

1930 OIL AND GAS COMPANY FOR  
POOLING, EDDY COUNTY, NEW  
MEXICO

CASE NO.

6978

---

APPLICATION,  
TRANSCRIPTS,  
Small Exhibits,  
ETC.



BRUCE KING  
GOVERNOR  
LARRY KEHOE  
SECRETARY

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-2434

Mr. John B. Draper  
Montgomery & Andrews  
Attorneys at Law  
325 Paseo De Peralta  
Santa Fe, New Mexico

Re: CASE NO. 6928  
ORDER NO. R-6391

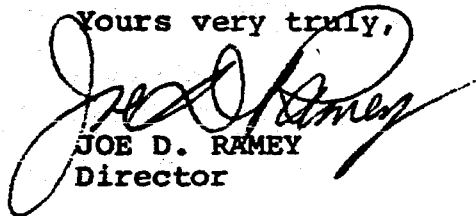
Applicant:

ARCO Oil and Gas Company

Dear Sir:

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

Yours very truly,

  
JOE D. RAMEY  
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x  
Artesia OCC x  
Aztec OCC       

Other William F. Carr, Thomas Kellahin

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

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

CASE NO. 6928  
Order No. R-6391

APPLICATION OF ARCO OIL AND GAS  
COMPANY FOR COMPULSORY POOLING,  
EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 5, 1980, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 7th day of July, 1980, the Commission, a quorum being present, having considered the testimony, exhibits, and the record, 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, ARCO Oil and Gas Company, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the S/2 of Section 24, Township 17 South, Range 28 East, NMPM, South Empire-Morrow Gas Pool, Eddy County, New Mexico.

(3) That the applicant has the right to drill and proposes to drill a well at an orthodox location 660 feet from the South line and 1980 feet from the East line of said Section 24.

(4) That in companion Case No. 6927, Doyle Hartman requested compulsory pooling of the S/2 of said Section 24 to be dedicated to a well to be drilled at an unorthodox location 800 feet from the South line and 1980 feet from the West line of said Section 24.



-2-  
Case No. 6928  
Order No. R-6391

(5) That the preponderance of evidence indicated that the unorthodox location as proposed by Doyle Hartman was the most favorable for recovering hydrocarbons which underlie said Section 24.

(6) That the application of Doyle Hartman was approved by Order No. R-6390.

(7) That this application should be denied.

IT IS THEREFORE ORDERED:

(1) That the application in this cause is denied.

(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

ALEX J. ARMIJO, Member

  
EMERY C. ARNOLD, Member

  
JOE D. RAMEY, Member & Secretary

SEAL

2d/

## NEW MEXICO OIL CONSERVATION COMMISSION

## COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date JUNE 5, 1980 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
ERM. Prunty	Atlantic Richfield	Midland
JAMES W. JOHNSTON	Atlantic Richfield Co	Midland
STEVEN E. AREA	Atlantic Richfield Co	M. D. D.
J. L. CORKILL	Husky Oil Co.	DENVER
Lee Flowers	DEPCO Inc.	DENVER
William F. Carr	Campbell & Black, P.A.	Santa Fe
Dick Wambach	Consultant	Midland
Wm. P. Aycock	Rad + Ho, Aycock & Assoc.	Midland
CW Holmstrom	Consultant	MIDLAND
R. Huber	Huber	Santa Fe
W. V. Kellerman	Kellerman & Kellerman	Santa Fe
George S. Schultz	ARCO OIL & GAS	Midland
Paul Lindholm	ARCO	Midland

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION  
STATE LAND OFFICE BLDG.  
SANTA FE, NEW MEXICO  
15 June 1980

COMMISSION HEARING

IN THE MATTER OF:

Application of Doyle Hartman for com- ) CASE  
pulsory pooling and an unorthodox ) 6927  
location, Eddy County, New Mexico. )

and )

Application of ARCO Oil and Gas Com- ) CASE  
pany for compulsory pooling, Eddy ) 6928  
County, New Mexico. )

BEFORE: Commissioner Joe Ramey  
Commissioner Emery Arnold

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Commission: Ernest L. Padilla, Esq.  
Legal Counsel to the Commission  
State Land Office Bldg.  
Santa Fe, New Mexico 87501

For the applicant, Doyle Hartman: William F. Carr, Esq.  
CAMPBELL & BLACK P. A.  
Jefferson Place  
Santa Fe, New Mexico 87501

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For the Applicant, ARCO:

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P. O. Box 2307  
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For Pennzoil:

W. Thomas Kellahin, Esq.  
KELLAHIN & KELLAHIN  
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1 MR. RAMEY: It appears we have two cases  
2 this morning that concern the same acreage, so I think, without  
3 objection, we'll consolidate the cases; have one transcript,  
4 issue two orders. Is that agreeable?

5 We will call Case 6927.

6 MR. PADILLA: Application of Doyle Hart-  
7 man for compulsory pooling and an unorthodox location, Eddy  
8 County, New Mexico.

9 MR. RAMEY: Call Case 6928.

10 MR. PADILLA: Application of ARCO Oil and  
11 Gas Company for compulsory pooling, Eddy County, New Mexico.

12 MR. RAMEY: I'll ask for appearances at  
13 this time.

14 MR. CARR: May it please the Commission,  
15 I am William F. Carr, Campbell and Black, P. A., Santa Fe,  
16 appearing on behalf of Doyle Hartman, the applicant in Case  
17 6927.

18 MR. DRAPER: May it please the Commission,  
19 I am John B. Draper, from the firm of Montgomery and Andrews  
20 here in Santa Fe, appearing on behalf of ARCO Oil and Gas  
21 Company, applicant in Case Number 6928.

22 MR. KELLAHIN: Mr. Ramey, I'm Tom Kellahin  
23 of Santa Fe, New Mexico, appearing on behalf of Pennzoil  
24 Company.

25 MR. FLOWERS: May it please the Commission,

1 I'm Lee Flowers with DEPCO, Incorporated, and I'd like to  
2 make a statement.

3 MR. CORKILL: Sir, I am J. L. Corkill,  
4 C-O-R-K-I-L-L, representing Husky Oil Company, Midland, and  
5 I'll make a statement supporting ARCO.

6 MR. RAMEY: Any other appearances? I  
7 would ask that all witnesses at this time stand and be sworn.

8  
9 (Witnesses sworn.)

10  
11 MR. RAMEY: Okay, Mr. Carr, you may pro-  
12 ceed.

13 MR. CARR: Thank you.

14 May it please the Commission, initially  
15 I would move to amend the application of Doyle Hartman. We  
16 would propose to move the well location from its proposed  
17 location 660 feet from the south and west lines of Section 4,  
18 and move it towards a standard location 800 feet from the  
19 south line and 1000 feet from the west line. We're moving  
20 from an unorthodox location to a more orthodox location, and  
21 I do not believe the application will have to be re-advertized.

22 MR. RAMEY: It would be less unorthodox  
23 than you -- than the one we advertised.

24 MR. CARR: Yes, sir.

25 MR. RAMEY: Okay, I think you're probably

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1 correct in assuming that; it's less unorthodox and more ortho-  
2 dox.

3 MR. CARR: At this time I would like to  
4 call our first witness, Mr. Donald Wambaugh.

5  
6 DONALD C. WAMBAUGH  
7 being called as a witness and having been duly sworn upon his  
8 oath, testified as follows, to-wit:

9  
10 DIRECT EXAMINATION

11 BY MR. CARR:

12 Q Will you state your full name and place  
13 of residence?

14 A Donald Curtis Wambaugh, Midland, Texas.

15 Q Mr. Wambaugh, by whom are you employed  
16 and in what capacity?

17 A I am a consulting geologist. I work for  
18 myself.

19 MR. RAMEY: Would you spell your last  
20 name, please?

21 A W-A-M-B-A-U-G-H.

22 Q Have you previously testified before this  
23 Commission and had your credentials accepted and made a mat-  
24 ter of record?

25 A No, sir.

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1 Q Will you briefly summarize your educational  
2 background and your work experience?

3 A I graduated from Ohio State University  
4 with a degree in geology in 1951. I went to work in Hobbs,  
5 New Mexico, for Continental Oil Company; worked there from  
6 1951 to 1954. I moved to Midland in Texas in 1954; worked  
7 with Continental Oil Company until 1960, when I left them to  
8 open my own consulting office; been on my own since.

9 Q Are you familiar with the area which is  
10 the subject of this application?

11 A Yes, sir.

12 Q And are you familiar with the application  
13 of Mr. Hartman in this matter?

14 A Yes.

15 MR. CARR: Are the witness' qualifications  
16 acceptable?

17 MR. RAMEY: Yes, they are.

18 Q Mr. Wambaugh, would you briefly state what  
19 Mr. Hartman is seeking with this application?

20 A This is an application of Doyle Hartman  
21 for compulsory pooling and an unorthodox location, Eddy  
22 County, New Mexico.

23 Applicant in the above styled cause seeks  
24 an order pooling all mineral interests in the Pennsylvanian  
25 formation underlying the south half of Section 24, Township

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1 17 South, Range 28 East, to be dedicated to a well to be  
2 drilled at an unorthodox location 800 feet from the south  
3 line and 1000 feet from the west line of said Section 24.

4 Also to be considered will be the cost  
5 of drilling and completing said well and the allocation of the  
6 cost thereof, as well as the actual operating cost and the  
7 charges for supervision; designation of applicant as operator  
8 of the well, and a charge for risk involved in drilling said  
9 well.

10 Q Now, have you prepared certain exhibits  
11 for introduction in this case?

12 A Yes, sir.

13 Q Will you please refer to what has been  
14 marked as Hartman's Exhibit Number One and explain to the  
15 Commission what this is and what it shows?

16 A All right. Exhibit Number One is a  
17 structure map contoured on top of the Lower Morrow formation  
18 of Pennsylvanian age.

19 It shows a gentle dip to the southeast of  
20 monoclinal magnitude and has the location of Mr. Hartman's  
21 well circled in red in the southwest quarter of Section 24.

22 Q And it has indicated on there the location  
23 of a channel, is that correct?

24 A Yes, there is a location of a channel,  
25 yes, sir.

1 Q And in your opinion, how important is the  
2 structure in this general area in regard to obtaining commer-  
3 cial production from the Morrow formation?

4 A In my opinion, I do not think that struc-  
5 ture has too much to do with the -- with the production hori-  
6 zons, formations.

7 Q So this exhibit is offered only as general  
8 background?

9 A Yes, sir.

10 Q Will you now refer to what has been marked  
11 as Hartman's Exhibit Number Two and explain what it is and  
12 what it shows?

13 A Yes, sir. Exhibit Number Two is an Iso-  
14 pachous map of the Lower Morrow net sand porosity. It has  
15 been derived by using electric log examination with the para-  
16 meters of 35 API units gamma ray or less, and greater than  
17 8 percent porosity determinations.

18 Q Okay. Now, I think it's important that  
19 we make very clear what you are showing with this Isopach map.  
20 You are limiting this to -- well, you are mapping only the  
21 best quality sand, is that correct?

22 A Yes, sir, and it's a method of comparing  
23 one well to another and rather than having apples and oranges,  
24 you have all oranges.

25 Q You have, in Section 24 in the northeast

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1 corner, a Pennzoil well. Has that well in fact produced or  
2 not?

3 A Yes, sir, that well is presently producing  
4 from the Lower Morrow and it's been a very poor producer, and  
5 according to these parameters, does not have any of the sand  
6 qualities that --

7 Q But that is because you are confining this  
8 to mapping only the best quality sand.

9 A Yes, sir.

10 Q And throughout, as you're talking and  
11 working with your exhibits, are you talking about all the  
12 Morrow formation, the Middle Morrow, the Lower?

13 A No, sir, only the sand in the Lower Morrow.

14 Q Now, this plat reflects two channels.  
15 How do the thicknesses in these two channels compare with each  
16 other?

17 A The channel that goes through the west  
18 half of Section 24, which shows the proposed proration unit  
19 on it, is -- has a thicker sand deposition than the channel  
20 shown on the east side of the exhibit, and is a narrower  
21 channel. It's a thicker sand with a narrower border. It has --  
22 the other one is a thinner sands and is spread out wider  
23 laterally.

24 Q Now, Mr. Wambaugh, I direct your attention  
25 to two wells completed in the channel in Section 25, and ask

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1 if you would indicate the thickness of the sand intercepted by  
2 each of those two wells?

3 A All right. The ARCO No. 1 "BV" State has  
4 95 feet of sand. The ARCO No. 2 "BV" State has 79 feet of  
5 sand.

6 Q Are there other wells in this general area  
7 that have intercepted sands of like quality?

8 A Yes, sir, the Amoco No. 5 Empire South  
9 Deep intercepted this sand, also.

10 Q Are these typical Morrow sands, based on  
11 your experience?

12 A No, sir, normally you do not find a thick  
13 channel section like this in the Morrow. Most of the time  
14 it's more of a lensical type lateral sheet sand.

15 Q All right. Is there a gas/water contact  
16 that can be established in this area?

17 A Yes, sir, the Amoco Empire South Deep Unit  
18 indicates gas/water contact from log determination, and also  
19 the fact that I'll show on a later cross section, they only  
20 perforated the very top portion of the sand.

21 MR. RAMEY: Mr. Wambaugh, would you ident-  
22 ify those Amoco wells that you were talking about?

23 A No. 5 --

24 MR. RAMEY: The No. 5 in Section 31?

25 A -- is in Section 31, yes, sir, which would



1 be in "G".

2 MR. RAMEY: Thank you.

3 Q Now, Mr. Wambaugh, as I look at this ex-  
4 hibit, I notice you have, as you move from southeast to north-  
5 west, you have turned the channel, pulled it somewhat to the  
6 north, to due north. Would you explain why you have inter-  
7 preted this data in this fashion?

8 A Yes, sir. It seemed to me under geological  
9 concepts and from determination of the data, that this would  
10 be a more logical way. Normally sand channels, rivers, do not  
11 run in a straight line. Also, at one point in time, if you  
12 take a straight line through the Amoco 5, the "BV" 1 and 2,  
13 you find that Yates drilled a well in Section 23, which is a  
14 dry hole.

15 Q Is it possible that the sand could have  
16 just thinned out between the wells in Section 25 and the Yates  
17 dry hole in Section 23?

18 A Yes, sir, but it would be very difficult  
19 to show that under geological concepts.

20 Q You believe that turning the channel to  
21 the north, then, is geologically a sound interpretation of  
22 the data that you have?

23 A Yes. Yes, sir.

24 Q Now, I would direct your attention to the  
25 Amoco Empire South Well No. 19 in Section 36.

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1 A Yes, sir.

2 Q And also to the Yates Empire South Well  
3 No. 13 in Section 30.

4 A Yes, sir.

5 Q And ask you if you have been able to see --  
6 have you examined logs on those wells?

7 A Yes, sir, I have.

8 Q Have you been able to -- have you found  
9 any evidence of a channel in either of those wells?

10 A No, sir. The sand present in the Lower  
11 Morrow does not fit the parameters, and both of these wells  
12 are completed as Upper Morrow Sands wells.

13 Q So, based on that, what can you conclude  
14 about the location of the channel?

15 A The channel goes between those two wells.

16 Q Now, I would ask you to refer to what has  
17 been marked Applicant's Exhibit Number Three. This is your  
18 cross section A-A', and if you'd like to go to the cross sec-  
19 tion, I would like you to explain to the Commission what this  
20 shows?

21 A This is the cross section that is marked  
22 in red on the Isopach map and it runs approximately through --  
23 well, through this channel with the available well data.

24 On the righthand side is the Amoco 5 and  
25 yellow shows the total sand thickness under these parameters

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1 that are shown on electric log as total sand, gross sand  
2 thickness, under the parameters of gross sand thickness.

3 Q Will you speak louder, please?

4 A Yes. And this shows that if you correlate  
5 these logs you can see identifiable characteristics that tie  
6 all three wells together and by projecting them into the loca-  
7 tion, Mr. Hartman's location, we can estimate an amount of  
8 sand that he would hope to penetrate; in the neighborhood of  
9 about the same amount of thickness as in the "BV" 2.

10 Q All right, and the data as to the thickness  
11 of the pay is also reflected on your Isopach map, which is  
12 your Exhibit Number Two?

13 A Yes, it's been derived from these logs.

14 Q Now, are the sands encountered in these  
15 three wells typical Morrow development in the area?

16 A No. Most of the Morrow development in this  
17 area is not this solid thick sand; it's a broken sand; it has  
18 three or four stringers of sand.

19 Q Are you aware of any other Morrow channel  
20 of this character in that general area?

21 A Not to my knowledge, no, sir.

22 Q Now, on this log do you show the perfor-  
23 ations in each well?

24 A Yes, sir. The wells are perforated.  
25 I've shown the perforations in the borehole to indicate that

1 on the "BV" 2 they perforated almost all the sand body; on  
2 the "BV" 1 almost the sand body; and on the Amoco well, as I  
3 stated before, they perforated the very top portion, because  
4 there's an oil/water contact indicated here in the log data.

5 Q Will you now refer to what has been marked  
6 Mr. Hartman's Exhibit Number Four and explain the information  
7 contained on this exhibit?

8 A Yes, sir. This is the green line on the  
9 Isopachous map, which is C-C', running approximately north-  
10 south through the other channel that we see in the area.

11 The common well is this well here, which  
12 is the Amoco No. 5, and we go north from there.

13 As you -- as I explained to you before,  
14 the Yates No. 13, this sand is essentially gone. You see a  
15 remnant of it.

16 Q When you say this sand, which sand are  
17 you talking about?

18 A The Lower Morrow Sand that is in the chan-  
19 nel here. It is essentially gone and this well is not indi-  
20 cated to have perforated any of the Morrow Sand.

21 As you go on further north you begin to  
22 see some development of sands, and this well, the Yates 18,  
23 has a thinner section than is in the western channel. The  
24 Conoco well has two sections. You can begin to see the shale  
25 breakup in it a little bit as you get toward the edge of the

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1 channel, and this well here is the General American No. 9.  
2 Again it seems to have a fairly solid clean sand but the net  
3 stuff is kind of broken up.

4 Q How does the quality of the pay in the  
5 wells reflected on your cross section C-C' compare with the  
6 wells on the A-A' cross section?

7 A The thickness and the quality of the sand  
8 are not -- are inferior.

9 Q On which one?

10 A On the eastern cross section, C-C' versus  
11 A-A'.

12 Q Will you now refer to Hartman Exhibit Number  
13 Five and review this for the Commission?

14 A This is cross section B-B', which is marked  
15 in blue on the Isopachous map and it is approximately an east-  
16 west cross section through -- again we have common wells, the  
17 Continental 19 is shown over here to the lefthand side, and  
18 we have Mr. Hartman's location, and Exxon's proposed location  
19 is listed on here.

20 Again we're looking at the Lower Morrow  
21 Sands on a cursory, preliminary type identification of these  
22 examination logs. We see the Continental well with three  
23 distinct sands; two have been perforated, one with poor quality  
24 and one with quality that can be included in this Isopachous  
25 material. And these sands pinchout somewhere. They're not

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1 present in the Pennzoil well; however, there is a -- you can  
2 see a thin sand that can be taken across and into the two  
3 Yates wells on the west side in the Lower Morrow.

4 Q Now, Mr. Wambaugh, is it possible for you  
5 to project the sand interval from the A-A' cross section into  
6 the present cross section?

7 A Yes, sir. If we take a copy of the log  
8 of the ARCO "BV" 2 and place it into location -- may I have  
9 a piece of tape, please? This is the log that appears on  
10 A-A' and we've, as I said, we've projected those sands, that's  
11 a reasonable thing done geologically for interpretation to  
12 see what we might find if we take that log and put it over  
13 and correlate it in its position, we find Mr. Hartman might  
14 expect at this location a similar sand which pinches out to  
15 the east, even though the Pennzoil A-24 State Communitized,  
16 through their drill stem test, they had some gas and some  
17 good pressure, which means that we are closely on the edge,  
18 and this again thins out going to the west, as you would ex-  
19 pect, and we have this channel thing. We have a thickening  
20 of the interval between the Lower Morrow and the Barnett. We  
21 also have a thickening of the Lower Morrow at the Chester  
22 section, where we have this --

23 Q Now, in projecting from one cross section  
24 to another, as you have, is this a sound geologic practice?

25 A Yes, sir, this is usually done to antici-

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1 pate. The operator would like to know what he's expected to  
2 intercept in his location. This is a normal procedure.

3 Q Mr. Wambaugh, do you have anything further  
4 to add to your testimony on direct?

5 A No, sir.

6 Q Were Exhibits One through Five prepared  
7 either by you or under your direction and supervision?

8 A Yes, sir, they were.

9 MR. CARR: At this time we would offer  
10 into evidence Hartman Exhibits One through Five.

11 MR. RAMEY: Hartman Exhibits One through  
12 Five will be admitted.

13 MR. CARR: I have nothing further on  
14 direct, of this witness.

15 MR. RAMEY: Any questions of the witness?

16 MR. DRAPER: If it please the Commission,  
17 it might be more efficient since we've combined the cases,  
18 for ARCO, once the direct on 6927 is completed, to present  
19 its direct on 6928, and then allow such cross examination as  
20 may then appear necessary.

21 MR. RAMEY: All right, that's agreeable  
22 with the --

23 MR. CARR: I have no objection to recalling  
24 anyone if Mr. Draper wants to examine them at a later time.  
25 We may, however, want to reserve the right to cross examine

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1 witnesses in the ARCO case as they are called.

2 At this time I'd call Charles W. Holmstrom.

3  
4 CHARLES W. HOLMSTROM

5 being called as a witness and having been duly sworn upon his  
6 oath, testified as follows, to-wit:

7  
8 DIRECT EXAMINATION

9 BY MR. CARR:

10 Q Will you state your full name and place  
11 of residence?

12 A Charles Wagner Holmstrom. I live in Mid-  
13 land, Texas.

14 Q Will you spell your last name, please?

15 A H-O-L-M-S-T-R-O-M.

16 Q Mr. Holmstrom, by whom are you employed  
17 and in what capacity?

18 A I'm a geophysical consultant, self-employed.

19 Q Have you previously testified before this  
20 Commission and had your credentials accepted and made a matter  
21 of record?

22 A No.

23 Q Will you briefly summarize for the Commis-  
24 sion your educational background and your work experience?

25 A I graduated from the University of Okla-

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1 homa in 1958 with a Bachelor's degree in geology. Two years  
2 following that I worked for Republic Exploration, a seismic  
3 contractor. Following that, I worked for GSI for seven years,  
4 a second seismic contractor. The seven years after that I  
5 worked for Union Texas Petroleum, a division of Allied Chemi-  
6 cal Company in Midland, and since 1974 I've been a consultant.

7 Q Are you familiar with the general area  
8 involved in this case?

9 A Yes.

10 Q Are you familiar with Mr. Hartman's appli-  
11 cation?

12 A Yes.

13 MR. CARR: We would tender Mr. Holmstrom  
14 as an expert witness in geophysics.

15 MR. RAMEY: I think he would qualify.

16 Q Mr. Holmstrom, when were you first em-  
17 ployed by Mr. Hartman to prepare seismic data for him con-  
18 cerning the proposed well?

19 A January, 1980.

20 Q And what were you employed for? What were  
21 you to attempt to establish?

22 A At that time we talked about shooting two  
23 seismic lines and making arrangements with the contractor to  
24 have the data shot and processed in an attempt to locate the  
25 channel.

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1 Q Were you also employed to try and esta-  
 2 blish the width of the channel?

3 A Yes.

4 Q Now, Mr. Holmstrom, would you refer to  
 5 what has been marked for identification as Hartman Exhibit  
 6 Number Six and explain to the Commission what it is and what  
 7 it shows?

8 A This is an Isochron map from the Strawn  
 9 to the Chester, which is the interval on this seismic line --

10 Q Okay, now, just a minute. When you say  
 11 this seismic line, you're referring to your Exhibit Number  
 12 Seven.

13 A Yes.

14 MR. CARR: If we could go off the record  
 15 a minute.

16 (Thereupon a discussion was  
 17 held off the record.)

18 Q All right, if you'll continue and explain  
 19 that you're referring to Exhibit Number Seven.

20 A I'd like to back up just a little bit.

21 Before we started on this project, our  
 22 idea was to shoot a seismic line through the Hondo 2 "BV"  
 23 State and a second line through the Pennzoil 124-A with the  
 24 idea being that if we could see the channel by an anomaly on  
 25 the line through the Hondo 2 "BV" State and a similar anomaly

1 on the line through the Pennzoil well, we would know where  
2 the channel was. We're going from a position where we know  
3 the channel is to a position where it's a wildcat well.

4 Q Now, before you go on to Exhibit Number  
5 Seven, maybe you should briefly explain what an Isochron is,  
6 your Exhibit Number Six, what, exactly what is it?

7 A All right. This is the Isochron from the  
8 Strawn to the Chester and it measures the seismic time inter-  
9 val from the orange mark on line two to the yellow mark on  
10 line two. And through a channel there should be a thickening  
11 of this interval and it should be thinner on each edge.

12 Q Now, Mr. Holmstrom, how does an Isochron  
13 compare with an Isopach map?

14 A An Isopach measures intervals of equal  
15 thickness.

16 An Isochron map measures intervals of  
17 equal time, seismic time, as measured on this seismic cross  
18 section.

19 Q So is it fair to say that an Isochron map  
20 is similar to an Isopach map. It's just achieved with a  
21 different process?

22 A Yes.

23 Q Now, if you will now refer to Exhibit  
24 Number Seven, which is the seismic cross section with the  
25 overlay, and explain what that is and what that shows?

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1 A The overlay is called a synthetic seismo-  
2 graph. The process is to take a sonic log -- this is the  
3 trace of a sonic log.

4 Q The sonic log is on the --

5 A Is on the overlay.

6 Q It's labeled at the top, how?

7 A It's labeled at the top as interval velo-  
8 city times 1000.

9 Q All right.

10 A And by integrating the sonic log through  
11 a seismic computer routine, we make a synthetic seismogram,  
12 and the purpose of doing this is to identify the reflections  
13 at the well along the seismic line so that we will know where  
14 to look for the Morrow channel. This narrows down where you  
15 concentrate your data.

16 Q Now, is it correct, I want to be certain  
17 I'm understanding you, that the -- is it your testimony that  
18 the reason for relating to the sonic log is to give you some-  
19 thing to establish where the top of the Morrow is, where the  
20 tops of these different formations actually lie?

21 A Yes, that's -- that's the purpose that we  
22 use the integration of the sonic.

23 Q Then do you work from this to sort of  
24 hang your seismic data?

25 A Yes. Then the seismic data along this

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1 orange marker on line two, and these intervals measured from  
2 the data are transferred to a map and contoured as an Isochron  
3 map.

4 Q Now, if we look at --

5 MR. RAMEY: Just a minute, Mr. Carr.

6 MR. CARR: Yes, sir.

7 MR. RAMEY: Did you say the orange marker  
8 on line two or is it a yellow marker on line two?

9 A No, the orange marker is the Strawn. This  
10 is the Strawn on the sonic log, and this is the reflection  
11 that corresponds to it. The Strawn marker is shown by the  
12 upper orange mark on seismic section line two.

13 From this integrated sonic log we have  
14 now identified the reflection on line two at the Pennzoil  
15 location.

16 The orange mark is the Strawn. The lower  
17 yellow mark is the Chester, and the bottom orange mark, Wood-  
18 ford.

19 Q And these are all indicated on the left-  
20 hand side of the --

21 A Yes, they're indicated on the lefthand  
22 side of line two.

23 Q And if you go across the top of the ex-  
24 hibit, you have placed the location of certain wells, is that  
25 correct?

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1 A. Yes.

2 Q. They are shown by vertical lines coming  
3 down the exhibit?

4 A. The Pennzoil Well 124 is at shot point  
5 44 on line, seismic line two, and Mr. Hartman's location is  
6 at shot point 46 on seismic line two.

7 MR. RAMEY: Now, when you refer to seismic  
8 line two, what are you referring to exactly?

9 A. Seismic line two is marked in this area  
10 of the border, on the upper lefthand side.

11 Now, from this data I'd like to go the  
12 southern line, this line is through the ARCO well, No. 2 "BV"  
13 State.

14 The 2 "BV" State is located at shot point  
15 32 on seismic line one, the southern seismic line.

16 ARCO No. 1 "BV" is projected into seismic  
17 line one at shot point 35.

18 As Mr. Wambaugh's displays show, this is  
19 the better quality Morrow well with the thickest sand section.  
20 If you measure the interval, seismic time interval, from the  
21 Strawn to the Chester at the ARCO 1 "BV", it's a longer in-  
22 terval than at the No. 2 "BV", and as you move west along  
23 the seismic line out of the channel, it's noticeably thinner.

24 If you do the same thing on the east side  
25 of the channel, it's thinner.

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1 Q So what you've just shown us is the evi-  
2 dence of the geologic anomaly that appeared on the southern-  
3 most shot line, that appeared in the ARCO well where you have  
4 encountered the channel section?

5 A Yes. Now, I'd like to make the correlation  
6 from the ARCO 1 "BV", the best well, to the south and compare  
7 it to Mr. Hartman's location. I think you can see that the  
8 Strawn-Chester interval on each seismic line has a similar  
9 thickness. Out of the channel to the west the thickness is  
10 noticeably less. Out of the channel to the east it is notice-  
11 ably less.

12 Q Would you now refer to Mr. Hartman's Ex-  
13 hibit Number Eight and explain what this is?

14 A Number Eight is another seismic Isochron  
15 map measuring the interval from the Strawn to the Woodford,  
16 this interval, the Strawn, Woodford, and it has a similar  
17 appearance and shows the channel in the same position as the  
18 Strawn-Chester Isochron.

19 So I feel like our technique has found  
20 the channel.

21 MR. RAMEY: Were you referring to Exhibit  
22 Eight?

23 MR. CARR: For clarification let me just  
24 state that Exhibit Number Six is the Isochron of the Strawn-  
25 Chester.

1 Exhibit Number Seven is the seismic cross  
2 section with the overlay.

3 Exhibit Number Eight is the seismic cross  
4 section of the Strawn-Woodford, the second exhibit with the  
5 overlay that the witness testified to, that's Exhibit Eight.

6 And Exhibit Number Nine is the second or  
7 the last Isochron.

8 MR. PADILLA: Okay, that's what he just  
9 testified to, right?

10 MR. CARR: Right, that's correct, but the  
11 last thing actually was Exhibit Number --

12 MR. RAMEY: Seven was the seismic --  
13 seismic line two and seismic for line one and then Nine is  
14 the Strawn-Woodford Isochron.

15 MR. CARR: That's correct.

16 Q Mr. Holmstrom, based on this data where  
17 would you recommend that a well to the Morrow be drilled on  
18 the south half of Section 24?

19 A At the proposed location.

20 Q Would you recommend the drilling of a  
21 well to the Morrow at any other location in the south half  
22 of this section?

23 A No.

24 Q Would you think it would be prudent to  
25 drill a well in, say, Unit O of the south half of this section?

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1 Where the ARCO location is proposed?

2 A. No, I would not recommend a well in that  
3 location.

4 Q. Have you shared this seismic data with any  
5 other interest owners in the south half of the section?

6 A. Yes. A consultant working for Maralo  
7 and Pennzoil has reviewed these data.

8 Q. Mr. Holmstrom, were these -- was this  
9 seismic data all prepared by one company?

10 A. No. The seismic cross sections were pre-  
11 pared by GSI and the synthetic seismograms were prepared by  
12 GeoSearch Corporation.

13 Q. Do the results obtained by these differ-  
14 ent companies coincide?

15 A. I think they coincide very well, yes.

16 Q. Now, on these seismic cross sections, is  
17 this in fact just raw data that isn't subject -- what you --  
18 when you receive this, this is raw data that has not yet been  
19 interpreted, is that correct?

20 A. That's correct.

21 Q. In your opinion does the raw data, absent  
22 any interpretation on your part, show the existence of the  
23 geologic anomaly where you have placed it?

24 A. Yes, I think it shows an anomaly. Each  
25 line shows an anomaly.

1 Q How reliable is this seismic data?

2 A I would judge these --- each line to be of  
3 good quality for this area.

4 A Now, was all of this seismic data prepared  
5 strictly for the purpose of examining the south half of Sec-  
6 tion 24?

7 A Yes. One thing we did, at the time the  
8 data was gathered, was shoot it with 330 group intervals just  
9 so we would have more detail, working at finding the channel.

10 Q Was all this work done, no matter what  
11 company was involved, was it all done under your supervision  
12 and direction?

13 A Yes.

14 Q And are the tools that you're using pre-  
15 cise enough so that you can with accuracy determine where you  
16 have these anomalies?

17 A Yes, I think they're precise enough to  
18 find this type of anomaly.

19 Q Were all the seismic tests run under ident-  
20 ical conditions?

21 A Yes.

22 Q Is there any way that this could have been  
23 manipulated to move the channel east or west?

24 A No way that I know of.

25 Q Now, did you design the program that was

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1 particularly used in this effort?

2 A Yes.

3 Q And you designed it for the purpose of  
4 locating the channel in this exact area?

5 A Yes, that was the purpose of this project.

6 Q And does your seismic data confirm the  
7 information that was available from well logs in the area?

8 A Yes.

9 Q Now, it shows the channel -- it shows the  
10 anomaly. Where exactly is this as you -- between what forma-  
11 tions is the anomaly located?

12 A The anomaly is measured on the maps between  
13 the Strawn formation and the Chester.

14 Q Is there any way it could be above or  
15 below this interval? Or above those two -- could it be in  
16 the Strawn or in the Chester?

17 A Well, it's shown on the well logs as be-  
18 tween the Strawn and the Chester.

19 Q Does any anomaly exist immediately to the  
20 east of the Pennzoil dry hole in the south half of this sec-  
21 tion?

22 A No.

23 Q Does this data also give you some basis  
24 to make an estimate as to the width of the channel that you  
25 are dealing with?

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1 A. I estimate the width of the channel to be  
2 approximately 1500 feet.

3 Q. Okay, Mr. Holmstrom, would you just now  
4 by way of summary, summarize what this data shows?

5 A. The data were gathered in an attempt to  
6 shoot through a known producing channel and to shoot a second  
7 line where there was no production, across the proposed loca-  
8 tion to see if there was a similar anomaly on the northern  
9 line, number two.

10 I think these data show an anomaly on  
11 each line and I feel like the project has been successful.

12 Q. Were Exhibits Seven through Nine prepared  
13 by you or under your direction and supervision?

14 A. Yes.

15 MR. CARR: At this time we would offer  
16 Hartman Exhibits Seven through Nine.

17 MR. RAMEY: Hartman's Exhibits Seven through  
18 Nine will be admitted in evidence.

19 MR. CARR: I have nothing further of this  
20 witness on direct.

21 MR. RAMEY: Any questions of the witness  
22 at this time?

23 MR. CARR: I would call Mr. Bill Aycock.  
24 (There followed a discussion  
25 off the record.)

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1 MR. CARR: You're correct. There were  
2 four exhibits and we should have said or we failed to move  
3 the admission of Exhibit Number Six, which is the first Iso-  
4 chron, and we would do that now.

5 MR. RAMEY: All right, Exhibit Six will  
6 be admitted.

7  
8 WILLIAM P. AYCOCK  
9 being called as a witness and having been duly sworn upon his  
10 oath, testified as follows, to-wit:

11  
12 DIRECT EXAMINATION

13 BY MR. CARR:

14 Q Will you state your full name and place  
15 of residence?

16 A William P. Aycock, Midland, Texas.

17 Q Mr. Aycock, by whom are you employed and  
18 in what capacity?

19 A I'm employed by Mr. Doyle Hartman in con-  
20 nection with this application.

21 Q Have you previously testified before this  
22 Commission and had your credentials accepted and made a matter  
23 of record?

24 A Yes, sir, I have.

25 Q Are you familiar with the subject area

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1 and the application in this case?

2 A. Yes, sir, I am.

3 MR. CARR: Are the witness' qualifications  
4 acceptable?

5 A. MR. RAMEY: Yes, they are.

6 Q. Will you please refer to what has been  
7 marked for identification as Applicant's Exhibit Number Ten  
8 and explain to the Commission what this is and what it shows?

9 A. Applicant's Exhibit Number Ten is a tabu-  
10 lation with a land map attached which summarizes the three  
11 tracts comprising the south half of Section 24, and the owner-  
12 ship in each of those three tracts.

13 Tract Number One and Tract Number Two  
14 are the tracts in which Mr. Hartman has ownership and I would  
15 call the Commission's attention, respectfully, to the fact  
16 that Tract Number One is the south half of the southwest  
17 quarter of Section 24, and Tract Number Two is the northwest  
18 quarter of the southwest quarter of Section 24, the two tracts  
19 together comprising a gross of 120 acres.

20 Mr. Hartman owns a total of 100 net acres  
21 out of the total of 120 acres, with a total ownership under  
22 the whole 320-acre proposed proration unit of 31.25 percent.

23 Likewise, all of the other working interest  
24 owners are listed in each of the tracts with the net acres  
25 that they own under each tract and their net acres under the

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1 entire 320-acre unit indicated along the line that is desig-  
2 nated with the name of the operator.

3 It is quite apparent that the largest  
4 owners under the south half of 24 are Mr. Hartman and Pennzoil,  
5 and that the next largest owner is Inexco.

6 Q Now, Mr. Aycock, will you refer to what  
7 has been marked Exhibit Number Eleven and review the informa-  
8 tion contained thereon?

9 A Exhibit Number Eleven is a summary of  
10 working interest ownership supporting Unit M as the Morrow  
11 drillsite in the south half of 24. Attached to the page of  
12 it are the name of each of the operators who were previously  
13 indicated as having ownership in the south half of 24; their  
14 number of net acres in the south half of 24; their working  
15 interest; the form of participation; and the status of their  
16 commitment.

17 The supporting parties, which are documented  
18 by inclusions of the statements in writing that Mr. Hartman  
19 has received from each of them, are Doyle Hartman with 100  
20 net acres, 31.25 percent working interest; Pennzoil with 100  
21 net acres, with 31.25 percent working interest; we have a  
22 letter here dated June 2nd, 1980, from H. W. Hollingshead,  
23 Junior, stating that after a review of all the available  
24 geological and geophysical data, Pennzoil considers the  
25 southwest quarter southwest quarter of Section 24 to be the

1 preferable Morrow location in the south half of 24, and it is  
2 Pennzoil's intention to either join or farmout to your proposed  
3 well, and a final management decision should be shortly forth-  
4 coming.

