BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 17, 1960

REGULAR HEARING

IN THE MATTER OF:

Application of the applicant, Phillips Petroleum Company, and the protestant, Tennessee Gas and Oil Company, for a hearing de novo in Case No. 1947, Order No. R-1683, relating to the application of Phillips Petroleum Company for two 80-acre non-standard oil proration units and one unorthodox oil well location in the Kemnitz-Wolfcamp Pool, Lea County, New Mexico.

CASE 1947

BEFORE:

Mr. Murray Morgan
Governor John Burroughs

TRANSCRIPT OF HEARING

MR. PAYNE: The next case is 1947, which is an application of Phillips Petroleum Company for two 80-acre non-standard oil proration units and one unorthodox well location.

I would like to call for appearances in this case at this time.

MR. SPANN: Charles C. Spann of Grantham, Spann and Sanchez, 904 Simms Building, Albuquerque, appearing for the applicant. I have with me Mr. Carl Jones, attorney from Midland, Texas, also with Phillips; and Mr. R. M. Williams of Bartlesville, Oklahoma, also with Phillips Petroleum.

MR. HINKLE: I would like to enter an appearance for the Tennessee Gas and Oil Company. William M. Armstrong, Division

Attorney for the Tennessee Gas at Midland. Howard Bratton and Clarence Hinkle of Hervey, Dow and Hinkle, Roswell.

MR. PAYNE: Any other appearances?

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, would like to enter an appearance on behalf of Samedan Oil Corporation.

MR. ANDERSON: R. M. Anderson, Sinclair Oil and Gas Company. I would like to enter an appearance for the purpose of making a closing statement at the conclusion of the testimony.

MR. HOUSTON: Richard Houston and Oliver Seth for Shell Oil Company.

MR. PAYNE: You may proceed, Mr. Spann.

MR. SPANN: For the record, as I understand it, there was a de novo, or application for de novo hearing filed by Tennessee; and then Phillips, who had received a portion of their original application, in other words, a 60-acre unit, also filed an application for de novo hearing. So is it the Commission's position that we're the moving party at this point?

MR. PAYNE: Yes, inasmuch as you were the original applicant, and that both you and Tennessee asked for de novo. I think you should put on your testimony, and then Tennessee, and then for other parties to put on what they might wish.

MR. SPANN: We have one witness, Mr. Don Czirr.

(Witness sworn.)

MR. SPANN: At this time I would like to, in the interest of saving some time here, I would like to offer in evidence the

Transcript of Proceedings, together with the exhibits which were held incident to the Examiner hearing, and from which hearing this de novo application or proceeding came.

MR. PAYNE: Is there any objection to the incorporation of the proceedings in the Examiner hearing in this case, which incidentally is the same case number?

MR. HINKLE: We have no objection.

MR. PAYNE: All right.

MR. SPANN: It will be received?

MR. PAYNE: It will be received.

MR. SPANN: As part of the record?

MR. PAYNE: Yes, sir.

MR. SPANN: And so considered.

DON CZIRR

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

DIRECT EXAMINATION

BY MR. SPANN:

Q Would you state your name, for the record, please?

A Don Czirr, C-z-i-r-r.

Q By whom are you employed?

A Phillips Petroleum Company. I'm the Division Reservoir Engineer in Midland, Texas.

Q You previously testified at the Examiner hearing in connection with this case, is that correct?

A That is correct.

Q Have you ever testified before the full Commission?

A No, sir, I have not.

MR. SPANN: Does the Commission require a further qualification of this witness?

MR. PAYNE: No, sir, his qualifications are accepted.

Q (By Mr. Spann) Mr. Czirr, directing your attention to the Transcript of Proceedings in this cause, which was held before the Examiner, have you reviewed your testimony that was given at that time?

A Yes, sir, I have.

Q I believe that was held on April 30, 1960. Would your testimony today in connection with the matters inquired into at that time be the same as you gave it at that hearing?

A Yes, sir, it would be. Our position at that time was that we had the New Mexico A Lease, a 240-acre lease; we were asking for permission to drill an off-pattern well and to obtain two 80-acre non-standard proration units to fit this lease into the configuration of the pool, as we interpret it.

Q Explain to the Commission just what brought about this situation that resulted in this application; describe the rules and the development of the Field and what's actually occurred here in connection with your lease.

MR. SPANN: Incidentally, for the Commission to follow this, although I assume that this exhibit is in evidence in the

prior transcript, I would like to hand the Commission some contour maps that show the location of the wells. I think to keep the record straight, I would like to have that marked as Exhibit 5, if I may.

(Whereupon, Phillips Exhibit 5 marked for identification.)

