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

9 April 1986

COMMISSION HEARING

IN THE MATTER OF:

Application of Southland Royalty Company for special pool rules, Lea County, New Mexico. CASE 9802

BEFORE: Richard L. Stamets, Chairman
Ed Kelley, Commissioner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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I N D E X

E X H I B I T S

MR. STAMETS: Call next Case 8802.

MR. TAYLOR: The application of Southland Royalty Company for special pool rules, Lea County, New Mexico.

MR. STAMETS: Call for appearances.

MR. IVES: Peter Ives, with the firm of Campbell and Black, representing Southland Royalty Company.

MR. STAMETS: Other appearances?

MR. KELLAHIN: Mr. Chairman, I'm Tom Kellahin from Santa Fe, New Mexico, appearing on behalf of Conoco, Inc.

MR. STAMETS: Mr. Ives.

MR. IVES: May it please the Commission, we are here today before the Commission seeking temporary special pool rules for the South Corbin Wolfcamp Pool.

Our testimony which we will present today will show that 80-acre spacing is currently justified from a geologic and engineering standpoint for the pool; that without the granting of 80-acre spacing economic

waste will occur and development of the pool will be hindered or curtailed and we believe that an expedited order is neede in this matter to prevent economic waste due to a drilling obligation of Southland Royalty Company, which they face on May 3rd, 1986.

I have four witnesses today from Southland Royalty Company to present testimony and exhibits and I would call my first witness.

MR. TAYLOR: We have to swear your witnesses first.

Tom, do you have any witnesses?

MR. KELLAHIN: No, sir.

(Witnesses sworn.)

MR. IVES: Call as my first witness, Mr. Trey Shepherd.

TREY SHEPHERD, III

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

DIRECT EXAMINATION

BY MR. IVES:

Q Mr. Shepherd, would you please state your

name and residence for the record.

A My name is Trey Shepherd and I live at 5201 Brazos, Midland, Texas.

Q And what is your current occupation and by whom are you currently employed?

A I am a landman for Meridian Oil, Incorporated.

Q I would like to review with you your educational background beginning with college. Please tell us what degrees, beginning with college, you have received.

A I went to the University of Texas at Austin and received a Bachelor of Business Administration in petroleum land management in 1979.

Q And have you received any advanced degrees since then?

A No, I have not.

Q Are you a member of any professional associations or societies?

A I'm a member of the American Association of Petroleum Landmen and the Permian Basin Landmen's Association.

Q I would also like to review your work experience for the Commission beginning with your work assignments after college.

A In 1979 I went to work for Atlantic Rich-

field Company in Tulsa, Oklahoma, as a staff landman.

In 1980 I was transferred to Tyler, Texas as a Senior Landman and I worked there until the early part of 1983 and was transferred to Lafayette, Louisiana, as a Provence (sic) Landman, and in the middle of the summer of 1983 I went to work for Southland Royalty Company in Midland and have been with them since that date.

Q Are you familiar with the wells in the area which is the subject of this application?

A Yes, I am.

Q And are you familiar with the application at issue in this matter?

A Yes.

MR. IVES: I would tender Mr. Shepherd as an expert witness in the area of -- as a landman.

MR. STAMETS: He is considered qualified.

Would somebody clear the record in the relationship between Meridian and Southland?

MR. IVES: Certainly. We were going to cover that.

MR. STAMETS: Fine.

Q Mr. Shepherd, if I could ask you to state for the Commission, just what is the relationship between

Meridian Oil, Incorporated, and Southland Royalty company?

A Meridian Oil, Incorporated, acquired Southland Royalty Company in the fourth quarter of last year. They now act as agent for Southland Royalty Company.

Q For purposes of this proceeding, we will refer to Southland Royalty Company, as they were the initial applicant before the Commission, simply for ease and convenience.

Mr. Shepherd, could you please briefly state for the Commission what is sought in this application?

A We are seeking temporary pool rules of 80-acres for the South Corbin Wolfcamp Field.

Q And when you say temporary pool rules, what period of time are you speaking of?

A Approximately 18 months.

Q And why are you seeking these temporary pool rules?

A To gain information to determine whether this request for 80-acre spacing is justified or whether the wells should actually be drilled on 40 acres.

Q I would like to please refer to what's been marked as Exhibit One for identification and explain to the Commissioners what it is and what it shows.

A This is a map of the South Corbin Wolfcamp Field. The field is shaded in the gray color. Over

that, portions of that, are Southland's acreage shaded in green. The farmouts which we have acquired are shaded in pink.

This contains the wells in the field, their names, operators, their completion dates, production history, perforated intervals, et cetera.

Q Could you please relate to the Commission generally the history of development in the South Corbin Wolfcamp Field?

A Not a great deal of activity in the field itself; there've been only nine wells drilled in approximately the last 19 years. Two of those were drilled in 1967, one other well in 1968. There was then approximately an 11-year period before any additional drilling was done, and the most recent activity has been by Southland Royalty Company in Section 17.

Q And what was the date of the first well drilled in the pool?

A 1967.

Q What has the effective spacing in the area been?

A The effective spacing is 80 acres.

Q And I would like to ask what drilling obligation Southland Royalty Company has at the present time in the South Corbin Wolfcamp Field?

A We have two farm-ins in the southwest quarter of Section 17. Our first farm-in is from J. M. Huber Corporation. It covers the east half of the southwest quarter and the southwest quarter of the southwest quarter. Our next obligation date under that farm-in is May the 3rd of this year.

We also have a farm-in from Armstrong Energy Corporation in the northwest quarter of the southwest quarter and with a May 15th obligation date.

Q And does Southland Royalty Company seek and need an expedited order in this matter?

A Yes, sir, we do, if we are to meet this drilling obligation. We need an order by May the 3rd.

Q What are Southland Royalty Company's development plans in the South Corbin Wolfcamp?

A We plan to drill our next well in Unit K of Section 17 and depending on the performance of that well and the two existing wells that we have drilled, two recent wells we have drilled, rather, we plan additional wells in Unit C of Section 17 and Unit J of Section 18.

Q Was Exhibit One prepared by Southland Royalty Company?

A Yes, it was.

Q And do you have personal knowledge of the information which is set forth on Exhibit One?

A Yes, I do.

Q Is the information on Exhibit One accurate and correct?

A Yes.

MR. IVES: I would at this point in time offer Exhibit One into evidence.

MR. STAMETS: Is the witness referring to the information relative the acreage in the pool, (not clearly understood)depths, well locations, or is he also referring to the production data, depth, and so on?

A You mean insofar as what I have prepared?

MR. STAMETS: In your preparation and your knowledge of Exhibit Number One?

A I have discussed this information with the engineers that will testify later and I myself have prepared the information in regard to the acreage within the pool and Southland's acreage and the farm-in acreage that we hold.

MR. STAMETS: Mr. Ives, I think I would prefer to wait till all of the data on Exhibit One has been discussed before we --

MR. IVES: That's fine.

Q Mr. Shepherd, is it your opinion that granting the application will be in the best interest of preventing waste in the south part of the Wolfcamp Pool?

A Yes, it is.

MR. IVES: Those are all the questions I have of this first witness.

MR. STAMETS: Any questions of the witness?

He may be excused.

MR. IVES: I'm going to call our second witness, Mr. Randy Herr.

RANDY HERR,

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

DIRECT EXAMINATION

BY MR. IVES:

Q Would you please state your name and place of residence, Mr. Herr?

A My name is Randy Herr and I live in Midland, Texas.

Q And what is your current occupation and by whom are you currently employed?

A I'm a petroleum geologist for Meridian Oil, Incorporated.

Q I would like to review with you your educational background beginning with college and degrees, ad

vanced degrees which you have received.

A I received my Bachelor of Science in geology from Texas A & M in 1970; then received a Master of Science in geology from the University of Utah in 1979.

Q And are you a member of any professional associations or societies?

A A member of the Association -- American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, the West Texas Geological Society and the Permian Basin Section of the Society of Economic Paleontologists and Mineralogists.

Q Mr. Herr, I'd like to now review with you your work experience since college, if you could cover each job you've had, your position, and general responsibilities.

A In 1979 I joined Union Oil Company of California where I was a development geologist with that company. I worked development projects throughout the Permian Basin area.

In 1981, and to the present, I am a petroleum geologist with Southland Royalty Company where I have recommended exploration and development projects in southeast New Mexico, the Central Basin Platform, the Midland Basin, and the Northern Valverde Basin.

Q Mr. Herr, are you familiar with the wells in the area of -- that are the subject of this application?

A Yes, I am.

Q Are you familiar with the application at issue in this matter?

A Yes, I am.

MR. IVES: I would tender Mr. Herr as an expert in geology, petroleum geology, before the Commission and for purposes of this proceeding.

MR. STAMETS: The witness is considered qualified.

Q Mr. Herr, directing your attention to what has been marked for identification as Exhibit Two, could you please explain to the Commissioners what it is and what it shows?

A Okay. This is a north/south stratigraphic cross section that goes through the South Corbin Wolfcamp Field. There is an index map on the lefthand side of the map showing the locations for the wells involved in the cross section.

This stratigraphic cross section is hung with the datum on the top of the Third Bone Spring Sand, that's the very top dark line.

The next heavy line located below that is the top of the Wolfcamp.

The next heavy line located below that is the top of the Strawn; similarly below that is the Atoka and

Morrow sections.

The Wolfcamp has been split into different, several different horizons.

The uppermost horizon is called the Upper Wolfcamp dolomite facies. This is a nonproductive facies in the area.

Similarly, below this is the Upper Wolfcamp cherty limestone facies. It also is not productive in this area.

The producing area in the South Corbin Field is located in the Middle Wolfcamp zone. In particular the main pay in the area is called the South Corbin Wolfcamp pay and on the cross section it is shown in the yellow horizon.

Now the Wolfcamp in this area pays from a limestone detrital, which is characterized by a very clean gamma ray character on the log. If you will look at the cross section in the producing wells, you will notice that very clean gamma ray character.

Our Huber 17 Federal No. 1, which would be the fourth well from the left, is perforated and producing from one of these very clean gamma ray portions of the log.

Our West Corbin 5, located just to the left of that well, which would be the third well on the

cross section, is perforated in the lower portion of the Middle Wolfcamp but we have evidence to suggest that that production is actually coming from the zone that's at approximately 10,800, which is the correlative zone that produces in the Huber 17 Federal No. 1.

Q Mr. Herr, you've indicated that you believe that, I believe the word is channeling, may be occurring in the West Corbin No. 5 Well from the primary pay zone which is marked in yellow on Exhibit Two and coming into the perforations in the West Corbin 5. Why exactly is that?

A We have several reasons. First, as you recall, I've stated that the pay in this area is associated with a very clean gamma ray character on these logs and if you will look at the perforated interval in the West Corbin No. 5, there is no reservoir development within that portion of the Woflcamp.

Secondly, we have run a production survey within that well and all of the production in that well is coming from the top perforated -- perforation in that well, and that perforation is opposite a zone which has 1 percent porosity.

Also we have a water analysis on both the Corbin 5 and the Huber 17 and both those water analyses are very similar in content, suggesting to us that the Corbin 5 has channeled down from the main -- well, from the South

Corbin Wolfcamp pay.