5 The third operator that is listed on the  
6 under the parties supporting Unit M, is Inexco, with 84.375  
7 net acres, a working interest under the whole 320-acre unit  
8 of 26.3672 percent. The indications that Mr. Hartman has,  
9 they will either join or farmout. They are participating in  
10 the cost of the gathering and interpreting the seismic data  
11 as to their interest under the south half of 24, and we do  
12 not have any current correspondence from them, but we will  
13 present a later summary of all the correspondence, beginning  
14 with the time the proposed well was first discussed with ARCO  
15 and other parties, and present the entire correspondence from  
16 each party.

17 The Maralo group is the next that Mr.  
18 Hartman has indications that will support Unit M as the pre-  
19 ferable location in the south half of Section 24. The Maralo  
20 group has a 6.25 acre, net acres, which gives them 1.9531  
21 percent. They have indicated they will join. They're waiting  
22 on Mary Ralph Lowe to make the final decision. It has been  
23 recommended by both their Midland office and their Houston  
24 office to her, and it was indicated by Mr. Holmstrom they've  
25 had a geophysical consultant review the data that's been pre-

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1 sented here to this Commission on behalf of Maralo.  
2

3 Now, Tenneco has 1.5625 net acres, a .4883  
4 percent working interest. They have indicated they will join.  
5 We have a letter from them in this -- in this exhibit that  
6 says that in writing. They're waiting on final management  
7 approval.

8 Conoco has 1.5625 acres, a .4883 percent  
9 working interest. They have indicated both verbally and in  
10 writing that they will farmout, and they are waiting on final  
11 management approval.

12 In each case, Mr. Hartman has pursued the  
13 attempt to voluntarily make an agreement to develop the south  
14 half of 24 will authorities diligently, and all of these parties  
15 that are listed, for a total of 293.75 acres, which comprises  
16 91.7969 percent of the proposed 320-acre unit, have indicated  
17 they will voluntarily cooperate and will either join in the  
18 drilling of the well, or they will farmout as to their in-  
19 terest prior to the time that the well is spudded.

20 MR. RAMEY: Mr. Aycock, one question.

21 A. Yes, sir.

22 MR. RAMEY: I think you said Continental  
23 had agreed in writing, and I don't have a copy of that.

24 A. Well, Mr. Ramey, if you'll wait till we  
25 get to the -- I have a -- the last exhibit that I'm going to  
present is this big packet of correspondence and it has all

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1 the correspondence, and the Conoco letters are contained  
2 therein. If you would delay that question until we get there,  
3 I think I can answer it.

4 If you want to go into it now, I'll be  
5 glad to pull it out. It's up to you, sir.

6 MR. RAMEY: No. You just have -- you just  
7 have the other letters --

8 A Yes, sir.

9 MR. RAMEY: -- in this Exhibit Eleven.

10 A We have all of them on our last exhibit  
11 and we have them in chronological order and we will review  
12 each piece of correspondence and we will put into the record  
13 the point that we think is -- is cogent and consequential  
14 as far as this application is concerned, that each of those  
15 pieces of correspondence has in writing.

16 MR. RAMEY: If you have to.

17 A Yes, sir, if you wish for us to.

18 The parties opposing Unit M are ARCO Oil  
19 and Gas with 20 acres, a 6.25 percent working interest; and  
20 Exxon with 6.25 acres, a 1.9531 percent working interest; a  
21 total opposing ownership of 26.25 net acres, or 8.2031 per-  
22 cent of the total anticipated proposed 320-acre unit to be  
23 assigned to the well.

24 Q Mr. Aycock, will you now refer to what  
25 has been marked Exhibit Number Twelve and review this for the

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1 Commission?

2 A. Exhibit Number Twelve is two tabulations  
3 and two graphs of shut-in subsurface and surface pressures  
4 that have been reported to the Commission by the various oper-  
5 ators for wells, both in the entire nearby area, including  
6 the single well in the Aid-Morrow, and the nearby wells that --  
7 in the South Empire-Morrow Pool. On the first two pages there  
8 is a summary of that information in a tabular form, in chrono-  
9 logical order by well, by location, with whether the drill stem  
10 tests are measured or calculated pressures, for all wells.

11 And then immediately behind that for just  
12 those wells that are in the immediate vicinity of the proposed  
13 location. In both cases it can be established beyond reason-  
14 able doubt that the initial subsurface pressure, depending  
15 upon the datum for which minor adjustments would have to be  
16 made, that are not sufficient to account for the differences  
17 in the pressure reported, and certainly the surface pressure  
18 differences cannot be accounted for any differences in datums,  
19 since they're already observed at consistent datum, it will  
20 be observed that the initial surface pressure is between 3100  
21 and about 3260 pounds, and the initial subsurface pressure is  
22 between 4260 to 4400 pounds, and the main -- the point in  
23 having collected this data was to show that as a function of  
24 time all of both the surface and subsurface pressures had been  
25 reported to the Commission, at the Artesia office, had been

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1 consistently declining.

2                   There are a few exceptions to this but  
3 in general it can be seen that these have been declining.  
4 In particular, I would call the Commission's attention to the  
5 fact that the initial surface pressure that was reported by  
6 the ARCO "BV" 1 was 2936 pounds and the initial subsurface  
7 was 4053 pounds, and this is in the vicinity of 200 to 250  
8 pounds less than the initial pressures which have been re-  
9 ported to the Commission by wells which were prior completed  
10 either the Single 8 Morrow Well or the nearby wells in the  
11 South Empire Morrow Pool.

12                   In addition to that, the initial pressure,  
13 the last one that has been reported, according to the files --  
14 by the way, I have a complete copy of all the Artesia District's  
15 files for each of the wells in both the South Empire Morrow  
16 and the Aid Fields, including dry holes over there, if there  
17 is any need to refer to them.

18                   On 12-5-79 a shut-in pressure, shut-in  
19 surface pressure of 2254 psig was reported by ARCO on the  
20 "BV" State 2, and the subsurface measured pressure was 3178  
21 psi.

22                   These pressures indicate to me that the  
23 pressure is declining in the area of the proposed location,  
24 and as will be substantiated by later information, the corol-  
25 lary of this is that drainage is probably occurring from the

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1 acreage on which the proposed well is to be located to the  
2 south to Section 25.

3 Q Will you now refer to what has been  
4 marked Exhibit Number Thirteen and review the information  
5 contained thereon?

6 A Exhibit Number Thirteen is a summary of  
7 reservoir production information for Morrow Sand wells that  
8 are located in the immediate vicinity of the south half of  
9 Section 24. This does not comprise all of the South Empire  
10 Morrow Field, but just the portion which is immediately ad-  
11 jacent.

12 Once again, the attempt has been made to  
13 accumulate all of the consequential technical engineering  
14 parameters that have been reported to the Commission.

15 I will call the Commission's attention  
16 to the fact that located -- each vertical column represents  
17 an operator and well. The first line gives the section, the  
18 unit number, or the unit designation in which the well is  
19 located, the section and township, the next line gives --  
20 pardon me -- gives the completion date and the completion  
21 interval.

22 The next group of data include that that  
23 is reported on the NMOCD C-122 Gas Well Potential Test, as  
24 well as those parameters which can be readily derived by an  
25 engineering -- straightforward engineering analysis of those

1 test results.

2 The next group of data are log interpre-  
3 tation results and have a summary for each of the wells of  
4 the consequential volumetric parameters that can be derived  
5 in a straightforward fashion by an analysis of the logs.

6 Then I have the estimated mean effective  
7 permeability, which has to be derived by combining data that  
8 is derived independently from the C-122 test analyses and  
9 from the log interpretation results.

10 The next group of data gives the cumula-  
11 tive production as of March 1st, 1980, which is the latest  
12 data that we've been able to procure for both gas and liquids.

13 The next line gives the estimated ulti-  
14 mate recovery from an approximate extrapolation of the cur-  
15 rent producing trends to an economic limit, estimated econ-  
16 omic limit of 1-million cubic feet of gas per month.

17 The next line is the estimated original  
18 gas in place in MMCF, which is derived by constructing for  
19 the wells and for the group of wells, the linear relation-  
20 ship between the ratio of measured subsurface pressure and  
21 the consistent compressibility factor as a function of cumu-  
22 lative gas production.

23 The next to last line is the estimated  
24 gas recovery factor, a fraction of the original gas in place,  
25 which is derived by comparing the estimated ultimate recovery

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1 from projecting performance trends with the estimated original  
2 gas in place that was derived from static pressure studies.

3 The very last line is the estimated ef-  
4 fective drainage area in acres, which is derived by comparing  
5 the estimated net pore space by wells in MMCF per acre, with  
6 the number of MMCF indicated to be the original gas in place  
7 from a study of the pressure performance reported for each  
8 well.

9 I will call the Commission's attention  
10 to two consequential factors. Number one, the two ARCO, or  
11 Hondo wells, and they're reported both ways in the Commission  
12 files that I have, and on this tabulation we've indicated  
13 them as the operator to be Hondo Oil and Gas, are very ano-  
14 malous as to the quality of the pay. As an example, the net  
15 effective pay is the fourth line from below where it says  
16 log interpretation results on the table.

17 I'd estimated 81 feet of net effective  
18 pay for the "BV" No. 2; 108 feet of net effective pay for the  
19 "BV" No. 1; and you can -- a quick perusal of the other num-  
20 bers will show that the highest net effective pay number for  
21 any of the remaining wells is 54 feet, and that's for the  
22 Amoco South Empire Deep Unit No. 5, which penetrates the  
23 gas/water contact for this -- this Lower Morrow channel re-  
24 servoir, however it needs to be described.

25 All the rest of them are considerably

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1 thinner than this. I've indicated the ratio of net effective  
2 pay to gross pay, and that also shows that the quality of the  
3 two ARCO wells is higher than any of the other nearby wells.  
4 I've also shown the original gas in place and there is a mis-  
5 take on this, a typographical error here. It should be MMCF  
6 per acre rather than MCF per acre.

7 I call the Commission's attention to the  
8 fact that I've estimated approximately 70 million cubic feet  
9 per acre in place from the log analysis of the State "BV" No.  
10 2; approximately 134 million cubic feet per acre in place  
11 from an analysis of the "BV" 1; and the remainder of the  
12 wells in the immediate area are much lower than this; some  
13 of them as little as 20 percent of these, 10 to 20 percent  
14 of these numbers.

15 The permeability thickness combined with  
16 the net effective pay gives an estimate of the mean effective  
17 permeability for each of the wells, as derived from an analy-  
18 sis of the C-122 tests and logs.

19 I call the Commission's attention to the  
20 fact that the permeability alone is not as anomalous as are  
21 the thicknesses, so it is my conclusion that the reason that  
22 the productivity of these wells is so much better than that  
23 of any of the rest of the wells in the area, is because the  
24 pay thickness is greater, and this combined with an estimated  
25 effective permeability of about the same calibre as some of

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1 the others results in a much higher permeability thickness  
2 product, and as the Commission is aware, the product of perm-  
3 eability thickness in combination with the available pressure  
4 is the determining factor in determining what the true gas  
5 deliverability will be.

6 I also call the Commission's attention to  
7 the fact that the estimated ultimate recoveries for the two  
8 ARCO wells are as much as seven or eight times those for any  
9 of the other wells that are in the nearby area. I've esti-  
10 mated over a half million barrels of condensate will be pro-  
11 duced by the two wells, based on the current performance and  
12 that would average out to over 250,000 barrels per well, and  
13 that's -- that's almost ten times what it is for some of the  
14 others, and at least double what it is for the -- for the  
15 highest other well in the immediate area.

16 I've estimated 34 million -- 34 billion,  
17 pardon me estimated recovery of gas for the two ARCO wells,  
18 and this is -- is almost -- it's about equivalent to -- well,  
19 it's more than equivalent to all the rest of the wells that  
20 are listed on this table combined.

21 So I think every piece of information  
22 we have says that -- that the two ARCO wells are of abnormal  
23 quality, have much, much more favorable gas deliverability  
24 characteristics than any of the rest of the wells, and the  
25 indications that are available from the data that has been

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1 put into the Commission files are that the recovery will be  
2 manyfold greater.

3 So it is quite apparent that Mr. Hartman,  
4 as a prudent operator, would attempt to tap a reservoir with  
5 these outstanding characteristics, rather than trying to  
6 penetrate some other reservoir that would probably have, based  
7 on an analogy with the remaining data that's available, would  
8 have greatly inferior original gas in place, and probably gas  
9 deliverability, as well.

10 The map that goes with the tabulation  
11 shows not all of the data that's listed, but it shows certain  
12 of the pieces of data that we consider consequential. You  
13 will note that it's color-keyed for each well, the original  
14 gas in place in MMCF per acre, as derived from log analysis,  
15 is in yellow; the original gas in place in MMCF, as derived  
16 from static pressure studies, is in purple; the permeability  
17 thickness product in millidarcy feet is in orange; the cumu-  
18 lative and estimated ultimate recovery for each of the wells,  
19 where that information is available; for liquids the cumula-  
20 tives and ultimates are shown in green; and for gas they are  
21 shown in red.

22 I think the impression that one gets from  
23 perusal of the numerical results presented on the table will  
24 be borne out areally by referring to the map, and it will  
25 once again be quite apparent that the two ARCO wells have such

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1 outstanding characteristics that it would be -- only be pru-  
2 dent for an operator who had invested a large sum of money in  
3 a state lease to try to penetrate that reservoir if he believed  
4 that the reservoir were present under his lease.

5 Q Mr. Aycock, how many acres, approximately,  
6 could each of the ARCO wells in Section 25 drain?

7 A The indicated drainage by combining the  
8 pressure studies with the log analyses for the two ARCO wells  
9 is slightly in excess of 300 acres. From the integrated re-  
10 sults of my studies and those of Mr. Holmstrom and Mr. Wam-  
11 baugh, we estimate that the south half of Section 24 and the  
12 north half of Section 25 each have in the vicinity of 100  
13 acres that are gas productive, and the south half of Section  
14 25 has about 115 acres that are productive.

15 So therefor, the total productive acreage  
16 that we estimate for the two ARCO wells would be in the vic-  
17 inity of 225 net acres, and the engineering studies indicate  
18 that they're draining considerably in excess of that, which  
19 leads Mr. Hartman to believe that if he does not attempt to  
20 penetrate the reservoir, that he believes lies under the  
21 southwest quarter of Section 24, and compete in it competi-  
22 tively, that the outstanding quality and the high rates of  
23 depletion that are going on for those wells, will lead to  
24 depletion of the reserves that underly his property, and  
25 he'll be denied the opportunity to recover them.

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1 Q Mr. Aycock, will you identify what has  
2 been marked Applicant's Exhibit Number Fourteen?

3 A Applicant's Exhibit Number Fourteen has  
4 a cover of a land map and each of the wells in the entire  
5 area, both in the South Empire Pool and in the Aid-Morrow  
6 Pool that have been productive, are indicated, as well as Mr.  
7 Hartman's proposed location, and behind that you will find  
8 tabulations of gas and liquid production, with graphs of the  
9 gas production plotted as the log of gas production rate as  
10 a function of time.

11 This is -- this is put into the record  
12 as data substantiation for the prior engineering estimates  
13 that have already been discussed.

14 Q Mr. Aycock, will you now refer to what  
15 has been marked Applicant's Exhibit Number Fifteen, which is  
16 the summary of correspondence, and review this for the Com-  
17 mission, pointing out only things which you think need to be  
18 particularly emphasized?

19 A This exhibit is composed of all of the  
20 correspondence that concerns this matter that is in Mr. --  
21 that is Mr. Hartman's file. I have had it arranged in chrono-  
22 logical order with the oldest on top proceeding to the  
23 youngest on the bottom for purposes of ease of finding each  
24 piece of information.

25 I have, let's see, let me count them and

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1 tell you how many individual pieces of correspondence there are.

2 There are 33 individual pieces of corres-  
3 pondence, some of which are represented by several pages in  
4 this exhibit.

5 The first piece of information that is  
6 listed is a letter from ARCO to Pennzoil, dated December 13th,  
7 1979, referring to the -- a farmout request on the south half  
8 of Section 24. They go into the fact that the 40-acres has  
9 expired and that ARCO is willing to drill another well on  
10 this spacing unit if Pennzoil and the other non-operating  
11 parties will allow ARCO to earn all of their rights, and the  
12 basis on which they're to earn all those rights was proposed  
13 as the difference between 20 percent and 70 percent, and Mr.  
14 Hartman understands that that was later modified to 30 per-  
15 cent and 70 percent.

16 And I think it's consequential that at  
17 the time this letter was written that it was ARCO's intention  
18 to pursue vigorously the development of the south half of  
19 24, as indicated by the last paragraph of this letter.

20 The next piece of correspondence that's  
21 listed is a letter from James A. Davidson, who represents --

22 MR. RAMEY: Mr. Aycock, do you think it's  
23 necessary to go into all of these? Could you summarize them?

24 A No, sir, not unless the Commission desires  
25 to. I think they're arranged in a form that -- that the Com-

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1 mission can refer to them at their leisure and if there are  
2 any questions I will be glad to answer them or Mr. Carr can  
3 contact me, or whatever you all desire.

4 I don't want to waste your time on some-  
5 thing you don't want to fool with, Mr. Ramey.

6 MR. RAMEY: Well, I think that the gist  
7 of the matter is that you've probably contacted all these  
8 people and tried to voluntarily form a unit.

9 A Yes, sir, we've done, as far as I am con-  
10 cerned, as diligent an effort as is humanly possible has been  
11 made to try to procure a voluntary communitization of this  
12 acreage, and it really comes down to the fact that I can --  
13 I can summarize the whole situation, that ARCO very strongly  
14 believes for technical reasons that we're not privy to, that  
15 the proposed location is not the optimum one, and Exxon is  
16 not interested in developing any of the acreage in Section 24  
17 at all, pending the outcome of their well in Section 23.

18 I think it's quite apparent that both  
19 ARCO and Exxon have other interests in nearby property which  
20 are very substantially in excess of those that they have un-  
21 der the captioned property, while Pennzoil and Hartman, et al,  
22 do not enjoy such a position.

23 So the parties are not in the same econo-  
24 mic business position with regards to not only where the de-  
25 velopment of the south half of Section 24 should take place,

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1 but the timing of that development. And, as you probably  
2 derived from Mr. Holmstrom's work, and from Mr. Wambaugh's  
3 work, all of that work leads to the conclusion that Exxon will  
4 probably either drill a dry hole or a very poor quality well,  
5 as far as the Lower Morrow section is concerned. There may  
6 be some other objective that they have in mind that will lead  
7 them to commercial results, but there's no indication that  
8 there's any data that would support their chances of pene-  
9 trating, particularly, this Lower Morrow channel sand at their  
10 location are very good at all. In fact, we guess that they  
11 might have, based on our interpretation, as much as 20 acres  
12 productive in the Lower Morrow channel.

13 MR. RAMEY: So just briefly, why, these  
14 letters, you have agreement with some 91 percent of the  
15 working interest owners, with only Exxon and ARCO have not  
16 agreed.

17 A Yes, sir. Mr. Ramey, I want to be very --  
18 I want to be very explicit in this. We do not have contrac-  
19 tual arrangements completed at this time. The reason I say  
20 we have agreement is that they have told us that they are in  
21 agreement and they have told us that they are preparing it,  
22 and there is a letter in here from Mr. Hartman to Continental  
23 that I'd like the Commission to review, in which Mr. Hartman  
24 makes it very plain that forced pooling is an absolute last  
25 resort with him and he does not desire to have to resort to

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1 forced pooling, and for several reasons. Among them are hard  
2 feelings, and in addition to that, it's quite frankly, not  
3 as economically attractive for those operators who decide to  
4 take the considerable risks that are associated with the  
5 drilling of this well, in spite of the favorable indications  
6 that are present for it, as would be under a voluntary com-  
7 munitization of some kind.

8 But on the other hand, until such time as  
9 those contractual arrangements have been completed, Mr. Hart-  
10 man has no -- really no way to do anything but to keep every-  
11 body on the forced pooling notice, but we don't want the Com-  
12 mission to get the idea that we're coming in here expecting  
13 the Commission to do the work that an operator would expect  
14 to do.

15 We think Mr. Hartman, and those of us --  
16 I've been working on this project almost full time for better  
17 than two months myself, trying to help him, and I've been --  
18 I have had -- have discussed the situation with representatives  
19 of ARCO once and with representatives of Pennzoil twice, par-  
20 ticipated in those discussions, and we have been plain spoken.  
21 We've told them, as far as our engineering and performance  
22 data, we laid that all out for them in general terms. We  
23 offered to review all the data with them. No one evidenced  
24 any interest in reviewing any of this data or trying to come  
25 to a really -- a voluntary type arrangement that would pre-

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1 vent us having to impose on the Commission's time with this  
2 matter.

3 The only thing I can say is that in sum-  
4 mary of our position, the geologic, the geophysics, and the  
5 engineering data all indicate to us that the reservoir that's  
6 penetrated by the two ARCO wells and by the Amoco South Empire  
7 Deep No. 5 are very anomalously good, and that a prudent oper-  
8 ator, if he had reason to believe that that quality reser-  
9 voir underlaid any part of the acreage that was under his  
10 control, would certainly desire to attempt to complete in  
11 that in preference to some other zone for which we neither  
12 have what we believe is very solid evidence of its existence,  
13 nor of its quality.

14 In addition to that fact, I want to point  
15 out to the Commission, that the proposed location by Mr. Hart-  
16 man is on acreage that Mr. Hartman, in fact, owns and controls,  
17 and if Mr. Hartman is right, then he's made a -- you will note  
18 in here when you get to both ARCO and Exxon have AFE's in  
19 here, the estimated cost of this well is between \$850,000 and  
20 \$1,200,000. The difference in those two cost estimates re-  
21 volves around the -- whether or not the well has to be stimu-  
22 lated and whether or not -- to what degree surface equipment  
23 is required to sell the gas. Whichever estimate is correct,  
24 it is quite apparent that the well will be very expensive  
25 and this is not a business venture that can be undertaken

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1 lightly, certainly by Doyle Hartman, who at this time has ap-  
2 proaching a half million dollars tied up in the participation  
3 in the dry hole and the acreage bonuses that he paid, and  
4 certainly not even to someone of ARCO's size and resources is  
5 this a venture that's to be undertaken lightly.

6 Mr. Hartman does not question the fact  
7 that ARCO has the strength of their convictions and that they  
8 have reasons that to them are compelling to request another  
9 location, but Mr. Hartman's position is that the best work  
10 that can be done by the technical people that he has access  
11 to, as well as the indications that we have from the other  
12 operators, is that approximately 90 percent of the total  
13 ownership under the south half of Section 24 considers the  
14 proposed location preferable to the one proposed by ARCO.

15 Q Mr. Aycock, did you participate in the  
16 decision, the decision-making process which resulted in  
17 picking the particular location?

18 A Yes, sir, and I also encouraged Mr. Hart-  
19 man to pursue diligent -- once my studies had progressed to  
20 the point, it was apparent to me that the ARCO wells were  
21 being produced at approximately 10 million cubic feet a day  
22 apiece, and that the pressures were indicating a significant  
23 rate of decline with respect to time, that if he were going  
24 to make any attempt to produce the gas that would be under  
25 his acreage, that he better get with it or there would be --

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1 if delays were encountered of as much as six months or a year,  
2 it could well be that it would not be an economical venture  
3 at that point.

4 In addition to that fact, Mr. Ramey,  
5 you'll note in the correspondence file that Mr. Hartman has  
6 made an attempt to find a drilling rig, and I'm sure the Com-  
7 mission is aware that drilling rigs with the capability of  
8 drilling to this depth are in a premium position in southeast  
9 New Mexico at the present time.

10 The only drilling contractor that Mr.  
11 Hartman considers reputable, and who has a rig that will be  
12 available at all -- there's two letters in here from them,  
13 it's Kenai Drilling Company, and they point out very specifi-  
14 cally that they have a window in time available for one rig,  
15 the other one is already committed, and if he does not drill  
16 it at that point, they would not have a rig available for  
17 him until into 1981.

18 So what we are requesting is that the  
19 Commission consider this matter expeditiously in view of the  
20 fact that if a favorable order to Mr. Hartman's application  
21 is forthcoming, he will not be able to develop it as rapidly  
22 as he would like if the rig is otherwise committed at the  
23 time the order is available.

24 He would like to start drilling this well  
25 on or about the first of July, if possible.

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1 Q Mr. Aycock, when you were picking this  
2 location did you rely heavily on the seismic data which was  
3 available to you?

4 A We relied most heavily on the seismic,  
5 but we really attempted to come up with an integrated de-  
6 scription of the entire reservoir and base our final decision  
7 on that.

8 Yes, I'd have to say of the technical in-  
9 formation that's available, we relied most heavily on the  
10 seismic data because the fact that you have independently  
11 derived data from two separate companies that are reliable  
12 and known, and that you have a geophysicist of demonstrated  
13 capability, who is in my opinion a technically conservative  
14 person, and by that I mean Mr. Holmstrom is not the type of  
15 person who's given to ill advised flights of fancy in advising  
16 a client as to what to do in a matter of this kind.

17 When you take all of that data into account,  
18 then it appears that there is a compelling case for diligently  
19 pursuing the location that's requested from this Commission  
20 for development.

21 Q Now, Mr. Aycock, what Mr. Hartman is  
22 seeking in this case is approval of a standard proration unit  
23 in the Morrow, is that correct?

24 A Yes, sir, that's correct.

25 Q Have the working interest owners with

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1 acreage that is involved in this application, have the working  
2 interest owners been notified of this hearing?

3 A. I believe that at three separate times  
4 everybody involved has been notified and at least two of them  
5 have been by certified mail.

6 Q. And the letters are in this material --

7 A. Yes, sir, they're in this material that's  
8 been presented in our last exhibit.

9 Q. Has an AFE been submitted to the working  
10 interest owners?

11 A. At least three separate times.

12 Q. And what are the costs reflected on that  
13 AFE?

14 A. \$1,120,000 for a completed well.

15 Q. In your opinion are these costs in line  
16 with what has been charged by other operators in the area?

17 A. I think in reviewing the difference be-  
18 tween the AFE that's been presented by ARCO and by Mr. Hartman  
19 to the operators, realizing that, of course, actual costs  
20 will be the basis for final settlement, Mr. Hartman prefers  
21 to take into account contingencies in his estimates that ARCO  
22 apparently does not feel are important enough to be taken  
23 into account. That's a matter of technical and professional  
24 judgment, and if I were a participant, I would prefer to know  
25 what I felt like the up side potential for my economic exposure

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1 could be, and I believe that Mr. Hartman's AFE more nearly  
2 reflects this than does ARCO's.

3 Q Do you consider the drilling of this  
4 well to be a high risk venture?

5 A Yes, sir, I do.

6 Q Just briefly summarize why you think that.

7 A Well, I think you're talking about in the  
8 vicinity of \$800,000 to look at the pay. You have, in spite  
9 of the fact that the seismic data has anomalies that are quite  
10 apparent that are associated with the wells to the south,  
11 you have no guarantee that even if this anomaly is present,  
12 that it will be a commercial gas reservoir. That still has  
13 to be proven.

14 I think it would be a prudent business  
15 risk to assume that it probably is, if it's as well developed  
16 as the seismic data indicate, that it probably is as well  
17 developed, because it appears that the anomaly is only asso-  
18 ciated with -- with the two ARCO wells, which we've already  
19 testified we consider an abnormally good quality and reserve,  
20 apparent reserve, prospects.

21 So when you take into account the cost  
22 and the fact that the delay in getting this well drilled be-  
23 tween the time it was originally discussed in December and  
24 now, there have already been two increases in the cost of  
25 tubular goods and contract drilling prices have gone up. As

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1 you'll notice from Kenai's letters, had the first rig been  
2 available to drill this well, the move-in cost would have been  
3 \$40,000 less than they are now projected to be.

4 So what is happening is that as time goes  
5 on, it appears that if the reserves are there, as we trust  
6 that they are and hope they are, they are probably being  
7 drained, and the cost of developing those reserves is going  
8 up at a rather rapid rate.

9 So because of those matters, if anything --  
10 my advice to Mr. Hartman is if you're going to do anything,  
11 you'd better do it now. I do not consider the outcome of the  
12 Exxon well either on the pro or the con side would necessarily  
13 influence his decision.

14 In the first place, in order to get an  
15 adequate evaluation of the Exxon well, you would probably not  
16 only have to have it completed and have the data released,  
17 but you'd have to have an extended period of production. We  
18 could easily be looking at one or two years to accomplish  
19 this. By that time, if the reserves are present, they have  
20 been substantially, largely drained.

21 So I think a prudent businessman under  
22 these conditions, if he has the resources to take the risk,  
23 and he's in the oil and gas business, would choose to go ahead  
24 and drill it now, particularly when he has advice from compe-  
25 tent explorationists in both the geological and geophysical

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1 disciplines, that they consider that the well ought to be  
2 drilled and ought to be drilled at the location that's pro-  
3 posed.

4 Q Are you prepared to make a recommendation  
5 to the Commission as to the risk factor that should be assessed  
6 against those who do not voluntarily --

7 A Yes, sir, I think the risk factor should  
8 be the maximum.

9 Q Have you made an estimate of overhead and  
10 administrative costs while drilling and producing this well  
11 if it is drilled?

12 A We have conformed, we substantially agree  
13 with ARCO and we have modified the operating agreement and  
14 the gas balancing agreement to agree with what they have pro-  
15 posed, so it will remove that -- that part of any disagreement  
16 that would have to be adjudicated by this Commission.

17 Q Do you have those figures?

18 A Yes, sir, they are included in the cor-  
19 respondence that's been in my last exhibit.

20 MR. RAMEY: Do you have those right on  
21 top of your head?

22 A Let me read them to you, Mr. Ramey, because  
23 if I quote them to you, I'm liable to quote wrong.

24 The drilling well rate is \$3100 and the  
25 producing rate is \$310.

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1 Q And these are in line with what is being  
2 charged in the area?

3 A Yes, sir.

4 Q Do you recommend that these figures be  
5 incorporated into any order which results from this hearing?

6 A Yes, sir, I do.

7 Q Mr. Hartman would like to be designated  
8 operator of the well?

9 A Yes, sir, he would.

10 Q Has Mr. Hartman filed an application for  
11 permit to drill with this Commission?

12 A Yes, sir, he has. He filed a C-101 and  
13 a C-102 that were received by the Commission on the 29th of  
14 April, 1980.

15 Q Do you happen to know when ARCO filed  
16 an application for permit to drill?

17 A No, sir, I don't, but it was after the  
18 1st of May, according to the information that I have. I  
19 don't know the exact date the Commission received it, but the  
20 date that Mr. Hartman received it was on May 2nd, 1980. It  
21 was dated May 2nd, I beg your pardon.

22 Q And you have stated that Mr. Hartman  
23 hopes to spud the well early in July of this year?

24 A He would like to, because that's the  
25 only time a rig is going to be available for him to drill it

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1 this year.

2 Q In your opinion will granting this appli-  
3 cation be in the interest of conservation, the prevention of  
4 waste, and the protection of correlative rights?

5 A Yes, sir, I think it will, because the  
6 fact that the Empire South No. 5 penetrates the gas/water  
7 contact and we have a very narrow but prolific reservoir,  
8 says that it is not beyond comprehension that water fingering  
9 or coning could occur at some point, and if it were to occur  
10 and reduce the ability of ARCO's two wells to drain the re-  
11 serves, regardless of the correlative rights aspect of it,  
12 real waste could occur in that a substantial amount of re-  
13 maining gas could be trapped and not be available unless other  
14 wells were drilled.

15 As a matter of business practice, if Mr.  
16 Hartman is faced with having to drill into a depleted reser-  
17 voir, or he were faced with any other situation which would  
18 not lead him to being in a position to be economically com-  
19 petitive with ARCO and/or Exxon, then he would probably not  
20 be in a position, regardless of willingness, he would probably  
21 not be in a position of prudent business practice to under-  
22 take the risks associated with this well.

23 Q Were Exhibits Ten through Fifteen prepared  
24 by you or have you reviewed them and can testify as to their  
25 accuracy?

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1 A YES, SIR.

2 MR. CARR: At this time we would offer  
3 Hartman Exhibits Ten through Fifteen.

4 MR. RAMEY: Exhibits Ten through Fifteen  
5 will be admitted.

6 MR. CARR: I have nothing further of this  
7 witness on direct.

8 MR. RAMEY: We'll have a little recess.

9  
10 (Thereupon a recess was  
11 taken.)

12  
13 MR. RAMEY: You may proceed with your  
14 presentation, Mr. Draper.

15  
16 STEVE AREA  
17 being called as a witness and having been duly sworn upon his  
18 oath, testified as follows, to-wit:

19  
20 DIRECT EXAMINATION

21 BY MR. DRAPER:

22 Q Please state your name for the record.

23 A Stephen E. Area.

24 Q How do you spell your last name?

25 A A-R-E-A.

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1 Q What is your employment?

2 A Atlantic Richfield Company, and I'm a  
3 landman. My responsibilities include handling contracts,  
4 leasing, forming units in New Mexico.

5 Q How long have you held that position?

6 A A little over a year.

7 Q And what is your educational background?

8 A I've got a law degree from the University  
9 of Tulsa in 1978; was admitted to the Bar in early 1979; and  
10 during my term -- during law school I was a commercial banking  
11 officer for a year.

12 Q Thank you.

13 MR. DRAPER: Are Mr. Area's qualifications  
14 sufficient?

15 MR. RAMEY: Yes, they are.

16 Q Are you familiar with Application Number  
17 6928 by ARCO Oil and Gas Company presently pending before the  
18 Oil and Gas Commission?

19 A Yes, I am.

20 Q And what is the nature of that application?

21 A The nature of the application is for com-  
22 pulsory pooling, Eddy County, New Mexico. The pooling of  
23 all mineral interests in the Pennsylvanian formation under-  
24 lying the south half of Section 24, Township 17 South, Range  
25 28 East, to be dedicated to a well to be drilled at a standard

1 location thereon.

2 Also to be considered will be the cost of  
3 drilling and completing said well and the allocation of the  
4 costs thereof, as well as actual operating costs, charges for  
5 supervision, designation of applicant as operator of the well,  
6 a charge for risk involved in drilling said well.

7 Q I would ask you to refer to what has been  
8 marked as ARCO Exhibit Number One and describe for the Com-  
9 mission what that exhibit consists of.

10 A This exhibit is entitled Pennsylvanian  
11 Ownership and reflects our proposed location of the Pennzoil  
12 24 State Com No. 1, which is to be located 660 from the south  
13 line, 1980 from the east line.

14 This south half proration unit in Section  
15 24 is outlined by a red border, and we also have located on  
16 this south half spacing unit the proposed location, as we knew  
17 it prior to today, 660 -- 660 from the south, 660 from the  
18 west, of Mr. Hartman's unorthodox location.

19 Also appearing on this exhibit we have  
20 outlined -- we have outlined in green the Morrow wells in the  
21 area, and that is the circles are enclosed in green. We have  
22 also highlighted the dry holes by a star -- by a little circle  
23 with a little star points, and a circle around it, and those  
24 appear in the south half of 24, referred to as the Pennzoil  
25 well in previous conservation.

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1 And, also, up here in Section 23 in the  
2 northwest quarter, also the location for the drilling of the  
3 Exxon well appears in the east half of Section 23, and we've  
4 also included on this exhibit the State acreage that is shown  
5 by the word "State" and appearing all of Section 25, all of  
6 Section 26, encompasses all of Section 24, and the east half  
7 of 23, and I have the State lease numbers that correspond to  
8 those tracts.

9 Section 24 in the south half, in the south-  
10 west quarter northeast quarter, State Lease -- State Lease B,  
11 as in boy, 5862.

12 In the northwest of the southwest it's  
13 V, as in Victor, 221.

14 In the south half of the southwest it's  
15 LG-6340.

16 In the southeast quarter it's State Lease  
17 G-6251.

18 In Section 25, Township 17, 28, it's the  
19 whole section is encompassed by State Lease 647.

20 And in Section 23, 17, 28, the east half,  
21 it's State Lease LG-6339.

22 Now, I just want to re-emphasize the com-  
23 mon ownership that appears by this plat that reflects the  
24 State's interest in 25, 26, the south half of 24, and in fact  
25 the north and the south half of 24, and the east half of 23.

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1 Q I would like you now to refer, Mr. Area,  
2 to what I've marked as ARCO Exhibit Number Two, and ask you  
3 to describe that exhibit.

4 A This exhibit is entitled Working Interest  
5 Owners - Proposed Pennzoil 24 State Com No. 1.

6 It lists the parties who have an interest  
7 in the south half of Section 24; lists the acreage -- acres  
8 which they are contributing, and lists the interest if each  
9 party were going to join the drilling of the well.

10 There has been indications from evidently  
11 previous testimony, that some of the parties may be interested  
12 in farming out to the -- to this well, and that would, of  
13 course, increase ARCO's interest in the drilling of the well.

14 If you would like, I'd be glad to go over  
15 the acres contributed and the interests.

16 Q No, thank you.

17 A Okay.

18 Q I would like to move on to ARCO Exhibit  
19 Number Three, and ask you to describe that exhibit.

20 A This exhibit is dated December 13th, 1979,  
21 and it was the first attempt after the dry hole was drilled  
22 and completed by Pennzoil, the first attempt by anyone to  
23 subsequently put together a working interest unit in the  
24 south half of 24.

25 Q How long after the plugging of the dry

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1 hole was that?

2 A The dry hole was plugged in May of 1979  
3 and as this letter is dated, it was December 13th when ARCO  
4 proposed their standard -- or their location in the south half  
5 of 24, and their interest in moving forward to the development  
6 of this area.

7 Q And Exhibit Number Four?

8 A Well, if I --

9 Q Oh, go ahead.

10 A Well, let me just add one other thing on  
11 this Exhibit before we leave it, Exhibit Number Three.

12 The normal procedure for ARCO in generating  
13 a well proposal is to initiate correspondence with parties  
14 such as this and a permit, which is later filed for a location,  
15 and so forth, is done subsequently to the discussion of the  
16 this formation with parties and it's usually a task encountered  
17 by the engineers later on down the line when we've got every-  
18 thing firmed up.