Q (By Mr. Spann) I will ask Mr. Czirr to explain what is shown on that exhibit in connection with this present testimony, in answer to my question.

A Basically, the map shows the configuration of the Kemnitz-Wolfcamp Pool. It shows the Phillips New Mexico A Lease in red, the 240-acre lease under discussion now.

We drilled our No. 1 well, the New Mexico A-1, made a flowing oil well with no water production. We drilled our No. 2 well in accordance with the rules that had been established for this pool, which provide that the proration units shall be either the East or West Half of a Governmental Quarter Section, and that the well will be located in either the Northeast Quarter of a quarter section or the Southwest Quarter of a quarter section.

We followed these rules in the development of this lease. The No. 2 well did not encounter commercial rates of production, although we did have shows of oil on drillstem tests and in the samples. The interpretation, as was brought out at the previous hearing, was that this 240-acre lease contained a minimum of 160 acres that could reasonably be considered to be productive, but because of the thinning of the pay section along the south edge

of our lease, we required an exception to the fixed rules to develop a second well on this lease, develop 160 acres.

Q This situation, could that reasonably be expected when you have rigid spacing rules, as you approach the edge of a field?

A Yes. It would be certain to happen in any field where you are dealing with large units, as we have in these deeper pays.

Q It's your position, then, that you have in excess of 160 productive acres within this lease?

A That's my opinion, yes.

Q And the proposed well location which is shown on that exhibit, is that the most feasible location to produce this acreage, in your opinion?

A Yes, sir.

Q Now, Mr. Czirr, are you familiar with the order that was entered by the Commission in this cause, as a result of the Examiner hearing?

A Yes, sir, I am.

Q Generally, what did that order grant to the applicant?

A The order granted the request for the off-pattern well location, or New Mexico A Well No. 3, as requested; the unorthodox proration units were not exactly as we had requested. We had requested for two 80-acre non-standard proration units, but as the Commission pointed out, we had not followed the quarter section lines and it was not considered to be feasible to describe the proration unit we had designed for the New Mexico A Well No. 3, which we were granted an

exception for, and we were given 60 acres, which would be the north 60 acres of the East Half of the Southwest Quarter of Section 25.

Q That unit did follow quarter section lines or quarter-quarter section lines?

A Yes, that was the reason for the reduction, apparently, was to follow the quarter section lines, or description that could be easily registered.

Q In your opinion is there an 80-acre unit, non-standard unit within the productive area that would follow quarter section lines or quarter-quarter section lines?

A Yes, we could design our proration unit for our New Mexico A Well No. 3 along lines as shown by this plat.

(Whereupon, Plaintiff's Exhibit 6 marked for identification.)

Q Directing your attention to Phillips Exhibit 6, what does that show?

A It shows the South Half of Section 25, the Phillips New Mexico A Lease and the two non-standard proration units that we're proposing today, each containing 80 acres. The proration units are exactly as approved by the Commission, except the 20 acres shown for the New Mexico A Well No. 3, which would be the North Half of the Southeast Quarter of the Southwest Quarter, that would be the only change from what was issued.

Q Now you had proposed to amend your original application, or the plat attached to your original application, to substitute

Exhibit 6 as being the non-standard unit?

A Yes, sir.

Q Which you would like dedicated to this well, is that correct?

A That's correct.

MR. HINKLE: Did I understand that you are asking that your application be amended?

MR. SPANN: To substitute this plat and that non-standard unit for the one that is described in the original application.

MR. HINKLE: You are amending your application different from what it was advertised?

MR. SPANN: I think it's within the general terms of the notice.

MR. PAYNE: Inasmuch as it is a de novo hearing, presumably the applicant would be entitled to start all over again, so we'll look at the case as though he's asking what is shown on Exhibit 6 as the 80-acre non-standard unit.

MR. SPANN: That's correct.

MR. HINKLE: For the purpose of the record, we would like to object to this amendment. There may be somebody that's interested in this area who would have objected to this particular form, setting up this form of proration unit, which wouldn't have objected otherwise to the advertisement the way it was originally.

MR. PAYNE: Your objection will be so noted, Mr. Hinkle.

MR. SPANN: I believe that's all we have from this

witness.

MR. PAYNE: Any questions of Mr. Czirr? Mr. Hinkle.

CROSS EXAMINATION

BY MR. HINKLE:

Q You don't recall, Mr. Czirr, whether or not your original testimony showed the date of the completion of your No. 2 Well?

A It did, I believe.

Q What was that date?

A It shows that it was plugged and abandoned 8-28-58.

Q As a non-commercial or dry hole?