And finally, we -- on the logs there is an interval located beneath the yellow horizon, which is a washout zone where we feel that there's a good chance that we've had a bad cement across that zone.

Q Mr. Herr, let me hand you what has been marked for identification as Exhibit Three and ask you to explain what it is and what it shows.

A Okay, this is the water analysis which I referred to on the West Corbin 5 and the Huber 17 No. 1.

If you'll look on the lefthand column at the column -- or the row called chlorides, chlorides are the most common indicators we use for -- in comparing the waters in the formation.

If you'll look at those numbers, the Corbin 5 and Huber 17 have very similar chloride contents and -- but radically different chloride contents with the Corbin No. 1, which is the second well on the left on the cross section.

So we feel that the production in the Corbin 5 is actually going down from the main pay which we think is at 10,800 into that top perforation in the well.

Q And why do you feel that the chlorides are a good indicator of a relationship in this instance?

A Well, chlorides are the most common con-

stituent and the most easily measured constituent to characterize formation water.

Q Were Exhibits Two and Three prepared by you or compiled under your direction and supervision?

A Yes.

MR. IVES: At this time --

Q Do they accurately and correctly set forth the information contained therein and as you have testified here today?

A Yes.

MR. IVES: I would offer Exhibits Two and Three into evidence at this time.

MR. STAMETS: These exhibits will be admitted.

Q Mr. Herr, is it your opinion as a petroleum geologist to a reasonable probability that the Huber 17 and the Corbin 5 both are geologically related in that they appear to be producing from the same primary pay zone?

A Yes.

Q Is it your opinion as a petroleum geologist to a reasonable probability that granting this application will be in the best interest of conservation and prevention of waste, and the protection of correlative rights?

A Yes.

MR. IVES: I have no further

questions of this witness.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Herr, was the purpose of this exhibit to show that there's basically a single pay in the field that is continuous between wells?

A Yes, that was the intent.

Q Looking at the third well I see a set of perforations below the main pay interval. Are those still open?

A The upper perforations are. They have -- we have squeezed the perforations from 11,261 to 333.

Q Were those tested?

A Yes, they were tested.

Q What did they produce?

A We tested a half a barrel of oil and 19 barrels of load water in 10 hours.

Q Okay. Are there any other pay intervals in the Wolfcamp in this area that are producing or have produced significant quantities of oil?

A The West Corbin No. 1, which is the second well to the left, produces from a Wolfcamp limestone detrital pay which is in the lower part of the Middle Wolfcamp.

And there are a few other wells in the area which produce from a slightly different interval but the majority of the wells produce from that pay interval which we have identified as the South Corbin Wolfcamp pay.

Q Do you have any idea -- were -- were you around in 1985 or whenever this third well was perforated over that extensive interval?

A I was, yes, I was with Southland at the time.

Q Do you know why that interval was perforated?

A No, I do not, but we have an engineer with us today that could answer that question for you.

Q All right. Do you know if Southland has any plans to repair that well?

A We, at the moment we do have a workover procedure in on that West Corbin No. 5 to go in and attempt to squeeze that pay and reperforate the well.

MR. STAMETS: Any other questions of this witness?

MR. KELLAHIN: Yes, sir.

MR. STAMETS: Mr. Kellahin.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Herr, I'm using a stratigraphic cross section that's not colored as yours is. Perhaps you could help me, sir.

What is the proposed vertical limit for the pool?

A In which particular well or --

Q You can use any of them as a type well to show me the vertical limits.

A Okay. Then I would go to the Huber 17 Federal No. 1 and it's that cleanest portion of the gamma ray curve and occurs from approximately 10,870 to 11,010.

MR. STAMETS: I'm not clear on that now. Would you be proposing a Wolfcamp pool for less than the entire Wolfcamp interval or would -- are you just indicating what the main pay is?

A That is the interval that I think is where the -- the pay is located.

Q I'm asking you something else. I didn't make myself clear.

In terms of identifying for you or any other operator that proposes to drill in the pool we need to have a type log from which we can take the uppermost portion of the pool and the lower portion. Certainly there will be

some distance in there that may produce but in order to have an order that tells us what the pool limits are vertically, which of the logs would you select and what would the interval be?

A Well, I would select, then, the interval on the cross section that we have labeled the Middle Wolfcamp zone, and it's shown as an arrow with the label "Middle Wolfcamp" located between the last two wells on the cross section on the right hand side.

Q All right, it would be that portion of the Wolfcamp?

A Yes.

Q When we're looking for the continuity, as a geologist, of the pay interval from well to well, are you satisfied as a geologist that you will find that pay interval reasonably continuous across the area that you've mapped?

A The pay which I -- or the interval which I call the South Corbin Wolfcamp pay, I think it is reasonably continuous across that area.

Q Does the thickness of that interval increase and decrease as you move from well to well?

A The overall interval changes somewhat. The main change that occurs within the well is the actual thickness of the limestone detrital.

Q Does the qualify of the reservoir change dramatically from well to well as we move across the pool?

A I don't think it necessarily is that the quality of the reservoir changes as much as, say, maybe the thickness.

Q As a geologist, then, are you satisfied that the area to which these special rules are to be applied is one that constitutes a separate and distinct reservoir in the interval that you propose to be the new pool?

A I'm sorry, I don't understand that question.

Q You have mapped us an area in your stratigraphic cross section from northwest to southeast. Within that area do you find a separate and distinct reservoir in this Wolfcamp interval that is both separated vertically and horizontally from other pools?

A Yes.

Q Where is the closest pool that produces from this interval other than the one we're talking about now? How far away is the next pool like this?

A I believe the closest one that I'm familiar with would be the Scharb Wolfcamp Field.

Q And approximately how far away is that?

A It would be located one township away, six to eight miles, approximately.

Q In terms of establishing an initial horizontal boundary for the pool, does one of your exhibits show us what the horizontal boundary is for the pool?

A That interval which I've marked the Middle Wolfcamp.

Q Yes, sir, and horizontally, then, on a land plat is that what's depicted on Exhibit Number One in some fashion?

A I'm not sure of that. Would you repeat that, please?

Q Yes, sir. You're preparing the land plat and the well locations in reference to your geology and I want to find out from you as a geologist whether or not the wells that you propose to include in the pool are all in the same pool.

A Yes.

Q As a geologist, do you think it would be appropriate to initially space this pool on less than 80 acres?

A Not at the moment until we have additional information.

Q With the current present information available to you, are you satisfied that geology shows you that this pay interval is reasonable continuous?

A Yes.

Q It is not so discontinuous that you would leave reservoir untested if you should drill the wells 80 acres apart.

A With the information we have now, no, I don't think so.

Q At this point with the current state of information available to you, would you believe that wells drilled on 40-acre spacing now would result in the drilling of unnecessary wells?

A I believe in certain portions of this pool it definitely would or could result in waste.

Q Will spacing on 80 acres lead to a more efficient and quicker development of this pool?

A I think so, yes.

MR. KELLAHIN: Nothing further.

RECROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Herr, if you discovered a producing interval in the Upper Wolfcamp, would you propose to dually complete that interval with the Middle Wolfcamp?

A If it was mechanically feasible, but to date all that upper horizon, which I've labeled the Upper Wolfcamp dolomite facies, we've encountered numerous shows within that interval but all formation tests that I'm aware

of have recovered salt water.

Q I'm at a loss as to why you don't want to include the entire Wolfcamp interval in these pool rules.

MR. IVES: Sir, could you repeat the question?

MR. STAMETS: Well, it's not exactly a question. I was just saying I'm at a loss as to why you don't want to include the entire Wolfcamp interval within these pool rules.

A That would not bother me.

MR. IVES: We do propose to dedicate the entire Wolfcamp Pool to 80-acre spacing.

MR. STAMETS: Okay. I did not understand that because --

MR. IVES: On a temporary basis.

MR. STAMETS: -- of the response to Mr. Kellahin's questions.

MR. CARR: Mr. Stamets, one thing to try and avoid any confusion. This is an existing pool at the present time. The initial well was drilled in 1967 and the shaded area on Exhibit One does outline what is the existing pool boundary and it includes the Wolfcamp interval.

MR. STAMETS: Well, I under-

stood that Mr. Herr, in response to Mr. Kellahin's question, wanted the horizontal -- or vertical limits of the pool to be the Middle Wolfcamp as identified on the two righthand logs on Exhibit Number Three -- no, Exhibit Two.

A I would say that I misunderstood the question.

Q All right, thank you.

MR. IVES: If I may, I believe this point may be clarified. I believe the line which Mr. Herr was referring to on the Exhibit Two comes between the second and third wells from the righthand side of the page as opposd to the line between the first and second.

Q Is that correct, Mr. Herr?

A Yes.

MR. STAMETS: Are there other questions of this witness?

MR. LYON: May I ask a few questions?

MR. STAMETS: Mr. Lyon.

QUESTIONS BY MR. LYON:

Q Mr. Herr, referring to your cross section -- I'm V. T. Lyon, Chief Engineer for the Division.

You have some discontinuous (not clearly understood) shown on a few of these wells. For instance,

the second well from the left, the West Corbin No. 1, you have an interval which is at approximately 11,200 to 11,300 feet. It is shown -- is outlined by an irregular polygon there and labeled Wolfcamp pay, and apparently, as I interpret this, that is not considered to be in connection with any other wells shown on the cross section.

A At the moment we do not think it connects with any other wells.

Q But that is part of the Wolfcamp, is that correct?

A Yes.

Q And is part of this particular field or pool that we've been referring to.

A Yes, right.

Q And the perforations on the third well from the left are shown below the yellow interval but you maintain that that well is producing from the yellow interval, is that correct?

A That's correct.

Q Then in the fourth well, just in the perforations that straddle 11,200, those perforations have been squeezed, is that what that symbol means?

A Yes.

Q And it's actually producing from the top of the yellow zone shown at -- straddling 10,900 feet?

A Yes, opposite that label No. 2 there.

Q You also show on six, the sixth well from the left, the upper interval there, that shows perforations and is labeled Wolfcamp pay, which is above the yellow interval, is that the pay zone in that well?

A Yes.

Q And in your last well on the right there are two sets of perforations. One of them is in the yellow and the other one is not in the yellow.

What is the situation on this well?

A The lower perforations, the well was worked over subsequently, and the upper perforations are the producing perforations in that well.

Q If I understand your exhibit correctly, and correct me if I'm wrong, you do indicate a zone with apparent continuous pay represented by the yellow --

A Yes, that's correct.

Q -- but that there are other intervals which are found from one location to another in the Wolfcamp, is that correct, that are not continuous?

A Well, as I've stated, that the interval which we marked the South Corbin Wolfcamp pay is the interval which produces in most or a majority of the wells in that field. There are a few of the stringers that produce in other portions of the Wolfcamp.

MR. LYON: I believe that's all

the questions I have.

MR. STAMETS: Any other questions of Mr. Herr?

He may be excused.

MR. IVES: I would now like to call Mr. John Stark for or on behalf of Southland Royalty Company.

JOHN STARK,

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

DIRECT EXAMINATION

BY MR. IVES:

Q Mr. Stark, would you please state your name and residence?