19 Q Okay, now if you would move on to Exhibit  
20 Number Four, and describe that for the Commission?

21 A Exhibit Number Four is a letter from Pennz-  
22 oil, Kenneth Midlock, dated January 7th, whereas he has -- he  
23 is forwarding to the working interest owners in this south  
24 half the proposal which ARCO had sent to them on December 13th,  
25 and you will also note that the net revenue interest was de-

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1 creased and based on the change in the trade that existed be-  
2 tween Pennzoil and ARCO. ARCO really just wasn't aware of  
3 existing overrides when their December 13th letter had re-  
4 flected an 80-20 split on the interest, and this 70-30 change  
5 reflected that. That's what this letter implies, this change,  
6 as well as their submitting to the other co-owners, as we  
7 requested.

8 Q Okay. I would like to at this point in  
9 chronological order show you a part of Exhibit Number Fifteen  
10 submitted by Mr. Hartman, a letter dated January 25th, 1980,  
11 signed by Doyle Hartman, and ask you to look at that and tell  
12 us whether ARCO ever received that letter?

13 A ARCO never received a copy of this January  
14 25th, 1980, letter. This is the first -- today's the first  
15 day I've seen it.

16 Q What is the substance of that letter for  
17 those of us that don't have a copy?

18 A He's mentioning that ARCO has proposed  
19 a farmout request to Pennzoil and he proceeds to discuss the  
20 status of his position.

21 He said, let me take another minute to  
22 read this, if I may.

23 Q First, to whom is it addressed?

24 A It is addressed to all participants in  
25 captioned lease, and the captioned lease, it says.

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1 Aid Area, south half southwest quarter, and well, from the  
2 caption, the only person who has an interest in the south  
3 half of the southwest quarter is Mr. Hartman.

4 Let me just go on to read this, if I can.  
5 He mentions the sale in which he has the opportunity to join  
6 in the purchase of the tract that ARCO purchased at the lease  
7 sale, and asking the other interest owners if they were inter-  
8 ested in participating in the purchase, and he also mentions  
9 some kind of a -- that they're going to shoot two lines across  
10 our lease at approximate cost of \$15,000.

11 We weren't aware that he was going to  
12 shoot any lines. As I say, this letter, we did not receive  
13 a copy of it.

14 Q Thank you. Moving on to ARCO Exhibit  
15 Number Five, if you have a copy there would you describe what  
16 that exhibit consists of?

17 A This is a letter from Doyle Hartman to  
18 all owners in the south half of Section 24, and he is asking  
19 everyone to work with ARCO, either join or farmout and hope-  
20 fully farmout as much interest as possible, so ARCO will be  
21 encouraged to drill it.

22 Q What's the date of that letter?

23 A This is February 13th, 1980.

24 Q And does Mr. Hartman suggest a specific  
25 well location in that letter?

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1 A Yes. He suggests a non-standard location  
2 in the west half of the southwest quarter.

3 Q And does he comment on the consequences  
4 of seeking an unorthodox well location?

5 A Yes, he does. If I may quote his letter,  
6 if ARCO, operator of the offset acreage to the south, refused  
7 to grant a waiver and/or opposed this non-standard location  
8 at the hearing, approval from the NMOCD would provide for a  
9 severe penalty in the form of a highly restricted allowable  
10 for the new well. Allowable would be based on a pipeline  
11 deliverability test to be performed after completion of the  
12 well with the actual allowable to be 25 to 50 percent of the  
13 actual test results.

14 Q Let me refer you to the next ARCO exhibit,  
15 Number Six, and ask you to describe that, if you would, briefly?

16 A This is a letter from Doyle Hartman to  
17 all working interest owners, and he is asking the working  
18 interest owners at this point to just work with him and have  
19 him drill the well. This is our first indication that Mr.  
20 Hartman is interested in drilling the well himself.

21 Q And does Mr. Hartman propose a specific  
22 well location?

23 A Yes, he does. He states, we are currently  
24 staking an 11,000 foot Morrow well to be drilled at a location  
25 660 from the south line, 660 from the west line of Section 24.

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1 Q What type of a location is that?

2 A This is an unorthodox location.

3 Q And does Mr. Hartman indicate the geologi-  
4 cal characteristics of the reservoir he expects to encounter?

5 A Yes. I'm quoting again, in our opinion,  
6 we are dealing with a narrow but prolific Morrow channel sand,  
7 crossing a portion of the west half of Section 24 and the east  
8 half of Section 23; therefor, in order to maximize potential  
9 of our leasehold interest, as well as to protect the interests  
10 of our royalty owners, we propose the following, and he pro-  
11 poses an unorthodox location.

12 Q Do you have any idea whether Mr. Hartman's  
13 seismic data was available at the time that he proposed the  
14 well location?

15 A Well, I had a luncheon with Mr. Hartman  
16 and Bill Aycock and I believe one other gentleman from Doyle  
17 Hartman's company, and at that point in time it was -- he in-  
18 formed us the seismic was still being processed and that he  
19 had -- he said he did have seismic but he admitted that it was  
20 still being processed at that time, and this was -- this  
21 luncheon took place between May 2nd and May 20th.

22 Q Let me refer you to a several page docu-  
23 ment, marked Exhibit Seven, ARCO Exhibit Seven, and ask you  
24 in this case, also, to describe the gist of this document.

25 A This -- this letter directed to the

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1 working interest owners, the attached list, in the south half  
2 of Section 24, ARCO is just re-affirming its continuing intent  
3 to drill the well in the south half of Section 24, and we also  
4 attach to this an AFE and a joint operating agreement, and we  
5 also mentioned in the letter that we -- we are willing to  
6 honor Exxon and Inexco's desire to wait for the data from the  
7 Exxon well before committing to this, what we consider, a  
8 risky well, as most wells in this area are.

9 Q At this point how long had it been since  
10 ARCO had initiated its attempt to reach a voluntary agreement  
11 for the development of this south half of Section 24 at its  
12 orthodox location?

13 A Approximately five months.

14 Q Is this an unusual length of time --

15 A No.

16 Q -- for such a procedure to take?

17 A No, not at all. We have -- because you're  
18 waiting on other parties and because you're dealing with a  
19 number of parties, the time frame is usually a lot longer than  
20 this.

21 Q Are you personally familiar with the  
22 authenticity of ARCO Exhibits One through Seven?

23 A Yes, I am. They were either prepared by  
24 me or under my direction.

25 MR. DRAPER: I would move the admission

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1 of ARCO Exhibit One through Seven.

2 MR. RAMEY: ARCO Exhibits One through  
3 Seven will be admitted.

4 Any questions of the witness? Mr. Carr?

5  
6 CROSS EXAMINATION

7 BY MR. CARR:

8 Q Mr. Area, I'd like to refer you to what  
9 is your Exhibit Number Two. I believe you made a statement  
10 that there were other people who -- other parties who had  
11 indicated an interest in participating with ARCO in the well,  
12 and if they did, that that would increase ARCO's interest in  
13 drilling the well, is that correct?

14 A That's correct.

15 Q Who are those other parties?

16 A Inexco and Exxon. Inexco and Exxon had  
17 said that they wanted to wait till the EXxon well was drilled  
18 before making decision in joining or farming out.

19 And we've had correspondence from, well,  
20 from December 13th when we first initiated this correspondence.  
21 There was correspondence received from Pennzoil stating that  
22 they were willing to farmout to us, and then it switched back  
23 and they were reconsidering, and our last correspondence with  
24 Pennzoil, on the last correspondence we received from Pennzoil  
25 stated that they were not going to make a decision on joining

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1 or farming out until the Exxon well was drilled.

2 Q What is the interest that ARCO has in the  
3 south half of Section 24, what percentage of the working in-  
4 terest?

5 A 6.25 percent prior to receiving any farm-  
6 outs.

7 Q And what does Exxon have?

8 A I'll have to look at this. Exxon has  
9 1.9531 percent.

10 Q And Inexco?

11 A Inexco, 26.8672 percent.

12 Q So we're looking at something in the  
13 neighborhood of something less than 35 percent of the inter-  
14 est, even if everyone did come forward and has indicated  
15 they have an interest.

16 A Well, you're excluding Pennzoil. Pennzoil's  
17 interest is 3.25 percent.

18 But if you totaled Inexco's and Exxon's  
19 you do receive about 27 percent and with ours it would be  
20 35 percent. Pennzoil is another 31 percent.

21 Q Are you anticipating Pennzoil to partici-  
22 pate in the well with you?

23 A We don't know what their decision is  
24 going to be and this is a -- as we mentioned, it's a risky  
25 well, and I -- and we understood their position that we're

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1 going to wait for the Exxon well, and having invested their  
2 own funds in a dry hole already in this south half, we felt  
3 it was very unlikely that they would join us. They would  
4 probably farmout.

5 Q And when did you last communicate with  
6 Inexco representatives?

7 A Oh, let me refer to our correspondence  
8 here. On May 12th we received correspondence from Inexco  
9 that in essence said Inexco said that they will decide after  
10 reviewing the seismic and the hearing, this hearing, the re-  
11 sults of this hearing.

12 Q Are you aware that on that same date  
13 Inexco communicated with Mr. Hartman that they were going to  
14 participate in the seismic and believed that the proposed --  
15 Mr. Hartman's proposed location was the preferable one?

16 A Well, if this is the date, same date, May  
17 12th, then I'll have to -- let me pull my correspondence with  
18 Inexco. Yeah, May 12th? We do have -- this is this letter  
19 I was referring to and they are stating, I quote, on technical  
20 well, if ARCO has data to support their proposed location that  
21 was heretofor not available to other co-owners in the area,  
22 we would welcome the opportunity to review same and incorpor-  
23 ate the information in our interpretation of the area.

24 Then they go on in the last paragraph,  
25 please advise us of the hearing date so we can keep abreast of

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1 the situation, so that we can make a timely decision regarding  
2 the joinder or farming out, as well.

3 Q Okay, and who is that letter addressed  
4 to?

5 A It's addressed to Doyle Hartman.

6 Q So they are telling him that they would  
7 like to know the hearing date so they can make their deter-  
8 mination regarding joinder or farmout to him?

9 A That's correct.

10 Q Do you have correspondence in your file  
11 from Pennzoil dated May 8, a letter from Mr. Kenneth Medlock,  
12 Landman?

13 A May 8th? No, I do not.

14 Q Would it surprise you to learn that they  
15 wrote -- well, let me -- this is a letter dated May 6th, 1980,  
16 which is included in Doyle Hartman Exhibit Number Fifteen.  
17 Have you seen that letter before?

18 A Let me check. I recall Pennzoil making  
19 a statement. Whether it was in the form of correspondence or  
20 telephone, I don't -- I don't know, but I don't, in the chrono-  
21 logical order we have put this together -- well, here it is,  
22 I'm sorry.

23  
24 It says May 6th, it's the same letter  
25 that's included in your file.

Q And doesn't that letter indicate that

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1 Pennzoil at this time does not intend to farmout or participate  
2 with ARCO in a well?

3 A. Until the Exxon well is drilled, that's  
4 correct.

5 Q. Now, I believe that you made reference to  
6 a Doyle Hartman letter dated January 25, 1980. This is the  
7 letter that makes reference to seismic work, a proposal for  
8 seismic work.

9 Are you a participant with Mr. Hartman  
10 in the captioned lease?

11 A. In the south half of Section 24?

12 Q. Yes.

13 A. Well, the captioned lease, as I stated,  
14 said the south half of the southwest. We are not a partici-  
15 pant in the south half of the southwest.

16 Q. Well, then would it be logical for you  
17 to receive a letter addressed to those who participate in the  
18 south half of the southwest?

19 A. No, we would not receive any correspondence  
20 dealing with the south half of the southwest, and I don't  
21 understand --

22 Q. Mr. Hartman is the only working interest  
23 owner in the south half of the southwest, is that correct?

24 A. That's correct.

25 Q. Would it surprise you to learn that he

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1 has other people who participate with him in these ventures  
2 in terms of financing or --

3 A No, it wouldn't surprise me.

4 Q And that a letter of this nature to all  
5 participants in a lease which is defined as only his lease,  
6 would be directed to those individuals and not the other  
7 working interest owners in the general vicinity?

8 A Yes.

9 Q I believe you testified that you'd had  
10 some conversation fairly recently, early May, with Mr. Hartman  
11 concerning seismic data, and you indicated it wasn't ready  
12 at that time.

13 A It was still being processed, that's cor-  
14 rect.

15 Q Now, was Jerry Tweed also at lunch with  
16 you that day?

17 A That's correct.

18 Q And do you recall Jerry Tweed stating that  
19 ARCO was also looking at seismic data and formulating their  
20 plans?

21 A I believe Jerry stated that we had some  
22 seismic in the area and I believe that's all Jerry said, and  
23 that it was not available.

24 Q Now, you testified, your Exhibit Number  
25 Five, you read a paragraph from this concerning a penalty tha-

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1 would be imposed if ARCO objected to an unorthodox location  
2 for Mr. Hartman's well.

3 A Right.

4 Q Could you tell me if the proposed unortho-  
5 dox location was in fact crowding the ARCO acreage in Section  
6 25?

7 A Whether or not it's crowding the acreage?

8 Q Is it unorthodox vis-a-vis the south line  
9 of their lease?

10 A Well, that's more of an engineering deci-  
11 sion. I don't make that decision.

12 Q You don't know then whether it is unortho-  
13 dox or not?

14 A It appears from the location on the map  
15 that the 660-660 was unorthodox. I'm assuming --

16 Q If you don't know, that's fine.

17 A I don't know that 880 and 1000 is unortho-  
18 dox.

19 Q Now, I believe you indicated using your  
20 Exhibit Number Seven, that it was desireable to -- or that  
21 this letter states that it is desireable to wait until after  
22 the Exxon well is completed before the south half of Section  
23 24 is developed, is that correct?

24 A No, that -- I don't believe that was a  
25 proper assessment, and I believe that I said that we were

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1 willing to abide by the interests or the feelings of the --  
2 some of the working interest owners that wanted to wait.

3 We have, all along we were willing to drill  
4 the south half of 24 regardless of the events of the Exxon  
5 well.

6 Q And so you're not testifying that you be-  
7 lieve it's desirable to wait to develop, then.

8 A No. ARCO is willing to -- ARCO is willing  
9 to go ahead and drill it now, but if the working interest  
10 owners in the section, if all of them had wanted to wait on  
11 the Exxon well, we would have been amenable to that.

12 Q If you wait, that would delay actually  
13 producing the south half of Section 24, is that correct?

14 A That's correct, but when you're dealing  
15 with a risky well like this is, as much data as you can col-  
16 lect as possible is important in making a decision. There's  
17 big money involved.

18 Q At the present time you have two wells  
19 producing from this channel, do you not?

20 A Well, I know that there's two wells in  
21 Section 25, but whether it's in the same channel or not, I  
22 don't know.

23 Q If they are in the same channel, they  
24 would be draining the channel as it crosses Section 24, is  
25 that correct?

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1 MR. RAMEY: Mr. Carr, you may be asking  
2 this witness questions that should be reserved for an engineer.

3 MR. CARR: Yes, I'll defer those until  
4 we have an engineering witness.

5 A. Okay. I don't know those.

6 MR. CARR: I have no further questions.

7 MR. RAMEY: Any other questions? Mr.  
8 Kellahin?

9 MR. KELLAHIN: Yes, Mr. Ramey.

10 CROSS EXAMINATION

11 BY MR. KELLAHIN:

12 Q Mr. Area, is it?

13 A Yes.

14 Q You're a landman for ARCO?

15 A That's correct.

16 Q Did you participate in the preparation  
17 and filing of the compulsory pooling application before the  
18 Oil Conservation Division?  
19

20 A When you say participate, we --

21 Q Provided the information to your attorney  
22 or --

23 A Yes.

24 Q -- whoever filed it, the application?

25 A Yes, sir.

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1 Q Do you know of your own knowledge when  
2 that application was filed before this Division?

3 A No, I don't. Not from personal knowledge,  
4 I don't know the date, and such.

5 Q Do you know whether or not Pennzoil was  
6 included as a non-consenting party in that application?

7 A I don't know, no.

8 Q To your own knowledge do you know whether  
9 or not Pennzoil has agreed in writing to join ARCO in the  
10 drilling of the well in the south half of the section?

11 A In the last correspondence I received  
12 from Pennzoil, they did not decide whether to join or farm  
13 out.

14 Q So if your application for compulsory  
15 pooling is successful, it would have to include Pennzoil?

16 A That's correct.

17 MR. KELLAHIN: I have no further questions.

18 MR. RAMEY: Mr. Carr?  
19

20 RE CROSS EXAMINATION

21 BY MR. CARR:

22 Q Mr. Area, in regard to your comments  
23 concerning the application for permit to drill, I guess I  
24 didn't understand it. Did you supply information that was  
25 used by ARCO and incorporated into this permit or this appli-

1 cation?

2 A Right. I was -- I was one of probably  
3 one or two other people that may have contributed information  
4 to it.

5 Q I'd like to hand you a copy of an appli-  
6 cation from the Commission files and ask you if that looks  
7 like the application that was filed by ARCO, if you can ident-  
8 ify it?

9 A Well, I didn't see a copy of this. This  
10 is the first I've seen.

11 Q Who is it signed by?

12 A Our District Drilling Superintendent,  
13 whose name I can't read.

14 Q What is the date on that?

15 A Well, it says received May 12th, and --

16 Q Now, I'd like you --

17 A -- at the bottom, I guess May 5th is when  
18 he signed it.

19 Q I'd like you to look at the second page  
20 of that, that's the C-102, and there are some questions there  
21 about status of the acreage, and I think it says -- makes  
22 some reference to whether or not the acreage has been com-  
23 munitized or is being communitized.

24 A Okay.

25 Q There's a question that says if more than

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1 one lease of different ownership is dedicated to the well,  
2 have the interest of all owners been consolidated by commun-  
3 itization, unitization, forced pooling, et cetera, and what  
4 is your answer to that?

5 A No.

6 Q And then they ask if it is no, to explain,  
7 and what explanation is given?

8 A It says, acreage is in the process of  
9 being communitized.

10 Q Now, is that a correct statement?

11 A Well, I guess from a verbatim standpoint,  
12 this drilling -- this drilling superintendent may have thought  
13 communitized meant, that might be correct, but maybe from a  
14 landman's situation, I know that's not correct.

15 Q So should it have said that the acreage  
16 was subject to forced pooling, or something other than com-  
17 munitization?

18 A Probably so.

19 MR. CARR: I have no further questions.

20 MR. RAMEY: Any other questions of the  
21 witness?

22 MR. DRAPER: A couple.

23 MR. RAMEY: Mr. Draper.

24  
25

REDIRECT EXAMINATION

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1  
2 BY MR. DRAPER:

3 Q Mr. Area, who is the first party to try  
4 to develop the south half subsequent to the dry hole being  
5 plugged in the southwest quarter in May of 1979?

6 A Atlantic Richfield, ARCO, was the first  
7 one, December 13th.

8 Q And has that attempt to develop the south  
9 half been pursued diligently?

10 A Yes, it has. We have diligently contacted  
11 all the parties and followed up with correspondence. The  
12 drilling of this well has been very important to us and we --  
13 this was put on the top of my priority list as far as getting  
14 the well put together.

15 Q And when did Mr. Hartman first surface,  
16 with the other owners in the south half, his proposal to  
17 drill?

18 A I believe it was April 18th is when he  
19 indicated he wanted to drill it.

20 MR. DRAPER: Thank you.

21 MR. RAMEY: Any other questions? The  
22 witness may be excused.

23  
24 GEORGE B. SCHULTZ

25 being called as a witness and having been duly sworn upon his

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1 oath, testified as follows, to-wit:

2  
3 DIRECT EXAMINATION

4 BY MR. DRAPER:

5 Q Please state your name.

6 A George B. Schultz. S-C-H-U-L-T-Z.

7 Q And your employment?

8 A ARCO Oil and Gas Company of Atlantic  
9 Richfield Corporation.

10 Q Have you previously testified before the  
11 Commission so that your credentials are of record with the  
12 Commission?

13 A No, I have not.

14 Q Would you please state your qualifications  
15 including your educational background and your work experience?

16 A I have a Bachelor's of Physics from DePaul  
17 University in Chicago. I have a Master's in geophysics from  
18 Stanford University, and two and a half years working exper-  
19 ience with ARCO Oil and Gas.

20 MR. DRAPER: Are the witness' qualifications  
21 acceptable to the Commission?

22 MR. RAMEY: I assume he's familiar with  
23 the area in this case?

24 Q Would you confirm that?

25 A Yes.

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1 MR. RAMEY: He is qualified.

2 MR. DRAPER: Thank you.

3 Q Mr. Schultz, has ARCO ever attempted any  
4 seismic investigation in the area of the south half of Section  
5 24?

6 A Yes, we have.

7 Q And did ARCO ever -- did ARCO in that  
8 attempt have any problems with that attempt?

9 A Yes, we did, and after an extensive period  
10 of study, over two and a half years in length, and after a  
11 sizeable geophysical expenditure, ARCO Oil and Gas has en-  
12 countered the following significant problems: Among others,  
13 which necessarily make suspect any geophysical interpretation  
14 of Lower Pennsylvanian units in this area, number one, and  
15 there are four points I'd like to bring out, we have found  
16 there to be no seismic marker that can be reliably mapped  
17 between the Atoka and the Chester. This severely jeopardizes  
18 strat-seis studies where correct identification of events, in  
19 our opinion, is of utmost importance.

20 Number two, we feel that while a unit  
21 greater than 45 feet is resolvable with adequate quality  
22 seismic data, often the velocity contrast between a sand body  
23 and surrounding sedimentary units is so minor that often the  
24 units in this zone yield no reflection.

25 Number three, we recognize there to be

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1 a severe near surface velocity gradient which results in a  
2 misleading structural representation of events on seismic  
3 data.

4 And number four, the ambient noise levels  
5 are high due to production in the area.

6 And we've reached a conclusion that is  
7 supported by the chief geophysicist of ARCO Oil and Gas, that  
8 to date, after extensive seismic efforts, we have found seismic  
9 data to be at best inconclusive regarding its usefulness in  
10 exploration of lower Pennsylvanian objectives on the Delaware  
11 Basin Shelf.

12 MR. CARR: I'm going to object. If the  
13 chief geophysicist for ARCO has these conclusions, he should  
14 be here to subject himself to cross examination on it. This  
15 is hearsay and I object to it.

16 Q Mr. Schultz, if you'll testify based on  
17 your qualifications as an expert geophysicist of your own  
18 personal knowledge and your personal conclusions.

19 A Yes, I can testify to that same conclusion  
20 and the point is well taken. These -- these data are incon-  
21 clusive.

22 Q Thank you.

23 MR. RAMEY: So it's your opinion that the  
24 data is inconclusive?

25 A Yes.

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1           Q           Mr. Schultz, would you be so kind as to  
2 refer to Hartman Exhibits Six through Nine and comment on  
3 those for the Commission?

4           A           Yes. I'd like to comment with regard to  
5 some points of interpretation and some testimony that has  
6 been made.

7                       The testimony that was made stated that  
8 an Isochron is similar to an Isopach and this is essentially  
9 true, but there are two critical differences between an Iso-  
10 pach and an Isochron.

11                      The first critical difference is that an  
12 Isochron is dependent upon the velocity between the units  
13 being mapped, and therefor, if there is a velocity anomaly  
14 between those two units, it is, the resultant effect would be  
15 to create a spurious increase in reflection time between those  
16 units which may have no -- no basis in real geology.

17                      The second problem with an Isochron, and  
18 let me state that without velocity control between the two  
19 units mapped the resultant Isochron is inconclusive as to  
20 the presence of any unit within that Isochron.

21                      The second point I'd like to make is that  
22 the Pennsylvanian nonconformity between -- lies between the  
23 two units mentioned in the Isochron, the two units used in  
24 the interpretation, the Strawn and the Chester, which could  
25 create a time thickening between those two events not asso-

1 ciated with the presence of a -- presence or absence of a  
2 channel sand between those two units.

3 Without submitting any evidence as to the  
4 nature of that effect upon the Isochron, that also would be  
5 considered to be inconclusive.

6 The second problem is my -- or another  
7 point I'd like to address, would be that a migrated section  
8 can affect the structural representation of seismic record  
9 section. The two pieces of evidence submitted were not migrated  
10 seismic sections. Were they to be migrated, we might see a  
11 total shifting of the anomaly as represented laterally along  
12 the seismic section, as well as possibly vertically.

13 When you're doing an Isochron map on seismic  
14 data, what you really have is a structural map between two  
15 events. You're doing two structure maps and then you're  
16 taking a time difference between the two. So that only --  
17 there is more than one event that needs to be properly posi-  
18 tioned in time and space to guarantee the correct position  
19 of an anomaly.

20 And it is geophysical knowledge that  
21 highs and lows shift around when migrated correctly. We  
22 feel that the presence of the existence of a near surface  
23 velocity anomaly, as I mentioned in my original four problems  
24 that we encountered, could act to create an inaccurate mi-  
25 grated section unless that problem were corrected prior to

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1 migration and this is an industry problem that has not been  
2 solved to date.

3 So the resultant effect would be that a  
4 migration would be very difficult to do and produce a correct  
5 migrated section.

6 Mr. Holmstrom used a synthetic seismogram  
7 to identify the seismic events on his seismic sections, and  
8 he correctly stated the use of a seismic section -- or a syn-  
9 thetic seismogram, excuse me -- and that is to establish a  
10 time-depth relationship in the local area, being the seismic  
11 events and the sedimentary lithology in the local area.

12 Now it appeared to me, however, that he  
13 may have made some mistakes in identifying the events because  
14 the Woodford, the top of the Woodford is the top of a shale  
15 and that event would be a velocity decrease, which would ap-  
16 pear as a peak on a seismic section.

17 At the same time the top of the Chester  
18 is in increase in velocity, being a limestone, and that event  
19 would be a trough on a seismic section.

20 The two events would be an opposite  
21 polarity regardless of the polarity of the seismic section.  
22 Mr. Holmstrom has identified both seismic events as being  
23 troughs. One of them has to be incorrect.

24 I mention that we have done extensive  
25 seismic work and made extensive, vast seismic expenditures

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1 in the area, and in identifying the anomaly on the seismic  
2 section that goes to the proposed location, Mr. Holmstrom  
3 projected his synthetic from the "BV" Well onto that seismic  
4 section, and we have found that that distance is far too great  
5 a distance to be a reliable tie between a seismic section and  
6 a synthetic. We feel at ARCO Oil and Gas that a synthetic  
7 could be within 300 feet of the seismic section to reliably  
8 identify the events, particularly in an area such as the Lower  
9 Pennsylvanian in the Delaware Basin Shelf where the lithology  
10 is very complex.

11 Mr. Holmstrom made a comment that based  
12 upon his seismic data he could see the fact that -- I believe  
13 I'm stating this correctly -- that the sand body within the  
14 "BV" 1 was thicker than the sand body within the "BV" 2.  
15 This conflicts with our knowledge of -- with our -- with our  
16 knowledge of the capability of seismic data in that we do not  
17 believe that the channel itself is necessarily resolvable;  
18 therefor, fine differences between the thicknesses of those  
19 two channels is highly speculative as coming from seismic  
20 data.

21 It was stated that this well is a high  
22 risk venture and that much of the evidence used to locate the  
23 position of the Hartman location was based upon seismic data.  
24 We agree that it's a high risk venture and we do not feel  
25 that seismic data is adequate enough to locate a well in

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1 this complex lithology.

2 MR. DRAPER: No more questions.

3 MR. RAMEY: Are there questions of the  
4 witness?

5 MR. CARR: I have some.

6  
7 CROSS EXAMINATION

8 BY MR. CARR:

9 Q Mr. Schultz, you discussed for some time  
10 the problems that exist with migrated sections.

11 A Yes.

12 Q You understand that we are not dealing  
13 with a migrated section here today.

14 A Yes.

15 Q All right, so that testimony really doesn't  
16 apply to the particular exhibits that were presented, does  
17 it?

18 A Yes, it does. No, that's incorrect. It  
19 does apply because a migrated section will move the anomalies  
20 as they are presented today.

21 Q But if you're not dealing with one, how  
22 could that apply? We don't have one here.

23 A No, but we know that as a fact that that  
24 does happen.

25 Q Well --

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1 A Highs become lows and lows become highs  
2 on migrated record sections.

3 Q But how does that relate to anything  
4 presented here today?

5 A It would relate because a well is proposed  
6 to being drilled on an anomaly that may move were it migrated.  
7 Therefor, the data presented is suspect.

8 Q Now you're attacking the validity of  
9 relying on seismic work for locating wells.

10 A I'm attacking the validity of using  
11 seismic data in the Lower Pennsylvanian on the Delaware Basin  
12 Shelf.

13 Q Now, if you were trying to determine where  
14 you should locate a well and you had normal data, well logs,  
15 things of that nature, you would not think it valid to look  
16 at seismic work to see if it confirms other data that you  
17 have available to you?

18 A Yes, we would -- we would do that and we  
19 have; however, we have found it to be inconclusive.

20 Q But it is another tool that is available  
21 to you to determine where you should locate a well, is that  
22 not correct?

23 A We would not base a location on the seismic  
24 data.

25 Q Would you consider that in making your

1 determination?

2 A. We would consider it.

3 Q. It would be one of a number of factors?

4 A. That's correct.

5 Q. If your seismic data confirmed your Iso-  
6 pach -- if your Isochron confirmed your Isopach, wouldn't  
7 you think that that would be stronger evidence than either  
8 one of them alone?

9 A. We cannot state that it confirms anything  
10 because we feel it is inconclusive.

11 Q. Now you have been saying that you have a  
12 lot of data that could show this, could show that. What do  
13 you have with you that would show something?

14 A. I have no seismic data.

15 MR. CARR: Thank you.

16 MR. RAMEY: Any other questions? Mr.  
17 Kellahin?

18 MR. KELLAHIN: Yes, Mr. Ramey.

19  
20 CROSS EXAMINATION

21 BY MR. KELLAHIN:

22 Q. Mr. Schultz, I'm having trouble under-  
23 standing the thrust of your testimony here today. Am I cor-  
24 rect in assuming that ARCO has not used your services or the  
25 seismic information in order to establish their proposed loca-

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1 tion, I believe it is 1660 from the south line and 1980 from  
2 the east line -- 660, I'm sorry, from the south line and  
3 1980 from the east line of Section 24?

4 A. No, that is incorrect. Services have been  
5 used; however, the geophysical interpretation we have in our  
6 company does not dispute the -- does not dispute the engin-  
7 eering evidence to be presented, nor does it confirm it.

8 Q. I think the answer to my question is yes,  
9 then.

10 A. No, it is not. We --

11 Q. You have not used your seismic data to  
12 support your proposed location in this case.

13 A. That is correct.

14 Q. Thank you.

15 MR. RAMEY: Any other questions? Mr.  
16 Draper?

17 REDIRECT EXAMINATION

18 BY MR. DRAPER:

19 Q. Mr. Schultz, you stated that you don't  
20 have any seismic data with you today? Why is that?

21 A. Two reasons, the first is that the data  
22 is inconclusive. It neither supports nor condemns the en-  
23 gineering evidence to be presented.

24 The second is that all current seismic  
25

1 data in ARCO Oil and Gas is considered proprietary.

2 Q You mentioned that it's one factor that  
3 is looked at in determining well locations. In the scale of  
4 priorities, most important to least important, where does that  
5 fall in terms of the --

6 A In this particular location it would be  
7 the least important consideration.

8 MR. DRAPER: No other questions.

9 MR. KELLAHIN: In light of Mr. Draper's  
10 question, I have one further question, Mr. Ramey.

11  
12 RECROSS EXAMINATION

13 BY MR. KELLAHIN:

14 Q Mr. Schultz, you said in response to your  
15 attorney's question that your seismic study neither supports  
16 nor condemns ARCO's proposed location. May we also assume  
17 that your seismic study likewise neither supports nor con-  
18 demns the Hartman location?

19 A That would have to be correct.

20 MR. RAMEY: Any other questions? The  
21 witness may be excused, and we'll recess until 1:30.

22  
23 (Thereupon the noon recess  
24 was taken.)  
25

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1 MR. RAMEY: The hearing will come to  
2 order. Mr. Draper?

3 MR. DRAPER: If the Commission please, we  
4 call Paul Lindquist, and he has not been sworn.

5 MR. RAMEY: All right.

6  
7 (Witness sworn.)

8  
9 PAUL E. LINDQUIST  
10 being called as a witness and having been duly sworn upon his  
11 oath, testified as follows, to-wit:

12  
13 DIRECT EXAMINATION

14 BY MR. DRAPER:

15 Q Please state your name for the Commission.

16 A Paul E. Lindquist.

17 Q How is that spelled?

18 A L-I-N-D-Q-U-I-S-T.

19 Q And what is your employment, Mr. Lind-  
20 quist?

21 A I'm an exploration geologist with Atlantic  
22 Richfield.

23 Q Have you testified before the Commission  
24 previously so that your qualifications are of record?

25 A No, I haven't.

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1 Q Would you please state those briefly, in-  
2 cluding your educational background and your work experience,  
3 present duties?

4 A I got my undergraduate degree from Weaver  
5 State College in geology and then went to Texas A&M, where I  
6 received a Master's degree in geological oceanography.

7 I've been with ARCO Oil and Gas since  
8 graduation, approximately two and a half years, working in  
9 Bakersfield and in the Midland office since August, in the  
10 Morrow.

11 Q Are you familiar with the particular area  
12 in geology that's involved in the present proceeding?

13 A Yes, I am.

14 Q You are?

15 A Yes.

16 MR. DRAPER: Are the witness' qualifica-  
17 tions acceptable?

18 MR. RAMEY: Consider the witness qualified.

19 Q Mr. Lindquist, I would like to direct  
20 your attention to the Hartman Exhibit Number One, and Number  
21 Two, and ask you to comment on the orientations that are  
22 shown on these exhibits.

23 A Okay. Contrary to the testimony previously  
24 presented, I believe that structure, especially the structure  
25 on top of the Middle Morrow, does have a direct bearing on

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1 exploration in the Morrow.

2 My structure contour map is essentially  
3 the same as Mr. Hartman's and I have no disagreement with it  
4 at all. Of main -- the main points of contention, especially  
5 with the Exhibit Number One, is the fact that he swings his  
6 channel sand to the north, veering off of a down dip direction.  
7 A channel per se, fluvial channel systems, as this has been  
8 presented as, essentially conforms to the depositional dip  
9 at the time and flows directly that depositional dip.

10 In this area the structure as we see it  
11 today in the top of the Middle Morrow, such as this map, is  
12 believed to be, especially by myself and by other work that  
13 I've seen, to be fairly conformable to the structural dip at  
14 time of deposition of the Morrow, with the land mass being  
15 generally to the northwest and the channels being deposited  
16 in a general northwest/southeast orientation.

17 Mr. Hartman's interpretation in this case  
18 does not conform to that. In fact, his very structural con-  
19 tours show a much more likely mode of deposition. I would  
20 prefer to -- it makes better geologic sense to me to continue  
21 the channel from the South Empire Deep No. 5 to the "BV" 1  
22 and 2, gently curving as the structural contours do to the  
23 northeast, swinging south of the two dry holes in Sections  
24 22 and 23 in Section 17 South, Range 28 East.

25 The orientation on the net sand porosity

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1 Isopach, or Exhibit Two, also shows this curious orientation.  
 2 They stated that these river channels do not run straight.  
 3 I might point out to them that river channels don't defy the  
 4 law of gravity and they flow downhill.

5 In this case he has taken his own struc-  
 6 tural contours and violated that concept. He also stated that  
 7 river channels are not straight, yet he has drawn them  
 8 straight from the "BV" 1 and 2 to the Amoco South Empire Deep  
 9 No. 2, and when he runs out of data to the north, he swings  
 10 it across his location.

11 I might further suppose that this map and  
 12 the channel trend on the Exhibit Number One was completed  
 13 after the examination of the seismic data, and that --

14 MR. CARR: Objection. Objection. They're  
 15 making statements here that there's no foundation for. They  
 16 are matters which are not in evidence and could not be within  
 17 the knowledge of this witness.

18 We're perfectly willing to let our wit-  
 19 nesses be recalled to establish whatever should be established  
 20 by cross examination, but to call similar witnesses and try  
 21 and cross examine our witnesses with independent testimony  
 22 that is really not supported by anything in evidence, we  
 23 think is improper.

24 MR. RAMEY: What did you specifically  
 25 object to, Mr. Carr?

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1 MR. CARR: I objected to conclusions by  
2 this witness that the geological data presented by Mr. Hart-  
3 man was prepared following review of the seismic data and I  
4 believe there's nothing in the record anywhere to support  
5 that and no possible way for them to put in evidence to base  
6 that conclusion on.

7 I object to it.

8 MR. RAMEY: I have to agree with you.  
9 Do you wish to say something, Mr. Draper?

10 MR. DRAPER: Mr. Commissioner, I might  
11 just direct a question to the witness that I think will avoid  
12 any of that difficulty.

13 Q Mr. Lindquist, do the contours shown on  
14 Exhibit One submitted by Mr. Hartman conform to what you  
15 understand to be the depositional pattern in that area?

16 A Yes, the contours, structural contours  
17 do.

18 Q Is the channel which has been found to be  
19 productive here, is it a fluvial type of channel --

20 A It has been interpreted --

21 Q -- in your opinion as a geologist?

22 A It has been interpreted as that by me and  
23 several geologists of -- that I've been in contact with.

24 Q And what is a fluvial channel?

25 A A fluvial channel is a sub-area channel

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1 that is deposited flowing basically from a source area down  
2 dip to, in this case, a sea or a shoreline.

3 Q Is it material that's deposited by the  
4 flow of water?

5 A Yes, it is.

6 Q And does the flow of water take place at  
7 right angles to the contours as a --

8 A Normally they --

9 Q -- geological rule of thumb?

10 A Normally --

11 Q I mean does water run downhill or does  
12 it run sideways?

13 A In this case the obvious answer is the  
14 water does run downhill. It runs in a general trend down  
15 structural dip.