A As a non-commercial well, yes, sir.

Q When did you first file this application for non-standard unit?

A Could I refer to my briefcase? I may have some notes on it.

Q Yes.

A I have a letter from Mr. Spann to the Commission dated April 6, requesting a hearing of this application.

Q When was that?

A The letter is dated April 6, 1960.

Q Are you familiar with the engineering studies that have been carried on in connection with this pool or field?

A Yes, sir.

Q Did the Phillips participate in those engineering studies?

A Yes, sir.

Q Are you familiar with the negotiations which have been carried on with respect to trying to unitize the pool or field?

A Yes.

Q Has the Phillips participated in those proceedings?

A Yes.

Q Why was it that you waited from August, 1958, until April, 1960, to make an application to drill this well,in the face of these negotiations which were going on for unitization?

A I couldn't say. It could be, I really don't know what the basis for the decision was.

Q I assume that by the Commission's ruling here, that all of the exhibits which were introduced at the Examiner hearing are a part of your testimony?

A All of Phillips' exhibits.

Q All of Phillips' exhibits?

A That's correct.

MR. PAYNE: They're all a part of the record, Mr. Hinkle.

Q (By Mr. Hinkle) I believe there was one exhibit that was an isopaque map showing the productive acreage?

A That's correct.

Q What exhibit was that, do you recall?

A No, I do not recall the number.

Q Can you find it?

A Not by number, no.

Q Do you have it available? It shows it was Exhibit No. 3 in the transcript. Do you have that with you?

A Yes, I have the same exhibit with me.

Q I wish you would refer to Exhibit No. 3 and explain to the Commission whether or not it shows all of the acreage which you have portrayed on Exhibit 6 to be productive, your Exhibit No. 6?

A Yes, I would say that it does. All our proration units are certainly within the zero isopaque line, and are almost entirely within the ten foot isopaque line.

MR. HINKLE: That's all.

MR. PAYNE: Any further questions of Mr. Czirr? Mr. Houston.

MR. HOUSTON: We have some questions, if the Commission please. R. L. Houston for Shell Oil Company.

BY MR. HOUSTON:

Q You recovered some oil from the Phillips A-2 well on a drillstem test, as I understand it, is that right?

A That is correct.

Q Can you tell me from what depth that, the area tested by that drillstem test was?

A New Mexico A Well No. 2 was drillstem tested through the interval 10,641 to 10,835.

Q I believe you made a test at a lower depth and recovered no oil and recovered only water?

A I believe that's correct.

Q What interval did it cover?

A We drillstem tested in the New Mexico A Well No. 2 10,870 to 11,005, recovered salt water, 644 foot salt water.

Q Did you undertake to pick the zone of porosity on the electrolog which you ran in the Phillips A-2 where the oil that you recovered on the first drillstem test came from?

A On the electrolog?

Q Yes.

A 10,747 to 53.

Q I beg your pardon?

A 10,747 to 53, to 10,753.

Q You found that some six feet had porosity that produced the oil, is that right?

A That was our interpretation, yes, sir.

Q Did the electrolog indicate any porosity between that zone and the main producing zone in the Kemnitz-Wolfcamp Pool that would be oil bearing?

A If I understand the question, no, it did not.

Q Sir?

A If I understand the question, no, it did not. This was a porosity within the Kemnitz pay interval. That was it, as far as we were concerned in our interpretation.

Q There was a main Kemnitz pay interval that was separate and apart from this interval in which you recovered the oil in the Phillips A-2, is that not correct?

A No, I don't believe that's correct.

Q It was in the same pay zone from which the main Kemnitz pay is taken?

A Yes. I don't know whether you can correlate exact intervals from one well to the other, but it was in the same general pay of the Kemnitz pay, yes, sir.

Q Did you find that most of the -- correlating the electrologs now, that most of the Kemnitz pay was beneath the water level in the Phillips A-2?

A We had quite a bit of porosity that was below the oil-water contact, yes.

Q Below the oil-water contact?

A Yes.

Q Would you say that that was the main zone of porosity in the Kemnitz-Wolfcamp Pool?

A Well, I don't know whether I can say that or not. It was the major porosity in that particular well. The structure between our No. 1 well and No. 2 well is not that much, I don't believe.

Q Sir?

A I don't believe that you have a main pay that you can, you know, say that this interval was your main pay that occurs in either part of the pool.

Q You don't say that there is an interval that the main part of the field can be identified from log to log?

A Yes, it was identified in this well.

Q It could not be identified at all in this well?

A The top of the Kemnitz pay was identified in this well, just like it was in all the other wells, and was used in preparing the contour map that we used as a matter of explanation here this morning.

