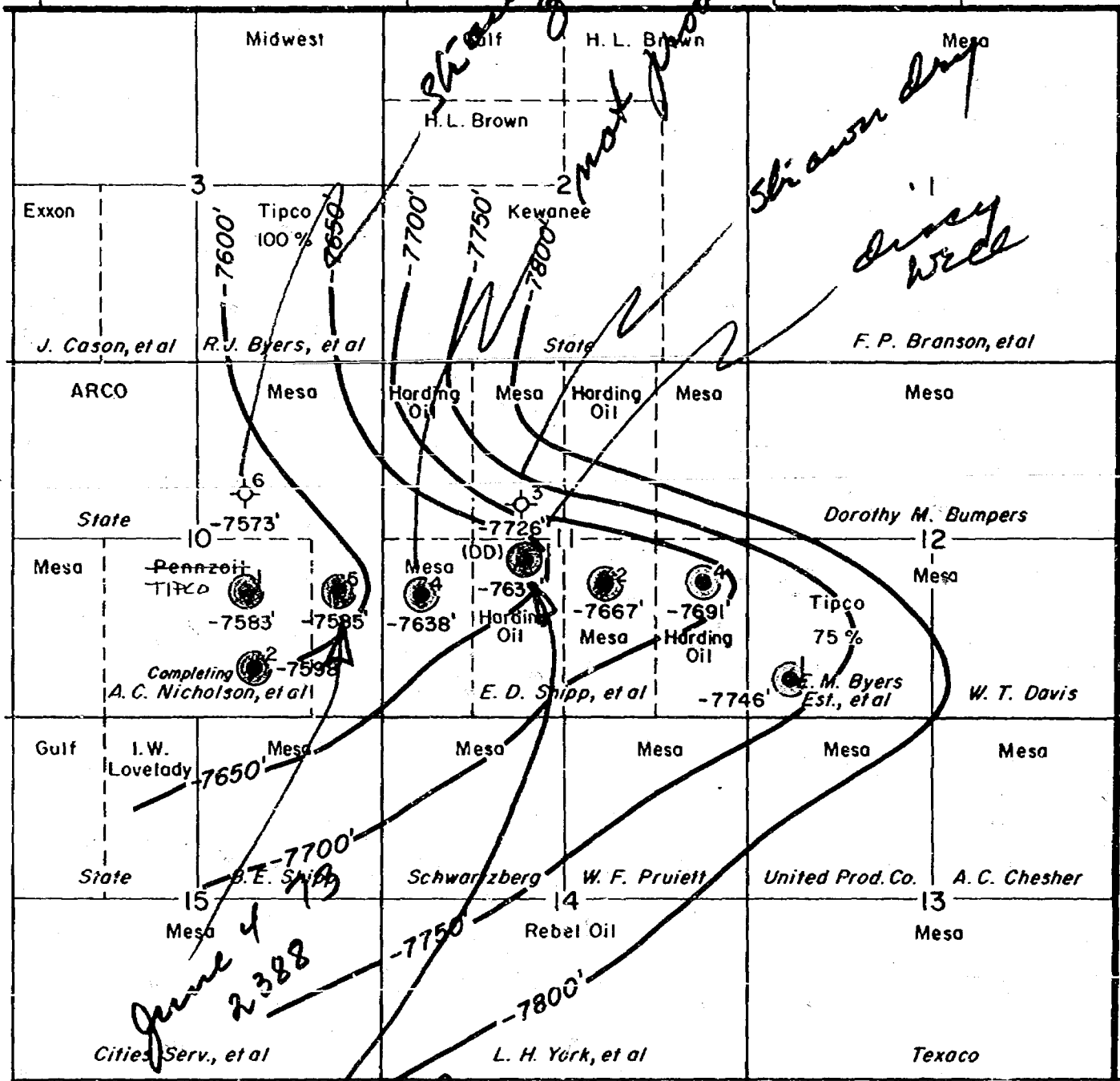
34

35

36

Continental

State



LEGEND

- - Yesso Bank Well
- - Strawn Well
- - Atoka Well
- - Wolfcamp Well

EXHIBIT NO. 1

STRUCTURE MAP

TOP OF STRAWN

C.I. = 50'

HUMBLE CITY (Strawn) POOL

LEA COUNTY, NEW MEXICO

SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.