16 Q Thank you. Do you have any input and have  
17 you had a chance to review the exhibits Eight, Nine, and Ten  
18 that Mr. Johnston will be discussing subsequently?

19 A Yes, I had input into those exhibits.

20 Q And have you reviewed them in their en-  
21 tirety as to their geological -- as to the geological data  
22 that's plotted on those exhibits?

23 A Yes, I have and they reflect this general  
24 swing to the south of the two wells in Section 23 and 22.

25 Q And do you agree with the geological data

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1 that's shown on those exhibits?

2 A Yes, I do.

3 MR. DRAPER: Thank you. No further ques-  
4 tions.

5 MR. RAMEY: Any questions of the witness?

6 MR. CARR: I don't think we have any ques-  
7 tions of the witness. We would reserve the right to recall  
8 him for cross examination once we see Exhibits Eight, Nine,  
9 and Ten, to which he's testified.

10  
11 J. W. JOHNSTON  
12 being called as a witness and having been duly sworn upon his  
13 oath, testified as follows, to-wit:

14  
15 DIRECT EXAMINATION

16 BY MR. DRAPER:

17 Q Would you be so kind as to state your  
18 name?

19 A My name is James W. Johnston.

20 Q What is your employment, Mr. Johnston?

21 A I'm an area engineer with Atlantic Rich-  
22 field Company of Midland, Texas.

23 Q Have you testified before the Commission  
24 previously so that your qualifications are a matter of record?

25 A No, I have not.

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1 Q Would you state those qualifications, edu-  
2 cational background and work experience?

3 A I have a Bachelor of Science degree in  
4 petroleum engineering from the University of Tulsa in 1971.  
5 I was employed for fourteen months as a production engineer  
6 with Amerada Hess in Seminole, Texas. Subsequently went to  
7 work for Atlantic Richfield in Midland; worked for approxi-  
8 mately four years in operations and analytical engineering.  
9 I worked fifteen months as a staff reservoir engineer in our  
10 Dallas reservoir engineering group.

11 For the last approximately two and a half  
12 years I've been an area engineer, first line supervisor, with  
13 Atlantic Richfield in Midland.

14 MR. DRAPER: Are the witness' --

15 MR. RAMEY: He's qualified.

16 MR. DRAPER: Thank you.

17 Q Mr. Johnston, I would like to refer your  
18 attention to what has been labeled as ARCO Exhibit Number  
19 Eight, and ask you to identify that exhibit and discuss its  
20 significance for the matters before the Commission.

21 A Exhibit Number Eight is a gross sand Iso-  
22 pach on the Morrow Cycle Two.

23 This shows the proposed standard proration  
24 unit that we are seeking in the south half of Section 24 out-  
25 lined in red. It shows the wells that have penetrated the

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1 Pennsylvanian formation, Morrow formation, in the immediate  
2 area. There's a legend at the bottom that indicates the status  
3 of each well. We have shown in a red color, reddish pink,  
4 wells completed in what we call Cycle Three; green wells, the  
5 majority of the wells in what we call Cycle Two of the Morrow.  
6 There are dry holes exhibited, the Pennzoil Aid State Com No.  
7 1 in the west half of the south half of Section 24 is shown  
8 as a dry hole. The Yates "JZ" No. 1 is shown as a dry hole.

9 There are other wells that are not com-  
10 pleted in the Pennsylvanian that are completed in other zones  
11 that are also shown on this map.

12 In addition we have two locations, excuse  
13 me, we have our proposed standard location in the east half  
14 of the south half of Section 24, 660 from the south line,  
15 1980 from the east line.

16 We also have shown in Section 23 the  
17 location of the Exxon New Mexico "CY" State No. 1, which is  
18 currently drilling to a contract depth which should encounter  
19 the Morrow.

20 This exhibit shows an Isopach of what  
21 we call the Morrow Cycle Two gross sand, as I said, which is  
22 the predominant producing interval in this area.

23 Q Would you explain what you mean by the  
24 Cycle Two gross sand, please?

25 A I'll go further than that. I'd like to

1 explain -- I'd like to reference the Morrow reservoirs.

2                   These Morrow gas reservoirs in this area  
3 are sandstones deposited in fluvial channel systems during  
4 early Pennsylvanian time. These systems run in a general  
5 northwest to southeast direction that parallels the structural  
6 dip, which is to the southeast, as was pointed out earlier.

7                   We've identified four separate sequences  
8 of silt stone, sandstones, shales, limestones in the Morrow  
9 section that represent successive depositional sequences, and  
10 we have log markers on these and we call these cycles one,  
11 two, three, and four. Cycle One is the deepest and Four is  
12 the shallowest.

13                   In the Empire Deep area, as you can see,  
14 most of the production is what we call Cycle Two.

15                   The basis of this mapping is well control  
16 and knowledge of regional geology. The gross sand volumes,  
17 identified for each well under the location completion marker  
18 for each well, were determined from lithology logs, generally  
19 gamma ray logs, and sand volumes were determined for each one  
20 of these wells. These were mapped, contoured, and the method  
21 was consistent for each well. It was an objective technique  
22 that we use in the Morrow to identify individual fluvial  
23 channels, system fluvial channels, their orientation, their  
24 trends, their extent, and things of this nature.

25                   I'd like to point out that this exhibit

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1 shows that there are two separate sand trends that dominate  
2 in this area.

3 The northernmost trend runs, we interpret  
4 it to run in a northwest/southeast direction through the major  
5 portion of Section 24, particularly the east half of 24,  
6 through Section 19 to the east, and Section 30 to the south-  
7 east.

8 We have another sand trend that runs  
9 through Section 25, southeast into Section 31. We believe  
10 this is a single, thick, narrow fluvial channel that produces  
11 presently in three wells, that has produced -- excuse me,  
12 let me correct. That has produced in three wells, the ARCO  
13 "BV" State Nos. 1 and 2 Wells, and the Amoco Empire South  
14 Deep No. 5 Well.

15 If you'll notice with regard to wells in  
16 Section 30 and 36 laterally offsetting this channel, the  
17 Amoco South Empire Deep No. 7 in Section 30 is shown as a  
18 Cycle Three well. This well penetrated the Morrow Cycle Two  
19 and it was dry, noncommercial in Cycle Two. This is the case  
20 for the Empire South Deep No. 19 in Section 36, which places  
21 an obvious limitation on the lateral extent of this channel.  
22 It indicates it to be a very narrow channel in that regard.

23 In the same regard we have the Pennzoil  
24 Aid State Com No. 1 Well in the south half of Section 24,  
25 which in a similar manner we also believe places a severe

1 limitation on the amount of mappable sand from this single  
2 fluvial channel crossing the south half of Section 24.

3 In contrast with that, the volume of sand  
4 that we can map in the east half of Section 24, our standard  
5 location is designed, and we anticipate encountering sands  
6 associated with the northernmost system of fluvial channels  
7 that we've mapped, and we believe that any well that would  
8 encounter the, what I refer to as the "BV" channel, running  
9 through, diagonally through Section 25, would be located in  
10 the extreme southwest portion of Section 24, would have asso-  
11 ciated with it a very limited amount of that particular re-  
12 servoir.

13 I'll also note that this map shows green  
14 and pink shading associated with this gross sand map, which  
15 I shall refer to later on in my testimony.

16 By way of reference to quality, I'd like  
17 to review with you information which indicates the quality  
18 of the wells associated with each one of these channels.  
19 I'll try not to belabor this.

20 The well in the north half of Section 30  
21 is the Empire South Deep No. 18. This well has a cumulative  
22 of 3.25 billion cubic feet; was completed in June of 1978;  
23 in February it was producing 1.38 million cubic feet of gas  
24 per day.

25 The well in the south half of Section 19

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1 was completed in March of 1979. It has a cumulative of  
2 631 million cubic feet of gas per day and a rate in February  
3 of 1.1 million cubic feet of gas per day.

4 The General American Green "B" No. 9 in  
5 the north half of Section 9 was completed in July of 1979.  
6 It has a cumulative of 1.16 billion cubic feet of gas and a  
7 February rate of 2.2 million cubic feet of gas per day.

8 MR. RAMEY: It's Section 19 instead of  
9 9, isn't it?

10 A I beg your pardon. That's correct, Sec-  
11 tion 19.

12 Moving over to the west in Section 24,  
13 the Pennzoil Aid State No. 1 was drilled in 1971. It's an  
14 old well. It has a cumulative, however, of 2.12 billion cubic  
15 feet and its current rate is 10 Mcf a day.

16 Moving down into the channel running  
17 through Section 25, what I refer to as the "BV" channel, the  
18 Amoco Empire South Deep Unit Well was completed in November,  
19 1974. It's currently temporarily abandoned with a cumulative  
20 of 1.6 billion cubic feet.

21 MR. RAMEY: Which well is that?

22 A That's in the north half of Section 31.

23 Moving to Section 25, ARCO State "BV" No.  
24 1 in the south half of 25. This well was completed in July  
25 of 1978. It has a cumulative of 7.2 billion and a current rate

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1 of approximately 10 million cubic feet of gas per day.

2 In the north half of Section 25 our "BV"  
3 No. 2, completed very recently, in December of last year, has  
4 a current rate of 10 million cubic feet of gas per day, and  
5 a cumulative of 678 million cubic feet of gas per day.

6 I offer this by way of review of the  
7 quality and the nature of the production in each one of these  
8 two sand trends.

9 MR. KELLAHIN: What was the cumulative  
10 on the last well?

11 A 678 million cubic feet of gas per day.  
12 That was for the ARCO "BV" No. 2.

13 MR. KELLAHIN: Was that a per day figure?

14 A Cumulative of 678 million.

15 MR. KELLAHIN: Okay.

16 Q The, as a matter of review, the signifi-  
17 cance of this exhibit which shows two sand trends based on  
18 an objective mapping technique, consideration of the regional  
19 geology, shows the -- these are in Cycle Two, mapped in Cycle  
20 Two, which is the predominant interval producing here, it  
21 shows the channel system running through Section 24, 19, and  
22 30 in the northern part of the map. It shows what we believe  
23 to be a single fluvial channel running through Section 25  
24 and Section 31.

25 Q Does this exhibit agree with the Exhibits

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1 Numbers One and Two submitted by Mr. Hartman?

2 A This exhibit does not agree at all with  
3 the exhibits presented by Mr. Hartman labeled One and Two.  
4 It differs in that Mr. Hartman has the channel swinging to  
5 the north after it passes through the northern part of Section  
6 25.

7 We have this channel oriented in general  
8 northwest direction. There is a well drilling in Section  
9 23 which will provide more information this summer on the  
10 exact location of the channel in that area.

11 Additionally, Mr. Hartman has mapped the  
12 Empire South Deep No. 18, Continental State 19, and General  
13 American Green "B" No. 9 wells in Sections 30 and 19 in a  
14 single sand body running approximately due north up into Sec-  
15 tion 18 to the north of 19.

16 That is how they differ. We have our  
17 sands consistent with what we believe the regional geology  
18 is telling us.

19 Q Do you have any particular comments on  
20 the contours that are shown on his Exhibit Number Two?

21 A Yes, I do. With reference to Exhibit  
22 Number Two, I see little evidence for closure of the 100-foot  
23 and I believe that's 150-foot contour lines closed in the  
24 south half of Section 24 on this map.

25 We have the Pennzoil Aid State Com Well

1 in the south half of 24, which did not encounter the sand,  
2 and little else; nothing else in terms of geology and well  
3 control.

4 Q Was the ARCO Exhibit Number Eight prepared  
5 by you or under your direction?

6 A Yes.

7 Q Let me ask you to look at what I have  
8 labeled ARCO Exhibit Number Nine and identify that exhibit,  
9 if you would, and explain its significance.

10 A All right. Exhibit Number Nine is a cross  
11 section, constructed with porosity gamma ray logs across the  
12 width of the channel system covering portions of Sections 24,  
13 19, and 30, that I spoke of on the previous exhibit.

14 It includes the General American Green  
15 "B" No. 9, which is labeled "A", Conoco 19 Com No. 1, and  
16 the Yates Empire South Deep Unit No. 18, "A".

17 This also shows the markers we used to  
18 identify the cycles, the cycle tops, I might add, since the  
19 Cycle Two lies between the Cycle Two and Cycle One lines.

20 It also shows the completion interval on  
21 these wells in the red bars and the major producing sand  
22 bodies in these wells.

23 This exhibit provides evidence which leads  
24 us to believe that what we have here is a broad, flat, fluvial  
25 channel system. The sands vary in thickness of structure;

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1 however, they are good quality sands, and this is also borne  
2 out by the cum and rate numbers which I spoke of on the pre-  
3 vious exhibit.

4 The significance of this exhibit, this is  
5 the basis for our well control for mapping the northern chan-  
6 nel system, and again, it's the basis for our belief that a  
7 well in the south half of Section 24 at a standard location  
8 660 from the south and 1980 from the east lines would en-  
9 counter similar sands to those exhibited here.

10 Q I missed what the explanation was for the  
11 yellow shaded areas.

12 A The yellow shaded areas show the major  
13 sand bodies that are producing in these wells presently.

14 Q Was this exhibit prepared by you or under  
15 your supervision?

16 A Yes, it was.

17 Q Okay. I'm going to ask you to refer to  
18 what's been labeled ARCO Exhibit Number Ten.

19 A ARCO Exhibit Number Ten is another cross  
20 section with porosity and gamma ray logs. This cross section  
21 runs at a point labeled "B", which is the Pennzoil Aid 24  
22 State Com No. 1 dry hole in the south half of Section 24,  
23 down through the ARCO State "BV" Com No. 2 in the north half  
24 of 25; southeasterly to the ARCO State "BV" No. 1, and  
25 finally to the Empire South Deep Unit No. 5, labeled "B" on

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1 the identification plat.

2 This also shows the Cycle Two interval  
3 that we have identified and the major sand bodies producing  
4 in the three wells that are productive.

5 The completion intervals are shown in red.  
6 This exhibit shows us evidence of a very thick -- the log  
7 response is very consistent; it indicates to be a very uniform  
8 single fluvial channel, running in a northwest/southeast  
9 direction from the ARCO "BV" No. 2 to the Empire South Deep  
10 No. 5 logs. It shows that the channel is very thick, 80 to  
11 110 feet, and verifies the very prominent northwest/southeast  
12 trend that we feel exists in this area, the Morrow Cycle Two  
13 channel systems.

14 To illustrate, you can draw practically  
15 a straight line between the ARCO "BV" No. 2 Well and the  
16 Empire South Deep No. 5 Well.

17 Again, with reference to the index map,  
18 indication is that this is very narrow, as evidenced by the  
19 dry holes in the southwest of Section 30 and northeast of  
20 Section 36, dry holes in Cycle Two, by the way, and the Penn-  
21 zoil dry hole in the south half of Section 24.

22 This is further evidence that the south  
23 half of Section 24 is very limited volumes of this particular  
24 fluvial channel sand. I direct your attention to the Pennzoil  
25 Aid 24 State Com No. 1. There is no evidence, in our opinion,

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1 that this channel exists in this well. In fact, all we see  
2 are some dirty upper Cycle Two sands that also appear in the  
3 ARCO State "BV" No. 2, No. 1, and Empire South Deep Unit  
4 wells, and these sands were dry, nonproductive in the Morrow  
5 in the Pennzoil Aid 24 State Com No. 1.

6 This exhibit is verification for our belief  
7 that this is a single, thick, narrow fluvial channel, and is  
8 the basis for our mapping of the same on Exhibit Number Eight.

9 Q Mr. Johnston, was this exhibit prepared  
10 by you or under your supervision?

11 A Yes, it was.

12 Q Very good. Let me ask you to look to what  
13 has been marked ARCO Exhibit Eleven.

14 A ARCO Exhibit Eleven is a table of reser-  
15 voir pressure data, static reservoir pressure data, that has  
16 been obtained from wells in what I have referred to as the  
17 "BV" channel. We have three columns in this table, the date  
18 the pressure measurement was taken, the well it was taken in,  
19 and the reservoir pressure corrected to a consistent datum  
20 to take out any error due to elevation differences.

21 If you'll note, in November, 1974, the  
22 original pressure measured in the Empire South Deep Unit --  
23 I believe that's when that well was completed, in that month  
24 and year -- shows a pressure of 4293 psi at that subsea datum.  
25 We believe this is approximately the original reservoir pres-

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1 sure of this channel. Note that in June of 1978, when the  
2 State "BV" No. 1 Well of ARCO was completed in the south  
3 half of Section 25, pressure obtained at that time equals  
4 4037 psi at the subject datum. This is evidence of drainage  
5 from the Empire South Deep Unit No. 5, pressure depletion of  
6 approximately 250 pounds.

7 We have an intermediate pressure measure-  
8 ment taken in March of 1979 of 3603, and in December of 1979  
9 we completed the State "BV" No. 2. We measured a static  
10 pressure on it of 3171. At the same time to check the com-  
11 munication between these wells, we shut in the State "BV"  
12 No. 1. It built up to static reservoir pressure in less than  
13 fifteen minutes to a level of 4154, which is virtually the  
14 same as that measured in the "BV" No. 2.

15 Now, this evidence -- this is evidence  
16 that the reservoir is highly continuous. The distance between  
17 the Empire Deep South No. 5 and the ARCO "BV" No. 1 is approx-  
18 imately 6000 feet; evidence of excellent communication along  
19 the channel and it demonstrates the capability of a well en-  
20 counteracting this channel to drain great lateral distances.  
21 It corroborates our concept of the reservoir as being a narrow,  
22 prolific, continuous, single fluvial channel sand, and also  
23 corroborates the northwest, southeast orientation of this  
24 sand.  
25

In contrast, again we have the -- I want

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1 to point out that this communication exists laterally across  
2 an area --

3 MR. KELLAHIN: Which exhibit are you re-  
4 ferring to?

5 A I'm referring to Exhibit Number Eight,  
6 excuse me.

7 This pressure communication evidenced  
8 between the Empire South Deep Unit No. 5 and the ARCO "BV"  
9 No. 1 occurred across an area that is offset on either side  
10 by wells that were dry in the Morrow Cycle Two, those being  
11 the Empire South Deep Unit No. 7 and the Empire South Deep  
12 No. 19.

13 Q Mr. Johnston, was this Exhibit Number  
14 Eleven prepared by you or under your supervision?

15 A Yes, it was.

16 Q All right. Let me then have you move on  
17 to what has been marked as ARCO Exhibit Number Twelve.

18 A ARCO Exhibit Number Twelve is a graph.  
19 It is a plot of measured reservoir pressure versus a function  
20 of time. We call this a Horner plot, and this is used to  
21 determine reservoir quality and flow capacity.

22 In summary, it indicates excellent trans-  
23 missability, transmissability of 155,957 millidarcy feet per  
24 centipoise, which is a measure of flow capacity. The calcu-  
25 lated permeability is 50, approximately 50 millidarcies,

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1 which is much greater than we would normally expect for the  
2 Morrow.

3 In summary, this corroborates our belief  
4 that the flow capacity of this reservoir is high and a well  
5 encountering this system could drain great lateral distances.  
6 Great distances.

7 Q Is the information contained in this ex-  
8 hibit consistent with the previous Exhibit Number Eleven?

9 A Yes, it is. It confirms it.

10 Q MR. Johnston, what do -- oh, I don't know  
11 if I asked you, on this Exhibit Number Twelve, was this pre-  
12 pared by you or under your supervision?

13 A Yes, it was.

14 Q What do the --

15 A One thing I --

16 Q Oh, excuse me, I'm sorry.

17 A One thing I want to mention is that this  
18 drill stem test was taken in an open hole interval that covered  
19 the channel sand, that was subsequently completed in.

20 Q What do these exhibits, Eight through  
21 Twelve, demonstrate concerning the wisdom of drilling in the  
22 southwest quarter of Section 24?

23 A I'd like to refer back to Exhibit Eight.  
24 I had referred earlier to pink and green shading. Using  
25 this objective mapping technique and trying to demonstrate

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1 from this where we believe would be the potential productive  
2 areas, we noted that with one exception, wells encountering  
3 40 feet of sand, as we have determined it, or less, were dry  
4 in Cycle Two. As such, we have shaded along that contour line  
5 in what we believe would be the extent of the productive  
6 limit in the southeast -- excuse me, correct that -- southwest  
7 portion of Section 24. We believe this represents a maximum  
8 volume because of the preponderance of evidence that this is  
9 a thick, narrow channel, that in all probability crosses only  
10 a portion, small portion, of the extreme southwest corner of  
11 that section.

12 Contrast that with Section 24 where we  
13 are mapping a considerable volume of sand, again, that we  
14 expect to encounter with the standard location at 660 from  
15 the south line, 1980 from the east line, Section 24.

16 In summary, we show a minimal chance of  
17 encountering the "BV" Channel Cycle Two reservoir with a well  
18 in the southwest portion of this Section 24, and if the well  
19 proposed by Mr. Hartman happens to encounter that reservoir,  
20 that the expected reservoir volume would be indeed small be-  
21 cause of the nature of this channel, as evidenced by well  
22 control, pressure data.

23 Q Again, what would be the effect of granting  
24 the Hartman application, will you comment?

25 A In our opinion the proposed well in the

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1 southwest corner of Section 24, proposed by Mr. Hartman, would  
2 likely be dry.

3 There is a possibility that it would en-  
4 counter some marginal, other zone production, possibly in the  
5 Canyon or Strawn, that would tie up development of the major  
6 reserves in the east half for a substantial period of time.

7 If he encountered the "BV" Channel tra-  
8 versing the southwest portion of Section 24, we believe the  
9 evidence shows that there is strong possibility of irreparable  
10 drainage from the developed reservoir to the south in Section  
11 25, a very high quality reservoir; we believe that he has a  
12 small volume under his -- under the south half of Section 24  
13 and that the opportunity for drainage of reserves from Section  
14 25 would be great.

15 Q Now, you have heard today that the Hartman  
16 application has been amended to adjust the location of that  
17 well. Based on their evidence, is that a logical position  
18 to move to?

19 A In our opinion the granting of the permit  
20 for that well could very well constitute economic waste be-  
21 cause our interpretation is that the well would likely be  
22 dry.

23 On the other hand, our mapping indicates  
24 that a well at the proposed standard location in the east  
25 side has a, we believe, a higher chance of encountering pro-

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1 ductive Morrow Cycle Two sands and that the correlative rights  
2 of those in the south half of Section 24 would best be served  
3 by developing what we believe to be the majority of reservoir  
4 volume which we map in the east half of Section 24, of the  
5 south half of 24.

6 Q And specifically what would your recommend-  
7 ation be?

8 A Specifically, I would propose denial of  
9 the Hartman application for the unorthodox location; approval  
10 of the ARCO pooling application, with the risk to be determined  
11 on whatever basis the Commission feels is equitable; approval  
12 of our standard location in order to provide recovery of what  
13 we map as the major reserve in the south half of Section 24,  
14 and again, on the basis of protection of correlative rights,  
15 we believe this is based on reliable well control and on our  
16 knowledge of regional geology that we have employed in this  
17 area and have been very successful with.

18 If the Hartman application is granted we  
19 recommend that the allowable should be severely restricted  
20 to much less than 25 percent of the deliverability because of  
21 the nature of the "BV" reservoir associated with the south  
22 half of Section 24.

23 In closing, I want to point out that  
24 ARCO Oil and Gas is willing to take the entire risk, based on  
25 our interpretation, and that we have a rig that will be

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1 available in July to drill the orthodox location if this ap-  
2 plication is approved.

3 MR. DRAPER: I would move at this time  
4 for the admission of -- I think we've already admitted ARCO  
5 Exhibits One through Seven -- Eight through Twelve, that have  
6 been testified to by Mr. Lindquist and Mr. Johnston.

7 MR. RAMEY: Exhibits Eight through Twelve  
8 will be admitted.

9 Any questions of the witness? Mr. Carr?

10 CROSS EXAMINATION

11 BY MR. CARR:

12 Q Mr. Johnston, I'd like you to refer to  
13 your Exhibit Number Eight.

14 A Yes, sir.

15 Q The south half of Section 24, you colored  
16 part of it pink and part of it green.

17 A Yes, sir.

18 Q Would you tell me again what the green  
19 shaded area indicates?

20 A Yes. The green shaded area in the south  
21 half of Section 24 indicates what we believe, based on well  
22 control and this mapping, to be the maximum volume of pro-  
23 ductive channel sand at a well in the southwest corner of  
24 Section 24 might encounter.  
25

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1 Q Now, when you are putting together a map  
2 of this nature, you're relying on well control in the area,  
3 is that correct?

4 A Yes, sir.

5 Q Now I can see wells to the east and west  
6 and south, but now what wells in this area to the north and  
7 northeast are you relying on -- northwest, I'm sorry, when  
8 you draw these contours?

9 A Wells to the north and northwest of what?

10 Q Of the south half of Section 24. As you  
11 draw this channel I can see how you got wells all the way  
12 around to the south and east and west, but when you -- as you  
13 move up to the northwest --

14 A Uh-huh.

15 Q -- there seems to me to be an absence of  
16 wells from which you could actually draw data to place these  
17 contours.

18 A We have four wells that we believe enter  
19 into the mapping that you're speaking of and those are the  
20 Pennzoil Aid State No. 1 in the north half of Section 24, the  
21 General American Green "B" No. 9 in the north half of 19, the  
22 Conoco State 19 Com in the south half of 19, and the Yates  
23 Empire South Deep No. 18 in the north half of Section 30.

24 Q So you're locating the channel as it moves  
25 to the northwest based on data you've obtained from wells

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1 gained from the southeast and east.

2 A We are locating what we believe is a  
3 channel, fluvial channel system.

4 Q But you are relying on wells that are to  
5 the east and southeast?

6 A We're relying on wells to the east and  
7 southeast with a control point in the south half of Section  
8 24, the Pennzoil Aid State Com No. 1 dry hole. It is also  
9 a control point.

10 Q Wouldn't you say you have more controls  
11 in the east and southeast than you certainly do to the west  
12 and north? And that as that acreage was developed you'd be  
13 in a better position to place the channel?

14 A We have a well in both the north and  
15 south halves of Section 24; north and south halves of Section  
16 19; the north and south halves of Section 30; and the north  
17 and south halves of Section 25, and we believe that's ade-  
18 quate well control for this mapping.

19 Q And we would like the Commission to decide  
20 whether those are south and east or north and west of the  
21 proposed location.

22 Now, I want to know when you're doing  
23 this if you aren't actually analogizing from the data you  
24 have and making certain interpreting in the way this structure  
25 trends.

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1 A. Yes.

2 Q. As an interpretive matter isn't it likely  
3 to expect different people to interpret the same data differ-  
4 ently?

5 A. We believe this interpretation is con-  
6 sistent, as evidenced by the cross section and our knowledge  
7 of regional geology.

8 Q. But my question was, wouldn't different  
9 people be likely to interpret it differently?

10 A. I believe that an interpretation has to  
11 be reasonable with respect to the knowledge of the regional  
12 geology and the available well controls.

13 Q. Is one -- more than one reasonable inter-  
14 pretation possible?

15 A. Yes.

16 Q. Now as I understand the testimony here  
17 today, in locating the channel, which we apparently both  
18 agree exists in this area somewhere --

19 A. You're speaking of what I call the "BV"  
20 channel?

21 Q. The "BV" 1 channel, yes. You have -- my  
22 understanding of your testimony is that you have placed this  
23 based on the well control in the area.

24 A. Well control as confirmed by reservoir  
25 pressure data.

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1 Q You have not considered seismic work, I  
2 gather from your testimony?

3 A No.

4 Q Okay. Looking at your Exhibits Eleven and  
5 Twelve, I believe it was your testimony, and correct me if  
6 this is incorrect, that in the "BV" channel there is a poten-  
7 tial for a great drainage, lateral drainage?

8 A Yes.

9 Q Now, Mr. Johnston, if there is great lateral  
10 drainage, if there is productive acreage in the southwest  
11 quarter of Section 24, how could that acreage be produced  
12 without drilling a well in the southwest quarter of Section  
13 24?

14 A We believe that the preponderance of pro-  
15 ductive reservoir in the south half of Section 24 is in the  
16 east half and associated with the northern channel system.

17 Q Doesn't this exhibit -- didn't you say  
18 that this green area was the maximum productive area in the  
19 southwest quarter?

20 A I said maximum, that's correct.

21 Q Yes, and we will take your lines for the  
22 purposes of this question, and my question is, how do you  
23 produce that acreage without a well?

24 A We are concerned with developing what we  
25 believe to be the major reserves in the south half of Section

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1 24. If a well --

2 Q But I didn't ask you that. But I asked  
3 a different question. I didn't ask you that and I want you  
4 to answer the question that I asked you.

5 How do you produce that without a well  
6 there? Can it be produced absent a well there? I don't see  
7 why the question is complicated to understand.

8 A I believe it's --

9 MR. DRAPER: I don't think I understand  
10 the question.

11 Q The question is, we have a -- the testimony  
12 here is the southwest quarter, the green shaded area, is what  
13 in his opinion is the maximum productive acreage in that  
14 corner of the section out of the "BV" channel.

15 MR. DRAPER: You're talking about which  
16 part of the south half?

17 Q I'm talking about the southwest of the  
18 south half, which is shaded green on Exhibit Eight.

19 MR. DRAPER: Okay.

20 Q And I want to know that, since they ap-  
21 parently have indicated a dry strip through this thing, how  
22 the gas under that tract shaded green is going to be produced  
23 if no well is drilled there. Can it be produced?

24 A Let me point out some things.

25 First of all, we have no well in the east

1 half of Section 24. We have no well in the southwest of 24.

2 We are making interpretation based on what  
3 we believe is the most reliable geological and well control  
4 data. It is our interpretation that there is a minimal  
5 chance of encountering that channel in the southwest portion

6 Q Well, are you saying --

7 A -- of Section 24, and that the chance is  
8 much greater of encountering productive sands in the east  
9 half.

10 Q Are you saying that what is shaded green  
11 in the southwest corner of Section 24 is not productive?

12 A We believe that would be the absolute  
13 maximum that could possibly be productive.

14 Q It might be productive to that extent?

15 A It may be. There's a very slight chance  
16 it will be.

17 Q I assume you mean by productive that there  
18 is gas under it, that acreage?

19 A Yes.

20 Q Will the gas under that acreage be pro-  
21 duced from the existing wells in Section 25 if no other well  
22 is drilled in the southwest corner?

23 A Yes.

24 Q Now, I've noticed the data that you've  
25 presented on the wells in the "BV" channel and the present

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1 production rates. Also, the present production rates that  
2 you indicated for the wells in Sections 19, 30, generally  
3 to the east of the "BV" channel. Is it fair to say that the  
4 production obtained out of the -- or the rates of production  
5 from the two wells in 25 is about seven times greater than  
6 what you're producing from the wells to the east?

7 A. Well, we're producing about 20 million  
8 total, Mr. Carr, from the "BV" Nos. 1 and 2 Wells together.  
9 And presently in the wells in the northern channel system,  
10 we have a rate of 1.38, 1.08, 2.23 million a day, respectively,  
11 10 Mcf a day.

12 That would add up to roughly 5 million a  
13 day versus 20; about four to one, I believe.

14 Q Now if a well was drilled at your proposed  
15 standard location in Section 24, wouldn't the gas underlying  
16 the southwest quarter, or southwest corner that's the shaded  
17 green area, be produced by wells to the south?

18 A I'm sorry, could you repeat that question?

19 Q If a well was drilled and completed at  
20 your proposed location in the south half of Section 24, the  
21 entire south half dedicated to it, no other well drilled on  
22 it.

23 A Yes.

24 Q Wouldn't the gas that underlies the  
25 southwest corner, which is shaded in green on Exhibit Eight,

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1 wouldn't that gas be produced from the wells in Section 25?

2 A. Possibly so.

3 Q. To your knowledge, does Mr. Hartman have  
4 any interest or derive any profit from the proceeds of the  
5 wells in Section 25?

6 A. No.

7 Q. Wouldn't you be draining him and at the  
8 same time denying him the right to offset you with counter  
9 draining?

10 A. If Mr. Hartman's location is approved  
11 preferentially to ours, we believe that the greatest volume  
12 of producable gas in the south half of Section 24 would not  
13 be drained by virtue of not having a well at the standard  
14 location 660 from the south and 1980 from the east in the  
15 south half of Section 24.

16 Q. And this is based on your interpretation  
17 of the structure?

18 A. That is correct.

19 Q. Not considering any seismic work.

20 A. Structure, this is the gross sand Isopach.

21 Q. Right.

22 MR. CARR: I have no questions.

23 MR. RAMEY: Mr. Kellahin?

24 MR. KELLAHIN: Yes, sir.

25

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CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Johnston, talking about Exhibit Number Eight, I haven't seen Exhibit Number Eight. Is this Exhibit Number Eight? Is that the same one you're looking at?

A Yes, it should be Exhibit Number Eight.

Q Mr. Johnston, I understood that you qualified as a petroleum engineer, sir?

A Yes, sir.

Q Would you describe for the Commission your expertise as a geologist and the preparation of the gross Isopach, Exhibit Number Eight?

A Mr. Callaway?

Q Yes, sir.

A I am not a geologist by degree. In the course of my petroleum engineering work I do work along the nature of geology. I work with geologists. I do geological work.

In working the Morrow you have to maintain a very close association between your geologists and engineers to maximize the quality of your interpretation. As such, I am very familiar with the geology in this area.

Q You and Mr. Lindquist --

A Lindquist, yes.

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1 Q Lindquist, work together --  
2 A Yes.  
3 Q -- and he's the geologist and --  
4 A He is one of the geologists and I am one  
5 of the engineers.  
6 Q Based upon your study of the wells, then,  
7 you're satisfied that your gross Isopach is true and accurate  
8 to the best of your knowledge?  
9 A Yes.  
10 Q This Pennzoil dry hole.  
11 A Yes, in the south half of 24?  
12 Q Yes, sir, the Aid State Com No. 1 Well?  
13 A Yes.  
14 Q Have you examined the log on that well?  
15 A I have the log included in cross section  
16 B-B, yes.  
17 Q You're satisfied in your opinion as a  
18 petroleum engineer that the Morrow zone involved here is in  
19 fact absent and the lack of production is not attributed to  
20 a mechanical failure reached in that well?  
21 A The Morrow zone is not absent. The Morrow  
22 zone is present, and present within the Morrow section are  
23 some dirty, shaley, nonproductive sands in Cycle Two.  
24 Q If I understood you correctly that if the  
25 Morrow sand present was less than 40 feet thick of gross in-

1 terval, it would not be commercial?

2 A That is an observation based on looking  
3 at this map. There's one exception to that. Otherwise it's  
4 consistent.

5 Q Do you attribute the lack of production  
6 out of the Pennzoil dry hole to any mechanical difficulty in  
7 the completion of that well?

8 A I know of nothing associated with the  
9 completion of that well that caused it to be noncommercial,  
10 no.

11 To my knowledge pipe was not set on that  
12 well, so completion was not attempted.

13 Q I don't know the answer. I was just  
14 asking.

15 A I don't believe it was.

16 Q This appears to be a little different than  
17 the typical Morrow stringers we encounter in Eddy County, in  
18 that it's fluvial in deposition and it appears to have a  
19 reasonable uniform development through here, in general terms,  
20 is that not true? We don't find a stringer appearing and dis-  
21 appearing in subsequent wells.

22 A Which stringer do you refer to?

23 Q Well, I thought we were talking about the  
24 Morrow Cycle Two.

25 A I wouldn't characterize the Morrow Cycle

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1 Two as a stringer.

2 Q All right. I am not familiar with the  
3 Cycle Two term. I am familiar with referring to the Morrow  
4 in different stringers, such as the A, B, and C.

5 A Earlier in my testimony I offered an ex-  
6 planation of our interpretation of the Morrow Cycle Two.

7 Q Would that equate with any of the letters  
8 that I'm familiar with being assigned to the Morrow formation?

9 A I'm not familiar with the letters that  
10 you have.

11 Q All right, sir. It would appear from  
12 your testimony, particular the pressure testimony, that as  
13 you've indicated, a particular Morrow test here in the area  
14 is capable of draining quite a lateral distance, is it not?

15 A We find evidence of that in what I've  
16 called the "BV" channel.

17 Q What would be the amount of gross sand  
18 interval attributable to the proposed location that ARCO is  
19 suggesting?

20 A According to our mapping it would be on  
21 the order of approximately 50 feet of gross sand.

22 Q The wellspot you have for the Doyle Hart-  
23 man location, I assume is the 660 location?

24 This is not the amended location?

25 A Yes. Let me explain that that location

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1 was put on there without the knowledge of the amended location  
2 that Mr. Carr presented at the front end of this. So yes,  
3 that is the 660-660 unorthodox location.

4 The new location would be to the north  
5 and west of that location.

6 MR. RAMEY: North and east.

7 A. I'm sorry, north and east. I beg your  
8 pardon.

9 Q. Could you approximate for us the amount  
10 of gross sand interval at the 660 location, as spotted on  
11 your map?

12 A. I would say that it would be somewhere  
13 between 40 and 50 feet.

14 This is difficult to determine because,  
15 as I said earlier, we're dealing with a narrow, thick, single  
16 fluvial channel, and I believe you're either going to hit it  
17 or you're not going to hit it, and your chances of hitting it  
18 are small.

19 Q. Mr. Johnston, I don't have benefit of the  
20 pressure information attributable to each of the wells, but  
21 it is my recollection, sir, that the thicker the gross inter-  
22 val encountered in each well, the better that well had pro-  
23 duced, is that not true?

24 A. Not necessarily. If you'll notice on  
25 Section 25, the "BV" channel, the "BV" No. 1 in the south

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1 half encountered 110 feet of gross sand. The "BV" No. 2 en-  
2 countered 96 feet, less than 100 feet of gross Cycle Two sand.  
3 I believe this is also evidenced on the cross section B-B,  
4 Exhibit Number Ten, and yet currently both these wells are  
5 capable of delivering in the order of 10 million cubic feet  
6 a day.

7 Q So the ARCO well in -- assigned to the  
8 north half of Section 25 is the better of those two wells in  
9 Section 25.

10 A Based on the recent gauge reports that  
11 we have, they are producing at similar quantities.

12 Q How do the quality, the cumulative pro-  
13 duction of the various Morrow wells to the east of Section  
14 24, how does that productivity of each of those wells compare  
15 to the thickness of gross Morrow interval attributed to each  
16 of those wells?