Q But there was a zone not productive of oil and of such porosity that it was not productive of oil between that interval and the main pay interval, as picked on the electrolog in the field by correlation?

A I don't really think I follow that question. I don't agree, if I do. We have the Kemnitz pay, which has a definite marker and we have porosity in this Kemnitz pay, and in the Phillips New Mexico Well No. 2 we did not encounter that porosity that was common through the middle part of the field. We did encounter six foot.

MR. HOUSTON: That's all.

MR. PAYNE: Are there other questions of the witness?

MR. ARMSTRONG: W. N. Armstrong with Tennessee Gas.

BY MR. ARMSTRONG:

Q If I understood you correctly, you said that the porosity, which I believe you said was six feet, the porosity that you found in the No. 2 dry hole was not the same porosity that was found in the No. 1 well, is that correct, above the water?

A No, that isn't what I intended to say. It is a porous interval in this same Kemnitz section that we're dealing with all over the field.

Q If you had run pipe in your No. 2 well and successfully completed same as a producer, would the production from that well have drained the Northwest Quarter of the Southeast Quarter?

MR. SPANN: I'm going to object to that question. It's purely speculative. You assume a fact that there has been no evidence about, as to whether they had completed it, they didn't complete it.

MR. PAYNE: Mr. Armstrong, inasmuch as there is no testimony in the record that the No. 2 well was commercially productive, it would seem that the witness should not be forced to make an assumption that had it been productive, such and such would have occurred, so the objection will be sustained.

MR. ARMSTRONG: No more questions.

MR. PAYNE: Any further questions of Mr. Czirr? Mr. Nutter.

BY MR. NUTTER:

Q Mr. Czirr, as I understand it, you amended your application now and what you are seeking is a unit comprising 60 acres in the West Half of the Southeast Quarter of Section 25, and also 20 acres in the Southeast Quarter of the Southwest Quarter of Section 25, is that correct, thereby forming an 80-acre unit?

A That is correct.

Q Are you seeking an 80-acre allowable for the 80-acre unit?

A Yes, sir.

Q You wouldn't request any adjustment in the allowable due to the unorthodox location of the well?

A No, sir.

Q Are you acquainted with Rule 104 (g) of the Commission Rules and Regulations?

A I don't believe so.

Q Assuming that the rule says: "Whenever an exception--" being an exception to the well spacing requirements of the State-wide rule -- "whenever an exception is granted, the Commission may take such action as will offset any advantage which the person securing the exception may obtain over other producers by reason of the unorthodox location." Would you imagine that would apply to 40-acre tracts where you get an orthodox location, but not to 80-acre tracts where you get an unorthodox location?

A I think our position here, that the area is being drilled on the basis of 80 acres in this pool, and by our offset operators, we would intend to develop on the same basis and not have an advantage or disadvantage.

Q Your offset operators are on a fixed pattern, however, aren't they?

A Well, that's correct.

Q Your well would be off of this fixed pattern, as I understand?

A That is correct.

MR. NUTTER: I thank you.

BY MR. PAYNE:

Q The basis of your application is that you have a 240-acre plus lease, and it is your contention that it has a minimum of 160 productive acres, and you want to dedicate the 160 acres to two wells?

A That's right.

Q One would be in a standard location and one would be an unorthodox location?

A That's right.

Q You don't feel that the well in the unorthodox location should be adjusted due to the offset, proximity to offset wells?

A No, I do not. We followed the rules as set out for the Kemnitz pay exactly, and invested our money on that basis. I think that we would have no particular advantage. We still need to develop to approximately the same density.

Q In other words, you believe that in order to seek the relief that you are seeking, it would be a prerequisite that the applicant had drilled a dry hole at an orthodox location?

A No, no, I was just saying that we certainly had attempted to follow the rules to the best of our ability, and in the light of our No. 2 well being uncommercial, we now had proof that we knew we had to drill this unorthodox location.

Q Now, could you drill an unorthodox location somewhere else on your proposed 80-acre proration unit?

A Yes, I believe we could. This appeared to be the most

logical. It was the center of a 40-acre tract and uniformly spaced from the boundary lines and the other wells.

Q Is it also the best structurally?

A It's probably as good as we have, yes.

Q I take it Phillips Petroleum Company would not wish to drill 330 feet from the easternmost boundary of the proration unit dedicated to the No. 1 well?

A What was the question?

Q I take it, then, that Phillips would be adverse to asking an unorthodox location for their No. 3 well to be located 330 feet from the east line of the proration unit dedicated to the Phillips A No. 1 well; this one is actually 660 from that line, is it not?