A My name is John Stark. I live in Midland, Texas.

Q What is your occupation and by whom are you employed?

A Operations engineer, with Southland Royalty Company.

Q Mr. Stark, have you previously testified before this Commission as a petroleum engineer and had your credentials accepted as a matter of record?

A Yes, I have.

Q Are you familiar with the wells in the area which are the subject of this application?

A Yes, I am.

Q Are you familiar with the application as issued in this matter?

A Yes, I am.

MR. IVES: I would tender Mr. Stark as an expert petroleum engineer.

MR. STAMETS: He is considered qualified.

Q Mr. Stark, I'd like you first to refer to what has been marked as Exhibit One and review the development of the pool referenced on Exhibit One and the data present on each well in the pool, if you would.

A Yes, sir. I prepared this map and the shaded area is the pool outline, currently the South Corbin Wolfcamp Field.

The well locations shown are all the wells that have been tested and are -- and have been completed in the Wolfcamp interval, and beside each well is well data that I have gathered and in the lower left -- righthand corner of the map it explains this information. It gives the operator name, the well name, the location of the well, completion date, total depth, perforations, ini-

tial potential, the current production rate, cumulative to the lastest available.

Q Was Exhibit One prepared by you?

A Yes, sir, it was.

Q And does it accurately and correctly set forth the information contained therein and as you have just testified at the hearing today?

A Yes.

MR. IVES: I would offer Exhibit One into evidence before the Commission.

MR. STAMETS: Exhibit One will be admitted.

Q Mr. Stark, asking you to refer to what has been marked as Exhibit Four for identification, could you please explain to the Commission what it is and what it shows?

A Yes. This exhibit shows the volumetric calculations I've made on the Huber 17 Federal No. 1, the well that we -- the most recent well drilled in the field by Southland, and it's located in Section 17 in the Unit letter M of that section.

This -- the information given, the first one, I've used the estimated ultimate recovery of the well of 100,000 barrels of oil. This was derived from decline curve analysis of this well and wells in the area.

The next -- next item is H net. That stands for the thickness of the net pay. I'm giving it 28 feet according to open hole log evaluation.

Also of porosity, I'm showing 6 percent as the average porosity of this net pay.

B sub O I (sic) stands for formation volume factor in initial conditions.

The next one is water saturation, SW, of this net pay interval.

RF is the recovery factor, which I assumed 25 percent, and then A stands for the acreage of acre drainage around this well and using the data I've just said we calculated 73 acres of drainage.

Q Have you done or performed any other calculations to substantiate the information on Exhibit Four?

A Yes, sir, we have pressure data from the Huber 17 No. 1.

The first pressure point we had was in December '85. After the well had produced 600 barrels of oil it gave initial pressure of 4000 pounds bottom hole pressure.

The second pressure data in this well was February of '86 after the well had produced approximately 4600 barrels. The pressure was 3,600.

From this pressure data and the recovery

data I then performed a material balance evaluation in which I estimated original oil in place of approximately 400,000 barrels of oil.

Using my 25 percent recovery factor, as explained previously, I come up with a recoverable oil around this well of 100,000 barrels, which substantiates the 100,000 barrels of coverable oil that I used in my volumetric calculations.

Q Was Exhibit Number Four prepared by you?

A Yes, it was.

Q And does it accurately and correctly set forth the information contained therein and as you have testified to here today?

A Yes.

MR. IVES: I would offer Exhibit Four into evidence before the Commission.

MR. STAMETS: Exhibit Four will be admitted.

Q Mr. Stark, is it your opinion as a petroleum engineer to a reasonable probability that 80-acre spacing will efficiently and econmically drain the South Corbin Wolfcamp Pool?

A Yes, sir.

Q Is it your opinion as a petroleum engineer to a reasonable probability that granting this appli-

cation would be in the best interest of conservation, the prevention of waste, and the protection of correlative rights?

A Yes, I do.

Q And is it your opinion as a petroleum engineer to a reasonable probability that granting this application will avoid drilling of unnecessary wells?

A Yes.

Q And is that opinion based on the fact that your volumetric calculations suggest that, for instance, the Huber 17 will drill -- will drain effectively 73 acres?

A Yes, sir, with the data we have now.

Q Assuming that 80-acre spacing was granted on a temporary basis, what information will you develop from any additional wells you've drilled in relation to the spacing issue here today?

A We would gather further performance and pressure data from the existing and wells to be drilled and from that data we would be able to do, as -- as explained, do further volumetric and material balance calculations to more accurately determine the drainage of acreage around each well.

Q And would that information, could that information then be used to justify either 80-acre spacing

on a permanent basis or suggest reversion to 40-acre spacing?

A Yes, sir, it would.

MR. IVES: Those are all the questions I have of this witness.

CROSS EXAMINATION

BY MR. STAMETS:

Q Is there any pressure data available for any of the wells in this pool?

A Wells besides the Huber 17?

Q Yes.

A Okay, yes, sir, we have pressure information in the West Corbin Unit Number Five that -- that data was gathered in September of '85 after the well had produced approximately 700 barrels of oil and it had a pressure of 4300 pounds initially, which is --

Q Is that bottom hole pressure?

A Yes, this is bottom hole pressure. The -- as I might go ahead and say, this pressure is approximately 300 pounds higher than the initial pressure found in the Huber 17-1, and due to the completion in the West Corbin 5, we now suspect channeling possibly occurring. I do not include this pressure data in the material balance because of the -- we weren't sure of the completion and the

zone it could possibly be coming from.

Q There's no pressure data available for West Corbin Unit No. 1, the Corbin Federal No. 1, any of these other wells in this pool?

A Yes, sir, we have one pressure where we have pressure information on the West Corbin Unit No. 1. It was gathered in October of '85. This was from equipment that is at the surface and we estimate bottom hole pressure and we -- it estimated approximately 1000 pounds bottom hole pressure.

Q As I recall looking at Exhibit Number Two, that's a different interval, producing interval from the No. 5, is that correct?

A Yes, sir. We believe so.

Q Is there any pressure data available for either of the wells in Section 20?

A No, sir. The data I've just said is all -- is all the pressure data I'm aware of.

Q Did you make a search of the records to determine if there was data available?

A Yes, sir, I looked through scout ticket information and called other operators and this -- this is all I found.

MR. STAMETS: Any other questions of this witness?

MR. LYON: I've got a few questions.

MR. STAMETS: Mr. Lyon.

QUESTIONS BY MR. LYON:

Q Mr. Stark, referring to Exhibit Four, why did you choose Huber 17 for this calculation, Huber 17 No. 1?

A Okay, we choose this well, we -- we had a -- we didn't suspect any problem with completion as the West Corbin 5 had encountered; any questions and suspicions that possibly channeling is going on. We also had bond logs and other logs that, you know, help us to determine that there was no channeling, you know, no cement channels behind pipe, so we felt confident the interval was completed as shown on the perforations.

We also had more pressure data that we, bottom hole pressure data, better quality, in this well that I could then compare my original oil in place calculations for material balance with my volumetrics and to see how they fit together.

Q Well, what is the basis for your estimated recovery of 100,000 barrels?

A That was based on looking at the performance of the wells in the area; the Wolfcamp interval, the

wells that were completed in the Wolfcamp in this entire area. I tried to look at the decline curve analysis on as many wells as I possibly could, including the West Corbin 5 and wells in the southern portion of the pool area.

And I just -- some showed much higher than that, some showed much less, but this average -- this number is an average that I obtained.

Q What's the cumulative production from this well?

A From the Huber 17-1?

Q Yes.

A It's approximately 4000 barrels of oil and 600 water.

Q All right. Now, your -- your net pay you picked from your logs?

A Yes, sir.

Q Your porosity you picked from your logs.

A Yes, sir.

Q What's -- what is the basis for your volumetric -- your reservoir volume factor?

A The -- of the oil, the formation volume factor?

Q Yes.

A I was using correlations using the gravity of oil we obtained and measured; bottom hole pressure

and temperatures, and correlation charts to come up with a formation volume factor initial.

Q So you had to (not clearly understood.)

A You mean the PVT information?

Q Right.

A No, sir, we have not done that.

Q You say there are -- are -- referring back to Exhibit One, there are nine wells producing in this field, is that right?

A Yes, sir, I believe that's correct.

Q Have any of those -- have any of those wells recovered 100,000 barrels?

A No, sir, but that includes the West Corbin No. 5, I included, and, as seen, that well in its short life has recovered nearly 64,000 barrels of oil already and it's still flowing top allowable rates of 365 oil a day.

Q Right.

A Due to the proximity to that well I had to weight somewhat my averaging of the -- close of that, such a good performing well.

Also, there are some Wolfcamp wells outside the pool area that I also had looked at, but, you know, just to compare some other performance.

Q Some of these wells have produced for

nigh on to twenty years, isn't that right?

A Yes, sir, the first well was completed in July of '67.

Q Apparently they were not of the same quality as those more recent wells there to the northwest.

A Well, that's -- that's exactly what we're trying to understand, is the difference -- what is making this area so different in its performance.

Q It's almost as if it were a separate field.

A That's what we'd like to determine with future data.

MR. LYON: I think that's all the questions I have.

MR. STAMETS: Any other questions of Mr. Stark?

MR. IVES: I have a couple of additional questions.

REDIRECT EXAMINATION

BY MR. IVES:

Q Mr. Stark, isn't your testimony here today that the pressure data you have across these number of wells is not determinative of the issues in this application?

A Well, at this point -- well, no, sir, not -- we'd like to get more information.

Q In other words you do need more and additional information in order to come to -- obtain what you will feel comfortable with in terms of figures showing possible relationships across the Wolfcamp Pool?

A Yes, sir, that's definitely true. We only have two really pressure data that we feel competent of and it's -- we just need much more to make a more accurate estimate.

Q And were those two pressure points that you're referring to taken from the Huber 17 Well?

A Yes, sir.

Q And is it your feeling that the volumetric calculation performed and which is set forth on Exhibit Four provides you the best indication of drainage in the pool at the present time?

A At the present time, that's the best estimate.

MR. IVES: I have no additional questions.

MR. STAMETS: Any other questions of the witness?

MR. KELLAHIN: Just a couple, Mr. Chairman.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Stark, are you satisfied that the reservoir parameters that you have used for the volumetric calculation are reasonably typical for other wells from which you have similar information?

A Yes, sir. We feel that that 100,000 recoverable oil, as I was mentioning before, is, we feel like, a reasonable number including all the poorer wells to the south in this pool.

Q I meant the actual parameters that go into the calculations.

A Yes, sir, that's --

Q The water saturation, all the rest of the numbers that you have used and seen in this well and in this log, are they generally typical of these others or is there a range of difference here?

A Yes, sir, I feel like these are typical of the wells I've looked at.

Q What is the original bottom hole pressure of the Wolfcamp Pool?

A I'm not -- again, the older -- I've looked in the histories of -- these wells are nearly twenty years old and I could not find any good quality data at all, and that's why we went to the effort ot start gathering data

in these wells.

Q Do you see any significant difference in the way the wells were completed and stimulated for production that might account for the fact that some wells have produced significantly less than other wells?