17 A What kind of comparison are you asking  
18 about?

19 Q All right, in Section 19 you've got two  
20 wells.

21 A Yes.

22 Q You've got one well with 82 feet of pay.

23 A 82 feet of gross sand.

24 Q Of gross sand, all right.

25 You've got one in the south with 67 feet

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1 of gross sand.

2 A Yes.

3 Q How does the productivity of those two  
4 wells compare?

5 A The -- I believe I stated earlier that  
6 the February rate on the Conoco 19 Com No. 1, the south half,  
7 is 1.1 million cubic feet a day with a cumulative production  
8 of 631 million cubic feet of gas.

9 The well in the north half of Section 19,  
10 the General American Green "B" No. 9 --

11 Q Yes, sir.

12 A -- has a cumulative of 1.16 billion and  
13 a February rate, February of this year rate of 2.23 million  
14 cubic feet of gas per day. That's --

15 Q You'll have to help me out, just reach  
16 the answer to the question. Is -- is the well in the north  
17 half of 19 a better producer than the well in the south half  
18 of 19?

19 A In terms of February rate, yes.

20 Q I draw the conclusion that for those two  
21 wells in 19 the fact that the gross interval in the well in  
22 the north is greater than the gross interval to the well in  
23 the south, that that accounts for the fact that the well in  
24 the north is a better producer.

25 A Not necessarily.

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1 Q All right, why not?

2 A Some of the -- some of the sands may be  
3 in intervals that are not completed.

4 Q As a petroleum engineer, Mr. Johnston,  
5 in choosing a location in this area, would it be your prefer-  
6 ence to lend greater weight to be closer to a producing well  
7 as opposed to being in the thicker pay section of this gross  
8 Isopach?

9 A The consideration behind our standard  
10 location 660 from the south, 1980 from the east in the south  
11 half of Section 24, was based on mapping, which was in turn  
12 based on the well control. It was based on the good quality  
13 of the wells in that system. And it was also based on a con-  
14 cern to move to a portion of that system where we would  
15 likely encounter fewer sands that had been partially drained  
16 by the existing wells in that system.

17 Q What portion of the south half of Section  
18 24 do you, in your opinion, believe is already suffered  
19 drainage from any of the offset wells?

20 A Due to the nature of this system that we  
21 see, we feel we have a very good chance of encountering pos-  
22 sibly virgin reservoir over there.

23 Q Am I correct in understanding that you  
24 believe none of the south half of Section 24 has experienced  
25 drainage?

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1 A I didn't say that, no.

2 Q That was my question. You said in deter-  
3 mining the location --

4 A Yes.

5 Q -- that you took into consideration the  
6 potential for drainage from offset wells.

7 A Yes.

8 Q I'm trying to decide what portion of the  
9 south half of 24 has been subject to drainage.

10 A Well, it's our interpretation that a major  
11 portion of the sand area that I've shown in pink is likely  
12 not been drained.

13 Q All right, sir. Was it your recommendation  
14 to your management as to this subject location for ARCO? Did  
15 you make that recommendation?

16 A I was one of the people involved in making  
17 this recommendation, yes.

18 Q In your opinion that's the optimum loca-  
19 tion to locate a well in the south half of 24?

20 A That is the optimum location for recovery  
21 of gas and protection of correlative rights.

22 Q Dispite the fact it's in close proximity  
23 to that Pennzoil nonproducing well?

24 A Yes. As I said before, we -- we've had  
25 success with our interpretation techniques in this area and

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1 we feel confident about it.

2 Q Wouldn't a better location in the south  
3 half of Section 24 be one that was drilled at a depth to  
4 encounter a thicker gross sand interval, such as the northeast  
5 corner of the proration unit?

6 A This gets back to our concerns about pos-  
7 sible drainage if you try to move to the extreme northeast  
8 corner of the south half of Section 24.

9 Q The northeast corner of the south half  
10 of 24 would put you in a thicker gross interval, would it not?

11 A According to the mapping.

12 Q But you've ignored that mapping in deter-  
13 mining your proposed location?

14 A No, indeed, we have not ignored it. In  
15 fact, we have located the well to encounter that channel  
16 system in a location that we believe will maximize recovery  
17 of the gas reserves in the east half of the south half of  
18 Section 24.

19 Q Is the well in the north half of 25,  
20 that's the ARCO well, I've forgot what its name was --

21 A Yes, that's the State "BV" No. 2.

22 Q The "BV" No. 2.

23 A Yes, sir.

24 Q That apparently is the best of the Morrow  
25 producers in the area, is it not?

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A. The "BV" Nos. 1 and 2 are currently delivering gas at approximately the same rate, and that rate is 10 million cubic feet of gas per day per well, approximately.

Q Those are the best two wells in the area?

A. In terms of rate, yes.

Q In terms of cumulative production they are still the best wells in the area?

A. In terms of cumulative production the "BV" No. 2 was just completed in December of last year, and subsequently has not produced as great a volume of gas as several of the other wells in the area.

Q Does ARCO have any interest in Section 23?

A. I have no knowledge of that.

Q Do you know -- I see ARCO is the operator of Section 26, are they not?

A. Yes, sir. Yes, sir.

Q What are your plans to develop that acreage, Mr. Johnston?

A. Our plans to develop that acreage are not the subject of this hearing, Mr. Callaway.

Q Do you believe that the extent of the Morrow formation developed by the two wells in Section 25 extend on into Section 26?

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1 A. I'm sorry, would you repeat that question?

2 Q Yes, sir. You've developed the Morrow  
3 formation in Section 25 with two Morrow wells.

4 A. Yes.

5 Q Your map here shows to me that the extent  
6 of that Morrow formation extends on into Section 26, does it  
7 not?

8 A. Indeed. I might point out, since you're  
9 interested in Section 26, I do know that the interest, working  
10 interest situation in Section 26, I believe the royalty in-  
11 terest situation, is identical to that in Section 25. I  
12 believe that was pointed out earlier.

13 Q So unless a well is drilled in the south-  
14 west quarter of the south half of 24, that acreage colored  
15 in green is going to be drained by this well in the north  
16 half of 25.

17 A. Again, we see a very, very small chance  
18 that the channel would extend, and in that small chance that  
19 it did, our map would indicate that it would be a very mini-  
20 mal volume compared to what we have in the east half, which  
21 we feel has much greater chance of being productive in the  
22 south half of Section 24.

23 MR. KELLAHIN: Thank you, I have no further  
24 questions.

25 A. Thank you.

CROSS EXAMINATION

BY MR. RAMEY:

Q Mr. Johnston, --

A Yes, sir.

Q I think you stated that the channels definitely run in a northeast -- northwest/southeast direction?

A Well, the channel system, sir, yes, sir, and we have identified the "BV" channel as a single fluvial channel that has this obvious orientation to us.

Q Have you mapped any other channels in Eddy County that were the same way, or have you ever mapped a channel that didn't meander somewhat?

Change direction?

A There are some areas where they meander some, but the general direction is predominantly northwest/southeast. We see this in several areas. I don't have evidence to back this up, but in the Carlsbad area and other areas this is quite evident also.

Q How many -- how many have you actually mapped?

A How many --

Q Channels?

A How many channels have I mapped?

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1 Q Yes. Is this the only one that you've  
2 actually mapped?

3 A No. I've been associated with mapping  
4 the Morrow for determining placement of future wells for the  
5 last seven months, and we've worked on at least four other  
6 areas.

7 Q And they're all -- where you have channels,  
8 why, they all seem to run in one direction?

9 A They -- they run in a general northwest/  
10 southeast trend, yes, sir. They do. And that's due to --  
11 as was pointed out earlier in Mr. Lingquist's testimony --  
12 this is due to the nature of the depositional environment and  
13 the structure. These channels run -- water runs downhill.  
14 It doesn't run along the side of a hill, and that's what these  
15 are, fluvial channels.

16 So the systems generally tend to run with --

17 Q You've never mapped one that's run north/  
18 south?

19 A In some areas we have -- we have seen  
20 some that -- that deviate somewhat from the northwest/southeast  
21 trend, but we seldom see ones that run directly due north/  
22 south.

23 Q But you have --

24 A And it violates -- because that violates  
25 structure, generally, and it's usually due -- if that's the

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1 case, it's usually due to the localized structural influences  
2 pulling them in that direction, which we don't have here.

3 There are other influences acting in  
4 other areas, in other words. In this area, I believe it has  
5 been shown by Mr. Hartman's Exhibit Number One, the preponder-  
6 ance of data, and we agree with it, that the structure runs  
7 northeast/southwest, so the channels run diagonally opposite  
8 to that, northwest/southeast.

9 MR. RAMEY: Thank you. Any other ques-  
10 tions of the witness? Mr. Arnold?

11 CROSS EXAMINATION

12 BY MR. ARNOLD:

13 Q I'd like to expand on that a little.  
14 Do you mean to tell me that you've never observed a river in  
15 nature which ran across structure; that all rivers in nature  
16 run down structure?  
17

18 A I guess I'd have to say that most of the  
19 rivers that I've seen follow the laws of gravity and tend to  
20 run down structure.

21 Q What about the San Juan River running out  
22 of the San Juan Basin, which dips from west to east and the  
23 river runs from east to west?

24 A I've not seen that river. I'm sorry.

25 Q I mean, I'm not sure that that's a sound

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1 premise, that rivers always run down structure.

2 A Well, let me -- let me re-emphasize that  
3 what we're dealing with here is not observations from the  
4 surface, as you know, but what we're dealing with here is in-  
5 terpretation of subsurface well control and regional geology.

6 Q Well, but I believe in that part of your  
7 postulation what you were doing was saying that when that  
8 channel formed the stream in which it formed had to be running  
9 down structure at that time.

10 Q Well, that's the way we feel, that it  
11 would -- we feel that it is more probable that that was the  
12 case, yes.

13 Q But topographic surfaces don't necessarily  
14 always correspond to structure.

15 A Oh, sure, there will be areas where the  
16 structure changes and the direction of a channel will change  
17 in relation to that structure.

18 MR. ARNOLD: Okay, thank you very much.

19 MR. RAMEY: Any other questions of the  
20 witness? He may be excused.

21 Do you have anything further, Mr. Draper?

22 MR. DRAPER: Mr. Commissioner, we would  
23 just have some cross examination which we haven't dealt with  
24 up to this point. Should I proceed with that at this point?

25 MR. RAMEY: Fifteen minute recess.

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1 MR. DRAPER: Okay.

2  
3 (Thereupon a recess was  
4 taken.)

5  
6 MR. RAMEY: Mr. Draper.

7 MR. DRAPER: Mr. Chairman, I would ask  
8 that we recall Mr. Wambaugh for cross examination.

9  
10 DONALD C. WAMBAUGH

11 being recalled as a witness, testified as follows, to-wit:

12 CROSS EXAMINATION

13  
14 BY MR. DRAPER:

15 Q Mr. Wambaugh, I ask you to look at your  
16 Exhibit Number Two, which is labeled Lower Morrow Net Sand  
17 Porosity Isopach.

18 A Yes, sir.

19 Q Is this an Isopach just of the -- you say  
20 net sand here. Does that mean you -- you mapped less than  
21 all of the producing sands?

22 A I'm not sure I understand your question.  
23 I derived this from analysis of electric logs, as I said,  
24 using in the Lower Morrow what you call your Cycle Two sand,  
25 the sands that exhibited on gamma ray 35 API units or less

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1 8 percent porosity or better.

2 Q So this would show a smaller amount of  
3 sands than a gross sand Isopach.

4 A Yes, sir.

5 Q And are the sands which would -- are in-  
6 cluded within gross sands producing sands? Could they be  
7 producing sands?

8 A Yes.

9 Q Okay. Looking at your contour intervals  
10 here, now in -- roughly in this channel that seems to be as-  
11 sociated with A-A', you have contour lines running longitud-  
12 inally along that channel until you get up into the south  
13 half of Section 24, and there they close off. They don't  
14 continue after that.

15 Now, on what basis did you determine that  
16 those contours closed?

17 A All right. If you examine cross section  
18 A-A', as I said to you this morning, if you project the  
19 thicknesses of those sands along this channel, and you pro-  
20 ject the sand at the location shown in dashed lines on the  
21 lefthand side of this cross section, then you can see that  
22 there would be approximately the same amount of sand present  
23 in that well as there is in the Hondo "BV" No. 2, which I  
24 show to be 79 feet, and show that it will be approximately  
25 that where the contours will drop off there.

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1 Q In other words, you found -- your electric  
2 logs showed contours were actually decreasing in that area?

3 A Yes, sir, you can see just relative to  
4 lines that they look like they possibly are decreasing.

5 Q All right. Now, looking at this exhibit  
6 in connection with the first exhibit, it appears that the  
7 three wells that are producing in this A-A' channel are on  
8 a down dip trend of the depositional strata here.

9 A Yes, sir.

10 Q Is that correct? Okay. Now, it would  
11 appear to me that looking at that channel as it's mapped  
12 through the control point that we have in the three wells,  
13 which is going straight down dip, that if that behavior con-  
14 tinues only a small distance further, it carries it straight  
15 on in the direction of the well that's presently being drilled  
16 by Exxon, or perhaps a little bit bending off not to the north  
17 but more to the west, if we're looking at going up dip as we  
18 proceed to the north and west.

19 A I think it's a question of interpretation.

20 Q Okay, which -- which way does -- which  
21 way is up dip as you leave the "BV" 2 control point?

22 A Well, they're actually nearly on strike  
23 because the 124 Aid is a -6852 and the "BV" 2 is a -6843.

24 Q Well, now if you take the 124 Aid, isn't  
25 that essentially on approximately the same contour as the

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1 "BV" 2?

2 A Yes, sir.

3 Q In other words, the water that deposited  
4 those sands was flowing -- was not flowing downhill but was  
5 flowing crossways. Is that the way -- would you agree with  
6 that interpretation?

7 A I agree water flows downhill. I also do  
8 not know at the time of deposition what the structural posi-  
9 tion of the Lower Morrow, which is the map, was. I only know  
10 its present structural position and my interpretation of where  
11 that channel is.

12 Q Do you have any reason to believe that  
13 the present structural position is any different from the  
14 position at the time of deposition?

15 A There have been movements in this basin  
16 at times since this deposition, so I have no reason -- I  
17 have no way of knowing. I don't know.

18 Q Are you aware of any movements in this  
19 particular area?

20 A No, sir.

21 Q Looking at that trend there, what we've  
22 been referring to as the "BV" channel, we have three control  
23 points. The distance here, it appears to me, between the  
24 Amoco ESD No. 5 and the "BV" 1 being approximately 6000 feet.  
25 Now isn't it a reasonable interpretation that with the con-

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1 tinuation shown by "BV" 2, the reasonable interpretation would  
2 be to continue that in a straight line, since that distance  
3 that we're extending it towards the direction of the corner  
4 of the section there is much -- it's a much smaller distance  
5 than the distance between the Amoco and the "BV" 1.

6 A. It's a matter of interpretation.

7 Q. Is it a smaller distance?

8 A. It's a smaller distance, but it's a mat-  
9 ter of interpretation of how you --

10 Q. Right. Would it be a reasonable inter-  
11 pretation to have it straight, or would you call that an un-  
12 reasonable interpretation?

13 A. It depends on the interpreter.

14 Q. Well, I think you can analyze whether an  
15 interpretation is reasonable or not without knowing who the  
16 person is that did it.

17 A. I think this is a reasonable interpre-  
18 tation.

19 Q. Going straight up from the -- along the --  
20 continuing along the line set by those three well points?

21 A. You have a thinning between this well,  
22 the "BV" 1 and the "BV" 2, and this would tend to make me  
23 think that this thing bends this way.

24 You also have, if you go in a direct line,  
25 you've got a dry hole over here, so we have assumed it goes

1 that way.

2 Q Is that dry hole on a direct line?

3 A I think it would be.

4 Q You said that the -- the fact that it was  
5 thinning out from the "BV" 1 to the "BV" 2 indicated there  
6 was a swing northward.

7 A Yes, sir.

8 Q What is the rationale of that?

9 A Well, you have to draw the contours to  
10 the -- you have to honor your control points. Now this one  
11 is 95, this one is 79. We'll go ahead and put the 75 on the  
12 down side or the thinner side of this one which is 79 because  
13 that's the way you contour this.

14 Q Couldn't you as easily have put it on  
15 the other side of the channel; the 79 contour appears on  
16 both sides. You chose the side that would swing it north.  
17 Why did you choose that side rather than the other? Did you  
18 have any articulate -- basis that can be articulated for  
19 that?

20 A No, it's just my interpretation. I  
21 examined the data and I drew it and it looked reasonable to  
22 me.

23 Q Okay. Let me turn your attention on the  
24 same exhibit. This would be Exhibit Number Two. Looking  
25 at what is shown as, I think, as a fluvial channel in line

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1 with the C-C' axis?

2 A Yes, sir.

3 Q Is that -- is the line made by that axis  
4 at right angles to the contours in this area?

5 A No.

6 Q The depositional contours?

7 A Now would you repeat that question again?  
8 I lost you somewhere in there.

9 Q Is this north/south line at right angles  
10 to the depositional contours that are shown on the previous  
11 exhibit?

12 A No, I don't believe so. They run along  
13 the strike of this channel.

14 Q Uh-huh.

15 A The cross section runs along the strike  
16 of this channel.

17 Q Is that the usual way that waters run,  
18 along the strike?

19 A Yes, sir.

20 Q Okay. That's all I have, thank you.

21 MR. RAMEY: Any other questions of the  
22 witness? He may be excused.

23 Will you call another witness?

24 MR. DRAPER: Mr. Chairman, I would call  
25 with your permission, Mr. Holmstrom.

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CHARLES W. HOLMSTROM

being called as a witness on recall, testified as follows,  
to-wit:

CROSS EXAMINATION

BY MR. DRAPER:

Q. Mr. Holmstrom, you testified concerning  
the seismic data that is contained in Exhibits is that Six  
through Nine?

A. Yes.

Q. And is it correct that specific data  
plotted there is unmigrated seismic data?

A. That is correct.

Q. Is it true that unmigrated seismic data  
allows a less accurate interpretation than migrated seismic  
data?

A. In some cases, yes.

Q. Why did you not migrate this data?

A. In -- on this particular seismic problem  
it is my opinion that these data should not be migrated.

Q. And what was the basis of that opinion?

A. It was my judgment that these data  
shouldn't be migrated, especially if the process of migration  
were attempted. The data we have is only in two dimensions

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1 and I think the most modern techniques are three dimensional  
2 migration.

3 Q But isn't it -- isn't it more essential  
4 to migrate data when you're trying to delineate structures of  
5 a smaller nature of the type that we're talking about here?

6 A Not in my opinion.

7 Q In other words, could it go the other  
8 way? In other words, the larger the area you're interpreting  
9 the seismic data, the more important it is to migrate?

10 A Now how is that again?

11 Q Well, let me state it a little bit more  
12 neutrally. Does the size of the structure you're trying to  
13 delineate have any effect on your decision whether to migrate  
14 your data or not?

15 A Each case is a separate problem.

16 Q In other words, the size of the structure,  
17 in this case the "BV" channel, is not a factor in your deci-  
18 sion?

19 A What I did do on these data were to keep  
20 the group interval at 330 feet between shot points, and I  
21 used that technique instead of migration to get fine detail  
22 because we were aware that -- or our idea was that it was a  
23 narrow channel.

24 Q Do you feel that with unmigrated data  
25 that the plot of the position of the "BV" channel can be ac-

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1 curate?

2 A Yes.

3 Q Did Mr. Hartman tell you where to run  
4 your seismic tests?

5 A Yes.

6 Q And where did he tell you to run those?

7 A Through the ARCO "BV" 2, through the  
8 Pennzoil well, and across his acreage at a drilling location.

9 Q Did you run any seismic on the nearby  
10 standard location?

11 A No.

12 MR. DRAPER: That's all the questions I  
13 have. Thank you.

14 MR. RAMEY: Any questions?

15 MR. PADILLA: I have one question.

16  
17 CROSS EXAMINATION

18 BY MR. PADILLA:

19 Q Mr. Holmstrom, was your study based on  
20 a location 660 feet from the west and 660 feet from the  
21 south?

22 A No. My study was -- the purpose of my  
23 study was to determine a drilling location.

24 Q Does the change this morning to a location  
25 1000 from the west and 800 from the west affect -- is that

1 based upon your study?

2 A Yes. In my opinion the amended location  
3 is more toward the center of the channel than the -- that the  
4 location that was announced in the bulletin.

5 MR. PADILLA: No further questions.

6 A The movement of the location was based  
7 on the seismic data.

8 MR. RAMEY: Any other questions of the  
9 witness? He may be excused.

10 MR. DRAPER: Mr. Chairman, with your  
11 permission I would call -- recall Mr. Aycock.

12 MR. RAMEY: Mr. Aycock.

13 WILLIAM P. AYCOCK  
14 being recalled as a witness, testified as follows, to-wit:  
15

16 CROSS EXAMINATION

17 BY MR. DRAPER:

18 Q Mr. Aycock, you, in your direct testimony  
19 mentioned the interests that had agreed by letter to join in  
20 your proposal for developing the south half of Section 24.  
21 Were those letters sent based on the newly announced location  
22 or on the original 660/660 location?  
23

24 A The only change that has been induced by  
25 the announcement of the amended location to the prospective

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1 partners of which I am aware is that two of them sent a geo-  
2 physicist to review the work that Chuck Holmstrom did.

3 All of the commitments had been received  
4 to either participate or to farm out prior to the time that  
5 the seismic had -- the data had been collected and had been  
6 processed.

7 Q In other words, those consents were ob-  
8 tained based on the 660/660 location?

9 A Yes, because that was what was proposed  
10 and that was what was advertised, as you're aware.

11 Q Isn't it going a little bit far to say  
12 that they assent to the current location announced today?

13 A Well, if you're -- if you're asking me  
14 if we're getting before this Commission and misrepresenting  
15 the facts, I can assure you that we are not.

16 Q Well, what percentage of the interests  
17 have assented to the 800/1000 location?

18 A I think I presented an exhibit that  
19 demonstrates that approximately 90 percent have indicated  
20 verbally that contracts are being prepared or management ap-  
21 proval has been recommended from the working level to the  
22 upper management levels, and we're awaiting those to be re-  
23 turned.

24 We have been promised in each case that  
25 that paper work will be completed prior to the July 1st spud

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1 date in case Hartman's application is successfully considered  
2 by this Commission and an order if forthcoming.

3 Q So what you're saying is that those were  
4 based on the 660/660 location?

5 A Originally they were. When the decision  
6 was made to amend the application due to the availability of  
7 the improved seismic data, all of the prospective partners  
8 were so informed and I am not aware that there was any, as I  
9 previously said, the only change of which I am aware, is that  
10 Maralo and Pennzoil sent a geophysicist to review the work  
11 with Chuck Holmstrom.

12 Q What was the date on which you determined  
13 to change the location?

14 A The exact date, the discussions, if memory  
15 serves me correctly, took place last week, originally, be-  
16 cause Chuck would have to be the one to tell you, but as I  
17 recall, the final processing of the data was not available  
18 until a week ago Tuesday or a week ago Wednesday, as near as  
19 I can remember.

20 Q Do you have any written indication that  
21 they also consent to this new location?

22 A The only consent that I have is what we  
23 presented in the -- in the exhibits that you have, and the  
24 fact that they've all been notified on at least three sepa-  
25 rate occasions by certified mail that the hearing was about.

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1 We did not, since the decision to amend  
2 the location was reached after the advertisement, then the  
3 contact had to be made verbally with each of them.

4 Q And did you make contact verbally with  
5 each?

6 A There are memos in the file from Mr.  
7 Hartman reflecting each of those telephone conversations with  
8 each individual at each company.

9 At my request Conoco was called even  
10 though they had previously, in addition to all the others,  
11 even though they had previously indicated without qualifica-  
12 tion that they were going to farm out. My opinion was that  
13 it might cause them to change their mind once they knew that  
14 there was seismic data which was available and that based  
15 upon that data the decision had been made to amend the loca-  
16 tion. At that point in time the decision had not been made  
17 as to the exact amount of the amendment that would be requested.

18 Q Did you -- did you contact ARCO Oil and  
19 Gas Company on that point?

20 A No.

21 Q Are they an interest owner?

22 A An interest owner, but they had also un-  
23 equivocally indicated that they were -- they had no interest  
24 in a location in the southwest corner of Section 24.

25 Q You stated in your testimony that to pro-

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1 perly evaluate test data or well control data it requires  
2 one and a half to two years.

3 A. No, I did not state that.

4 I said that an adequate evaluation of the  
5 well could take that long, depending upon the diligence with  
6 which the drilling and the production were pursued.

7 If a well were to remain shut in for a  
8 significant amount of time, which I have seen happen in both  
9 southeastern New Mexico and all over the Permian Basin, it  
10 might easily be six months to a year before a gas connection  
11 were affected. Past that point in time there would have to  
12 be from six months to a year of production data accumulated  
13 before a reasonable evaluation could be made.

14 Q. How long after it begins producing?

15 A. I said six months to a year is what has  
16 been established by most lending institutions as a minimum  
17 period that they will consider an evaluation adequate for  
18 collateral purposes.

19 In an independent like Mr. Hartman who  
20 is not self finance like the major companies, that becomes  
21 a very consequential time frame.

22 Are you familiar with how long the "BV"  
23 has been producing?

24 A. We have two months of production data  
25 as of February 1st, I believe, yes.

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1 Q And in two months you feel that that's  
2 sufficient to --

3 A It's quite apparent to me that is a matter  
4 of technical judgment, but I would agree with your technical  
5 witness that it's draining the same reservoir as is the "BV"  
6 1, so I don't -- in my opinion, that period is not required  
7 in that case. There are sepcial extenuating circumstances.

8 Q Okay. So you would modify your statement  
9 from --

10 A I said could. I didn't say would. I've  
11 seen wells stay shutin for an extended period of time beyond  
12 what most people would consider acceptable for one reason or  
13 an other, and under those conditions the only data that's  
14 available, if it's released, is the potential test and the  
15 log data. I would not consider that adequate at a step out  
16 location to evaluate a well and to give a client advice as  
17 to whether -- what my opinion was as to the bearing of that  
18 information upon his desire to develop or not develop his  
19 nearby property.

20 Q Isn't it true that one of the reasons  
21 that you are moving at this time after only two or three  
22 months production from the "BV", is that you'd rather do it  
23 now before you get the Exxon data, which might disprove what  
24 we've seen here today?

25 A Are you asking me or are you telling me?

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1 Q I'm asking you.  
2 A No, that is not. I testified originally,  
3 if you will recall, that when Mr. Hartman first asked me to  
4 take a look at the performance data of the wells, I advised  
5 him that if there were any gas that was under his leases, he  
6 had better diligently pursue the drilling and completion of  
7 a well to recover it or it would likely be gone.

8 Q Do you know whether stimulation has been  
9 used in this area?

10 A Stimulation, in general, other than to  
11 repair cement contamination, has in general not been necessary  
12 with these wells.

13 Q Okay. Let me refer you to your exhibit  
14 Fifteen, to the first legal sized sheet on the clip in that  
15 exhibit.

16 I refer your attention to item number  
17 eleven, acidizing, fracturing, and perforating.

18 A Uh-huh.

19 Q Which states \$150,000.

20 A That's right.

21 Q Isn't that an excessive amount for those  
22 operations?

23 A I believe I testified earlier, if you'll  
24 recall, the difference in the ARCO and the Hartman cost esti-  
25 mates were based on Hartman's desire to furnish all the pros-

1 pective partners with the cost that he was relatively sure  
2 would not be exceeded, because his experience as an indepen-  
3 dent, like most independents, is that participation is fre-  
4 quently decided upon by individuals based upon what their  
5 maximum financial exposure could be.

6 As a consequence, under those conditions,  
7 he felt it incumbent to provide them with that type of esti-  
8 mate, so the acidizing, fracturing, perforating expenditures  
9 are \$112,000 greater on the Hartman AFE than on the ARCO AFE  
10 and they are roughly \$52,400 greater for the abandon the  
11 well equipment category for surface equipment than are the  
12 ARCO.

13 And as I believe I additionally testified  
14 of course actual costs would be the basis for any settlement  
15 with any partner or for those that are force pooled. So  
16 these are simply estimates and are not being promulgated here  
17 as final costs.

18 Q Let's assume you did \$150,000 fracing and  
19 completion job here. Wouldn't that set up communication,  
20 fractures hundreds of feet away from the borehole?

21 A I'm not prepared to say what it would do  
22 under conditions that are unknown at this time. Obviously,  
23 the expenditure of any amount of money is on a justification  
24 basis. You try to complete the well with as small an ex-  
25 penditure as possible and you're prepared to go to some fur-

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1 ther measures depending upon what your financial capabilities  
2 and your faith in your technical capabilities are past that  
3 point.

4 Q Doesn't the magnitude of this number in-  
5 dicate that you anticipate that there would be --

6 A No, it does not. I've already --

7 Q -- a need for --

8 A I've already told you twice the reason  
9 it was put in there. I don't know how to answer any more  
10 than that.

11 MR. RAMEY: Mr. Aycock, let him ask the  
12 question before you answer it, would you please?

13 A All right, yes, sir.

14 Q Doesn't the magnitude of this number,  
15 \$150,000, indicate that you are anticipating the possibility

16 A No, it does not; not necessarily.

17 Q Let me try it again. Doesn't the magni-  
18 tude of this item for acidizing, fracturing, and perforating  
19 of \$150,000 for this one well indicate that you anticipate  
20 the possibility of either needing to reach out to productive  
21 areas or in any event, to finding yourself in a very poor  
22 reservoir?

23 A It indicates that there is a possibility  
24 of requiring expenditures above what would normally be ex-  
25 pected in the area to establish commercial production, yes.

1 MR. DRAPER: That's all I have. Thank  
2 you.

3 MR. RAMEY: Any questions? You may be  
4 excused, Mr. Aycock.

5 A. Thank you.

6 MR. RAMEY: Do you have anything further,  
7 Mr. Draper?

8 MR. DRAPER: Mr. Chairman, I have only a  
9 short closing comment, which I'm not sure whether Mr. Carr  
10 is planning to make a short statement or what the situation  
11 is.

12 MR. CARR: And I don't care who goes first  
13 but however John would like.

14 MR. DRAPER: Well, I'm talking, I might  
15 as well do that.

16 I'd just like to summarize briefly for  
17 the Commission what I feel are the major points that have  
18 come out of the wealth of data that's across our table today.

19 Now, as an initial point it indicates  
20 that ARCO was the first one to attempt to develop the south  
21 half of Section 24, preceding Mr. Hartman by a full four  
22 months in getting to the other owners and trying to put to-  
23 gether the participation and nonparticipation that would go  
24 into a voluntary agreement, and that they have continued this  
25 effort diligently and do intend, if at all possible, to pro-

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1 ceed with development as outlined in our application, if  
2 allowed to.

3 I would point out that the evidence has  
4 shown that the area in which Mr. Hartman would put his well  
5 is a very high risk area. They are, as you noted, asking for  
6 the maximum risk factor here.

7 Mr. Aycock has stated it's a very high  
8 risk situation, and the fact that they have moved their well  
9 today, their proposed location, if you look at the evidence  
10 which we have presented, it's even closer to that dry hole,  
11 the Penn Aid State Com NO. 1 that was dry, they've moved  
12 closer to that than they were before, and they've moved  
13 closer to that 40-foot contour that apparently in this area  
14 marks the division between producing and nonproducing sand.

15 I would also point out that they have  
16 proposed an unorthodox location in a high risk area that in  
17 all probability has very little reserves, especially when you  
18 compare it to the east half of that same unit. There was a  
19 lot of talk here about a well, if there is a little dip down  
20 there in the extreme southwest corner, which possibility we  
21 don't deny, then shouldn't Mr. Hartman have the right to go in  
22 there and get that.

23 Well, that's not really the question that  
24 we have been focusing on all day. The question is which  
25 location is more likely to produce reserves under the south

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1 half of Section 24, and I think we've shown very reasonably  
2 that given the well control data and given the depositional  
3 contours that are present, that you do have a northwest  
4 trending dry sand area that crosses much of the east half  
5 there of the unit.

6 Now, if Mr. Hartman is allowed to go  
7 ahead, and if he were lucky enough to encounter the "BV"  
8 channel, which is a prolific channel, it's narrow, it's thick,  
9 and it's well documented, this would lead to irreparable  
10 drainage of that reservoir on the basis of a very minor  
11 ownership, and that it's not a question of how does he get  
12 his due share out of there, but whether he can get his well  
13 in there and drain areas that are not under the south half  
14 of Section 24.

15 Now he recognizes the high investment,  
16 the high risk, that's got to go into this well with the high  
17 fracing and completing costs that he has anticipated may be  
18 necessary to bootstrap his well into a producer, and that is  
19 in spite of the fact that most of the wells in this area,  
20 you can say all the wells in this area, had no or at the most  
21 very little stimulation in their completion. And certainly  
22 none of the "BV" wells in this channel had it.

23 Now, if he happens to run into a stray  
24 zone -- we've been talking about the Cycle Two -- he may run  
25 into another zone there and although the Cycle Two zone is

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1 the main producing zone here, he may hit a small producing  
2 zone at some other level, say a Cycle Three, or what have you.  
3 And this would be equally a disaster for the development of  
4 the south half of Section 24, because that would tie up the  
5 development of that -- of that unit, where the unit could be  
6 much more usefully produced on the east half, that would be  
7 impossible with a small producing well down there in the  
8 southwest corner.

9 And I think a very reasonable interpre-  
10 tation of the data indicates that there are significantly  
11 greater sands to be tapped on the east half than in the south-  
12 west quarter.

13 Now, if the -- if the Commission were to  
14 see fit to approve Mr. Hartman's application, we would request  
15 that an allowable -- that the allowable be restricted signi-  
16 ficantly to much less than 25 percent of the deliverability.  
17 Now even this, in our opinion, because of the excessive  
18 stimulation that's planned, and because of a large transmis-  
19 sibility of the reservoir that they are admittedly trying to  
20 encounter, would in all likelihood that limitation on their  
21 allowable still be inadequate to protect correlative rights  
22 and prevent drainage.

23 That's all I have.

24 MR. RAMEY: Mr. Draper, let me go ahead  
25 with a question to Mr. Johnston. He may answer it from his

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1 seat.

2 Did you give me any administrative costs  
3 while drilling or producing?

4 MR. JOHNSTON: No, sir, I do not -- I'm  
5 not prepared to provide those to you right now.

6 We can, if you so desire, provide you  
7 with those.

8 MR. RAMEY: I think we're going to have  
9 to have those in the event we approve your application.

10 MR. JOHNSTON: We would be consistent  
11 with the figures Mr. Hartman has suggested in his application.  
12 We accept the \$3200 and --

13 MR. RAMEY: \$3100 and \$310?

14 MR. JOHNSTON: We'd accept that.

15 Consider it provided.

16 MR. RAMEY: Okay.

17 MR. JOHNSTON: Thank you.

18 MR. RAMEY: Mr. Carr, do you have a state-  
19 ment?

20 MR. CARR: We all know this Commission is  
21 charged with the protection of correlative rights and pre-  
22 vention of waste of hydrocarbons.

23 As correlative rights are defined in our  
24 statute, they're defined as the opportunity afforded, so far  
25 as is practicable to do so, to the owner of each property



1 in the pool to produce his just or equitable share of the  
2 reserves under his tract.

3 Mr. Hartman is before you today asking  
4 you to afford him the opportunity to produce the reserves  
5 that are under his tract.

6 There are several aspects of this case.  
7 First, the pooling aspect. Mr. Hartman, as the evidence  
8 clearly shows, attempted to obtain voluntary joinder in the  
9 drilling of a well in the southwest corner of the south half  
10 of Section 24. He is prepared to drill a well. He has a  
11 right to drill the well at that location. It's on his lease.  
12 And he filed his application for permit to drill and notified  
13 the Commission that the matter should be set for hearing to  
14 pool the acreage.

15 At a later date ARCO filed an application  
16 for permit to drill and attached a C-102 which contained a  
17 misrepresentation that the acreage was in the process of  
18 being communitized. Now, we're not saying that that was  
19 willful, but that was incorrect data, and based on incorrect  
20 data that application for permit to drill was approved, and  
21 we submit should be set aside.

22 We submit that Mr. Hartman is entitled  
23 under the statute to drill a well in the south half of Section  
24 24 at his proposed location.

25 Now, you have heard testimony today that

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1 ARCO was the first one to attempt to develop this acreage.  
2 I would submit to you that's clearly not true; Pennzoil was,  
3 and Mr. Hartman a year ago participated in a well to develop  
4 the south half. This is not something that started in December  
5 or in January, development of this half section has been going  
6 on for an extended period of time.

7 We were, however, the first party to file  
8 an application for permit to drill and to properly request  
9 that this matter be set for hearing.

10 Now, whatever equities come into this, I  
11 think that it's clear from the evidence that we represent  
12 approximately 90 percent, or will represent, approximately  
13 90 percent of the working interest in the south half of this  
14 section. ARCO on the other hand, has 6.25 and maybe will  
15 be able to increase that to something around 10 percent.

16 We submit that the reason we have 90 per-  
17 cent of the working interest ownership interested in partici-  
18 pating with Mr. Hartman is because they believe it is prudent  
19 to develop the south half of this section with a well where  
20 Mr. Hartman is proposing to drill it.

21 We talk about more reserves. We're not  
22 talking about pink versus green, as portrayed on Exhibit  
23 Eight. We're talking about the amount of gas under the tract  
24 and if you have a very poor Morrow deposit on one side of  
25 the section and a tremendous channel sand on the other, you

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1 need to look at the gas that will be produced, not the acreage  
2 that is actually involved.

3 Now, we think that there's also a question  
4 involved as to the unorthodox location. The question -- the  
5 evidence presented today shows, the Isopach and cross section,  
6 that there is a fault running generally in the area of the  
7 southwest corner of the south half of Section 24. I think  
8 the testimony today clearly shows that where you place your  
9 contour lines, exactly, and your well control, is a matter  
10 of interpretation. Two geologists today, as an example, will  
11 reach different conclusions from the same data. This is an  
12 interpretive matter, except in a situation as this one, where  
13 you have geophysical data, geophysical data which we submit  
14 shows the existence of a geologic anomaly, an anomaly that  
15 crosses the south half of Section 24 in such a way as to  
16 leave in that proration unit a number of productive acres in  
17 that channel which closely correlates with the number of pro-  
18 ductive acres in that channel which is available to the well  
19 immediately to the south of it.