CONSULTING ENGINEERS

MIDLAND, TEXAS

LAW OFFICES

HINKLE, BONDURANT, COX & EATON

TELEPHONE (505) 622-6510

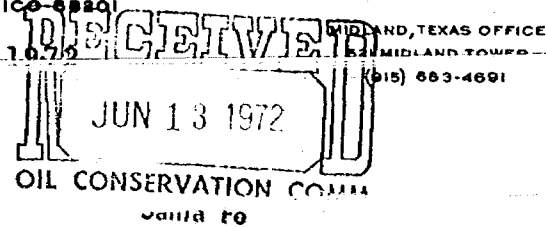
CLARENCE E. HINKLE
W. E. BONDURANT, JR.
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.
J. M. LITTLE

600 HINKLE BUILDING

POST OFFICE BOX 10

ROSWELL, NEW MEXICO 88201

June 12, 1972



Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

We enclose in triplicate application of Harding Oil Company for special field rules and the creation of a new pool as well as a discovery allowable in connection with its well in Section 11, Township 17 South, Range 37 East.

We have previously talked with Dan Nutter with regard to this matter and we understand that it will be placed on the examiner's hearing docket for June 28.

Yours very truly,

HINKLE, BONDURANT, COX & EATON

By Clarence E. Hinkle
Ch

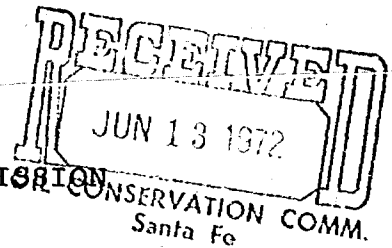
CEH:cs
Enc.

DOCKET MARKED

Date 6-13-72

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO



APPLICATION OF HARDING OIL COMPANY FOR THE PROMULGATION OF SPECIAL FIELD RULES ON A TEMPORARY BASIS BECAUSE OF A NEW DISCOVERY MADE BY APPLICANT IN ITS E. D. SHIPP NO. 1 WELL LOCATED IN UNIT K, 2080 FEET FROM THE WEST LINE AND 2310 FEET FROM THE SOUTH LINE OF SECTION 11, TOWNSHIP 17 SOUTH, RANGE 37 EAST, LEA COUNTY, IN THE STRAWN FORMATION THROUGH PERFORATIONS FROM 11,420 FEET TO 11,452 FEET, SAID RULES TO INCLUDE 80 ACRE SPACING AND PRORATION UNITS WITH THE PRIVILEGE OF DRILLING ON EITHER 40 ACRE COMPONENT, AND THE CREATION OF A NEW POOL IN CONNECTION THEREWITH, AND FOR A DISCOVERY ALLOWABLE.

Case 4749

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Comes Harding Oil Company and hereby makes application for the promulgation of special field rules on a temporary basis because of a new discovery made by applicant in its E. D. Shipp No. 1 well located in Unit K, 2080 feet from the west line and 2310 feet from the south line of Section 11, Township 17 South, Range 37 East, Lea County in the Strawn formation through perforations from 11,420 feet to 11,452 feet, said rules to include 80 acres spacing and proration units with the privilege of drilling on either 40 acres component, and the creation of a new pool in connection therewith and for a discovery allowable, and in support thereof respectfully shows:

1. That on March 9, 1972 applicant completed its E. D. Shipp No. 1 well located in Unit K of Section 11, Township 17 South, Range 37 East, Lea County, said well being drilled to a total depth of 11,672 feet and completed in the Strawn formation through perforations from 11,420 to 11,452 feet with a potential of 624 barrels of oil per day. This well is believed to be a new discovery in a separate and distinct Strawn formation from any other producing well in the area.

2. There is attached hereto, made a part hereof and for purposes of identification marked Exhibit "A", a plat showing all wells within a two mile radius of the discovery well and the ownership of all leasehold interests within said area.

3. Because of the character of the discovery and the producing formation it is believed that one well will effectively and efficiently drain 80 acres or more.

4. Applicant proposes to commence a second well which will be located in the approximate center of the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of said Section 11. Applicant believes that it will be in the interest of conservation and the prevention of waste and the orderly future development of the new pool indicated by the discovery well that temporary pool rules be adopted by the Commission providing for 80 acre spacing and proration units with the privilege of drilling in the center of either 40 acre component, with a tolerance of 150 feet, and that future development will show conclusively that one well will effectively and efficiently drain 80 acres or more. Applicant further believes that such temporary special pool rules will prevent the possibility of economic loss resulting from the drilling of unnecessary wells and will permit the operators in the pool to gather information concerning the reservoir characteristics, as well as protect correlative rights.

5. Applicant has made application for a discovery allowable and has filed Form C-109 with the Commission.

6. Applicant requests that this matter be set down for hearing at the examiner's hearing scheduled for June 28, 1972.

Respectfully submitted,

HARDING OIL COMPANY

By 

Member of the Firm of
HINKLE, BONDURANT, COX & EATON
Attorneys for Applicant
P.O. Box 10
Roswell, New Mexico 88201

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 4749

Order No. R-~~4338~~
R-4338-A

IN THE MATTER OF CASE NO. 4749 BEING
REOPENED PURSUANT TO THE PROVISIONS OF ORDER
NO. R-4338, WHICH ORDER ESTABLISHED SPECIAL
RULES AND REGULATIONS FOR THE HUMBLE CITY-
STRAWN POOL, LEA COUNTY, NEW MEXICO, INCLUDING
A PROVISION FOR 80-ACRE PRORATION UNITS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 11, 1973
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this day of July, 1973, the Commission,
a quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.