A No, sir, I have seen -- they're all completed similarly.

Q Have you done other volumetric calculations, other than this one for the Huber No. 17 Federal L?

A No, sir, I haven't.

Q And this is the one you used because it is the only well that you had what you thought was reliable information?

A Yes, sir.

Q Do you have any information from wells that are adjacent to each other from which to draw any kind of pressure information or conclusions about communication?

A No, sir, I don't, and as I believe noted earlier, the rest of the field is really spaced at 80 acre and greater, so, no, I don't.

Q I was looking at it in Sections 18 and 17. There are at least two wells there that are 40 acres apart and I -- is there anly information available to you from either of those wells that you could draw any comparisons or studies about the abilities of wells to drain or

communicate that close together?

A Well, again, we don't have that good a reliable pressure information in either well and I would not like to at this point without more data, to make a judgment either way on those two wells.

Q Thank you.

MR. STAMETS: Any other questions of Mr. Stark?

He may be excused.

MR. IVES: I'd like to call Mr. Gene Carlson to testify in behalf of Southland Royalty Company at this time.

GENE CARLSON,

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

DIRECT EXAMINATION

BY MR. IVES:

Q Mr. Carlson, would you please state your name and residence?

A My name is Gene Carlson. I live in Midland, Texas.

Q And what is your occupation and by whom are you currently employed?

A I am Regional Reservoir Engineer for Meridian Oil Company -- or Incorporated, excuse me, in Midland.

Q And if you could please summarize your educational background for the Commission beginning with college and covering any advanced degrees you have received.

A I received a BS degree in mechanical engineering from Texas A & M University in December, 1974.

Q Are you a member of any professional associations or societies?

A Yes, sir. I'm a member of the Society of Petroleum Engineers of the American Institute of Mining Engineering.

Q Are you -- let me ask you now to summarize your work experience since your graduation from college, covering what company you were with, when you were with them, and what position?

A I was originally with Exxon Company USA in Midland from 1975 until mid-1977, whereupon I went to work for Southland Royalty Company, also in Midland. I worked there until late 1979.

I was with Texas Oil and Gas in Dallas and Denver until mid-1981, whereupon I returned to Southland in Midland and stayed until I was transferred to Ft. Worth in 1982 and I recently returned to Midland as the Regional Reservoir Engineer for the newly merged organization, Meri-

dian Oil, Incorporated.

Q Mr. Carlson, are you familiar with the wells in the area which is the subject of this application?

A Yes, I am.

Q Are you familiar with the application at issue in this matter?

A Yes, I am.

MR. IVES: I would offer Mr. Carlson as an expert in the area of petroleum engineering.

MR. STAMETS: He is considered qualified.

Q Mr. Carlson, let me ask you please to refer to what has been marked for identification as Exhibit Number Five and explain to the Commissioners what it is and what it shows and please, if you would, detail out any acronyms or other abbreviations which are set forth on the exhibit, and it might be helpful to go column by column.

A All right. First of all, I'd like to explain in concept what we've done here is we've built upon previous testimony which established that a reasonable recovery, for example, the Huber 17-1, which is also coincidentally offset to most of the obligation problems that we have right now.

The Huber 17-1 is estimated to have an ultimate recovery of about 100,000 barrels if it were al-

lowed to drain what is estimated to be its 73 acres it will drain ultimately.

What we did here is we compared the economics of leaving one well on 80-acre spacing, that is, the Huber 17-1, for example, which would recover an ultimate 100,000 barrels of oil recovered.

The second case that we would have is going to the 40-acre development density, in which case the full 80 acres would be drained and hence increase the recovery from the two combined wells to about 110,000 barrels, or increase the recovery an additional 7 percent, or 7 acres.

The economics that we've summarized here show on the left column discussing the -- what -- or labeling the items that are under each of the four cases of economics that I'll delineate later.

The oil in thousands of stock tank barrels of oil is expressed in gross and net for a working interest of 100 percent and a net interest of 87-1/2.

The gas reserves volumes are the -- expressed in million cubic feet of -- million standard cubic feet of gas that is also expressed in gross and net, is indicated in parentheses.

With the working interest investment based on 100 percent working interest for a typical well in

this area is $874,000 by our best estimate. It would take -- the payout in years is after Federal income tax payout for an investment for the four cases that was run, and the ROR is the effective rate of return by discounted cash flow analysis that says what the effective interest rate that you get for your investment by doing this business opportunity.

The PI is the profit to investment ratio at 15 percent discount, also by the discounted cash flow method, and is the ratio of the -- what the last item is, which is the net present value at 15 percent discounted compared against the investment of $874,000 in the first example.

We used for all these economic calculations an oil price of $20.00 a barrel and a gas price of $1.50 per MCF. Of course, we'll remind you later in the presentation that oil is now running about $13.00 a barrel.

Initial producing rate that we used for each of these on a -- for a typical well would be 50 barrels of oil per day initial production rate. The gas/oil ratio employed was 2000 standard cubic feet of gas per barrel of oil and again the working interest used was 100 percent and the net revenue interest, 87-1/2 percent.

The first case of economics that was prepared shows what we believe to be the economics of the Huber 17-1 retroactive to its time zero or date of drilling.

If you recover 100,000 barrels from this well, as established in previous testimony, you would also recover 200,000,000 cubic feet of gas gross and you would spend $874,000 to get that.

It would take 1.7 years to payout after Federal income tax and you would achieve what I would consider to be an acceptable after Federal income tax rate of return of about 40 percent.

The profit to investment ratio is .26, which is well within most people's guidelines and the net present value that you would achieve over your investment discounted at 15 percent is $229,000.

What we see here is in general terms a very good acceptable economic proposition.

The next three cases of economics that are delineated show the other scenarios of how you can look at it from very many different viewpoints. I call your attention to the farthest right case of economics, which shows what we would have to do to drill the second well, or what would result if we drilled the second well on that 80-acre tract with 40-acre spacing and that second well would, as it's indicated, increase the recovery in oil, 100,000 barrels to almost 110,000 barrels, reflecting 80-acre drainage versus 73.

The gas associated with that would be

219,000,000 cubic feet of gas and working interest investment, as you can see, would double the single well case, and for the two well case here you see that the payout in years would be almost four years.

The rate of return experienced for us on the overall project basis would be about 4-7 percent, which you could greatly exceed by buying a Treasury bond at this time; just to show how you would compare that in your mind versus, you know, that is the main economic parameter we're looking at here and that's your rate of return.

The profit to investment ratio is negative because the rate of return is less than the discount rate of 15 percent employed in the PI calculations and, of course, the net present value to -- to us at 15 percent discount is negative for this case for the combined economics of the two wells.

Now let's look at it again and let's say that Southland -- or Meridian and Southland were not allowed to maintain the 80-acre spacing and we also made the business decision which by the economic parameters showed in the right cases we probably would not seek the opportunity to drill a 40-acre well, we would then have the production estimated to June 1st, 1986, without two wells in the reservoir, as indicated in the note at the bottom.

So our current well would recover more

than half of the 110,000 barrels stated for the two well case. We would recover from the Huber 17-1 because it would have a head start on the second well, would recover about 59,000 barrels and about 118,000,000 cubic feet of gas.

Again our working interest investment, looking back from time zero, $874,000.

Our payout on the well would change from 1.7 years to 3.5 years, and again our rate of return, AFIT, would drop well below acceptable rates of return, which would have to be -- most people use more than 50 percent, and as you can see, the rate of return for the case of us having the Huber 1 Well compete with someone else's new well, as we use in the vernacular, would be 7.4 percent rate of return.

The profit to investment again is negative because the return is less than the stated discount, and net present value to us of the Huber well, Huber 17-1, is negative also, $70,000.

We want to also point out the economics of the new well, in that if you despaced this based on the information we have in to date, the new well on 40-acre spacing would achieve less recovery than the Huber 17-1, or 51,000 barrels, approximately, 101,000,000 cubic feet of gas. They would have to spend $874,000 to do it and it would take 4.1 years for it to pay out. The rate of return

would be 2 percent AFIT. The profit to investment ratio would also be negative and the net present value would be minus $116,000.

What we would want to point out with this is that if you do engineering analysis with the available information as we have done, that this is not an economical prospect on 40-acre drainage.

If you have full development on 40-acre drainage and wells competing, no one is going to be able to make money out here based on current information that we have.

So, to draw the conclusion, then, if you drilled the thing on 40-acre spacing and everybody does their homework, you're not going to get as many wells drilled as if you would allow us to drill them on 80-acre spacing.

Q Mr. Carlson, assuming that the South Corbin Wolfcamp were developed on 40-acre spacing, is it your opinion as a petroleum engineer to a reasonable probability that such wells would be uneconomical and result in economic waste?

A Based on data at hand today, I believe that be true.

Q Was Exhibit Five prepared by you?

A Yes, sir.

Q And does it accurately and correctly set forth the information contained therein and as you have testified to here today?

A Yes, sir.

MR. IVES: I would offer Exhibit Five into evidence.

MR. STAMETS: Exhibit Five will be admitted.

Are there questions of Mr. Carlson?

MR. IVES: I have one last general question.

MR. STAMETS: All right.

Q Mr. Carlson, is it your opinion as a petroleum engineer to a reasonable probability that granting this applicatio is in the best interest of conservation, the prevention of economic waste, and the protection of correlative rights?

A Yes, sir, I believe that to be true.

MR. IVES: No further questions.

MR. STAMETS: Any other questions of Mr. Carlson?

He may be excused.

Mr. Ives, do you have anything

further you wish to offer in this case?

Does anyone have a closing statement?

MR. IVES: We have nothing further to offer, Mr. Commissioner.

MR. STAMETS: Tom, do you have any --

MR. KELLAHIN: Nothing, sir.

MR. LYON: May I inquire, is there anything in the record which shows that there is 80-acres of common lease which is available to each of these wells indicated?

MR. IVES: I'm not aware of anything in the record.

MR. LYON: What I'm concerned about is --

(Thereupon a discussion was had off the record.)

MR. STAMETS: Gentlemen, the Commission has decided that we will approve the application for a temporary period of 18 months. Let's see, today is the 9th of April, and unless there is some reason to make the effective data some other date we would propose to make that effective May the 1st, and the basis for this would be

the economic data that there is not a great deal of engineering data to demonstrate that the wells can, indeed, drain 80 acres, but there is sufficient economic data to indicate at this time the pool cannot be economically developed on less than the 80-acres, and we would ask that we be provided with a draft order which would set out those findings and -- and an order with provisions that we have discussed there, including coming back in for demonstration at the end of 18 months for a demonstration and 80 acres is indeed the correct spacing for this pool.

That being the decision of the Commission, we would sign that order as soon as it becomes available.