20 Now I would point out that the Supreme  
21 Court of New Mexico in the Jalmat decision stated that the  
22 Commission must first determine the extent of correlative  
23 rights before the Commission can protect them. In other  
24 words, you have to determine, as far as practicable, what  
25 reserves are under a tract.

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1 We submit here that the data presented  
2 is the best data that could be presented and it shows you  
3 very clearly what Mr. Hartman has under the south half of  
4 that section, and we're asking you to give Mr. Hartman the  
5 opportunity to produce that.

6 The engineering data that was presented  
7 shows that the wells, the ARCO wells in Section 25, are  
8 draining over great distances, and Mr. Draper indicated that  
9 we're not really concerned about the drainage, apparently,  
10 from north to south. What we're concerned about is Mr. Hart-  
11 man draining Section 25 south of him. I submit to you that  
12 if we look at where his well is placed in regard to the south  
13 line of his lease, it's back a standard distance from the  
14 ARCO property, and that what works one way conversely is  
15 also true, and the testimony clearly shows today that the  
16 existing wells in Section 25 will drain the gas under 24 unless  
17 we're permitted to drill a well there.

18 I think it's also important to realize  
19 that if we don't drill a well, if Hartman doesn't drill a  
20 well in the south half of that section, it's going to be pro-  
21 duced by ARCO. They'll get it all. They only have 6.25 per-  
22 cent of the well in the south half and they hope to get  
23 everyone else to drill wells out of their channel, and we  
24 submit that that's a very central part of this entire case.

25 We do believe that the evidence presented

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1 entitles Mr. Hartman to the order. We think that any way you  
2 read the evidence that the percentage of the interest that  
3 he represents, the dates of filing, that the equities come  
4 up on Mr. Hartman's side in this case, and we submit that if  
5 we do not get the order, he's going to be denied the oppor-  
6 tunity to protect his correlative rights contrary to the  
7 statutory challenge that's directed to this Commission.

8 MR. RAMEY: Thank you, Mr. Carr. Mr.  
9 Kellahin, do you have anything you wish to add?

10 MR. KELLAHIN: Yes, sir.

11 Mr. Ramey, I represent Pennzoil Company.  
12 As you can see from the evidence, Pennzoil has a substantial  
13 interest in the south half of this section. Tabulation shows  
14 that the percentage working interest is 31.25 percent, which  
15 equals that of Mr. Hartman's personal interest. With Mr.  
16 Hartman, Pennzoil has more acreage in the south half than  
17 any of the other individual operators, some five times more  
18 than ARCO with 6.25 percent working interest.

19 Pennzoil has authorized me today to inform  
20 you that they support Mr. Hartman's location; they believe  
21 it's the optimum location within the south half of this pro-  
22 ration unit from which to develop his acreage, and that they  
23 are opposed to the location requested by ARCO.

24 We would propose that the application of  
25 Mr. Hartman be approved as amended. Our support goes to the

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1 amended location, and we believe that it's a standard location  
2 off of the south half line and that it would not drain or sub-  
3 stantially damage the interests of ARCO, the offset operator  
4 to that well.

5 We believe that the application must be  
6 granted without penalty and without further delay to allow Mr.  
7 Hartman to timely commence the well.

8 MR. RAMEY: Thank you, Mr. Kellahin.  
9 Mr. Flowers?

10 MR. FLOWERS: Gentlemen, DEPCO has a  
11 working interest in Section 25, Township 17 South, Range 28  
12 East, and would like to state its opposition to Application  
13 Number 6927 by Doyle Hartman for an unorthodox location in  
14 the south half of Section 24, Township 17 South, Range 28 East.

15 We have looked at the situation and are  
16 of the strong opinion that approval of the Hartman application  
17 would be contrary to the protection of correlative rights and  
18 prevention of waste.

19 If the Commission sees fit to approve  
20 the Hartman application, we would strongly request that an  
21 allowable restriction to significantly less than 25 percent  
22 of deliverability be imposed.

23 Respectfully submitted by Lee Flowers.

24 MR. RAMEY: Thank you, Mr. Flowers.

25 Mr. Corkill?

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1 MR. CORKILL: Oil Conservation Commission,  
2 Energy and Mineral Department, Land Office Building, Santa  
3 Fe, New Mexico.

4 Gentlemen: Husky Oil Company, under the  
5 State of New Mexico Lease Number 647-368, which includes  
6 Section 25, Township 17 South, Range 28 East, Eddy County,  
7 New Mexico, owns a 15.97222 percent working interest in said  
8 Section 25. This 15.97222 working interest applies to the  
9 following interval: from 500 feet below the top of the San  
10 Andres formation to any depth.

11 Mr. Doyle Hartman has applied for an un-  
12 orthodox Morrow well to be located 660 from west line and 660  
13 from south line, Section 24, 17 South, 28 East, Eddy County,  
14 New Mexico.

15 Since a Morrow dry hole, Pennzoil, exists  
16 at a location 1980 from the west line, 660 from the south line  
17 in Section 24, Township 17 South, Range 28 East, Husky Oil  
18 Company as an offset working interest owner objects to the  
19 proposed unorthodox location.

20 If the Commission deems it adviseable  
21 to grant the unorthodox location, we strongly recommend that  
22 a severe allowable restriction be placed on the proposed un-  
23 orthodox location. The previously mentioned Pennzoil dry hole  
24 definitely demonstrates that the entire 320 acre spaced unit  
25 is not productive from the Morrow formation. Such an allow-

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1 able restriction should protect the correlative rights and  
2 ownership of offset owners.

3 At the same time, we firmly support Ap-  
4 plication Number 6928 by ARCO Oil and Gas for the same 320  
5 acre unit utilizing a well in an orthodox location for the  
6 reason that it will protect correlative rights and prevent  
7 waste.

8 Husky Oil Company has been an active part-  
9 icipant in the development of the deeper gas producing form-  
10 ations in this area since September, 1972.

11 Respectfully submitted.

12 Am I allowed to make any other statement?

13 MR. RAMEY: Certainly.

14 MR. CORKILL: I just want to make a com-  
15 ment on the seismic. Husky has been in this area since early  
16 '72, since the South Empire Deep Well No. 1 was drilled by  
17 Midwest. We have participated in probably fifty to sixty  
18 wells with a working interest from less than one percent up  
19 to 30 to 35 percent.

20 The operators for our wells have been  
21 DEPCO, ARCO, Yates, HEYCO, Gulf, Monsanto, Anadarko, Holly,  
22 almost -- seems to be almost everybody that operates in this  
23 portion of Eddy County.

24 To my knowledge no locations have been  
25 asked to be changed, or have they come to us with information

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1 indicating that on the basis of seismic should we change our  
2 location. We took it as the orthodox spot and that was it.

3 MR. RAMEY: Thank you. Does anyone have  
4 anything further to add in this case?

5 If not, we will take the case under ad-  
6 visement and the hearing is adjourned.

7  
8 (Hearing adjourned.)  
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C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that  
the foregoing transcript of hearing before the Oil Conserva-  
tion Commission was reported by me; that the said transcript  
is a full, true, and correct record of the hearing, prepared  
by me to the best of my ability.

Sally W. Boyd CSE

SALLY W. BOYD, C.S.R.

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WORKING INTEREST OWNERS - PROPOSED PENNZOIL  
24 State Com #1

<u>PARTY AND ADDRESS</u>	<u>ACRES</u>	<u>INTEREST</u>
ARCO Oil and Gas Company P. O. Box 1610 Midland, Texas 79702	20.0000	6.2500%
Doyle Hartman 508 C & K Petroleum Building Midland, Texas 79701	100.0000	31.2500%
Pennzoil Company P. O. Drawer 1828 Midland, Texas 79702	100.0000	31.2500%
Inexco Oil Company 1100 Milam Building, Suite 1900 Houston, Texas 77002	84.3750	26.3672%
Exxon Company, U.S.A. P. O. Box 1600 Midland, Texas 79702	6.2500	1.9531%
M. Ralph Lowe, Inc. Erma Lowe Maralo Inc. c/o Maralo Inc. 4600 Post Oak Place Suite 307 Houston, Texas 77027	3.1250 1.5625 1.5625	.9765% .4883% .4883%
Continental Oil Company P. O. Box 1959 Midland, Texas 79702	1.5625	.4883%
Tenneco Oil Company 6800 Park Ten Blvd. Suite 200 North San Antonio, Texas 78213	1.5625	.4883%
	<hr/> 320.0000	<hr/> 100.0000%

ARCO Oil and Gas Company  
Permian ( )  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0130  
Curt Krehbiel  
District Landman



December 13, 1979

Pennzoil Company  
ATTENTION: Mr. Ken Medlock  
Box 1828  
Midland, Texas 79702

Subject: Farmout Request  
Eddy County, New Mexico

Gentlemen:

Pennzoil as operator drilled a Morrow test in the S/2 of Section 24, T-17-S, R-28-E, Eddy County, New Mexico, which was completed as a dry hole. We understand that 40 acres of this 320 acre spacing unit has since expired. ARCO Oil and Gas Company is willing to drill another Morrow test on this spacing unit if Pennzoil and the other non-operating parties will agree to permit ARCO to earn all of their leasehold interest subject to the retention of the difference between existing burdens and 20% in order for ARCO to have an 80% net revenue interest during payout of such well. At payout Pennzoil and each other party would have the option to convert its overriding royalty interest to a 50% working interest.

We will appreciate your causing this proposal to be considered by the present owners of the remaining 280 acres in the S/2 of Section 24. Your early attention to this proposal is requested as we could conceivably commence this well as early as February 1980.

Yours very truly,

Curt Krehbiel

CK:bk



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January 7, 1980

RECEIVED  
JAN 8

ATLANTIC RICHFIELD COMPANY  
LAND DEPT.

TO: ALL CO-OWNERS  
(Address List Attached)

Re: ARCO Farmout Request  
Aid Field  
Eddy County, New Mexico  
S/2 Section 24, T-17-S,  
R-28-E

Gentlemen:

Enclosed is a copy of farmout request dated December 13, 1979, from ARCO, whereby they propose to farmout our interest in the S/2 Section 24, T-17-S, R-28-E on a net 70% revenue interest basis to a 50% back-in, towards the drilling of a Morrow test on the same proration unit on which we drilled our Aid "24" State Comm #1.

Our combined interest in the proposed unit is based on our operating agreement dated November 9, 1970, covering the Aid State #1, which we calculate to be the interest shown opposite your name.

The NW/4 SW/4 Section 24 has expired and will be up on the next New Mexico State Sale.

We are evaluating this request and will advise you of our decision and would appreciate it if you would advise us of your position in this regard as soon as possible.

Very truly yours,

*K. Medlock*  
Kenneth Medlock  
Landman

KM/mlm  
Encl.

cc: ARCO Oil & Gas Co. 4110  
P. O. Box 1610  
Midland, Texas 79702  
Attention: Mr. Curt Krehbiel

DOYLE HARTMAN

Oil Operator

SUITE 508

C A K PETROLEUM BUILDING  
MIDLAND, TEXAS 79701

(915) 684-4011

February 13, 1980

All Owners  
(Address List Attached)

Re: S/2 Section 24,  
T-19-S, R-28-E  
(Pennzoil Aid-State No. 1)

Gentlemen:

Please refer to recent correspondence from Arco Oil and Gas Company proposing a farmout covering the above noted Morrow tract.

We are the owners of the S/2 SW/4 of Section 24 which constitutes 25% of the above noted 320-acre tract and believe from various conversations with some of the interested parties in this matter that the location for any future Morrow well on this tract would be in W/2 SW/4 Section 24.

We have also checked with our lawyer in Santa Fe who handles all our New Mexico Oil Conservation Division work who advises as follows:

1. A well in W/2 SW/4 of Section 24 would be situated at a non-standard location under NMOCD rules.
2. Approval for this location could be obtained by receiving written waivers from the offset operators or at a NMOCD hearing.

If Arco (operator of the offset acreage to the south) refused to grant a waiver and/or opposed this non-standard location at the hearing, approval from the NMOCD would provide for a severe penalty in the form of a highly restricted allowable for the new well. The allowable would be based on a pipeline deliverability test to be performed after completion of the well with the actual allowable to be 25% to 50% of the actual test results.

This presents a serious problem for us as owners of the S/2 SW/4 of Section 24 (which appears to constitute a significant portion of the recoverable gas reserves in the S/2 of Section 24) since the offsetting Arco BV State No. 1 and 2 in Section 25, T-19-S, R-28-E, are non-prorated wells.

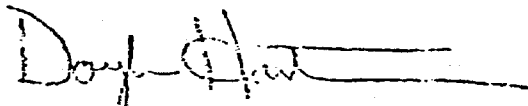
February 13, 1980  
Page 2

As you can see, the non-prorated wells will severely drain a prorated well drilled at the above noted non-standard location. Based on the foregoing, it appears to us that a decision by the working interest owners in the S/2 Section 24 regarding drilling or farming out is subject to considerations other than simply purely geologic merit.

It is our opinion that it is critical, in order to eliminate any possible opposition to a location in the W/2 SW/4 of Section 24, that Arco receive enough additional interest (by way of a farmout) so that it will agree to drill the well and be the operator.

We urge all parties to reach a decision in this matter as soon as at all possible due to the possible extreme drainage that could be occurring from the producing wells to the south.

Very truly yours,

  
Doyle Hartman

DH/mh  
Enclosure

DOYLE HARTMAN

Oil Operator

SUITE 538

C & K PETROLEUM BUILDING  
MIDLAND, TEXAS 79701

(915) 684-4011

April 18, 1980

RECEIVED

APR 21 1980

ARCO OIL AND GAS CO.  
NORTH & WEST LAND DEPT.

To: All Working Interest Owners  
(Address List Attached)

Re: Doyle Hartman No. 1  
South Empire State,  
S/2 Section 24, T-17-S, R-28-E  
Eddy County, New Mexico

Gentlemen:

Reference is made to various correspondence over the past several months regarding the drilling of a 11,000 foot Morrow well on the above described tract.

From various conversations with the larger owners in the subject tract this week, it has become apparent that the drilling of this well is being delayed, which appears to be contrary to the best interests of all concerned.

We own 100 net acres in the S/2 of Section 24 and have paid a considerable amount of money for these leases. Furthermore, we have also participated in an expensive dry hole which has been very valuable in further defining this prospect.

In our opinion, we are dealing with a narrow, but prolific Morrow channel sand crossing a portion of the W/2 of Section 24 and the E/2 of Section 23. Therefore, in order to maximize the potential of our leasehold interests as well as protect the interests of our royalty owners, we propose the following:

- (1) We are currently staking an 11,000-foot Morrow well to be drilled at a location of 650' FSL and 660' FWL Section 24 and will file the necessary New Mexico Oil Conservation Division forms as soon as the surveyors plats are available.
- (2) We respectfully request that all working interest owners agree to one of the following alternatives:
  - (a) Participate in the proposed well under a Model-Form Operating Agreement naming the undersigned as operator. AFE and Operating Agreement will be furnished as soon

cc: Thomas  
Sullivan  
Daugherty

Hartman wants to check  
hearing for late May. 6



( ( ( (

Working Interest Owners  
April 18, 1980  
Page 2

as possible; or,

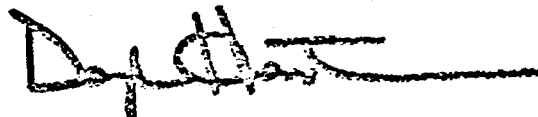
- (b) Farmout your interest while retaining a gross 30% of 8/8 override absorbing all present royalty out of the override so operator would be assigned a 70% net revenue interest.

At payout, each party to have the option of converting its net part of the override to a 50% working interest. All interests subject to proportionate reduction.

Rights earned limited to 100' below total depth drilled.

Due to the considerable amount of time that has already elapsed in getting this well started, please advise as soon as at all possible regarding your decision to participate or farmout as well as your comments concerning our proposed plan of development including proration unit and location.

Very truly yours,



Doyle Hartman

DH/mh

Address list attached



May 2, 1980

WORKING INTEREST OWNERS ADDRESS LIST ATTACHED

Subject: ARCO Oil and Gas Company  
Pennzoil 24 State Com #1 Well  
S/2 Section 24, T-17-S, R-28-E  
Eddy County, New Mexico  
NM-4488

Gentlemen:

By letter dated December 13, 1979, to Pennzoil Company, ARCO proposed drilling the subject well and asked that you consider farming out. We are presently enclosing two copies of an Operating Agreement and AFE for your further consideration. We will appreciate those wishing to join signing and returning one copy each of the AFE and JOA. Those wishing to farmout need sign and return only a copy of the JOA. An Exhibit "A" showing the interests of the parties will be prepared and forwarded with copies of other parties' execution pages to complete your files. The agreement will be limited to rights below 2300' beneath the surface to the base of the Morrow formation. The farmout terms will provide for the farming out party to retain a 30% override out of which will be borne existing royalties and overrides with the option to convert the net portion of the retained override to a 50% working interest after payout, all subject to proportionate reduction.

After writing the December 13, 1979 letter, ARCO was advised by letter dated February 14, 1980, that Pennzoil had elected to farmout on the terms offered. By letter dated February 22, John Burke advised that the Lowe interests would participate in drilling the well rather than farming out. By copy of letter dated March 18, we were advised that Exxon was planning to drill in the E/2 of Section 23 and would prefer not to make a decision with regard to our well proposal until their well was completed. By letter dated March 20, Tenneco advised that it would prefer to participate subject to final management approval of the terms of any JOA and AFE. On March 25, Les Tacconi with Inexco advised by telephone that Inexco would prefer not to decide whether to join or farmout until the Exxon well in Section 23 was completed. In view of the position taken by Exxon and Inexco, ARCO was willing to defer its proposed well until the Exxon well was completed. By letter dated April 18, however, Doyle Hartman


Page 2

entered the picture and proposed a well on the same spacing unit but at an unorthodox location in the SW/4 of the SW/4. We understand he is trying to schedule a hearing this month before the New Mexico Oil and Gas Conservation Commission regarding the unorthodox location and the forced pooling of all interests in the S/2 of Section 24. ARCO intends to oppose the unorthodox location and continue with its plans to drill at the orthodox location in the SE/4 regardless of the outcome of the Exxon well in Section 23.

We are also attaching a schedule showing the interests of the parties in the S/2 of Section 24. ARCO's interest in this well including the farmout from Pennzoil is 37.50%. Should Inexco also elect to farmout, ARCO's interest will increase to 63.87%. A provision covering the farmout and rights to be earned will be included in the Exhibit "A" yet to be prepared.

We will appreciate your early attention to the execution and return of the enclosed JOA and AFE.

Yours very truly,

  
Curt Krehbiel

CK:bk

Enclosures

<u>PARTY AND ADDRESS</u>	<u>ACRES</u>	<u>INTEREST</u>
ARCO Oil and Gas Company P. O. Box 1610 Midland, Texas 79702	20.0000	6.2500%
Doyle Hartman 508 C & K Petroleum Building Midland, Texas 79701	100.0000	31.2500%
Pennzoil Company P. O. Drawer 1828 Midland, Texas 79702	100.0000	31.2500%
Inexco Oil Company 1100 Milam Building, Suite 1900 Houston, Texas 77002	84.3750	26.3672%
Exxon Company, U.S.A. P. O. Box 1600 Midland, Texas 79702	6.2500	1.9531%
M. Ralph Lowe, Inc. Erma Lowe Maralo Inc. c/o Maralo Inc. 4600 Post Oak Place Suite 307 Houston, Texas 77027	3.1250 1.5625 1.5625	.9765% .4883% .4883%
Continental Oil Company P. O. Box 1959 Midland, Texas 79702	1.5625	.4883%
Tenneco Oil Company 6800 Park Ten Blvd. Suite 200 North San Antonio, Texas 78213	1.5625	.4883%
	<hr/> 320.0000	<hr/> 100.0000%

Pennzoil Company  
ATTENTION: Kenneth Medlock  
P. O. Drawer 1828  
Midland, Texas 79702

Inexco Oil Company  
ATTENTION: William G. Goodwin  
1100 Milam Building, Suite 1900  
Houston, Texas 77002

Doyle Hartman  
508 C & K Petroleum Building  
Midland, Texas 79701

Exxon Company, U.S.A.  
ATTENTION: H. W. Hugly  
P. O. Box 1600  
Midland, Texas 79702

M. Ralph Lowe, Inc.  
Erma Lowe  
Maralo Inc. ATTENTION: John R. Burke  
c/o Maralo Inc.  
4600 Post Oak Place  
Suite 307  
Houston, Texas 77027

Continental Oil Company  
ATTENTION: David M. Goodfellow  
P. O. Box 1959  
Midland, Texas 79702

Tenneco Oil Company  
ATTENTION: Steve D. King  
6800 Park Ten Blvd.  
Suite 200 North  
San Antonio, Texas 78213

<b>Title</b> Penzoil 24 State Com #1: Drill & Equip		<input checked="" type="checkbox"/> Original authorization <input type="checkbox"/> Revision number																																																																																					
<b>Location</b> 660' FSL & 1980' FEL, Sec. 24, T-17-S, R-28-E, Eddy Co., New Mexico																																																																																							
<b>APPR TD 10,900 OBJ Form No.</b>		<b>Budget information</b> Budget (1) _____ Amt. _____ Item (2) _____ Amt. _____ Capital Instabudget dated _____ <input type="checkbox"/> Named on Instabudget Amount capital differs from Instabudget \$ _____ Over/(under) _____ <input type="checkbox"/> Substituted for Amount capital differs from Instabudget \$ _____ Over/(under) _____ <input type="checkbox"/> Addition to Instabudget Current year capital differs from Instabudget current year by \$ _____ Over/(under) _____																																																																																					
<b>Purpose of authorization</b> <input checked="" type="checkbox"/> Drilling - New <input type="checkbox"/> Reconpletion <input type="checkbox"/> Workover <input type="checkbox"/> Other <input type="checkbox"/> Drill old well deeper <input checked="" type="checkbox"/> Development _____ % <input type="checkbox"/> Exploratory _____ % * Show percent of total cost applicable to each. <input checked="" type="checkbox"/> Single <input type="checkbox"/> Dual <input type="checkbox"/> Three or more		<b>Originated by</b> _____ <b>AFE number</b> _____ <b>District</b> _____ <b>Project identifier</b> _____ <b>Permian West</b> <b>Field name</b> _____ <b>Empire South Morrow</b> <b>Lease record number</b> _____ <b>NH-4488</b> <b>Expl. project No.</b> _____ <b>Field code</b> _____ <b>Subject to production payment?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Has well plan been prepared?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Co-owner operator AFE No(s).</b> _____																																																																																					
<b>Primary objective of drilling</b> <input type="checkbox"/> Oil only <input checked="" type="checkbox"/> Gas only <input type="checkbox"/> Oil and/or gas <b>Signed (Dist. Eng. and/or Explor. group)</b> _____ <b>Reason for drilling</b> <input checked="" type="checkbox"/> Develop reserves <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Rate <input type="checkbox"/> Replacement <input type="checkbox"/> Comb. reserve & rate _____ % rate <input type="checkbox"/> Service																																																																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Component AFE No(s)</th> <th rowspan="2">Description and justification</th> <th rowspan="2">Account codes</th> <th colspan="4">Amounts—in whole dollars, only</th> </tr> <tr> <th>On hand</th> <th>Capital</th> <th>Expense</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td></td> <td>Tangible</td> <td>031</td> <td></td> <td>217,000</td> <td></td> <td>217,000</td> </tr> <tr> <td></td> <td>Intangible</td> <td>037</td> <td></td> <td>606,000</td> <td></td> <td>606,000</td> </tr> <tr> <td></td> <td>Total Drilling Cost</td> <td></td> <td></td> <td>823,000</td> <td></td> <td>823,000</td> </tr> <tr> <td></td> <td>Lease Equipment</td> <td>038</td> <td></td> <td>35,000</td> <td></td> <td>35,000</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>858,000</td> <td></td> <td>858,000</td> </tr> <tr> <td colspan="2">Operator</td> <td>Net Atlantic Richfield share</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="2">Atlantic Richfield ownership decimal</td> <td>Range requested</td> <td>Lower</td> <td></td> <td>Upper</td> <td></td> </tr> <tr> <td>Payout (years) (AFIT)</td> <td>% Return (AFIT)</td> <td>PV (AFIT)</td> <td>%</td> <td>Start date</td> <td>Completion date</td> <td>\$ Prior year Capital _____ Expense _____</td> <td>\$ Curr. year Capital _____ Expense _____</td> </tr> <tr> <td colspan="6"> <b>Technical audits (check those required)</b>  <input type="checkbox"/> Engineering <input type="checkbox"/> Exploration <input type="checkbox"/> Dallas budget <input type="checkbox"/> Evaluation <input type="checkbox"/> Other _____ <input type="checkbox"/> Procedural audits       </td> <td colspan="2"> <input type="checkbox"/> Co-owner approval          Signature _____          Company _____       </td> </tr> <tr> <td colspan="4"> <b>Approvals (check highest level req'd)</b>  <input type="checkbox"/> District  <input type="checkbox"/> Other  <input type="checkbox"/> Regional  <input type="checkbox"/> Senior vice-president       </td> <td colspan="4"> <b>Authorized expenditure limit table No.</b> _____  <input type="checkbox"/> Executive vice-president  <input type="checkbox"/> President/Chairman  <input type="checkbox"/> For Board of Directors       </td> </tr> </tbody> </table>				Component AFE No(s)	Description and justification	Account codes	Amounts—in whole dollars, only				On hand	Capital	Expense	Total		Tangible	031		217,000		217,000		Intangible	037		606,000		606,000		Total Drilling Cost			823,000		823,000		Lease Equipment	038		35,000		35,000					858,000		858,000	Operator		Net Atlantic Richfield share					Atlantic Richfield ownership decimal		Range requested	Lower		Upper		Payout (years) (AFIT)	% Return (AFIT)	PV (AFIT)	%	Start date	Completion date	\$ Prior year Capital _____ Expense _____	\$ Curr. year Capital _____ Expense _____	<b>Technical audits (check those required)</b> <input type="checkbox"/> Engineering <input type="checkbox"/> Exploration <input type="checkbox"/> Dallas budget <input type="checkbox"/> Evaluation <input type="checkbox"/> Other _____ <input type="checkbox"/> Procedural audits						<input type="checkbox"/> Co-owner approval Signature _____ Company _____		<b>Approvals (check highest level req'd)</b> <input type="checkbox"/> District <input type="checkbox"/> Other <input type="checkbox"/> Regional <input type="checkbox"/> Senior vice-president				<b>Authorized expenditure limit table No.</b> _____ <input type="checkbox"/> Executive vice-president <input type="checkbox"/> President/Chairman <input type="checkbox"/> For Board of Directors			
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MartineRichfieldCompd.

# Drilling Cost Estimate - Page 2

Penzoil 24 State Com #1

## Data Processing Information

S. R. Keasler

3/25/80

Trans. ident.				
1	2	3	4	5
A	F	E	E	

A.E.E. number					
6	7	8	9	10	11

Update code  
1 - delete  
3 - add

Original revision indicator  
1 - Original  
2 - Revision

Drilling cost (continued)

	Dry hole	Completion costs	Detail code	Total gross dollars	Major account
			12 13 14	15 16 17 18 19 20 21 22	23 24 25 26
Foot, fresh water & drayage	30,000		5 4 9		
Drilling mud materials & drayage	20,000		5 5 1		
Drilling mud equipment	7,000		5 5 2		
Air compressor rental or gas cost			5 5 3		
Air or gas drig. accessories & drayage			5 5 4		
Open hole surveys	50,000		5 5 7		
Wireline recording services			5 5 8		
Wireline formation tester			5 5 9		
Mud log			5 6 0		
Cased hole surveys		8,000	5 6 1		
Perforating fees	(vann)	23,000	5 6 2		
Sidewall coring			5 6 3		
Conc. diamond XXXXXXXXXX 100 ft.	30,000		5 6 8		
Drill stem tests # 2	4,000		5 7 2		
X Acidize X Fracture gal. lbs		28,000	5 7 7		
Cement & fees for casing					
13-3/8" OD 1000 sacks	13,000				
" OD sacks					
8-5/8" OD 1500 sacks	18,000				
" OD sacks					
5-1/2" OD 2300 sacks		23,000			
" OD sacks					
Cement & fees for squeezes or plugs			5 7 9		
Fishing tool rental & drayage			5 8 0		
Directional drig. tool rental & drayage			5 8 1		
Operations - prorato			5 9 0		
Unleashed tool rental & drayage	3,000	2,000	5 8 7		
Unleashed drayage & supplies	2,000	1,000	5 9 4		
Unleashed services & material losses	2,000	2,000	5 8 9		
Overhead	1,000	1,000	5 9 2		
Supervision by contract personnel			1 0 5		
Supervision by A.R.C. personnel	9,000	2,000	1 0 6		
Intangibles					
Cost (casing, & intangibles)	488,000	118,000			
Subtotal well cost (dry hole & comp)	545,000	278,000			
	823,000				



# Drilling Program

Well: Permian 24 State Com #1

Date: 5/1/80

Location: Permian - West Area

660' FSL & 1980' FEL, Section 24, T-17-S, R-28-E, Eddy County, New Mexico

Project:

Morrow

formation

Depth

proved

10900

Contract footage

10900

Drywork depth

10900

Drilling program:

Surface casing

Position

Length

Cmt.

20" conductor pipe set @ 30'  
13.375" OD 8R STC 54.5# K-55

Cmt w/Redi-mix  
0-450

450

Circ

Protective string

6.625" OD 8R STC 28# S-80

0-3500

3500

Circ

String

6.5" OD 8R LTC 17# L-80

0-10900

10900

Circ

Loghead

13-3/8" X 12" - 900; 900 X 10" - 1500; 10" - 1500 X 6" - 1500

Stratified formation tops

Atoka

Bone Springs

3450

Strawn

9650

Dean

Dean

6280

Atoka

10150

Grayburg

Wolfcamp

7550

Morrow

10375

San Andres

Cisco

8800

Chester

10925

Drilling program

450  
50 - 3500  
500 - 10000  
6000 - TD

Spud mud dry drill w/fresh water if

10# Brine

Cut Brine

Brine polymer 9.2 - 9.5#/gal. Vis. 34 WL 8-10

Logs

R-Sonic

LC-CHL-CR

LL-MSFL

Upmeter

Surface to TD

TD - 3000'

TD - 3000'

Minimum run

ing

2 50' cores in Morrow Approximately 10,700 depth

ore priority

none

ill stem tests

1-Cisco, Strawn or Atoka

1-Morrow

amples

10- intervals from 3000'-TD

aid samples

2 qts - analyze locally

id logging

2 - man unit, 6400' to TD

evaluations

pe completion

Single gas well

mpletion equipment

2-3/8" tbg w/pkr

at (District Drilling Superintendent)

forced

Operations Manager

Date

Engineer

Date

Inspector (geology)

Date

checked

Manager

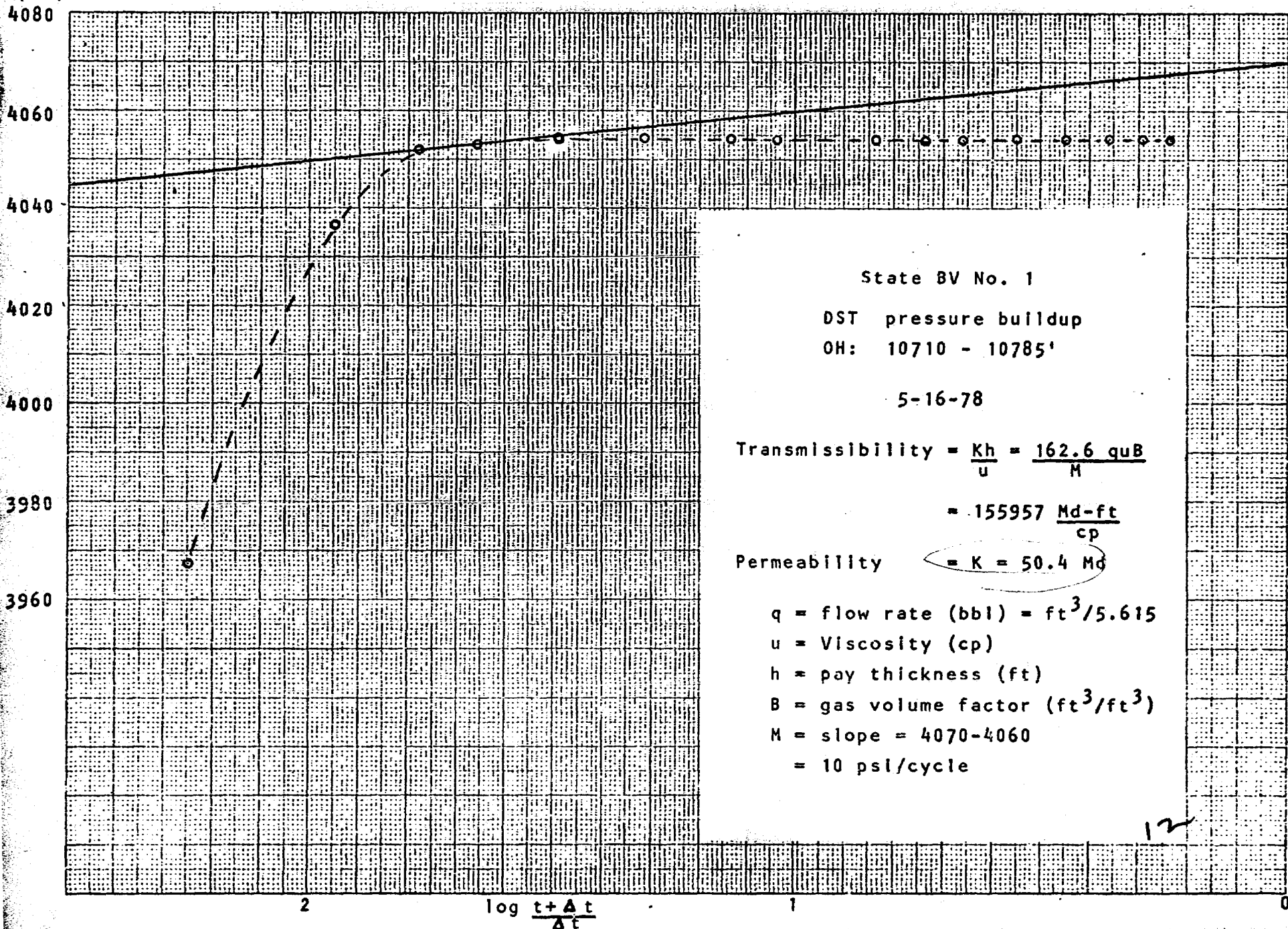
Date

RESERVOIR PRESSURE DATA

BV Channel

<u>Date</u>	<u>Well</u>	<u>Reservoir Pressure</u> <u>@ - 7025</u> <u>Psi</u>
11-25-74	ESDU No. 5	4293
6-19-78	St. BV No. 1	4037
3-5-79	St. BV. No. 1	3603
12-6-79	St. BV. No. 2	3171
12-19-79	St. BV No. 1	3154

Pressure  
(psi)



State BV No. 1

DST pressure buildup

OH: 10710 - 10785'

5-16-78

$$\text{Transmissibility} = \frac{Kh}{u} = \frac{162.6 \text{ quB}}{M}$$

$$= 155957 \frac{\text{Md-ft}}{\text{cp}}$$

$$\text{Permeability} = K = 50.4 \text{ Md}$$

$$q = \text{flow rate (bbl)} = \text{ft}^3 / 5.615$$

$$u = \text{Viscosity (cp)}$$

$$h = \text{pay thickness (ft)}$$

$$B = \text{gas volume factor (ft}^3/\text{ft}^3)$$

$$M = \text{slope} = 4070 - 4060$$

$$= 10 \text{ psi/cycle}$$

12

DOYLE HARTMAN  
Oil Operator  
SUITE 205  
C & K PETROLEUM BUILDING  
MIDLAND, TEXAS 79701  
(915) 604.4011

May 2, 1980

To: All Working Interest Owners  
(Address List Attached)

Re: South Empire State No. 1  
S/2 Section 24, T-17-S, R-28-E  
Eddy County, New Mexico

Gentlemen:

As mentioned in our previous letter to you dated April 18, 1980, we are enclosing two copies of AFE for our proposed South Empire State No. 1, located 660 FSL & 660 FWL Section 24, T-17-S, R-28-E, Eddy County, New Mexico. If this AFE meets with your approval, sign one copy and return it to this office. Upon receipt of a signed AFE, we will forward a Model-Form Operating Agreement. The second copy of the AFE may be retained for your files.

We are now in the process of scheduling a hearing before the full Commission of the New Mexico Oil Conservation Division in Santa Fe concerning our request for non-standard location of 660 FSL & 660 FWL Section 24. We will keep you informed on the progress of this hearing.

If you should have any further information in this regard, please let us hear from you.

Very truly yours,

*Doyle Hartman*  
Doyle Hartman

DH/mh

Enclosures as above

13  
RECEIVED

MAY 5 1980

ARCO OIL AND GAS CO.  
NORTH & WEST LAND DEPT.