(2) That by Order No. R-4338, entered in Case No. 4749 on
July 17, 1972, special rules and regulations were
promulgated for the Humble City-Strawn Pool, Lea County, New
Mexico.

-2-
Case No. 4749
Order No. R-

(3) That this case was reopened pursuant to Order No. R-4338 to allow all interested parties to show cause why the subject pool should not be developed on other than 40-acre proration units.

(4) That the special rules and regulations promulgated by Order No. R-4338 should be extended for an additional one year period in order to prevent the possibility of economic loss resulting from the drilling of unnecessary wells, and in order to allow the operators in the subject pool additional time in which to gather information concerning the reservoir characteristics of the pool.

(5) That this case should be reopened at an examiner hearing in July, 1974, at which time the operators in the subject pool should appear and show cause why the Humble City-Strawn Pool should not be developed on other than 40-acre proration units.

IT IS THEREFORE ORDERED:

(1) That the special rules and regulations governing the Humble City-Strawn Pool, promulgated by Order No. R-4338, shall remain in full force and effect for an additional period of one year.

(2) That this case shall be reopened at an examiner hearing in July, 1974, at which time the operators in the subject pool shall appear and show cause why the Humble City-Strawn Pool should not be developed on other than 40-acre proration units.

(3) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

DRAFT

GMH/dr

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

APPLICATION OF HARDING OIL
COMPANY FOR A DISCOVERY
ALLOWABLE AND SPECIAL POOL
RULES, LEA COUNTY, NEW MEXICO.

CASE No. 4749

Order No. R-4338

NOMENCLATURE

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 28, 1972,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this day of July, 1972, the Commission, a
quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.

(3) ~~That the applicant, Harding Oil Company, seeks the~~
~~creation of a new oil pool for production in~~
~~Lea County, New Mexico, and the assignment of an oil discovery~~
allowable in the amount of approximately 57,100 barrels to
the discovery well for said pool.

(2) ~~That the applicant, Harding Oil Company, also seeks the promulgation of~~
~~special rules, for said pool, including a provision for 80-acre~~
proration units.

(4) That the evidence presently available indicates that the ^{Harding Oil Company} E. D. Shipp Well No. 1, located in Unit K of Section 11, Township 17 South, Range 37 East, NMPM, Lea County, New Mexico, ~~has~~ discovered a separate common source of supply which ^{has been} ~~should be~~ designated the Humble City-Strawn Pool; that the vertical limits of said pool ^{have been defined as the Strawn} ~~should be the~~ formation, and that the horizontal limits of said pool ^{have previously been defined} ~~should be all of said Section 11.~~ ^{on the SW 1/4 of said Section 11.}

(5) That the discovery well for the aforesaid pool, E. D. Shipp Well No. 1, located in Unit K of Section 11, township 17 South, Range 37 East, NMPM, Lea County, New Mexico, is entitled to and should receive a bonus discovery oil allowable in the amount of 57,100 barrels, based upon the top perforations ^{of the} in said well at 11,420 feet, to be assigned over a two-year period.

(6) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 30-acre spacing units should be promulgated for the Humble City-Strawn Pool.

(7) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

(8) That the temporary special rules and regulations should be established for a one-year period in order to allow the operators in the subject pool to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

(9) That this case should be reopened at an examiner hearing in June, 1973, at which time the operators in the subject

pool should be prepared to appear and show cause why the Humble City-Strawn Pool should not be developed on ^{other than} 40-acre spacing units.

IT IS THEREFORE ORDERED:

(1) That ^{the Humble City-Strawn Pool as heretofore} ~~a new pool~~ in Lea County, New Mexico, ^{defined, and described} ~~classified,~~ ^{as an oil pool for} ~~production,~~ is hereby ^{extended to include therein:} ~~created and designated the Humble City-Strawn Pool, with vertical limits comprising the~~ ~~formation and horizontal limits comprising the following described area:~~

TOWNSHIP 17 SOUTH, RANGE 37 EAST, NMPM
Section 11: SE 14

^{Harding Oil Company, E. D. Shipp well No. 1 located in unit K 8}
(2) That the ~~aforsaid~~ discovery well is hereby authorized an oil discovery allowable of 57,100 barrels to be assigned to said well at the rate of 79 barrels per day in accordance with Rule 509 of the Commission Rules and Regulations.