If there is nothing further, then, this hearing will be recessed until 9:00 o'clock tomorrow morning.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY the foregoing Transcript of Hearing before the Oil Conservation Division (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 CSR

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

9 April 1986

COMMISSION HEARING

IN THE MATTER OF:

Application of Southland Royalty Company for special pool rules, Lea County, New Mexico. CASE 8802

BEFORE: Richard L. Stamets, Chairman
Ed Kelley, Commissioner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division:	Jeff Taylor Legal Counsel to the Division Oil Conservation Division State Land Office Bldg. Santa Fe, New Mexico 87501
For the Applicant:	Peter N. Ives Attorney at Law CAMPBELL & BLACK P. A. P. O. Box 2208 Santa Fe, New Mexico 87501
For Conoco, Inc.:	W. Thomas Kellahin Attorney at Law KELLAHIN & KELLAHIN P. O. Box 2265 Santa Fe, New Mexico 87501

I N D E X

E X H I B I T S

MR. STAMETS: Call next Case 8802.

MR. TAYLOR: The application of Southland Royalty Company for special pool rules, Lea County, New Mexico.

MR. STAMETS: Call for appearances.

MR. IVES: Peter Ives, with the firm of Campbell and Black, representing Southland Royalty Company.

MR. STAMETS: Other appearances?

MR. KELLAHIN: Mr. Chairman, I'm Tom Kellahin from Santa Fe, New Mexico, appearing on behalf of Conoco, Inc.

MR. STAMETS: Mr. Ives.

MR. IVES: May it please the Commission, we are here today before the Commission seeking temporary special pool rules for the South Corbin Wolfcamp Pool.

Our testimony which we will present today will show that 80-acre spacing is currently justified from a geologic and engineering standpoint for the pool; that without the granting of 80-acre spacing economic

waste will occur and development of the pool will be hindered or curtailed and we believe that an expedited order is neede in this matter to prevent economic waste due to a drilling obligation of Southland Royalty Company, which they face on May 3rd, 1986.

I have four witnesses today from Southland Royalty Company to present testimony and exhibits and I would call my first witness.

MR. TAYLOR: We have to swear your witnesses first.

Tom, do you have any witnesses?

MR. KELLAHIN: No, sir.

(Witnesses sworn.)

MR. IVES: Call as my first witness, Mr. Trey Shepherd.

TREY SHEPHERD, III

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

DIRECT EXAMINATION

BY MR. IVES:

Q Mr. Shepherd, would you please state your

name and residence for the record.

A My name is Trey Shepherd and I live at 5201 Brazos, Midland, Texas.

Q And what is your current occupation and by whom are you currently employed?

A I am a landman for Meridian Oil, Incorporated.

Q I would like to review with you your educational background beginning with college. Please tell us what degrees, beginning with college, you have received.

A I went to the University of Texas at Austin and received a Bachelor of Business Administration in petroleum land management in 1979.

Q And have you received any advanced degrees since then?

A No, I have not.

Q Are you a member of any professional associations or societies?

A I'm a member of the American Association of Petroleum Landmen and the Permian Basin Landmen's Association.

Q I would also like to review your work experience for the Commission beginning with your work assignments after college.

A In 1979 I went to work for Atlantic Rich-

field Company in Tulsa, Oklahoma, as a staff landman.

In 1980 I was transferred to Tyler, Texas as a Senior Landman and I worked there until the early part of 1983 and was transferred to Lafayette, Louisiana, as a Provence (sic) Landman, and in the middle of the summer of 1983 I went to work for Southland Royalty Company in Midland and have been with them since that date.

Q Are you familiar with the wells in the area which is the subject of this application?

A Yes, I am.

Q And are you familiar with the application at issue in this matter?

A Yes.

MR. IVES: I would tender Mr. Shepherd as an expert witness in the area of -- as a landman.

MR. STAMETS: He is considered qualified.

Would somebody clear the record in the relationship between Meridian and Southland?

MR. IVES: Certainly. We were going to cover that.

MR. STAMETS: Fine.

Q Mr. Shepherd, if I could ask you to state for the Commission, just what is the relationship between

Meridian Oil, Incorporated, and Southland Royalty company?

A Meridian Oil, Incorporated, acquired Southland Royalty Company in the fourth quarter of last year. They now act as agent for Southland Royalty Company.

Q For purposes of this proceeding, we will refer to Southland Royalty Company, as they were the initial applicant before the Commission, simply for ease and convenience.

Mr. Shepherd, could you please briefly state for the Commission what is sought in this application?

A We are seeking temporary pool rules of 80-acres for the South Corbin Wolfcamp Field.

Q And when you say temporary pool rules, what period of time are you speaking of?

A Approximately 18 months.

Q And why are you seeking these temporary pool rules?

A To gain information to determine whether this request for 80-acre spacing is justified or whether the wells should actually be drilled on 40 acres.

Q I would like to please refer to what's been marked as Exhibit One for identification and explain to the Commissioners what it is and what it shows.

A This is a map of the South Corbin Wolfcamp Field. The field is shaded in the gray color. Over

that, portions of that, are Southland's acreage shaded in green. The farmouts which we have acquired are shaded in pink.

This contains the wells in the field, their names, operators, their completion dates, production history, perforated intervals, et cetera.

Q Could you please relate to the Commission generally the history of development in the South Corbin Wolfcamp Field?

A Not a great deal of activity in the field itself; there've been only nine wells drilled in approximately the last 19 years. Two of those were drilled in 1967, one other well in 1968. There was then approximately an 11-year period before any additional drilling was done, and the most recent activity has been by Southland Royalty Company in Section 17.

Q And what was the date of the first well drilled in the pool?

A 1967.

Q What has the effective spacing in the area been?

A The effective spacing is 80 acres.

Q And I would like to ask what drilling obligation Southland Royalty Company has at the present time in the South Corbin Wolfcamp Field?

A We have two farm-ins in the southwest quarter of Section 17. Our first farm-in is from J. M. Huber Corporation. It covers the east half of the southwest quarter and the southwest quarter of the southwest quarter. Our next obligation date under that farm-in is May the 3rd of this year.

We also have a farm-in from Armstrong Energy Corporation in the northwest quarter of the southwest quarter and with a May 15th obligation date.

Q And does Southland Royalty Company seek and need an expedited order in this matter?

A Yes, sir, we do, if we are to meet this drilling obligation. We need an order by May the 3rd.

Q What are Southland Royalty Company's development plans in the South Corbin Wolfcamp?

A We plan to drill our next well in Unit K of Section 17 and depending on the performance of that well and the two existing wells that we have drilled, two recent wells we have drilled, rather, we plan additional wells in Unit C of Section 17 and Unit J of Section 18.

Q Was Exhibit One prepared by Southland Royalty Company?

A Yes, it was.

Q And do you have personal knowledge of the information which is set forth on Exhibit One?

A Yes, I do.

Q Is the information on Exhibit One accurate and correct?

A Yes.

MR. IVES: I would at this point in time offer Exhibit One into evidence.

MR. STAMETS: Is the witness referring to the information relative the acreage in the pool, (not clearly understood)depths, well locations, or is he also referring to the production data, depth, and so on?

A You mean insofar as what I have prepared?

MR. STAMETS: In your preparation and your knowledge of Exhibit Number One?

A I have discussed this information with the engineers that will testify later and I myself have prepared the information in regard to the acreage within the pool and Southland's acreage and the farm-in acreage that we hold.

MR. STAMETS: Mr. Ives, I think I would prefer to wait till all of the data on Exhibit One has been discussed before we --

MR. IVES: That's fine.

Q Mr. Shepherd, is it your opinion that granting the application will be in the best interest of preventing waste in the south part of the Wolfcamp Pool?

A Yes, it is.

MR. IVES: Those are all the questions I have of this first witness.

MR. STAMETS: Any questions of the witness?

He may be excused.

MR. IVES: I'm going to call our second witness, Mr. Randy Herr.

RANDY HERR,

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

DIRECT EXAMINATION

BY MR. IVES:

Q Would you please state your name and place of residence, Mr. Herr?

A My name is Randy Herr and I live in Midland, Texas.

Q And what is your current occupation and by whom are you currently employed?

A I'm a petroleum geologist for Meridian Oil, Incorporated.

Q I would like to review with you your educational background beginning with college and degrees, ad

vanced degrees which you have received.

A I received my Bachelor of Science in geology from Texas A & M in 1970; then received a Master of Science in geology from the University of Utah in 1979.

Q And are you a member of any professional associations or societies?

A A member of the Association -- American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, the West Texas Geological Society and the Permian Basin Section of the Society of Economic Paleontologists and Mineralogists.

Q Mr. Herr, I'd like to now review with you your work experience since college, if you could cover each job you've had, your position, and general responsibilities.

A In 1979 I joined Union Oil Company of California where I was a development geologist with that company. I worked development projects throughout the Permian Basin area.

In 1981, and to the present, I am a petroleum geologist with Southland Royalty Company where I have recommended exploration and development projects in southeast New Mexico, the Central Basin Platform, the Midland Basin, and the Northern Valverde Basin.

Q Mr. Herr, are you familiar with the wells in the area of -- that are the subject of this application?

A Yes, I am.

Q Are you familiar with the application at issue in this matter?

A Yes, I am.

MR. IVES: I would tender Mr. Herr as an expert in geology, petroleum geology, before the Commission and for purposes of this proceeding.

MR. STAMETS: The witness is considered qualified.

Q Mr. Herr, directing your attention to what has been marked for identification as Exhibit Two, could you please explain to the Commissioners what it is and what it shows?

A Okay. This is a north/south stratigraphic cross section that goes through the South Corbin Wolfcamp Field. There is an index map on the lefthand side of the map showing the locations for the wells involved in the cross section.

This stratigraphic cross section is hung with the datum on the top of the Third Bone Spring Sand, that's the very top dark line.

The next heavy line located below that is the top of the Wolfcamp.

The next heavy line located below that is the top of the Strawn; similarly below that is the Atoka and

Morrow sections.

The Wolfcamp has been split into different, several different horizons.

The uppermost horizon is called the Upper Wolfcamp dolomite facies. This is a nonproductive facies in the area.

Similarly, below this is the Upper Wolfcamp cherty limestone facies. It also is not productive in this area.

The producing area in the South Corbin Field is located in the Middle Wolfcamp zone. In particular the main pay in the area is called the South Corbin Wolfcamp pay and on the cross section it is shown in the yellow horizon.

Now the Wolfcamp in this area pays from a limestone detrital, which is characterized by a very clean gamma ray character on the log. If you will look at the cross section in the producing wells, you will notice that very clean gamma ray character.

Our Huber 17 Federal No. 1, which would be the fourth well from the left, is perforated and producing from one of these very clean gamma ray portions of the log.

Our West Corbin 5, located just to the left of that well, which would be the third well on the

cross section, is perforated in the lower portion of the Middle Wolfcamp but we have evidence to suggest that that production is actually coming from the zone that's at approximately 10,800, which is the correlative zone that produces in the Huber 17 Federal No. 1.

Q Mr. Herr, you've indicated that you believe that, I believe the word is channeling, may be occurring in the West Corbin No. 5 Well from the primary pay zone which is marked in yellow on Exhibit Two and coming into the perforations in the West Corbin 5. Why exactly is that?

A We have several reasons. First, as you recall, I've stated that the pay in this area is associated with a very clean gamma ray character on these logs and if you will look at the perforated interval in the West Corbin No. 5, there is no reservoir development within that portion of the Woflcamp.