ADDRESS LIST

Pennzoil Company  
P. O. Box 1828  
Midland, Texas 79702

Attention: Mr. Mike McCullough

Inexco Oil Company  
1100 Milam Building  
Suite 1900  
Houston, Texas 77002

Attention: Mr. William G. Goodwin

Maralo, Inc. and Mrs. Erma Lowe  
4600 Post Oak Place  
Suite 307  
Houston, Texas 77027

Attention: Mr. John Burke

Exxon Company, U.S.A.  
P. O. Box 1600  
Midland, Texas 79702

Attention: Mr. H. W. Hugly

Continental Oil Company  
P. O. Box 1959  
Midland, Texas 79702

Attention: Mr. David M. Goodfellow

Tenneco Oil Company  
6800 Park Ten Blvd.  
Suite 200 North  
San Antonio, Texas 78213

Attention: Mr. H. M. Hinze

Arco Oil and Gas Company  
P. O. Box 1610  
Midland, Texas 79702

Attention: Mr. Curt Krehbiel

# DETAIL WELL ESTIMATE

LEASE NO. LG-6340 APPR. NO. \_\_\_\_\_  
 LEASE NAME South Empire State WELL NO. 1 W. I. \_\_\_\_\_  
 COUNTY Eddy STATE New Mexico FIELD Empire Morrow, South  
 LOCATION: 660 FSL and 660 FHL Section 24, T-17-S, R-28-E

DRILLING INTANGIBLES:	PRODUCER	DRY HOLE
1. Drilling Cost _____ Feet @ _____ Per Foot		
2. Day Work <u>52 Days at \$5000./day</u>		
<u>Rig Mobilization \$73,000.</u>	<u>330,000</u>	<u>330,000</u>
3. Coring Service _____ Well Surveys _____	<u>25,000</u>	<u>25,000</u>
4. Testing _____	<u>5,000</u>	<u>5,000</u>
5. Fuel _____ Water _____		
6. Mud <u>and Water</u> Mud Logging _____	<u>26,000</u>	<u>26,000</u>
7. Cementing Service _____ Cement _____ Floats _____	<u>42,800</u>	<u>17,800</u>
8. Company Labor _____ Contract Labor _____	<u>12,000</u>	<u>1,200</u>
9. Digging Pits _____ Filling Pits _____	<u>12,000</u>	<u>12,000</u>
10. Roads & Bridges _____ Dredging & Grading _____	<u>12,000</u>	<u>12,000</u>
11. Acidizing _____ Fracturing _____ Perforating _____	<u>150,000</u>	<u>---</u>
12. Plugging _____	<u>8,500</u>	<u>8,000</u>
13. Trucking Cost _____	<u>2,500</u>	<u>2,500</u>
14. Development Superintendence <u>75</u> days @ <u>\$350.00 /day</u>	<u>26,250</u>	<u>18,200</u>
15. Rental Equipment _____	<u>23,000</u>	<u>18,000</u>
16. Swabbing and Testing <u>15 days at \$1,200.</u>	<u>18,000</u>	<u>---</u>
17. Other Costs <u>Bits</u>	<u>29,100</u>	<u>29,100</u>
<u>Contingence</u>	<u>30,350</u>	<u>15,200</u>
Total Intangibles	<u>750,000</u>	<u>520,000</u>

## WELL EQUIPMENT:

18. Casing <u>500</u> Ft. of <u>13 3/8</u> @ <u>23.368</u> Per Ft.		
<u>2,500</u> Ft. of <u>8 5/8</u> @ <u>11.853</u> Per Ft.		
<u>11,400</u> Ft. of <u>5 1/2</u> @ <u>12.764</u> Per Ft.	<u>186,826</u>	<u>41,317</u>
19. Tubing <u>11,400</u> Ft. of <u>2 7/8</u> @ <u>5.067</u> Per Ft.	<u>57,764</u>	
20. Casing Head _____	<u>6,000</u>	<u>6,000</u>
21. Xmas Tree or Pumping Connections _____	<u>39,000</u>	
22. Pumping Unit _____		

# DETAIL WELL ESTIMATE

LEASE NO. LG-6340 APPR. NO. \_\_\_\_\_  
 LEASE NAME South Empire State WELL NO. 1 W. I. \_\_\_\_\_  
 COUNTY Eddy STATE New Mexico FIELD Empire Morrow, South  
 LOCATION: 660 FSL and 660 FWL Section 24, T-17-S, R-28-E

## DRILLING INTANGIBLES:

	PRODUCER	DRY HOLE
1. Drilling Cost _____ Feet @ _____ Per Foot		
2. Day Work <u>52 Days at \$5000./day</u>		
<u>Rig Mobilization \$73,000.</u>	<u>330,000</u>	<u>330,000</u>
3. Coring Service _____ Well Surveys _____	<u>25,000</u>	<u>25,000</u>
4. Testing _____	<u>5,000</u>	<u>5,000</u>
5. Fuel _____ Water _____		
6. Mud <u>and Water</u> Mud Logging _____	<u>26,000</u>	<u>26,000</u>
7. Cementing Service _____ Cement _____ Floats _____	<u>42,800</u>	<u>17,800</u>
8. Company Labor _____ Contract Labor _____	<u>12,000</u>	<u>1,200</u>
9. Digging Pits _____ Filling Pits _____	<u>12,000</u>	<u>12,000</u>
10. Roads & Bridges _____ Dredging & Grading _____	<u>12,000</u>	<u>12,000</u>
11. Acidizing _____ Fracturing _____ Perforating _____	<u>150,000</u>	<u>---</u>
12. Plugging _____		<u>8,000</u>
13. Trucking Cost _____	<u>8,500</u>	<u>2,500</u>
14. Development Superintendence <u>75</u> days @ \$ <u>350.00</u> /day	<u>26,250</u>	<u>18,200</u>
15. Rental Equipment _____	<u>23,000</u>	<u>18,000</u>
16. Swabbing and Testing <u>15 days at \$1,200.</u>	<u>18,000</u>	<u>---</u>
17. Other Costs <u>Bits</u>	<u>29,100</u>	<u>29,100</u>
<u>Contingence</u>	<u>30,350</u>	<u>15,200</u>
Total Intangibles	<u>750,000</u>	<u>520,000</u>

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<u>2,500</u> Ft. of <u>8 5/8</u> @ <u>11.853</u> Per Ft.		
<u>11,400</u> Ft. of <u>5 1/2</u> @ <u>12.764</u> Per Ft.	<u>186,826</u>	<u>41,317</u>
19. Tubing <u>11,400</u> Ft. of <u>2 7/8</u> @ <u>5.067</u> Per Ft.	<u>57,764</u>	
20. Casing Head _____	<u>6,000</u>	<u>6,000</u>
21. Xmas Tree or Pumping Connections _____	<u>39,000</u>	
22. Pumping Unit _____		
23. Engine _____		
24. Sucker Rods _____		
25. Pump _____		
26. Tank Battery _____	<u>7,200</u>	
27. Separator or Dehydration Equip. _____	<u>32,000</u>	
28. Metering Equipment _____		
29. Flow Lines _____	<u>12,500</u>	
30. Other <u>Contingence</u>	<u>10,000</u>	
	<u>18,710</u>	<u>2,683</u>
Total Tangibles	<u>370,000</u>	<u>50,000</u>
TOTAL COST OF WELL	<u>1,120,000</u>	<u>570,000</u>

## REMARKS:

Originated by Larry A. Nemy Title Engineer Date April 30, 1980  
 Approved \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_



Wm Carr - Hartman

John B Draper - Arco

Tom Kellshin - Pennzoil

Lee Flower - Depco

JR Cortill - Husky

Hartman  
Amend location  
800 S 1000 W

Donald Wambough

Structure not Foster  
Channel Thru W/2

Chas. W. Holstrom

Bill Aycock

#10

Indicated Drainage  
300 acres

225 net acres under ARCO wells

1,120,000 well

Risk - \$800,000 look at pay  
200%

Drilling costs - \$3100

Prod " \$310

C-101 & 102 April 80

John Draper - ARCO

Steven Area

Geo. B. Schultz

Problems

1. No seismic marker
2. No
- 3.

Seismic inconclusive

Paul Lutzquist

James W. Johnston

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD  
COMPANY FOR COMPULSORY POOLING  
OF A MORROW GAS WELL IN SECTION 24,  
TOWNSHIP 17 SOUTH, RANGE 28 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO.



Case No. 6928

AMENDED APPLICATION

COMES NOW, ATLANTIC RICHFIELD COMPANY, by and through its attorneys, Montgomery & Andrews, P.A., and, as provided by Section 70-2-17, N.M.S.A. 1978, hereby makes application for an order pooling all of the mineral interest in the Pennsylvanian formation in and under the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico, and in support thereof would show the Commission:

1. Applicant is the owner of 6.25% of the working interest in and under the S/2 of Section 24, and applicant has the right to drill thereon.
2. Applicant proposes to dedicate the above-referenced pooled unit to a well to be drilled at an orthodox location 660 feet from the South and 1,980 feet from the East lines of said Section 24.
3. Application has sought either voluntary agreement for pooling or farmout from all other working interest owners in the S/2 of said Section 24 but has been unsuccessful in its efforts. The other working interest owners and their respective ownership interests are as follows:

Pennzoil Company	31.2500%
Doyle Hartman	31.2500%
Inexco Oil Company	26.3672%
Maralo, Inc.	.4883%
Mrs. Erma Lowe	.4883%
M. Ralph Lowe, Inc.	.9765%

Exxon Company, U.S.A. 1.9531%

Continental Oil Company .4883%

Tenneco Oil Company .4883%

4. Said pooling of interest and well completion will avoid the drilling of unnecessary wells, will prevent waste and will prevent correlative rights.

5. In order to permit the applicant to obtain its just and fair share of the oil and gas underlying the subject lands, the mineral interest should be pooled, and applicant should be designated the operator of the well to be drilled.

WHEREFORE, the applicant respectfully requests the Commission to:


1. Enter a compulsory pooling order pooling the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico, into a drilling and spacing unit for the Pennsylvanian formation.

2. Authorize the applicant to drill a well 660 feet from the South and 1,980 feet from the East lines in the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M.

3. Designate the applicant as the operator of said well and for any owner or owners who elect not to pay their proportionate share in advance, make provision for applicant to recover its costs of drilling, equipping and completing the well, its costs of supervision while drilling, and after completion, including overhead charges, and a risk factor for the risk assumed by the applicant in drilling, completing and equipping the well.

4. For such further relief as the Commission deems appropriate.

Respectfully submitted,  
MONTGOMERY & ANDREWS, P.A.

By   
John B. Draper  
P.O. Box 2307  
Santa Fe, New Mexico 87501

Attorneys for Applicant

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

RECEIVED  
JUN - 3 1980  
OIL CONSERVATION DIVISION  
SANTA FE

APPLICATION OF ATLANTIC RICHFIELD  
COMPANY FOR COMPULSORY POOLING  
OF A MORROW GAS WELL IN SECTION 24,  
TOWNSHIP 17 SOUTH, RANGE 28 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO.

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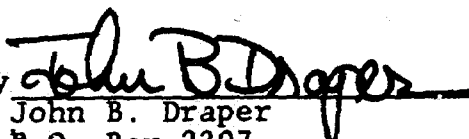
1. Enter a compulsory pooling order pooling the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico, into a drilling and spacing unit for the Pennsylvanian formation.

2. Authorize the applicant to drill a well 660 feet from the South and 1,980 feet from the East lines in the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M.

3. Designate the applicant as the operator of said well and for any owner or owners who elect not to pay their proportionate share in advance, make provision for applicant to recover its costs of drilling, equipping and completing the well, its costs of supervision while drilling, and after completion, including overhead charges, and a risk factor for the risk assumed by the applicant in drilling, completing and equipping the well.

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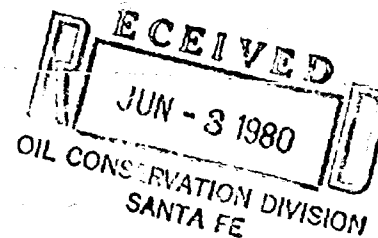
Respectfully submitted,  
MONTGOMERY & ANDREWS, P.A.

By   
John B. Draper  
P.O. Box 2307  
Santa Fe, New Mexico 87501

Attorneys for Applicant

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD  
COMPANY FOR COMPULSORY POOLING  
OF A MORROW GAS WELL IN SECTION 24,  
TOWNSHIP 17 SOUTH, RANGE 28 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO.



Case No. 6928

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2. Applicant proposes to dedicate the above-referenced pooled unit to a well to be drilled at an orthodox location 660 feet from the South and 1,980 feet from the East lines of said Section 24.
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WHEREFORE, the applicant respectfully requests the Commission to:

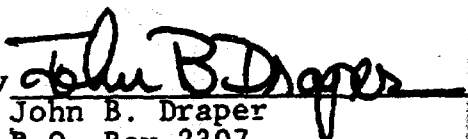
1. Enter a compulsory pooling order pooling the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico, into a drilling and spacing unit for the Pennsylvanian formation.

2. Authorize the applicant to drill a well 660 feet from the South and 1,980 feet from the East lines in the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M.

3. Designate the applicant as the operator of said well and for any owner or owners who elect not to pay their proportionate share in advance, make provision for applicant to recover its costs of drilling, equipping and completing the well, its costs of supervision while drilling, and after completion, including overhead charges, and a risk factor for the risk assumed by the applicant in drilling, completing and equipping the well.

4. For such further relief as the Commission deems appropriate.

Respectfully submitted,  
MONTGOMERY & ANDREWS, P.A.

By   
John B. Draper  
P.O. Box 2307  
Santa Fe, New Mexico 87501

Attorneys for Applicant

Docket No. 17-80

Dockets Nos. 19-80 and 20-80 are tentatively set for June 25 and July 9, 1980. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - THURSDAY - JUNE 5, 1980

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205  
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6927: Application of Doyle Hartman for compulsory pooling and an unorthodox location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the S/2 of Section 24, Township 17 South, Range 28 East, to be dedicated to a well to be drilled at an unorthodox location 660 feet from the South and West lines of said Section 24. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.

CASE 6928: Application of ARCO Oil and Gas Company 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 S/2 of Section 24, Township 17 South, Range 28 East, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.

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Docket No. 16-80

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 4, 1980

9 A.M. - OIL CONSERVATION DIVISION 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 6803: (Continued from April 23, 1980, Examiner Hearing)

In the matter of the hearing called by the Oil Conservation Division on its own motion to permit EPROC Associates, Hartford Accident and Indemnity Company, and all other interested parties to appear and show cause why its Monsanto State H Well No. 1 located in Unit E of Section 2, Township 30 North, Range 16 West, San Juan County, should not be plugged and abandoned in accordance with a Division-approved plugging program.

CASE 6906: Application of Amoco Production Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its South Mattix Unit Well No. 39 located in Unit G of Section 15, Township 24 South, Range 37 East, to produce oil from the Fowler-Upper Yeso and Fowler-Drinkard Pools thru parallel strings of tubing.

CASE 6907: Application of Amoco Production Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its Myers B Federal Well No. 28 located in Unit M of Section 9, Township 24 South, Range 37 East, to produce gas from the Jalmat and Langlie Mattix Pools thru parallel strings of tubing.

CASE 6908: Application of Estoril Producing Corporation for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its Curry State Well No. 1, a Pennsylvanian test to be drilled 660 feet from the North and East lines of Section 22, Township 23 South, Range 34 East, Antelope Ridge Field, the N/2 of said Section 22 to be dedicated to the well.

CASE 6909: Application of El Paso Natural Gas Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Basin-Dakota and Largo-Gallup production in the wellbore of its Rincon Unit Well No. 164 located in Unit L of Section 2, Township 26 North, Range 7 West.

CASE 6886: (Continued from May 21, 1980, Examiner Hearing)

Application of Aminoil USA, Inc. for compulsory pooling and an unorthodox location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp and Pennsylvanian formations underlying the S/2 of Section 10, Township 24 South, Range 28 East, to be dedicated to a well to be drilled at an unorthodox location 2080 feet from the South line and 1773 feet from the East line of said Section 10. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6910: Application of Grace Petroleum Corporation for four compulsory poolings, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Gallup formation underlying four 40-acre proration units, being the SE/4 NE/4, the SE/4 NW/4, and the NW/4 NW/4 of Section 28, and the SW/4 SE/4 of Section 29, all in Township 24 North, Range 7 West, each to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said wells and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the wells, and a charge for risk involved in drilling said wells.

CASE 6911: Application of Grace Petroleum Corporation for compulsory pooling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Gallup formation underlying the NE/4 NW/4 of Section 11, Township 23 North, Range 7 West, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.

CASE 6912: Application of Southland Royalty Company for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion of its State "14" Comm. Well No. 1 located in Unit E of Section 14, Township 19 South, Range 29 East, Turkey Track Field, to produce gas from the Morrow and Atoka formations thru tubing and the casing-tubing annulus, respectively

CASE 6913: Application of Kerr-McGee Corporation for an unorthodox well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its State F Well No. 14 to be drilled 1310 feet from the North line and 1330 feet from the West line of Section 2, Township 8 South, Range 33 East, Chaveroo-San Andres Pool.

CASE 6914: Application of Wilson Oil Company for a non-standard proration unit and unorthodox location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 320-acre non-standard gas proration unit comprising the S/2 of Section 29, Township 20 South, Range 36 East, North Osudo-Morrow Gas Pool, to be dedicated to its State JD Well No. 1 at an unorthodox location 1650 feet from the South line and 1980 feet from the West line of said Section 29.

CASE 6915: Application of Jake L. Hamon for a non-standard gas proration unit and an unorthodox well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 320-acre non-standard gas proration unit comprising the S/2 of Section 8, Township 20 South, Range 36 East, North Osudo-Morrow Gas Pool, to be dedicated to a well to be drilled at an unorthodox location 660 feet from the South line and 1980 feet from the West line of said Section 8.

CASE 6916: Application of Petro-Lewis Corporation for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of the Drinkard and Blinbry production in the wellbore of its State DC Well No. 1, a quadruple completion located in Unit F of Section 19, Township 21 South, Range 37 East.

CASE 6917: Application of Yates Petroleum Corporation for an NCPA determination, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks a new onshore reservoir determination for its Goat Roper "LP" Com. Well No. 1 located in Unit P of Section 30, Township 17 South, Range 26 East.

CASE 6918: Application of Yates Petroleum Corporation for downhole commingling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Upper Penn and Morrow gas production in the wellbore of its Kennedy "JQ" Com. Well No. 1 located in Unit H of Section 33, Township 17 South, Range 26 East, Kennedy Farms Field.

CASE 6919: Application of Yates Petroleum Corporation for downhole commingling or consolidation of two pools, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Wolfcamp and Penn gas production in the wellbore of its Anderson State "CS" Com. Well No. 1-Y located in Unit G of Section 14, and its Fordinkus State "HZ" Com. Well No. 1 located in Unit G of Section 22, both in Township 18 South, Range 24 East, or, in the alternative, the consolidation of the Fordinkus-Cisco Gas Pool and the Penasco Draw Permo-Penn Gas Pool into one Permo-Penn gas pool to include the above-described wells.

**CASE 6920:** Application of Yates Petroleum Corporation for a dual completion and unorthodox well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its 5 Mile Draw Federal Well No. 1 to produce from the Pennsylvanian and Abo formations thru the tubing and casing-tubing annulus, respectively; applicant also seeks approval for the unorthodox location of said well in the Abo formation 800 feet from the South line and 2100 feet from the East line of Section 34, Township 6 South, Range 25 East, the SE/4 of the section to be dedicated to the well.

**CASE 6903:** (Continued from May 21, 1980, Examiner Hearing)

Application of Harvey E. Yates Company for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a Pennsylvanian-Mississippian test well to be drilled 660 feet from the South line and 990 feet from the East line of Section 33, Township 13 South, Range 36 East, the S/2 of said Section 33 to be dedicated to the well.

**CASE 6904:** (Continued from May 21, 1980, Examiner Hearing)

Application of Harvey E. Yates Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the McDonald Unit Area, comprising 1,440 acres, more or less, of fee lands in Townships 13 and 14 South, Range 36 East.

**CASE 6921:** Application of Harvey E. Yates Company for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp-Mississippian formations underlying the S/2 of Section 33, Township 13 South, Range 36 East, to be dedicated to a well to be drilled at an unorthodox location 660 feet from the South and East lines of Section 33. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.

**CASE 6922:** Application of Harvey E. Yates Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp-Pennsylvanian formations underlying the E/2 of Section 24, Township 18 South, Range 28 East, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well.

**CASE 6923:** Application of Harvey E. Yates Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the Cayton-Austin Unit Area, comprising 960 acres, more or less, of State and fee lands in Township 14 South, Range 36 East.

**CASE 6924:** Application of Caribou Four Corners, Inc. for two unorthodox oil well locations, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of two wells to be drilled, the first being 860 feet from the North line and 2090 feet from the West line, and the second being 910 feet from the North line and 395 feet from the West line, both in Section 13, Township 29 North, Range 15 West, Cha Cha-Gallup Oil Pool, the E/2 and the W/2, respectively, of the NW/4 of said Section 13 to be dedicated to the wells.

**CASE 6925:** Application of Caribou Four Corners, Inc. for two exceptions to Rule 306, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 306 of the Division Rules and Regulations to permit the permanent flaring of gas from its Kirtland Wells Nos. 1 and 2, located in Units A and B, respectively, of Section 13, Township 29 North, Range 15 West.

**CASE 6889:** (Readvertised)

Application of Belco Petroleum Corporation for directional drilling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to directionally drill a well, the surface location of which is 1980 feet from the North line and 920 feet from the West line of Section 36, Township 22 South, Range 30 East, in such a manner as to bottom it at an unorthodox location within 660 feet of a point 1320 feet from the North line and 2640 feet from the West line of said Section 36 in the Morrow formation, the N/2 of said Section 36 to be dedicated to the well.

**CASE 6896:** (Continued from May 21, 1980, Examiner Hearing)

Application of John E. Schalk for a non-standard gas proration unit and an unorthodox gas well location, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 160-acre non-standard Blanco Mesaverde gas proration unit comprising the NE/4 of Section 8, Township 25 North, Range 3 West, to be dedicated to his Gulf Well No. 2 to be drilled at an unorthodox location 1925 feet from the North line and 790 feet from the East line of said Section 8.

**CASE 6926:** In the matter of the hearing called by the Oil Conservation Division on its own motion for an order creating, contracting vertical limits, and extending horizontal limits of certain pools in Chaves, Eddy, and Lea Counties, New Mexico:

(a) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for Pennsylvanian production and designated as the Arkansas Junction-Pennsylvanian Pool. The discovery well is Rex Alcorn Bobbi Well No. 1Y located in Unit J of Section 20, Township 18 South, Range 36 East, NMPM. Said pool would comprise:

TOWNSHIP 18 SOUTH, RANGE 36 EAST, NMPM  
Section 20: SE/4

(b) CREATE a new pool in Eddy County, New Mexico, classified as an oil pool for Delaware production and designated as the Avalon-Delaware Pool. The discovery well is MWJ Producing Company State GW Well No. 1 located in Unit K of Section 36, Township 20 South, Range 27 East, NMPM. Said pool would comprise:

TOWNSHIP 20 SOUTH, RANGE 27 EAST, NMPM  
Section 36: SW/4

(c) CREATE a new pool in Eddy County, New Mexico, classified as an oil pool for Delaware production and designated as the East Burton-Delaware Pool. The discovery well is J. C. Williamson TOG Federal Well No. 1 located in Unit F of Section 16, Township 20 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 20 SOUTH, RANGE 29 EAST, NMPM  
Section 16: NW/4

(d) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Strawn production and designated as the Dog Canyon-Strawn Gas Pool. The discovery well is Harvey E. Yates Company Gates Federal Deep Well No. 1 located in Unit P of Section 6, Township 17 South, Range 28 East, NMPM. Said pool would comprise:

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM  
Section 6: S/2

(e) CREATE a new pool in Chaves County, New Mexico, classified as an oil pool for San Andres production and designated as the South Double L-San Andres Pool. The discovery well is McClellan Oil Corporation Mark Federal Well No. 1 located in Unit I of Section 30, Township 15 South, Range 30 East, NMPM. Said pool would comprise:

TOWNSHIP 15 SOUTH, RANGE 30 EAST, NMPM  
Section 30: SE/4

(f) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Grayburg production and designated as the Empire-Grayburg Gas Pool. The discovery well is Carl A. Schellinger West Federal Well No. 1 located in Unit G of Section 14, Township 17 South, Range 27 East, NMPM. Said pool would comprise:

TOWNSHIP 17 SOUTH, RANGE 27 EAST, NMPM  
Section 14: NE/4

(g) CREATE a new pool in Lea County, New Mexico, classified as a gas pool for Morrow production and designated as the North Hume-Morrow Gas Pool. The discovery well is Bass Enterprises Production Company Bass 36 State Well No. 1 located in Unit E of Section 36, Township 15 South, Range 34 East, NMPM. Said pool would comprise:

TOWNSHIP 15 SOUTH, RANGE 34 EAST, NMPM  
Section 36: W/2

(h) CREATE a new pool in Lea County, New Mexico, classified as a gas pool for Atoka production and designated as the Lusk-Atoka Gas Pool. The discovery well is Phillips Petroleum Company Lusk Deep Unit A Com Well No. 13 located in Unit K of Section 18, Township 19 South, Range 32 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM  
Section 18: S/2

Docket No. 16-80

(i) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Morrow production and designated as the Milepost-Morrow Gas Pool. The discovery well is Exxon Corporation Scheidt Federal Well No. 1 located in Unit L of Section 30, Township 26 South, Range 26 East, NMPM. Said pool would comprise:

TOWNSHIP 26 SOUTH, RANGE 25 EAST, NMPM  
Section 36: N/2 N/2 and Lots 1, 2,  
3, and 4

TOWNSHIP 26 SOUTH, RANGE 26 EAST, NMPM  
Section 30: S/2  
Section 31: N/2 NW/4 and Lots 3 and 4

(j) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Atoka production and designated as the Turkey Track-Atoka Gas Pool. The discovery well is Tenneco Oil Company State HL 11 Well No. 1 located in Unit N of Section 11, Township 19 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM  
Section 10: E/2  
Section 11: S/2

(k) CONTRACT the vertical limits of the East Grama Ridge-Bone Springs Pool to the interval from 10,472 feet to 10,900 feet as found on the type log for the Getty Oil Company State 35 Well No. 1 located in Unit K of Section 35, Township 21 South, Range 34 East, NMPM, and redesignate said pool as the East Grama Ridge-Lower Bone Springs Pool.

(l) EXTEND the Airstrip-Upper Bone Springs Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 34 EAST, NMPM  
Section 25: W/2 SW/4  
Section 26: SE/4

(m) EXTEND the Atoka-Yesc Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM  
Section 33: NW/4 and N/2 S/2

(n) EXTEND the Brunson-Fusselman Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM  
Section 8: SE/4

(o) EXTEND the Buckeye-Abo Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM  
Section 9: NW/4

(p) EXTEND the Burton Flat-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 26 EAST, NMPM  
Section 13: W/2  
Section 14: E/2

(q) EXTEND the Catclaw Draw-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 26 EAST, NMPM  
Section 34: S/2

TOWNSHIP 21 SOUTH, RANGE 25 EAST, NMPM  
Section 2: Lots 1 through 8

(r) EXTEND the Chaveroo-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 7 SOUTH, RANGE 32 EAST, NMPM  
Section 34: NE/4

TOWNSHIP 8 SOUTH, RANGE 32 EAST, NMPM  
Section 3: SW/4

- (a) EXTEND the Cinta Roja-Morrow Gas Pool in Lea County, New Mexico, to include therein:  
TOWNSHIP 24 SOUTH, RANGE 35 EAST, NMPM  
Section 4: All
- (c) EXTEND the South Corbin-Strawn Pool in Lea County, New Mexico, to include therein:  
TOWNSHIP 18 SOUTH, RANGE 33 EAST, NMPM  
Section 29: N/2  
Section 30: N/2
- (u) EXTEND the South Corbin-Wolfcamp Pool in Lea County, New Mexico, to include therein:  
TOWNSHIP 18 SOUTH, RANGE 33 EAST, NMPM  
Section 28: W/2
- (v) EXTEND the Crooked Creek-Morrow Gas Pool in Eddy County, New Mexico, to include therein:  
TOWNSHIP 24 SOUTH, RANGE 24 EAST, NMPM  
Section 8: S/2
- (w) EXTEND the South Empire-Morrow Gas Pool in Eddy County, New Mexico, to include therein:  
TOWNSHIP 18 SOUTH, RANGE 29 EAST, NMPM  
Section 17: All
- (x) EXTEND the East Grama Ridge-Morrow Gas Pool in Lea County, New Mexico, to include therein:  
TOWNSHIP 22 SOUTH, RANGE 34 EAST, NMPM  
Section 12: W/2
- (y) EXTEND the Hat Mesa-Morrow Gas Pool in Lea County, New Mexico, to include therein:  
TOWNSHIP 21 SOUTH, RANGE 32 EAST, NMPM  
Section 10: W/2
- (z) EXTEND the Henshaw Queen-Grayburg-San Andres Pool in Eddy County, New Mexico, to include therein:  
TOWNSHIP 16 SOUTH, RANGE 30 EAST, NMPM  
Section 11: SW/4 SW/4  
Section 14: S/2 and W/2 NW/4  
Section 15: E/2 SE/4
- (aa) EXTEND the Hobbs-Drinkard Pool in Lea County, New Mexico, to include therein:  
TOWNSHIP 19 SOUTH, RANGE 38 EAST, NMPM  
Section 4: SE/4
- (bb) EXTEND the Indian Plats-Delaware Pool in Eddy County, New Mexico, to include therein:  
TOWNSHIP 22 SOUTH, RANGE 28 EAST, NMPM  
Section 2: N/2 NE/4
- (cc) EXTEND the South Kemnitz Atoka-Morrow Gas Pool in Lea County, New Mexico, to include therein:  
TOWNSHIP 16 SOUTH, RANGE 34 EAST, NMPM  
Section 29: W/2
- (dd) EXTEND the Logan Draw-San Andres Pool in Eddy County, New Mexico, to include therein:  
TOWNSHIP 17 SOUTH, RANGE 27 EAST, NMPM  
Section 19: N/2 NE/4 and SE/4 NE/4
- (ee) EXTEND the Middle Lynch Yates-Seven Rivers Pool in Lea County, New Mexico, to include therein:  
TOWNSHIP 20 SOUTH, RANGE 34 EAST, NMPM  
Section 21: E/2 SW/4

(ff) EXTEND the Penasco Draw San Andres-Yeso Associated Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 25 EAST, NMPM  
Section 31: SW/4

(gg) EXTEND the East Red Lake Queen-Grayburg Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 16 SOUTH, RANGE 28 EAST, NMPM  
Section 25: S/2 S/2  
Section 26: S/2 SE/4 and SE/4 SW/4  
Section 36: N/2 NW/4

(hh) EXTEND the North Shugart-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 31 EAST, NMPM  
Section 17: S/2

(ii) EXTEND the Tomahawk-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 7 SOUTH, RANGE 31 EAST, NMPM  
Section 25: SE/4

(jj) EXTEND the Turkey Track Seven Rivers-Queen-Grayburg Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM  
Section 9: E/2 NE/4

(kk) EXTEND the North Vacuum-Abo Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM  
Section 17: NW/4

(ll) EXTEND the Winchester-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 28 EAST, NMPM  
Section 3: All

(mm) EXTEND the Winchester-Upper Pennsylvanian Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM  
Section 30: W/2

\*\*\*\*\*  
Docket No. 18-80

DOCKET: EXAMINER HEARING - THURSDAY - JUNE 19, 1980

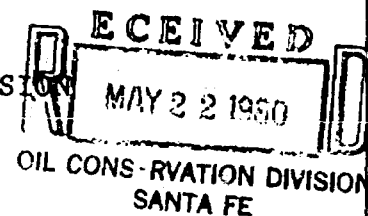
9 A.M. - OIL CONSERVATION DIVISION CONFERENCE ROOM,  
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

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 July, 1980, from fifteen prorated pools in Lea, Eddy, and Chaves Counties, New Mexico.
  - (2) Consideration of the allowable production of gas for July, 1980, from four prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.



BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO



APPLICATION OF ATLANTIC RICHFIELD  
COMPANY FOR COMPULSORY POOLING  
OF A MORROW GAS WELL IN SECTION 24,  
TOWNSHIP 17 SOUTH, RANGE 28 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO.

Case No. 6928

APPLICATION

COMES NOW, ATLANTIC RICHFIELD COMPANY, by and through its attorneys, Montgomery & Andrews, P.A., and, as provided by Section 70-2-17, N.M.S.A. 1978, hereby makes application for an order pooling all of the mineral interests in the Pennsylvanian formation in and under the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico, and in support thereof would show the Commission:

1. Applicant is the owner of 6.25% of the working interest in and under the S/2 of Section 24, and applicant has the right to drill thereon.

2. Applicant proposes to dedicate the above-referenced pooled unit to a well to be drilled at an orthodox location 660 feet from the South and 1,980 feet from the East line of said Section 24.

3. Applicant has sought either voluntary agreement for pooling or farmout from all other working interest owners in the S/2 of said Section 24 but has been unsuccessful in its efforts. The other working interest owners and their respective ownership interest is as follows:

Pennzoil Company	31.2500%
Inexco Oil Company	26.3672%
Maralo, Inc.	.4883%
Mrs. Erma Lowe	.4883%
M. Ralph Lowe, Inc.	.9765%

Exxon Company, U.S.A.	1.9531%
Continental Oil Company	.4883%
Tenneco Oil Company	.4883%

4. Said pooling of interest and well completion will avoid the drilling of unnecessary wells, will prevent waste and will protect correlative rights.

5. In order to permit the applicant to obtain its just and fair share of the oil and gas underlying the subject lands, the mineral interest should be pooled, and applicant should be designated the operator of the well to be drilled.

WHEREFORE, the applicant respectfully requests the Commission to:

1. Enter a compulsory pooling order pooling the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico, into a drilling and spacing unit for the Pennsylvanian formation.

2. Authorize the applicant to drill a well 660 feet from the South and 1,980 feet from the East line in the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M.

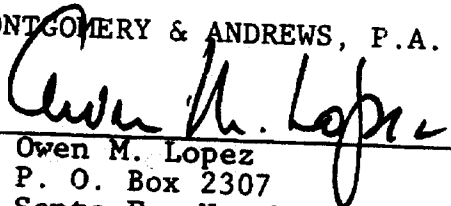
3. Designate the applicant as the operator of said well and for any owner or owners who elect not to pay their proportionate share in advance, make provision for applicant to recover its costs of drilling, equipping and completing the well, its costs of supervision while drilling, and after completion, including overhead charges, and a risk factor for the risk assumed by the applicant in drilling, completing and equipping the well.

4. For such further relief as the Commission deems appropriate.

Respectfully submitted,

MONTGOMERY & ANDREWS, P.A.

By

  
Owen M. Lopez  
P. O. Box 2307  
Santa Fe, New Mexico 87501

Attorneys for Applicant

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO



APPLICATION OF ATLANTIC RICHFIELD  
COMPANY FOR COMPULSORY POOLING  
OF A MORROW GAS WELL IN SECTION 24,  
TOWNSHIP 17 SOUTH, RANGE 28 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO.

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Continental Oil Company	.4883%
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WHEREFORE, the applicant respectfully requests the Commission to:

1. Enter a compulsory pooling order pooling the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico, into a drilling and spacing unit for the Pennsylvanian formation.

2. Authorize the applicant to drill a well 660 feet from the South and 1,980 feet from the East line in the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M.

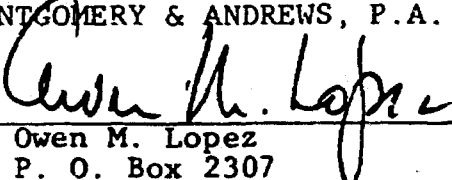
3. Designate the applicant as the operator of said well and for any owner or owners who elect not to pay their proportionate share in advance, make provision for applicant to recover its costs of drilling, equipping and completing the well, its costs of supervision while drilling, and after completion, including overhead charges, and a risk factor for the risk assumed by the applicant in drilling, completing and equipping the well.

4. For such further relief as the Commission deems appropriate.

Respectfully submitted,

MONTGOMERY & ANDREWS, P.A.

By

  
Owen M. Lopez  
P. O. Box 2307  
Santa Fe, New Mexico 87501

Attorneys for Applicant

# Memo

*From*

FLORENE DAVIDSON  
ADMINISTRATIVE SECRETARY

*To* Called in by Doug Lunsford  
5/14/80

ARCO Oil & Gas Co.

Compulsory Pooling

5/2 24-175-28E

Eddy County

Pennsylvanian formation

66015 + 1980/E

OIL CONSERVATION COMMISSION-SANTA FE

WORKING INTEREST OWNERS - PROPOSED PENNZOIL  
24 State Com #1

<u>PARTY AND ADDRESS</u>	<u>ACRES</u>	<u>INTEREST</u>
ARCO Oil and Gas Company P. O. Box 1610 Midland, Texas 79702	20.0000	6.2500%
Doyle Hartman 508 C & K Petroleum Building Midland, Texas 79701	100.0000	31.2500%
Pennzoil Company P. O. Drawer 1828 Midland, Texas 79702	100.0000	31.2500%
Inexco Oil Company 1100 Milam Building, Suite 1900 Houston, Texas 77002	84.3750	26.3672%
Exxon Company, U.S.A. P. O. Box 1600 Midland, Texas 79702	6.2500	1.9531%
M. Ralph Lowe, Inc. Erma Lowe Maralo Inc. c/o Maralo Inc. 4600 Post Oak Place Suite 307 Houston, Texas 77027	3.1250 1.5625 1.5625	.9765% .4883% .4883%
Continental Oil Company P. O. Box 1959 Midland, Texas 79702	1.5625	.4883%
Tenneco Oil Company 6800 Park Ten Blvd. Suite 200 North San Antonio, Texas 78213	1.5625	.4883%
	<hr/> 320.0000	<hr/> 100.0000%

Arco Ex 2

ARCO Oil and Gas Company  
Permian ( )  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0130  
Curt Krehbiel  
District Landman



December 13, 1979

Pennzoil Company  
ATTENTION: Mr. Ken Medlock  
Box 1828  
Midland, Texas 79702

Subject: Farmout Request  
Eddy County, New Mexico

Gentlemen:

Pennzoil as operator drilled a Morrow test in the S/2 of Section 24, T-17-S, R-28-E, Eddy County, New Mexico, which was completed as a dry hole. We understand that 40 acres of this 320 acre spacing unit has since expired. ARCO Oil and Gas Company is willing to drill another Morrow test on this spacing unit if Pennzoil and the other non-operating parties will agree to permit ARCO to earn all of their leasehold interest subject to the retention of the difference between existing burdens and 20% in order for ARCO to have an 80% net revenue interest during payout of such well. At payout Pennzoil and each other party would have the option to convert its overriding royalty interest to a 50% working interest.