(3) That temporary Special Rules and Regulations for the Humble City-Strawn Pool, Lea County, New Mexico, are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
HUMBLE CITY-STRAWN POOL

RULE 1. Each well completed or recompleted in the Humble City-Strawn Pool or in the Strawn formation within one mile thereof, and not nearer to or within the limits of another designated Strawn oil pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well shall be located on a standard unit containing 80 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a governmental quarter section; provided, however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

(10) That the horizontal limits of the Humble City-Strawn Pool should be extended to include the SE 1/4 of the above described Section 11.

Section 11 Township 17 South Range 37 East, Humble City, Lea County, New Mexico

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit comprising a governmental quarter-quarter section or lot, or the unorthodox size or shape of the tract is due to a variation in the legal subdivision of the United States Public Land Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Secretary-Director has received the application.

RULE 4. Each well shall be located within 150 feet of the center of a governmental quarter-quarter section or lot.

RULE 5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

RULE 6. A standard proration unit (79 through 81 acres) shall be assigned an 80-acre proportional factor of 6.67 for allowable purposes, and in the event there is more than one well

-5-
CASE NO. 4749
Order No. R-

on an 80-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

The allowable assigned to a non-standard proration unit shall bear the same ratio to a standard allowable as the acreage in such non-standard unit bears to 80 acres.

IT IS FURTHER ORDERED:

(1) That the locations of all wells presently drilling to or completed in the Humble City-Strawn Pool or in the Strawn formation within one mile thereof are hereby approved; that the operator of any well having an unorthodox location shall notify the Hobbs District Office of the Commission in writing of the name and location of the well on or before August 1, 1972.

(2) That, pursuant to Paragraph A. of Section 65-3-14^{1/2}, NMSA 1953, contained in Chapter 271, Laws of 1969, existing wells in the Humble City-Strawn Pool shall have dedicated thereto ⁸⁰~~160~~ acres in accordance with the foregoing pool rules; or, pursuant to

entry of such further orders as the Commission may deem necessary.
DONE at Santa Fe, New Mexico, on the day and year herein-
above designated.

next page

Paragraph C. of said Section 65-3-14.5, existing wells may have non-standard spacing or proration units established by the Commission and dedicated thereto.

Failure to file new Forms C-102 with the Commission dedicating ~~160~~⁸⁰ acres to a well or to obtain a non-standard unit approved by the Commission within 60 days from the date of this order shall subject the well to cancellation of allowable. Until said Form C-102 has been filed or until a non-standard unit has been approved, and subject to said 60-day limitation, each well presently drilling to or completed in the Humble City-Strawn Pool or in the Strawn formation within one mile thereof shall receive no more than ~~one-fourth~~^{one-half} of a standard allowable for the pool.

(3) That this case shall be reopened at an examiner hearing in June, 1973, at which time the operators in the subject pool may appear and show cause why the Humble City-Strawn Pool should not be developed on ^{other than} 40-acre ~~or 80-acre~~ spacing units, and why the limiting gas-oil ratio should not revert to the ~~Statewide limit of 2000 to one.~~

~~PROVIDED HOWEVER, that the Secretary-Director of the Commission may by administrative order rescind such authority whenever it reasonably appears to the Secretary-Director that such rescission would serve to prevent waste or protect correlative rights.~~

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 4749

Order No. R-~~4889~~

4338-B

IN THE MATTER OF CASE NO. 4749 BEING
REOPENED PURSUANT TO THE PROVISIONS OF
ORDER NO. R-4338-A, WHICH ORDER CONTINUED
SPECIAL RULES FOR THE HUMBLE CITY-STRAWN
POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 7, 1974
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this _____ day of October, 1974, the Commission,
a quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.

(2) That by Order No. R-4338, dated July 17, 1972,
temporary special rules and regulations were promulgated for
the Humble City-Strawn Pool, Lea County, New Mexico, including
a provision for 80-acre proration units.

(3) That by Order No. R-4338-A, dated July 23, 1974,
said temporary special rules and regulations were
continued in effect for an additional one-year period.

-2-
Case No. 4749
Order No. R-4338-B

(1) That pursuant to the provisions of Order No. R-4338-A, ~~dated July 23, 1972~~, this case was reopened to allow the operators in the subject pool to appear and show cause why the Humble City-Strawn Pool should not be developed on 40-acre spacing units.

(2) That the evidence establishes that one well in the Humble City-Strawn Pool can efficiently and economically drain and develop 80 acres.

(3) That the Special Rules and Regulations promulgated by Order No. R-4338 and Order No. R-4338-A have afforded and will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the ~~oil~~^{and gas} in the pool.

(4) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations promulgated by Order No. R-4338 and Order No. R-4338-A should be continued in full force and effect until further order of the Commission.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Humble City-Strawn Pool, Lea County, New Mexico, promulgated by Order No. R-4338 and Order No. R-4338-A, are hereby continued in full force and effect until further order of the Commission.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.