Secondly, we have run a production survey within that well and all of the production in that well is coming from the top perforated -- perforation in that well, and that perforation is opposite a zone which has 1 percent porosity.

Also we have a water analysis on both the Corbin 5 and the Huber 17 and both those water analyses are very similar in content, suggesting to us that the Corbin 5 has channeled down from the main -- well, from the South

Corbin Wolfcamp pay.

And finally, we -- on the logs there is an interval located beneath the yellow horizon, which is a washout zone where we feel that there's a good chance that we've had a bad cement across that zone.

Q Mr. Herr, let me hand you what has been marked for identification as Exhibit Three and ask you to explain what it is and what it shows.

A Okay, this is the water analysis which I referred to on the West Corbin 5 and the Huber 17 No. 1.

If you'll look on the lefthand column at the column -- or the row called chlorides, chlorides are the most common indicators we use for -- in comparing the waters in the formation.

If you'll look at those numbers, the Corbin 5 and Huber 17 have very similar chloride contents and -- but radically different chloride contents with the Corbin No. 1, which is the second well on the left on the cross section.

So we feel that the production in the Corbin 5 is actually going down from the main pay which we think is at 10,800 into that top perforation in the well.

Q And why do you feel that the chlorides are a good indicator of a relationship in this instance?

A Well, chlorides are the most common con-

stituent and the most easily measured constituent to characterize formation water.

Q Were Exhibits Two and Three prepared by you or compiled under your direction and supervision?

A Yes.

MR. IVES: At this time --

Q Do they accurately and correctly set forth the information contained therein and as you have testified here today?

A Yes.

MR. IVES: I would offer Exhibits Two and Three into evidence at this time.

MR. STAMETS: These exhibits will be admitted.

Q Mr. Herr, is it your opinion as a petroleum geologist to a reasonable probability that the Huber 17 and the Corbin 5 both are geologically related in that they appear to be producing from the same primary pay zone?

A Yes.

Q Is it your opinion as a petroleum geologist to a reasonable probability that granting this application will be in the best interest of conservation and prevention of waste, and the protection of correlative rights?

A Yes.

MR. IVES: I have no further

questions of this witness.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Herr, was the purpose of this exhibit to show that there's basically a single pay in the field that is continuous between wells?

A Yes, that was the intent.

Q Looking at the third well I see a set of perforations below the main pay interval. Are those still open?

A The upper perforations are. They have -- we have squeezed the perforations from 11,261 to 333.

Q Were those tested?

A Yes, they were tested.

Q What did they produce?

A We tested a half a barrel of oil and 19 barrels of load water in 10 hours.

Q Okay. Are there any other pay intervals in the Wolfcamp in this area that are producing or have produced significant quantities of oil?

A The West Corbin No. 1, which is the second well to the left, produces from a Wolfcamp limestone detrital pay which is in the lower part of the Middle Wolfcamp.

And there are a few other wells in the area which produce from a slightly different interval but the majority of the wells produce from that pay interval which we have identified as the South Corbin Wolfcamp pay.

Q Do you have any idea -- were -- were you around in 1985 or whenever this third well was perforated over that extensive interval?

A I was, yes, I was with Southland at the time.

Q Do you know why that interval was perforated?

A No, I do not, but we have an engineer with us today that could answer that question for you.

Q All right. Do you know if Southland has any plans to repair that well?

A We, at the moment we do have a workover procedure in on that West Corbin No. 5 to go in and attempt to squeeze that pay and reperforate the well.

MR. STAMETS: Any other questions of this witness?

MR. KELLAHIN: Yes, sir.

MR. STAMETS: Mr. Kellahin.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Herr, I'm using a stratigraphic cross section that's not colored as yours is. Perhaps you could help me, sir.

What is the proposed vertical limit for the pool?

A In which particular well or --

Q You can use any of them as a type well to show me the vertical limits.

A Okay. Then I would go to the Huber 17 Federal No. 1 and it's that cleanest portion of the gamma ray curve and occurs from approximately 10,870 to 11,010.

MR. STAMETS: I'm not clear on that now. Would you be proposing a Wolfcamp pool for less than the entire Wolfcamp interval or would -- are you just indicating what the main pay is?

A That is the interval that I think is where the -- the pay is located.

Q I'm asking you something else. I didn't make myself clear.

In terms of identifying for you or any other operator that proposes to drill in the pool we need to have a type log from which we can take the uppermost portion of the pool and the lower portion. Certainly there will be

some distance in there that may produce but in order to have an order that tells us what the pool limits are vertically, which of the logs would you select and what would the interval be?

A Well, I would select, then, the interval on the cross section that we have labeled the Middle Wolfcamp zone, and it's shown as an arrow with the label "Middle Wolfcamp" located between the last two wells on the cross section on the right hand side.

Q All right, it would be that portion of the Wolfcamp?

A Yes.

Q When we're looking for the continuity, as a geologist, of the pay interval from well to well, are you satisfied as a geologist that you will find that pay interval reasonably continuous across the area that you've mapped?

A The pay which I -- or the interval which I call the South Corbin Wolfcamp pay, I think it is reasonably continuous across that area.

Q Does the thickness of that interval increase and decrease as you move from well to well?

A The overall interval changes somewhat. The main change that occurs within the well is the actual thickness of the limestone detrital.

Q Does the qualify of the reservoir change dramatically from well to well as we move across the pool?

A I don't think it necessarily is that the quality of the reservoir changes as much as, say, maybe the thickness.

Q As a geologist, then, are you satisfied that the area to which these special rules are to be applied is one that constitutes a separate and distinct reservoir in the interval that you propose to be the new pool?

A I'm sorry, I don't understand that question.

Q You have mapped us an area in your stratigraphic cross section from northwest to southeast. Within that area do you find a separate and distinct reservoir in this Wolfcamp interval that is both separated vertically and horizontally from other pools?

A Yes.

Q Where is the closest pool that produces from this interval other than the one we're talking about now? How far away is the next pool like this?

A I believe the closest one that I'm familiar with would be the Scharb Wolfcamp Field.

Q And approximately how far away is that?

A It would be located one township away, six to eight miles, approximately.

Q In terms of establishing an initial horizontal boundary for the pool, does one of your exhibits show us what the horizontal boundary is for the pool?

A That interval which I've marked the Middle Wolfcamp.

Q Yes, sir, and horizontally, then, on a land plat is that what's depicted on Exhibit Number One in some fashion?

A I'm not sure of that. Would you repeat that, please?

Q Yes, sir. You're preparing the land plat and the well locations in reference to your geology and I want to find out from you as a geologist whether or not the wells that you propose to include in the pool are all in the same pool.

A Yes.

Q As a geologist, do you think it would be appropriate to initially space this pool on less than 80 acres?

A Not at the moment until we have additional information.

Q With the current present information available to you, are you satisfied that geology shows you that this pay interval is reasonable continuous?

A Yes.

Q It is not so discontinuous that you would leave reservoir untested if you should drill the wells 80 acres apart.

A With the information we have now, no, I don't think so.

Q At this point with the current state of information available to you, would you believe that wells drilled on 40-acre spacing now would result in the drilling of unnecessary wells?

A I believe in certain portions of this pool it definitely would or could result in waste.

Q Will spacing on 80 acres lead to a more efficient and quicker development of this pool?

A I think so, yes.

MR. KELLAHIN: Nothing further.

RECROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Herr, if you discovered a producing interval in the Upper Wolfcamp, would you propose to dually complete that interval with the Middle Wolfcamp?

A If it was mechanically feasible, but to date all that upper horizon, which I've labeled the Upper Wolfcamp dolomite facies, we've encountered numerous shows within that interval but all formation tests that I'm aware

of have recovered salt water.

Q I'm at a loss as to why you don't want to include the entire Wolfcamp interval in these pool rules.

MR. IVES: Sir, could you repeat the question?

MR. STAMETS: Well, it's not exactly a question. I was just saying I'm at a loss as to why you don't want to include the entire Wolfcamp interval within these pool rules.

A That would not bother me.

MR. IVES: We do propose to dedicate the entire Wolfcamp Pool to 80-acre spacing.

MR. STAMETS: Okay. I did not understand that because --

MR. IVES: On a temporary basis.

MR. STAMETS: -- of the response to Mr. Kellahin's questions.

MR. CARR: Mr. Stamets, one thing to try and avoid any confusion. This is an existing pool at the present time. The initial well was drilled in 1967 and the shaded area on Exhibit One does outline what is the existing pool boundary and it includes the Wolfcamp interval.

MR. STAMETS: Well, I under-

stood that Mr. Herr, in response to Mr. Kellahin's question, wanted the horizontal -- or vertical limits of the pool to be the Middle Wolfcamp as identified on the two righthand logs on Exhibit Number Three -- no, Exhibit Two.

A I would say that I misunderstood the question.

Q All right, thank you.

MR. IVES: If I may, I believe this point may be clarified. I believe the line which Mr. Herr was referring to on the Exhibit Two comes between the second and third wells from the righthand side of the page as opposd to the line between the first and second.

Q Is that correct, Mr. Herr?

A Yes.

MR. STAMETS: Are there other questions of this witness?

MR. LYON: May I ask a few questions?

MR. STAMETS: Mr. Lyon.

QUESTIONS BY MR. LYON:

Q Mr. Herr, referring to your cross section -- I'm V. T. Lyon, Chief Engineer for the Division.

You have some discontinuous (not clearly understood) shown on a few of these wells. For instance,

the second well from the left, the West Corbin No. 1, you have an interval which is at approximately 11,200 to 11,300 feet. It is shown -- is outlined by an irregular polygon there and labeled Wolfcamp pay, and apparently, as I interpret this, that is not considered to be in connection with any other wells shown on the cross section.

A At the moment we do not think it connects with any other wells.

Q But that is part of the Wolfcamp, is that correct?

A Yes.

Q And is part of this particular field or pool that we've been referring to.

A Yes, right.

Q And the perforations on the third well from the left are shown below the yellow interval but you maintain that that well is producing from the yellow interval, is that correct?

A That's correct.

Q Then in the fourth well, just in the perforations that straddle 11,200, those perforations have been squeezed, is that what that symbol means?

A Yes.

Q And it's actually producing from the top of the yellow zone shown at -- straddling 10,900 feet?

A Yes, opposite that label No. 2 there.

Q You also show on six, the sixth well from the left, the upper interval there, that shows perforations and is labeled Wolfcamp pay, which is above the yellow interval, is that the pay zone in that well?

A Yes.

Q And in your last well on the right there are two sets of perforations. One of them is in the yellow and the other one is not in the yellow.

What is the situation on this well?

A The lower perforations, the well was worked over subsequently, and the upper perforations are the producing perforations in that well.

Q If I understand your exhibit correctly, and correct me if I'm wrong, you do indicate a zone with apparent continuous pay represented by the yellow --

A Yes, that's correct.

Q -- but that there are other intervals which are found from one location to another in the Wolfcamp, is that correct, that are not continuous?

A Well, as I've stated, that the interval which we marked the South Corbin Wolfcamp pay is the interval which produces in most or a majority of the wells in that field. There are a few of the stringers that produce in other portions of the Wolfcamp.

MR. LYON: I believe that's all

the questions I have.