We will appreciate your causing this proposal to be considered by the present owners of the remaining 280 acres in the S/2 of Section 24. Your early attention to this proposal is requested as we could conceivably commence this well as early as February 1980.

Yours very truly,

Curt Krehbiel

CK:bk

Arco Ex

 **PENNZOIL COMPANY**

POST OFFICE DRAWER 1828 • MIDLAND, TEXAS 79702 • (915) 682-7316

January 7, 1980

RECEIVED  
JAN 8

ATLANTIC RICHFIELD COMPANY  
LAND DEPT.

TO: ALL CO-OWNERS  
(Address List Attached)

Re: ARCO Farmout Request  
Aid Field  
Eddy County, New Mexico  
S/2 Section 24, T-17-S,  
R-28-E

Gentlemen:

Enclosed is a copy of farmout request dated December 13, 1979, from ARCO, whereby they propose to farmout our interest in the S/2 Section 24, T-17-S, R-28-E on a net 70% revenue interest basis to a 50% back-in, towards the drilling of a Morrow test on the same proration unit on which we drilled our Aid "24" State Comm #1.

Our combined interest in the proposed unit is based on our operating agreement dated November 9, 1970, covering the Aid State #1, which we calculate to be the interest shown opposite your name.

The NW/4 SW/4 Section 24 has expired and will be up on the next New Mexico State Sale.

We are evaluating this request and will advise you of our decision and would appreciate it if you would advise us of your position in this regard as soon as possible.

Very truly yours,

  
Kenneth Medlock  
Landman

KM/mlm  
Encl.

cc: ARCO Oil & Gas Co. 4100 West 10th  
P. O. Box 1610  
Midland, Texas 79702  
Attention: Mr. Curt Krehbiel

Arco Ex 4



DOYLE HARTMAN

Oil Operator

SUITE 508

C & K PETROLEUM BUILDING  
MIDLAND, TEXAS 79701

(915) 684-4011

February 13, 1980

All Owners  
(Address List Attached)

Re: S/2 Section 24,  
T-19-S, R-28-E  
(Pennzoil Aid-State No. 1)

Gentlemen:

Please refer to recent correspondence from Arco Oil and Gas Company proposing a farmout covering the above noted Morrow tract.

We are the owners of the S/2 SW/4 of Section 24 which constitutes 25% of the above noted 320-acre tract and believe from various conversations with some of the interested parties in this matter that the location for any future Morrow well on this tract would be in W/2 SW/4 Section 24.

We have also checked with our lawyer in Santa Fe who handles all our New Mexico Oil Conservation Division work who advises as follows:

1. A well in W/2 SW/4 of Section 24 would be situated at a non-standard location under NMOCD rules.
2. Approval for this location could be obtained by receiving written waivers from the offset operators or at a NMOCD hearing.

If Arco (operator of the offset acreage to the south) refused to grant a waiver and/or opposed this non-standard location at the hearing, approval from the NMOCD would provide for a severe penalty in the form of a highly restricted allowable for the new well. The allowable would be based on a pipeline deliverability test to be performed after completion of the well with the actual allowable to be 25% to 50% of the actual test results.

This presents a serious problem for us as owners of the S/2 SW/4 of Section 24 (which appears to constitute a significant portion of the recoverable gas reserves in the S/2 of Section 24) since the offsetting Arco BV State No. 1 and 2 in Section 25, T-19-S, R-28-E, are non-prorated wells.

Arco Ex 5

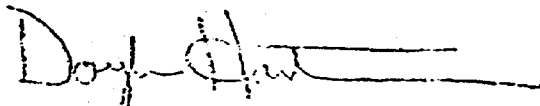
February 13, 1980  
Page 2

As you can see, the non-prorated wells will severely drain a prorated well drilled at the above noted non-standard location. Based on the foregoing, it appears to us that a decision by the working interest owners in the S/2 Section 24 regarding drilling or farming out is subject to considerations other than simply purely geologic merit.

It is our opinion that it is critical, in order to eliminate any possible opposition to a location in the W/2 SW/4 of Section 24, that Arco receive enough additional interest (by way of a farmout) so that it will agree to drill the well and be the operator.

We urge all parties to reach a decision in this matter as soon as at all possible due to the possible extreme drainage that could be occurring from the producing wells to the south.

Very truly yours,

  
Doyle Hartman

DH/mh  
Enclosure

DOYLE HARTMAN  
Oil Operator  
SUITE 503  
C & K PETROLEUM BUILDING  
MIDLAND, TEXAS 79701

(915) 684-4011

April 18, 1980

RECEIVED

APR 21 1980

ARCO OIL AND GAS CO.  
NORTH & WEST LAND DEPT.

To: All Working Interest Owners  
(Address List Attached)

Re: Doyle Hartman No. 1  
South Empire State,  
S/2 Section 24, T-17-S, R-28-E  
Eddy County, New Mexico

Gentlemen:

Reference is made to various correspondence over the past several months regarding the drilling of a 11,000 foot Morrow well on the above described tract.

From various conversations with the larger owners in the subject tract this week, it has become apparent that the drilling of this well is being delayed, which appears to be contrary to the best interests of all concerned.

We own 100 net acres in the S/2 of Section 24 and have paid a considerable amount of money for these leases. Furthermore, we have also participated in an expensive dry hole which has been very valuable in further defining this prospect.

In our opinion, we are dealing with a narrow, but prolific Morrow channel sand crossing a portion of the W/2 of Section 24 and the E/2 of Section 23. Therefore, in order to maximize the potential of our leasehold interests as well as protect the interests of our royalty owners, we propose the following:

- (1) We are currently staking an 11,000-foot Morrow well to be drilled at a location of 660' FSL and 660' FWL Section 24 and will file the necessary New Mexico Oil Conservation Division forms as soon as the surveyors plats are available.
- (2) We respectfully request that all working interest owners agree to one of the following alternatives:
  - (a) Participate in the proposed well under a Model-Form Operating Agreement naming the undersigned as operator. AFE and Operating Agreement will be furnished as soon

cc: Tronard  
Sullivan  
Laughlin

Hartman wants to check  
leaving for lat. May 20 & 6

( (

Working Interest Owners  
April 18, 1980  
Page 2

as possible; or,

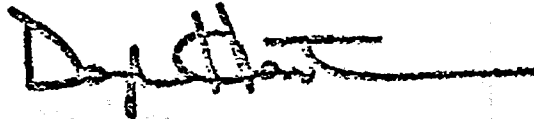
- (b) Farmout your interest while retaining a gross 30% of 8/8 override absorbing all present royalty out of the override so operator would be assigned a 70% net revenue interest.

At payout, each party to have the option of converting its net part of the override to a 50% working interest. All interests subject to proportionate reduction.

Rights earned limited to 100' below total depth drilled.

Due to the considerable amount of time that has already elapsed in getting this well started, please advise as soon as at all possible regarding your decision to participate or farmout as well as your comments concerning our proposed plan of development including proration unit and location.

Very truly yours,



Doyle Hartman

DH/mh

Address list attached

May 2, 1980

WORKING INTEREST OWNERS ADDRESS LIST ATTACHED

Subject: ARCO Oil and Gas Company  
Pennzoil 24 State Com #1 Well  
S/2 Section 24, T-17-S, R-28-E  
Eddy County, New Mexico  
NM-4488

Gentlemen:

By letter dated December 13, 1979, to Pennzoil Company, ARCO proposed drilling the subject well and asked that you consider farming out. We are presently enclosing two copies of an Operating Agreement and AFE for your further consideration. We will appreciate those wishing to join signing and returning one copy each of the AFE and JOA. Those wishing to farmout need sign and return only a copy of the JOA. An Exhibit "A" showing the interests of the parties will be prepared and forwarded with copies of other parties' execution pages to complete your files. The agreement will be limited to rights below 2300' beneath the surface to the base of the Morrow formation. The farmout terms will provide for the farming out party to retain a 30% override out of which will be borne existing royalties and overrides with the option to convert the net portion of the retained override to a 50% working interest after payout, all subject to proportionate reduction.

After writing the December 13, 1979 letter, ARCO was advised by letter dated February 14, 1980, that Pennzoil had elected to farmout on the terms offered. By letter dated February 22, John Burke advised that the Lowe interests would participate in drilling the well rather than farming out. By copy of letter dated March 18, we were advised that Exxon was planning to drill in the E/2 of Section 23 and would prefer not to make a decision with regard to our well proposal until their well was completed. By letter dated March 20, Tenneco advised that it would prefer to participate subject to final management approval of the terms of any JOA and AFE. On March 25, Les Tacconi with Inexco advised by telephone that Inexco would prefer not to decide whether to join or farmout until the Exxon well in Section 23 was completed. In view of the position taken by Exxon and Inexco, ARCO was willing to defer its proposed well until the Exxon well was completed. By letter dated April 18, however, Doyle Hartman

*Arco Ex 7*

Page 2

entered the picture and proposed a well on the same spacing unit but at an unorthodox location in the SW/4 of the SW/4. We understand he is trying to schedule a hearing this month before the New Mexico Oil and Gas Conservation Commission regarding the unorthodox location and the forced pooling of all interests in the S/2 of Section 24. ARCO intends to oppose the unorthodox location and continue with its plans to drill at the orthodox location in the SE/4 regardless of the outcome of the Exxon well in Section 23.

We are also attaching a schedule showing the interests of the parties in the S/2 of Section 24. ARCO's interest in this well including the farmout from Pennzoil is 37.50%. Should Inexco also elect to farmout, ARCO's interest will increase to 63.87%. A provision covering the farmout and rights to be earned will be included in the Exhibit "A" yet to be prepared.

We will appreciate your early attention to the execution and return of the enclosed JOA and AFE.

Yours very truly,

  
Curt Krehbiel

CK:bk

Enclosures

<u>PARTY AND ADDRESS</u>	<u>ACRES</u>	<u>INTEREST</u>
ARCO Oil and Gas Company P. O. Box 1610 Midland, Texas 79702	20.0000	6.2500%
Doyle Hartman 508 C & K Petroleum Building Midland, Texas 79701	100.0000	31.2500%
Pennzoil Company P. O. Drawer 1828 Midland, Texas 79702	100.0000	31.2500%
Inexco Oil Company 1100 Milam Building, Suite 1900 Houston, Texas 77002	84.3750	26.3672%
Exxon Company, U.S.A. P. O. Box 1600 Midland, Texas 79702	6.2500	1.9531%
M. Ralph Lowe, Inc. Erma Lowe Maralo Inc. c/o Maralo Inc. 4600 Post Oak Place Suite 307 Houston, Texas 77027	3.1250 1.5625 1.5625	.9765% .4883% .4883%
Continental Oil Company P. O. Box 1959 Midland, Texas 79702	1.5625	.4883%
Tenneco Oil Company 6800 Park Ten Blvd. Suite 200 North San Antonio, Texas 78213	1.5625	.4883%
	<hr/> 320.0000	<hr/> 100.0000%

Pennzoil Company  
ATTENTION: Kenneth Medlock  
P. O. Drawer 1828  
Midland, Texas 79702

Inexco Oil Company  
ATTENTION: William G. Goodwin  
1100 Milam Building, Suite 1900  
Houston, Texas 77002

Doyle Hartman  
508 C & K Petroleum Building  
Midland, Texas 79701

Exxon Company, U.S.A.  
ATTENTION: H. W. Hugly  
P. O. Box 1600  
Midland, Texas 79702

M. Ralph Lowe, Inc.  
Erma Lowe  
Maralo Inc. ATTENTION: John R. Burke  
c/o Maralo Inc.  
4600 Post Oak Place  
Suite 307  
Houston, Texas 77027

Continental Oil Company  
ATTENTION: David M. Goodfellow  
P. O. Box 1959  
Midland, Texas 79702

Tenneco Oil Company  
ATTENTION: Steve D. King  
6800 Park Ten Blvd.  
Suite 200 North  
San Antonio, Texas 78213



### Authorization for Expenditure

<b>Title</b> Penzoil 24 State Com #1: Drill & Equip						<input checked="" type="checkbox"/> Original authorization <input type="checkbox"/> Revision number																																																																																													
<b>Location</b> 660' FSL & 1980' FEL, Sec. 24, T-17-S, R-28-E, Eddy Co., New Mexico																																																																																																			
<b>APPR TD 10,900 OBJ Form No.</b> Purpose of authorization <input checked="" type="checkbox"/> Drilling - New <input type="checkbox"/> Recompletion <input type="checkbox"/> Workover <input type="checkbox"/> Other <input type="checkbox"/> Drill old well deeper <input checked="" type="checkbox"/> Development _____ % <input type="checkbox"/> Exploratory _____ % • Show percent of total cost applicable to each. <input checked="" type="checkbox"/> Single <input type="checkbox"/> Dual <input type="checkbox"/> Three or more				<b>Budget information</b> Budget (1) _____ Amt. _____ Item (2) _____ Amt. _____ Capital Instabudget dated _____ <input type="checkbox"/> Named on Instabudget Amount capital differs from Instabudget \$ _____ Over/(under) <input type="checkbox"/> Substituted for Amount capital differs from Instabudget \$ _____ Over/(under) <input type="checkbox"/> Addition to Instabudget Current year capital differs from Instabudget current year by \$ _____ Over/(under)		<b>Originated by</b> _____ AFE number _____ <b>District</b> Permian West <b>Field name</b> Empire South Morrow <b>Lease record number</b> NM-4488 <b>Expl. project No.</b> _____ <b>Field code</b> _____ <b>Subject to production payment?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Has well plan been prepared?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Co-owner operator AFE No(s).</b> _____																																																																																													
<b>Primary objective of drilling</b> <input type="checkbox"/> Oil only <input checked="" type="checkbox"/> Gas only <input type="checkbox"/> Oil and/or gas <b>Signed (Dist. Eng. and/or Explor. group)</b> _____ <b>Reason for drilling</b> <input type="checkbox"/> Develop reserves <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Rate <input type="checkbox"/> Replacement <input type="checkbox"/> Comb. reserve & rate <input type="checkbox"/> Service _____ % rate																																																																																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Component AFE No(s)</th> <th rowspan="2">Description and justification</th> <th rowspan="2">Account codes</th> <th colspan="4">Amounts—in whole dollars only</th> </tr> <tr> <th>On hand</th> <th>Capital</th> <th>Expense</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td></td> <td>Tangible</td> <td>031</td> <td></td> <td>217,000</td> <td></td> <td>217,000</td> </tr> <tr> <td></td> <td>Intangible</td> <td>037</td> <td></td> <td>606,000</td> <td></td> <td>606,000</td> </tr> <tr> <td></td> <td>Total Drilling Cost</td> <td></td> <td></td> <td>823,000</td> <td></td> <td>823,000</td> </tr> <tr> <td></td> <td>Lease Equipment</td> <td>038</td> <td></td> <td>35,000</td> <td></td> <td>35,000</td> </tr> <tr> <td></td> <td>Gross totals</td> <td></td> <td></td> <td>858,000</td> <td></td> <td>858,000</td> </tr> <tr> <td colspan="2">Operator Atlantic Richfield ownership decimal</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="2">Range requested</td> <td></td> <td></td> <td>Lower</td> <td></td> <td>Upper</td> </tr> <tr> <td>Payout (years) (AFIT)</td> <td>% Return (AFIT)</td> <td>PW (AFIT)</td> <td>% Start date</td> <td>Completion date</td> <td>\$ Prior year Capital Expense</td> <td>\$ Curr. year Capital Expense</td> <td>\$ Thereafter Capital Expense</td> </tr> <tr> <td colspan="5"> <b>Technical audits (check those required)</b>  <input type="checkbox"/> Engineering    <input type="checkbox"/> Exploration    <input type="checkbox"/> Dallas budget    <input type="checkbox"/> Evaluation    Other _____  <input type="checkbox"/> Procedural audits       </td> <td colspan="3"> <input type="checkbox"/> Co-owner approval          Signature _____          Company _____       </td> </tr> <tr> <td colspan="8"> <b>Approvals (check highest level needed)</b>  <input type="checkbox"/> District    Date _____  <input type="checkbox"/> Other    Date _____  <input type="checkbox"/> Regional    Date _____  <input type="checkbox"/> Senior vice-president    Date _____       </td> </tr> <tr> <td colspan="8"> <b>Authorized expenditure limit table No.</b> _____  <input type="checkbox"/> Executive vice-president    Date _____  <input type="checkbox"/> President/Chairman    Date _____  <input type="checkbox"/> To Board of Directors    Date _____       </td> </tr> </tbody> </table>								Component AFE No(s)	Description and justification	Account codes	Amounts—in whole dollars only				On hand	Capital	Expense	Total		Tangible	031		217,000		217,000		Intangible	037		606,000		606,000		Total Drilling Cost			823,000		823,000		Lease Equipment	038		35,000		35,000		Gross totals			858,000		858,000	Operator Atlantic Richfield ownership decimal							Range requested				Lower		Upper	Payout (years) (AFIT)	% Return (AFIT)	PW (AFIT)	% Start date	Completion date	\$ Prior year Capital Expense	\$ Curr. year Capital Expense	\$ Thereafter Capital Expense	<b>Technical audits (check those required)</b> <input type="checkbox"/> Engineering <input type="checkbox"/> Exploration <input type="checkbox"/> Dallas budget <input type="checkbox"/> Evaluation    Other _____ <input type="checkbox"/> Procedural audits					<input type="checkbox"/> Co-owner approval Signature _____ Company _____			<b>Approvals (check highest level needed)</b> <input type="checkbox"/> District    Date _____ <input type="checkbox"/> Other    Date _____ <input type="checkbox"/> Regional    Date _____ <input type="checkbox"/> Senior vice-president    Date _____								<b>Authorized expenditure limit table No.</b> _____ <input type="checkbox"/> Executive vice-president    Date _____ <input type="checkbox"/> President/Chairman    Date _____ <input type="checkbox"/> To Board of Directors    Date _____							
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Atlantic Richfield Co. (pany

☐ Original  
☐ Supplement

Drilling Cost Estimate - Page

Well name

Penzoll 24 State Com #1

T.O.

10,900

Location

660' FSL &amp; 1980' FEL Sec. 24, T-17-S, R-28-E

Region

Western

District

Permian

Field

Empire South Morrow

Objective

Morrow

@ 10,700 ft.

€

☒ Development☒ Single☐ Exploratory☐ Dual☐ Completion☐ Multiple

## Data Processing Information

Trans. Ident.			
1	2	3	4
A	F	E	E

5  
3

A.F.E. Number					
6	7	8	9	10	11

Update code  
1 = Delete  
3 = AddOriginal/Revision Indica  
1 = Original  
2 = Revision

## Tangible costs

## 1. Tubular goods

20" OD from 0' to 30'

13-3/8" OD from 0' to 650'

8-5/8" OD from 0' to 2650'

5-1/2" OD from 0' to 10900'

2-3/8" OD from 0' to 10700'

## 2. Casinghead and Christmas tree

## 3. Tubing accessories

## 4. Artificial lift accessories

## 5. Unclassified materials

## Total tangibles

## Intangible costs

## 6. Testing tubular goods

## 7. Trucking tubular goods

## 8. Casing accessories

## 9. Site preparation, maint., clean up

## 10. Permits, insurance, damages

## 11. Moving expense

## 12. Boat &amp; barge rental

## 13. Camp &amp; catering

## 14. Boiler

## 15. Roads, airstrips &amp; maintenance

## 16. Air freight &amp; air transportation

## 17. Contract footage drilling

ft @ \$ / ft.

## Contract daywork (items 18 through 24)

18. Drilling 41 days @ \$5000 /day

19. Casing 3 days @ \$5000 /day

20. Fishing days @ \$ /day

21. Lost circ. &amp; flows 1 days @ \$5000 /day

22. Log test &amp; core 5 days @ \$5000 /day

23. Shut down time days @ \$ /day

24. Completion or plugging days @ \$ /day

25. Completion unit daywork 7 days @ \$1000 /day

## 26. Rental: DP, DC, &amp; related tools

## 27. Well control equipment

28. Drill bits # 1 size 17-1/2

# 2 size 12-1/4

# 8 size 7-7/8

# size

## Dry hole

## Completion costs

## Detail code

## Total gross dollars

## Major account

			12	13	14	15	16	17	18	19	20	21	22	23	24	25
1. Tubular goods																
20" OD from 0' to 30'	1,000															
13-3/8" OD from 0' to 650'	14,000															
8-5/8" OD from 0' to 2650'	28,000															
5-1/2" OD from 0' to 10900'		104,000														
2-3/8" OD from 0' to 10700'		36,000														
2. Casinghead and Christmas tree	12,000	14,000	5	0	4											
3. Tubing accessories		30,000	5	0	6											
4. Artificial lift accessories			5	0	7											
5. Unclassified materials	2,000	3,000	5	0	8											
Total tangibles	57,000	160,000														
Intangible costs																
6. Testing tubular goods		2,000	5	6	9											
7. Trucking tubular goods	2,000	2,000	5	0	9											
8. Casing accessories	2,000	2,000	5	1	2											
9. Site preparation, maint., clean up	8,000		5	1	4											
10. Permits, insurance, damages			5	1	5											
11. Moving expense	32,000		5	1	7											
12. Boat & barge rental			5	1	8											
13. Camp & catering			5	2	2											
14. Boiler			5	2	5											
15. Roads, airstrips & maintenance			5	5	6											
16. Air freight & air transportation			5	2	8											
17. Contract footage drilling																
ft @ \$ / ft.			5	3	2											
Contract daywork (items 18 through 24)																
18. Drilling 41 days @ \$5000 /day	205,000		5	3	3											
19. Casing 3 days @ \$5000 /day	10,000	5,000	5	3	4											
20. Fishing days @ \$ /day			5	3	6											
21. Lost circ. & flows 1 days @ \$5000 /day	5,000		5	3	7											
22. Log test & core 5 days @ \$5000 /day	15,000	10,000	5	3	8											
23. Shut down time days @ \$ /day			5	3	9											
24. Completion or plugging days @ \$ /day			5	4	1											
25. Completion unit daywork 7 days @ \$1000 /day		7,000	5	4	2											
26. Rental: DP, DC, & related tools			5	4	3											
27. Well control equipment			5	4	7											
28. Drill bits # 1 size 17-1/2	1,000		5	4	8											
# 2 size 12-1/4	3,000															
# 8 size 7-7/8	16,000															
# size																

APPROVED

Penzoil 24 State Com #1

## Data Processing Information

S. R. Keasler

3/25/80

Drillable cost (continued)

Trans. Ident.

1 2 3 4  
A F E E

A.F.E. number

6 7 8 9 10 11

Update code  
1 delete  
3 add

Original form or indicator  
1 Original  
2 Revision

	Dry hole	Completion costs	Detail code	Total gross dollars	Major account
			12 13 14	15 16 17 18 19 20 21 22	23 24 25 26
Fuel, fresh water & drayage	30,000		5 4 9		
Drilling mud materials & drayage	20,000		5 5 1		
Drilling mud equipment	7,000		5 5 2		
Air compressor rental or gas cost			5 5 3		
Air or gas orig. accessories & drayage			5 5 4		
Open hole surveys	50,000		5 5 7		
Data recording services			5 5 8		
Wireline formation tester			5 5 9		
Mud log			5 6 0		
Cased hole surveys		8,000	5 6 1		
Perforating fees	(vann)	23,000	5 6 2		
Sidewall coring			5 6 3		
Conc. diamond XXXXXXXXXX 100 ft.	30,000		5 6 8		
Unit stem tests = 2	4,000		5 7 2		
X Acidize X Fracture gal lbs		28,000	5 7 7		
Cement & loss for casing					
13-3/8" OD 1000 sacks	13,000				
" OD sacks					
8-5/8" OD 1500 sacks	18,000				
" OD sacks					
5-1/2" OD 2300 sacks		23,000			
" OD sacks					
Cement & loss for squeezes or plugs			5 7 9		
Fishing tool rental & drayage			5 8 0		
Directional drig. tool rental & drayage			5 8 1		
Operations - prorata			5 9 0		
Unclassified tool rental & drayage	3,000	2,000	5 8 7		
Unclassified drayage & supplies	2,000	1,000	5 9 4		
Unclassified services & material losses	2,000	2,000	5 8 9		
Overhead	1,000	1,000	5 9 2		
Supervision by contract personnel			1 0 5		
Supervision by ARCO personnel	9,000	2,000	1 0 6		
Intangibles					
Cost (materials & intangibles)	488,000	118,000			
Drilled well cost (dry hole & comp)	545,000	278,000			
	823,000				

McCormick & Co. Inc.

# Drilling Prognosis

Penzoll 24 State Com #1

Date 5/1/80

Permian - West Area

660' FSL & 1980' FEL, Section 24, T-17-S, R-28-E, Eddy County, New Mexico

Project

Morrow

formation

Depth

Proved

10900

Contract footage

10900

Design depth

10900

Drilling program:

Surface casing

Position

Length

Cmt.

20" conductor pipe set @ 30'  
13.375" OD 8R STC 54.5# K-55

Cmt w/Redi-mix  
0-450

450

Circ

Protective string

6.625" OD 8R STC 28# S-80

0-3500

3500

Circ

String

6.5" OD 8R LTC 17# L-80

0-10900

10900

Circ

Loghead

13-3/8" X 12" - 900; 900 X 10" - 1500; 10" - 1500 X 6" - 1500

Stratified formation tops

ates	Bone Springs	3450	Strawn	9650
Queen	Dean	6280	Atoka	10150
Grayburg	Wolfcamp	7550	Morrow	10375
San Andres	Cisco	8800	Chester	10925

Drilling program

450	Spud mud dry drill w/fresh water if
3500	10# Brine
10000	Cut Brine
TD	Brine polymer 9.2 - 9.5#/gal. Vis. 34 WL 8-10

Log

EC-Sonic	Surface to TD
EC-CHL-GR	TD - 3000'
EC-HSFL	TD - 3000'
Spometer	Minimum run

Logging

2 50' cores in Morrow Approximately 10,700 depth

Core priority

none

Well stem tests

1-Cisco, Strawn or Atoka  
1-Morrow

Samples

10- intervals from 3000'-TD

Liquid samples

2 qts - analyze locally

Well logging

2 - man unit, 6400' to TD

Elevations

Well completion

Single gas well

Completion equipment

2-3/8" tbg w/pkr

1 (District Drilling Superintendent)

Approved

Operations Manager

Date

Approved

Geologist (Geophysicist)

Date

Date

Approved

Well Manager

Date

RESERVOIR PRESSURE DATA

BV Channel

<u>Date</u>	<u>Well</u>	<u>Reservoir Pressure</u> <u>@ - 7025</u> <u>Psi</u>
11-25-74	ESDU No. 5	4293
6-19-78	St. BV No. 1	4037
3-5-79	St. BV. No. 1	3603
12-6-79	St. BV. No. 2	3171
12-19-79	St. BV No. 1	3154

Arco Ex 11

Pressure  
(psi)

4080

4060

4040

4020

4000

3980

3960

State BV No. 1

DST pressure buildup

OH: 10710 - 10785'

5-16-78

$$\text{Transmissibility} = \frac{Kh}{u} = \frac{162.6 \text{ quB}}{M}$$

$$= .155957 \frac{\text{Md-ft}}{\text{cp}}$$

$$\text{Permeability} = K = 50.4 \text{ Md}$$

$$q = \text{flow rate (bbl)} = \text{ft}^3/5.615$$

$$u = \text{Viscosity (cp)}$$

$$h = \text{pay thickness (ft)}$$

$$B = \text{gas volume factor (ft}^3/\text{ft}^3)$$

$$M = \text{slope} = 4070 - 4060$$

$$= 10 \text{ psi/cycle}$$

Arco Ex 12

2

$\log \frac{t+\Delta t}{\Delta t}$

1

0

**DOYLE HARTMAN**

Oil Operator

SUITE 509

C & K PETROLEUM BUILDING  
MIDLAND, TEXAS 79701

(915) 684-4011

May 2, 1980

To: All Working Interest Owners  
(Address List Attached)

Re: South Empire State No. 1  
S/2 Section 24, T-17-S, R-28-E  
Eddy County, New Mexico

Gentlemen:

As mentioned in our previous letter to you dated April 18, 1980, we are enclosing two copies of AFE for our proposed South Empire State No. 1, located 660 FSL & 660 FWL Section 24, T-17-S, R-28-E, Eddy County, New Mexico. If this AFE meets with your approval, sign one copy and return it to this office. Upon receipt of a signed AFE, we will forward a Model-Form Operating Agreement. The second copy of the AFE may be retained for your files.

We are now in the process of scheduling a hearing before the full Commission of the New Mexico Oil Conservation Division in Santa Fe concerning our request for non-standard location of 660 FSL & 660 FWL Section 24. We will keep you informed on the progress of this hearing.

If you should have any further information in this regard, please let us hear from you.

Very truly yours,

*Doyle Hartman*  
Doyle Hartman

DH/mh

Enclosures as above

*Acco Ex 13*  
**RECEIVED**  
MAY 5 1980  
ARCO OIL AND GAS CO.  
NORTH & WEST LAND DEPT.



ADDRESS LIST

Pennzoil Company  
P. O. Box 1828  
Midland, Texas 79702

Attention: Mr. Mike McCullough

Inexco Oil Company  
1100 Milam Building  
Suite 1900  
Houston, Texas 77002

Attention: Mr. William G. Goodwin

Maralo, Inc. and Mrs. Erma Lowe  
4600 Post Oak Place  
Suite 307  
Houston, Texas 77027

Attention: Mr. John Burke

Exxon Company, U.S.A.  
P. O. Box 1600  
Midland, Texas 79702

Attention: Mr. H. W. Hugly

Continental Oil Company  
P. O. Box 1959  
Midland, Texas 79702

Attention: Mr. David M. Goodfellow

Tenneco Oil Company  
6800 Park Ten Blvd.  
Suite 200 North  
San Antonio, Texas 78213

Attention: Mr. M. M. Hinze

Arco Oil and Gas Company  
P. O. Box 1610  
Midland, Texas 79702

Attention: Mr. Curt Krehbiel

## DETAIL WELL ESTIMATE

LEASE NO. LG-6340 APPR. NO. \_\_\_\_\_  
 LEASE NAME South Empire State WELL NO. 1 W. I. \_\_\_\_\_  
 COUNTY Eddy STATE New Mexico FIELD Empire Morrow, South  
 LOCATION: 660 FSL and 660 FWL Section 24, T-17-S, R-28-E

### DRILLING INTANGIBLES:

	PRODUCER	DRY HOLE
1. Drilling Cost _____ Feet @ _____ Per Foot		
2. Day Work <u>52 Days at \$5000./day</u>	<u>330,000</u>	<u>330,000</u>
<u>Rig Mobilization \$73,000.</u>	<u>25,000</u>	<u>25,000</u>
3. Coring Service _____ Well Surveys _____		
4. Testing _____	<u>5,000</u>	<u>5,000</u>
5. Fuel _____ Water _____	<u>26,000</u>	<u>26,000</u>
6. Mud _____ and Water _____ Mud Logging _____	<u>42,800</u>	<u>17,800</u>
7. Cementing Service _____ Cement _____ Floats _____	<u>12,000</u>	<u>1,200</u>
8. Company Labor _____ Contract Labor _____	<u>12,000</u>	<u>12,000</u>
9. Digging Pits _____ Filling Pits _____	<u>12,000</u>	<u>12,000</u>
10. Roads & Bridges _____ Dredging & Grading _____	<u>150,000</u>	<u>---</u>
11. Acidizing _____ Fracturing _____ Perforating _____		<u>8,000</u>
12. Plugging _____	<u>8,500</u>	<u>2,500</u>
13. Trucking Cost _____	<u>26,250</u>	<u>18,200</u>
14. Development Superintendence <u>75</u> days @ <u>\$350.00 /day</u>	<u>23,000</u>	<u>18,000</u>
15. Rental Equipment _____	<u>18,000</u>	<u>---</u>
16. Swabbing and Testing <u>15 days at \$1,200.</u>	<u>29,100</u>	<u>29,100</u>
17. Other Costs <u>Bits</u>	<u>30,350</u>	<u>15,200</u>
<u>Contingence</u>		
Total Intangibles	<u>750,000</u>	<u>520,000</u>

### WELL EQUIPMENT:

18. Casing <u>500</u> Ft. of <u>13 3/8</u> @ <u>23.368</u> Per Ft.		
<u>2,500</u> Ft. of <u>8 5/8</u> @ <u>11.853</u> Per Ft.		
<u>11,400</u> Ft. of <u>5 1/2</u> @ <u>12.764</u> Per Ft.	<u>186,826</u>	<u>41,317</u>
19. Tubing <u>11,400</u> Ft. of <u>2 7/8</u> @ <u>5.067</u> Per Ft.	<u>57,764</u>	<u>6,000</u>
20. Casing Head _____	<u>6,000</u>	
21. Xmas Tree or Pumping Connections _____	<u>39,000</u>	
22. Pumping Unit _____		
23. Engine _____		
24. Sucker Rods _____		

# DETAIL WELL ESTIMATE

LEASE NO. LG-6340 APPR. NO. \_\_\_\_\_  
 LEASE NAME South Empire State WELL NO. 1 W. I. \_\_\_\_\_  
 COUNTY Eddy STATE New Mexico FIELD Empire Morrow, South  
 LOCATION: 660 FSL and 660 FWL Section 24, T-17-S, R-28-E

DRILLING INTANGIBLES:	PRODUCER	DRY HOLE
1. Drilling Cost _____ Feet @ _____ Per Foot		
2. Day Work <u>52 Days at \$5000./day</u>		
<u>Rig Mobilization \$73,000.</u>	<u>330,000</u>	<u>330,000</u>
3. Coring Service _____ Well Surveys _____	<u>25,000</u>	<u>25,000</u>
4. Testing _____		
	<u>5,000</u>	<u>5,000</u>
5. Fuel _____ Water _____		
6. Mud _____ and Water _____ Mud Logging _____	<u>26,000</u>	<u>26,000</u>
7. Cementing Service _____ Cement _____ Floats _____	<u>42,800</u>	<u>17,800</u>
8. Company Labor _____ Contract Labor _____	<u>12,000</u>	<u>1,200</u>
9. Digging Pits _____ Filling Pits _____	<u>12,000</u>	<u>12,000</u>
10. Roads & Bridges _____ Dredging & Grading _____	<u>12,000</u>	<u>12,000</u>
11. Acidizing _____ Fracturing _____ Perforating _____	<u>150,000</u>	<u>---</u>
12. Plugging _____		<u>8,000</u>
13. Trucking Cost _____	<u>8,500</u>	<u>2,500</u>
14. Development Superintendence <u>75</u> days @ \$ <u>350.00</u> /day	<u>26,250</u>	<u>18,200</u>
15. Rental Equipment _____	<u>23,000</u>	<u>18,000</u>
16. Swabbing and Testing <u>15 days at \$1,200.</u>	<u>18,000</u>	<u>---</u>
17. Other Costs <u>Bits</u>	<u>29,100</u>	<u>29,100</u>
<u>Contingence</u>	<u>30,350</u>	<u>15,200</u>
Total Intangibles	<u>750,000</u>	<u>520,000</u>

## WELL EQUIPMENT:

18. Casing <u>500</u> Ft. of <u>13 3/8</u> @ <u>23.368</u> Per Ft.		
<u>2,500</u> Ft. of <u>8 5/8</u> @ <u>11.853</u> Per Ft.		
<u>11,400</u> Ft. of <u>5 1/2</u> @ <u>12.764</u> Per Ft.	<u>186,826</u>	<u>41,317</u>
19. Tubing <u>11,400</u> Ft. of <u>2 7/8</u> @ <u>5.067</u> Per Ft.	<u>57,764</u>	
20. Casing Head _____	<u>6,000</u>	<u>6,000</u>
21. Xmas Tree or Pumping Connections _____	<u>39,000</u>	
22. Pumping Unit _____		
23. Engine _____		
24. Sucker Rods _____		
25. Pump _____		
26. Tank Battery _____	<u>7,200</u>	
27. Separator or Dehydration Equip. _____	<u>32,000</u>	
28. Metering Equipment _____		
29. Flow Lines _____	<u>12,500</u>	
30. Other <u>Contingence</u>	<u>10,000</u>	
	<u>18,710</u>	<u>2,683</u>
Total Tangibles	<u>370,000</u>	<u>50,000</u>
TOTAL COST OF WELL	<u>1,120,000</u>	<u>570,000</u>

REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Originated by Larry G. Nemy Title Engineer Date April 30, 1980  
 Approved \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

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

*ARCO Oil & Gas Company*  
APPLICATION OF ~~BOYLE-HARTMAN~~ FOR  
COMPULSORY POOLING AND AN UNORTHODOX  
LOCATION, EDDY COUNTY, NEW MEXICO

RECEIVED  
JUN 23 1980  
OIL CONSERVATION DIVISION  
SANTA FE

CASE NO. *6928*  
*6927*

Order No. R- *6391*

ORDER OF THE COMMISSION

*RH*  
*EP* BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 5, 1980, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission".

NOW, on this *July* day of ~~June~~, 1980, the Commission, having considered the testimony, exhibits and the record, 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.

*ARCO Oil & Gas Company*  
(2) That the applicant, ~~Doyle-Hartman~~, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the S/2 of Section 24, Township 17 South, Range 28 East, N.M.P.M., South Empire-Morrow Gas Pool, Eddy County, New Mexico.

(3) That the applicant has the right to drill and proposes to drill a well at an ~~unorthodox~~ location ~~1000~~ feet from the South line and ~~1000~~ feet from the ~~West~~ line of said Section 24. *660*

*1980*  
*East*  
(4) ~~That ARCO Oil and Gas Company opposed the proposed unorthodox well location at the hearing of the case~~

(4) That in companion Case No. 6927, Doyle Hartman requested compulsory pooling of the  $5\frac{1}{2}$  of said Section 24 to be dedicated to a well to be drilled at an unorthodox location 800 feet from the South line & 1980 feet from the West line of said Section 24.

(5) That the preponderance of evidence indicated that the unorthodox location as proposed by Doyle Hartman was the most favorable for recovering hydrocarbons which underlie said Section 24.

(6) That the application of Doyle Hartman was approved by Order No. \_\_\_\_\_.

(7) That this application should be denied.

IT IS THEREFORE ORDERED ~~DETERMINED~~

(1) That the application is this case is denied.

(2) Jurisdiction