MR. STAMETS: Any other questions of Mr. Herr?

He may be excused.

MR. IVES: I would now like to call Mr. John Stark for or on behalf of Southland Royalty Company.

JOHN STARK,

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

DIRECT EXAMINATION

BY MR. IVES:

Q Mr. Stark, would you please state your name and residence?

A My name is John Stark. I live in Midland, Texas.

Q What is your occupation and by whom are you employed?

A Operations engineer, with Southland Royalty Company.

Q Mr. Stark, have you previously testified before this Commission as a petroleum engineer and had your credentials accepted as a matter of record?

A Yes, I have.

Q Are you familiar with the wells in the area which are the subject of this application?

A Yes, I am.

Q Are you familiar with the application as issued in this matter?

A Yes, I am.

MR. IVES: I would tender Mr. Stark as an expert petroleum engineer.

MR. STAMETS: He is considered qualified.

Q Mr. Stark, I'd like you first to refer to what has been marked as Exhibit One and review the development of the pool referenced on Exhibit One and the data present on each well in the pool, if you would.

A Yes, sir. I prepared this map and the shaded area is the pool outline, currently the South Corbin Wolfcamp Field.

The well locations shown are all the wells that have been tested and are -- and have been completed in the Wolfcamp interval, and beside each well is well data that I have gathered and in the lower left -- righthand corner of the map it explains this information. It gives the operator name, the well name, the location of the well, completion date, total depth, perforations, ini-

tial potential, the current production rate, cumulative to the lastest available.

Q Was Exhibit One prepared by you?

A Yes, sir, it was.

Q And does it accurately and correctly set forth the information contained therein and as you have just testified at the hearing today?

A Yes.

MR. IVES: I would offer Exhibit One into evidence before the Commission.

MR. STAMETS: Exhibit One will be admitted.

Q Mr. Stark, asking you to refer to what has been marked as Exhibit Four for identification, could you please explain to the Commission what it is and what it shows?

A Yes. This exhibit shows the volumetric calculations I've made on the Huber 17 Federal No. 1, the well that we -- the most recent well drilled in the field by Southland, and it's located in Section 17 in the Unit letter M of that section.

This -- the information given, the first one, I've used the estimated ultimate recovery of the well of 100,000 barrels of oil. This was derived from decline curve analysis of this well and wells in the area.

The next -- next item is H net. That stands for the thickness of the net pay. I'm giving it 28 feet according to open hole log evaluation.

Also of porosity, I'm showing 6 percent as the average porosity of this net pay.

B sub O I (sic) stands for formation volume factor in initial conditions.

The next one is water saturation, SW, of this net pay interval.

RF is the recovery factor, which I assumed 25 percent, and then A stands for the acreage of acre drainage around this well and using the data I've just said we calculated 73 acres of drainage.

Q Have you done or performed any other calculations to substantiate the information on Exhibit Four?

A Yes, sir, we have pressure data from the Huber 17 No. 1.

The first pressure point we had was in December '85. After the well had produced 600 barrels of oil it gave initial pressure of 4000 pounds bottom hole pressure.

The second pressure data in this well was February of '86 after the well had produced approximately 4600 barrels. The pressure was 3,600.

From this pressure data and the recovery

data I then performed a material balance evaluation in which I estimated original oil in place of approximately 400,000 barrels of oil.

Using my 25 percent recovery factor, as explained previously, I come up with a recoverable oil around this well of 100,000 barrels, which substantiates the 100,000 barrels of coverable oil that I used in my volumetric calculations.

Q Was Exhibit Number Four prepared by you?

A Yes, it was.

Q And does it accurately and correctly set forth the information contained therein and as you have testified to here today?

A Yes.

MR. IVES: I would offer Exhibit Four into evidence before the Commission.

MR. STAMETS: Exhibit Four will be admitted.

Q Mr. Stark, is it your opinion as a petroleum engineer to a reasonable probability that 80-acre spacing will efficiently and econmically drain the South Corbin Wolfcamp Pool?

A Yes, sir.

Q Is it your opinion as a petroleum engineer to a reasonable probability that granting this appli-

cation would be in the best interest of conservation, the prevention of waste, and the protection of correlative rights?

A Yes, I do.

Q And is it your opinion as a petroleum engineer to a reasonable probability that granting this application will avoid drilling of unnecessary wells?

A Yes.

Q And is that opinion based on the fact that your volumetric calculations suggest that, for instance, the Huber 17 will drill -- will drain effectively 73 acres?

A Yes, sir, with the data we have now.

Q Assuming that 80-acre spacing was granted on a temporary basis, what information will you develop from any additional wells you've drilled in relation to the spacing issue here today?

A We would gather further performance and pressure data from the existing and wells to be drilled and from that data we would be able to do, as -- as explained, do further volumetric and material balance calculations to more accurately determine the drainage of acreage around each well.

Q And would that information, could that information then be used to justify either 80-acre spacing

on a permanent basis or suggest reversion to 40-acre spacing?

A Yes, sir, it would.

MR. IVES: Those are all the questions I have of this witness.

CROSS EXAMINATION

BY MR. STAMETS:

Q Is there any pressure data available for any of the wells in this pool?

A Wells besides the Huber 17?

Q Yes.

A Okay, yes, sir, we have pressure information in the West Corbin Unit Number Five that -- that data was gathered in September of '85 after the well had produced approximately 700 barrels of oil and it had a pressure of 4300 pounds initially, which is --

Q Is that bottom hole pressure?

A Yes, this is bottom hole pressure. The -- as I might go ahead and say, this pressure is approximately 300 pounds higher than the initial pressure found in the Huber 17-1, and due to the completion in the West Corbin 5, we now suspect channeling possibly occurring. I do not include this pressure data in the material balance because of the -- we weren't sure of the completion and the

zone it could possibly be coming from.

Q There's no pressure data available for West Corbin Unit No. 1, the Corbin Federal No. 1, any of these other wells in this pool?

A Yes, sir, we have one pressure where we have pressure information on the West Corbin Unit No. 1. It was gathered in October of '85. This was from equipment that is at the surface and we estimate bottom hole pressure and we -- it estimated approximately 1000 pounds bottom hole pressure.

Q As I recall looking at Exhibit Number Two, that's a different interval, producing interval from the No. 5, is that correct?

A Yes, sir. We believe so.

Q Is there any pressure data available for either of the wells in Section 20?

A No, sir. The data I've just said is all -- is all the pressure data I'm aware of.

Q Did you make a search of the records to determine if there was data available?

A Yes, sir, I looked through scout ticket information and called other operators and this -- this is all I found.

MR. STAMETS: Any other questions of this witness?

MR. LYON: I've got a few questions.

MR. STAMETS: Mr. Lyon.

QUESTIONS BY MR. LYON:

Q Mr. Stark, referring to Exhibit Four, why did you choose Huber 17 for this calculation, Huber 17 No. 1?

A Okay, we choose this well, we -- we had a -- we didn't suspect any problem with completion as the West Corbin 5 had encountered; any questions and suspicions that possibly channeling is going on. We also had bond logs and other logs that, you know, help us to determine that there was no channeling, you know, no cement channels behind pipe, so we felt confident the interval was completed as shown on the perforations.

We also had more pressure data that we, bottom hole pressure data, better quality, in this well that I could then compare my original oil in place calculations for material balance with my volumetrics and to see how they fit together.

Q Well, what is the basis for your estimated recovery of 100,000 barrels?

A That was based on looking at the performance of the wells in the area; the Wolfcamp interval, the

wells that were completed in the Wolfcamp in this entire area. I tried to look at the decline curve analysis on as many wells as I possibly could, including the West Corbin 5 and wells in the southern portion of the pool area.

And I just -- some showed much higher than that, some showed much less, but this average -- this number is an average that I obtained.

Q What's the cumulative production from this well?

A From the Huber 17-1?

Q Yes.

A It's approximately 4000 barrels of oil and 600 water.

Q All right. Now, your -- your net pay you picked from your logs?

A Yes, sir.

Q Your porosity you picked from your logs.

A Yes, sir.

Q What's -- what is the basis for your volumetric -- your reservoir volume factor?

A The -- of the oil, the formation volume factor?

Q Yes.

A I was using correlations using the gravity of oil we obtained and measured; bottom hole pressure

and temperatures, and correlation charts to come up with a formation volume factor initial.

Q So you had to (not clearly understood.)

A You mean the PVT information?

Q Right.

A No, sir, we have not done that.

Q You say there are -- are -- referring back to Exhibit One, there are nine wells producing in this field, is that right?

A Yes, sir, I believe that's correct.

Q Have any of those -- have any of those wells recovered 100,000 barrels?

A No, sir, but that includes the West Corbin No. 5, I included, and, as seen, that well in its short life has recovered nearly 64,000 barrels of oil already and it's still flowing top allowable rates of 365 oil a day.

Q Right.

A Due to the proximity to that well I had to weight somewhat my averaging of the -- close of that, such a good performing well.

Also, there are some Wolfcamp wells outside the pool area that I also had looked at, but, you know, just to compare some other performance.

Q Some of these wells have produced for

nigh on to twenty years, isn't that right?

A Yes, sir, the first well was completed in July of '67.

Q Apparently they were not of the same quality as those more recent wells there to the northwest.

A Well, that's -- that's exactly what we're trying to understand, is the difference -- what is making this area so different in its performance.

Q It's almost as if it were a separate field.

A That's what we'd like to determine with future data.

MR. LYON: I think that's all the questions I have.

MR. STAMETS: Any other questions of Mr. Stark?

MR. IVES: I have a couple of additional questions.

REDIRECT EXAMINATION

BY MR. IVES:

Q Mr. Stark, isn't your testimony here today that the pressure data you have across these number of wells is not determinative of the issues in this application?

A Well, at this point -- well, no, sir, not -- we'd like to get more information.

Q In other words you do need more and additional information in order to come to -- obtain what you will feel comfortable with in terms of figures showing possible relationships across the Wolfcamp Pool?

A Yes, sir, that's definitely true. We only have two really pressure data that we feel competent of and it's -- we just need much more to make a more accurate estimate.

Q And were those two pressure points that you're referring to taken from the Huber 17 Well?

A Yes, sir.

Q And is it your feeling that the volumetric calculation performed and which is set forth on Exhibit Four provides you the best indication of drainage in the pool at the present time?

A At the present time, that's the best estimate.

MR. IVES: I have no additional questions.

MR. STAMETS: Any other questions of the witness?

MR. KELLAHIN: Just a couple, Mr. Chairman.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Stark, are you satisfied that the reservoir parameters that you have used for the volumetric calculation are reasonably typical for other wells from which you have similar information?

A Yes, sir. We feel that that 100,000 recoverable oil, as I was mentioning before, is, we feel like, a reasonable number including all the poorer wells to the south in this pool.

Q I meant the actual parameters that go into the calculations.

A Yes, sir, that's --

Q The water saturation, all the rest of the numbers that you have used and seen in this well and in this log, are they generally typical of these others or is there a range of difference here?

A Yes, sir, I feel like these are typical of the wells I've looked at.

Q What is the original bottom hole pressure of the Wolfcamp Pool?

A I'm not -- again, the older -- I've looked in the histories of -- these wells are nearly twenty years old and I could not find any good quality data at all, and that's why we went to the effort ot start gathering data

in these wells.

Q Do you see any significant difference in the way the wells were completed and stimulated for production that might account for the fact that some wells have produced significantly less than other wells?

A No, sir, I have seen -- they're all completed similarly.

Q Have you done other volumetric calculations, other than this one for the Huber No. 17 Federal L?

A No, sir, I haven't.

Q And this is the one you used because it is the only well that you had what you thought was reliable information?

A Yes, sir.

Q Do you have any information from wells that are adjacent to each other from which to draw any kind of pressure information or conclusions about communication?

A No, sir, I don't, and as I believe noted earlier, the rest of the field is really spaced at 80 acre and greater, so, no, I don't.

Q I was looking at it in Sections 18 and 17. There are at least two wells there that are 40 acres apart and I -- is there anly information available to you from either of those wells that you could draw any comparisons or studies about the abilities of wells to drain or

communicate that close together?

A Well, again, we don't have that good a reliable pressure information in either well and I would not like to at this point without more data, to make a judgment either way on those two wells.

Q Thank you.

MR. STAMETS: Any other questions of Mr. Stark?

He may be excused.

MR. IVES: I'd like to call Mr. Gene Carlson to testify in behalf of Southland Royalty Company at this time.

GENE CARLSON,

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

DIRECT EXAMINATION

BY MR. IVES:

Q Mr. Carlson, would you please state your name and residence?

A My name is Gene Carlson. I live in Midland, Texas.

Q And what is your occupation and by whom are you currently employed?

A I am Regional Reservoir Engineer for Meridian Oil Company -- or Incorporated, excuse me, in Midland.

Q And if you could please summarize your educational background for the Commission beginning with college and covering any advanced degrees you have received.

A I received a BS degree in mechanical engineering from Texas A & M University in December, 1974.

Q Are you a member of any professional associations or societies?

A Yes, sir. I'm a member of the Society of Petroleum Engineers of the American Institute of Mining Engineering.

Q Are you -- let me ask you now to summarize your work experience since your graduation from college, covering what company you were with, when you were with them, and what position?

A I was originally with Exxon Company USA in Midland from 1975 until mid-1977, whereupon I went to work for Southland Royalty Company, also in Midland. I worked there until late 1979.

I was with Texas Oil and Gas in Dallas and Denver until mid-1981, whereupon I returned to Southland in Midland and stayed until I was transferred to Ft. Worth in 1982 and I recently returned to Midland as the Regional Reservoir Engineer for the newly merged organization, Meri-

dian Oil, Incorporated.

Q Mr. Carlson, are you familiar with the wells in the area which is the subject of this application?

A Yes, I am.

Q Are you familiar with the application at issue in this matter?

A Yes, I am.

MR. IVES: I would offer Mr. Carlson as an expert in the area of petroleum engineering.

MR. STAMETS: He is considered qualified.

Q Mr. Carlson, let me ask you please to refer to what has been marked for identification as Exhibit Number Five and explain to the Commissioners what it is and what it shows and please, if you would, detail out any acronyms or other abbreviations which are set forth on the exhibit, and it might be helpful to go column by column.

A All right. First of all, I'd like to explain in concept what we've done here is we've built upon previous testimony which established that a reasonable recovery, for example, the Huber 17-1, which is also coincidentally offset to most of the obligation problems that we have right now.

The Huber 17-1 is estimated to have an ultimate recovery of about 100,000 barrels if it were al-

lowed to drain what is estimated to be its 73 acres it will drain ultimately.

What we did here is we compared the economics of leaving one well on 80-acre spacing, that is, the Huber 17-1, for example, which would recover an ultimate 100,000 barrels of oil recovered.

The second case that we would have is going to the 40-acre development density, in which case the full 80 acres would be drained and hence increase the recovery from the two combined wells to about 110,000 barrels, or increase the recovery an additional 7 percent, or 7 acres.

The economics that we've summarized here show on the left column discussing the -- what -- or labeling the items that are under each of the four cases of economics that I'll delineate later.

The oil in thousands of stock tank barrels of oil is expressed in gross and net for a working interest of 100 percent and a net interest of 87-1/2.

The gas reserves volumes are the -- expressed in million cubic feet of -- million standard cubic feet of gas that is also expressed in gross and net, is indicated in parentheses.

With the working interest investment based on 100 percent working interest for a typical well in

this area is $874,000 by our best estimate. It would take -- the payout in years is after Federal income tax payout for an investment for the four cases that was run, and the ROR is the effective rate of return by discounted cash flow analysis that says what the effective interest rate that you get for your investment by doing this business opportunity.

The PI is the profit to investment ratio at 15 percent discount, also by the discounted cash flow method, and is the ratio of the -- what the last item is, which is the net present value at 15 percent discounted compared against the investment of $874,000 in the first example.

We used for all these economic calculations an oil price of $20.00 a barrel and a gas price of $1.50 per MCF. Of course, we'll remind you later in the presentation that oil is now running about $13.00 a barrel.

Initial producing rate that we used for each of these on a -- for a typical well would be 50 barrels of oil per day initial production rate. The gas/oil ratio employed was 2000 standard cubic feet of gas per barrel of oil and again the working interest used was 100 percent and the net revenue interest, 87-1/2 percent.

The first case of economics that was prepared shows what we believe to be the economics of the Huber 17-1 retroactive to its time zero or date of drilling.

If you recover 100,000 barrels from this well, as established in previous testimony, you would also recover 200,000,000 cubic feet of gas gross and you would spend $874,000 to get that.

It would take 1.7 years to payout after Federal income tax and you would achieve what I would consider to be an acceptable after Federal income tax rate of return of about 40 percent.

The profit to investment ratio is .26, which is well within most people's guidelines and the net present value that you would achieve over your investment discounted at 15 percent is $229,000.

What we see here is in general terms a very good acceptable economic proposition.

The next three cases of economics that are delineated show the other scenarios of how you can look at it from very many different viewpoints. I call your attention to the farthest right case of economics, which shows what we would have to do to drill the second well, or what would result if we drilled the second well on that 80-acre tract with 40-acre spacing and that second well would, as it's indicated, increase the recovery in oil, 100,000 barrels to almost 110,000 barrels, reflecting 80-acre drainage versus 73.

The gas associated with that would be

219,000,000 cubic feet of gas and working interest investment, as you can see, would double the single well case, and for the two well case here you see that the payout in years would be almost four years.

The rate of return experienced for us on the overall project basis would be about 4-7 percent, which you could greatly exceed by buying a Treasury bond at this time; just to show how you would compare that in your mind versus, you know, that is the main economic parameter we're looking at here and that's your rate of return.

The profit to investment ratio is negative because the rate of return is less than the discount rate of 15 percent employed in the PI calculations and, of course, the net present value to -- to us at 15 percent discount is negative for this case for the combined economics of the two wells.

Now let's look at it again and let's say that Southland -- or Meridian and Southland were not allowed to maintain the 80-acre spacing and we also made the business decision which by the economic parameters showed in the right cases we probably would not seek the opportunity to drill a 40-acre well, we would then have the production estimated to June 1st, 1986, without two wells in the reservoir, as indicated in the note at the bottom.

So our current well would recover more

than half of the 110,000 barrels stated for the two well case. We would recover from the Huber 17-1 because it would have a head start on the second well, would recover about 59,000 barrels and about 118,000,000 cubic feet of gas.

Again our working interest investment, looking back from time zero, $874,000.

Our payout on the well would change from 1.7 years to 3.5 years, and again our rate of return, AFIT, would drop well below acceptable rates of return, which would have to be -- most people use more than 50 percent, and as you can see, the rate of return for the case of us having the Huber 1 Well compete with someone else's new well, as we use in the vernacular, would be 7.4 percent rate of return.

The profit to investment again is negative because the return is less than the stated discount, and net present value to us of the Huber well, Huber 17-1, is negative also, $70,000.

We want to also point out the economics of the new well, in that if you despaced this based on the information we have in to date, the new well on 40-acre spacing would achieve less recovery than the Huber 17-1, or 51,000 barrels, approximately, 101,000,000 cubic feet of gas. They would have to spend $874,000 to do it and it would take 4.1 years for it to pay out. The rate of return

would be 2 percent AFIT. The profit to investment ratio would also be negative and the net present value would be minus $116,000.

What we would want to point out with this is that if you do engineering analysis with the available information as we have done, that this is not an economical prospect on 40-acre drainage.

If you have full development on 40-acre drainage and wells competing, no one is going to be able to make money out here based on current information that we have.

So, to draw the conclusion, then, if you drilled the thing on 40-acre spacing and everybody does their homework, you're not going to get as many wells drilled as if you would allow us to drill them on 80-acre spacing.

Q Mr. Carlson, assuming that the South Corbin Wolfcamp were developed on 40-acre spacing, is it your opinion as a petroleum engineer to a reasonable probability that such wells would be uneconomical and result in economic waste?

A Based on data at hand today, I believe that be true.

Q Was Exhibit Five prepared by you?

A Yes, sir.

Q And does it accurately and correctly set forth the information contained therein and as you have testified to here today?

A Yes, sir.

MR. IVES: I would offer Exhibit Five into evidence.

MR. STAMETS: Exhibit Five will be admitted.

Are there questions of Mr. Carlson?

MR. IVES: I have one last general question.

MR. STAMETS: All right.

Q Mr. Carlson, is it your opinion as a petroleum engineer to a reasonable probability that granting this applicatio is in the best interest of conservation, the prevention of economic waste, and the protection of correlative rights?

A Yes, sir, I believe that to be true.

MR. IVES: No further questions.

MR. STAMETS: Any other questions of Mr. Carlson?

He may be excused.

Mr. Ives, do you have anything

further you wish to offer in this case?

Does anyone have a closing statement?

MR. IVES: We have nothing further to offer, Mr. Commissioner.

MR. STAMETS: Tom, do you have any --

MR. KELLAHIN: Nothing, sir.

MR. LYON: May I inquire, is there anything in the record which shows that there is 80-acres of common lease which is available to each of these wells indicated?

MR. IVES: I'm not aware of anything in the record.

MR. LYON: What I'm concerned about is --

(Thereupon a discussion was had off the record.)

MR. STAMETS: Gentlemen, the Commission has decided that we will approve the application for a temporary period of 18 months. Let's see, today is the 9th of April, and unless there is some reason to make the effective data some other date we would propose to make that effective May the 1st, and the basis for this would be

the economic data that there is not a great deal of engineering data to demonstrate that the wells can, indeed, drain 80 acres, but there is sufficient economic data to indicate at this time the pool cannot be economically developed on less than the 80-acres, and we would ask that we be provided with a draft order which would set out those findings and -- and an order with provisions that we have discussed there, including coming back in for demonstration at the end of 18 months for a demonstration and 80 acres is indeed the correct spacing for this pool.

That being the decision of the Commission, we would sign that order as soon as it becomes available.

If there is nothing further, then, this hearing will be recessed until 9:00 o'clock tomorrow morning.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY the foregoing Transcript of Hearing before the Oil Conservation Division (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 CSR