A Yes, it is. Well, our position was that this was the most logical location and is the reason we selected it, it was center-spaced there. You are moving our well 300 foot --

Q 330 to the west and 330 to the south. If you had to recommend to your management that they either drill a well there or not at all, would you recommend that they drill one at that location with 80 acres dedicated to it?

A Well, I couldn't say, I feel that the No. 3 location is a more logical choice. Certainly if that was the only choice we had, we'd have to refer it to our management.

Q Do you feel that the location you have selected for the No. 3 well would better drain the acres dedicated to the well than

the location just mentioned?

A It would be as good, yes.

MR. PAYNE: Any further questions? Mr. Hinkle.

BY MR. HINKLE:

Q Mr. Czirr, refer to your Exhibit No. 6, it shows a well in the Northeast of the Southeast Quarter of 25 for Tennessee Gas. Does the Phillips have an interest in that well?

A Yes, sir.

Q What interest does it have?

A Fifty percent.

Q Do you feel that there's any oil in place under the lands which you have shown on Exhibit 6 that will not be produced by the No. 1 well and your No. 1 well? That's taking in the characteristics of the reservoir which I believe you testified to previously.

A Well, I'm sure the previous testimony and evidence given before the Commission in this, and the field rules hearing, stated that a well would drain far in excess of 80 acres, so we could probably close in all three wells there and ultimately deplete the area. That is, you could close in your Tennessee well, not drill the Phillips well, and so forth.

Q So it's your opinion that the Tennessee No. 1 well and the Phillips "A" well will actually produce all the oil in place under this 240 acres?

A I wouldn't say those particular wells would produce the

oil under that location. We know that a well will drain in excess of 80 acres. That applies for most all the wells in the pool.

Q Is this a State lease, this 240 acres?

A Yes, sir.

Q As a matter of fact, all the lands in the Kemnitz - Wolfcamp area are State leases, are they not?

A I don't know.

MR. HINKLE: I believe that's all.

BY MR. PAYNE:

Q When you say that one well in this pool will drain considerably in excess of 80 acres, I take it that you are including the function of time?

A Yes, sir.

Q So that it wouldn't necessarily take into consideration the economic realities of the time you might have to abandon the particular well.

A No, not particularly, Mr. Payne. I was just saying that the previous testimony and evidence given in the Kemnitz Pool has shown that one well will drain in excess of 80 acres, which was in line with the other gentleman's question.

Q Over how long a period of time and to what abandonment point?

A I couldn't say right now.

MR. PAYNE: Thank you.

MR. ARMSTRONG: Let me ask one more question in line with

Mr. Hinkle's question.

MR. PAYNE: Yes, sir.

BY MR. ARMSTRONG:

Q I don't think the record is quite clear on it, if there are no more wells drilled in the Kemnitz reservoir, will Phillips recover the original oil in place under its New Mexico A lease and under Tennessee Gas State Phillips lease through the wells that are existing there now? In other words, will Phillips from its interest in the No. 1 Tennessee well and from its 100 percent interest in its present No. 1 well, recover the amount of oil that was originally in place under the South Half of Section 25, in your opinion?

MR. SPANN: I'm going to object to that question. I don't believe it's material to the issue before the Commission. The question is, you are prorating production on an acreage basis; Phillips has, according to the testimony, 160 productive acres within this lease. The question is, are they entitled to produce it under the proration regulations, and not whether you are going to open up an entire field as to whether any of these wells or all of these wells are producing a fair share of the oil in place under the various acreage dedicated to the wells. If it was the intention here to interject that factor into consideration of this application; we have to go back and take every well, well by well, as soon as they are producing their proportionate share.

MR. PAYNE: His question doesn't actually go to whether each operator would get his fair share. His question is really

along the lines whether the two existing wells would adequately drain the acreage in dispute. So I think the question should be permitted, for whatever value it may have to the Commission for arriving at their decision. The objection is overruled.

A If the question is, will the Tennessee State No. 1 and the New Mexico No. 1 drain this area, the answer is, yes, they would.

Q (By Mr. Armstrong) That is not the question. What I'm trying to ask you is, will Phillips, by virtue of its 100 percent interest in the west three-quarters of the South Half of Section 25, and by virtue of its 50 percent interest in the Tennessee No. 1 State Phillips lease, recover the amount of oil that was originally in place under those two leases? If there are no more wells drilled in the field and from those two wells, will they recover the oil originally in place under those leases?

A It's possible that they would. As Mr. Spann said, you could apply the same situation throughout the field. Our position was that we had 160 acres here; generally throughout this area it was developed on the basis of 80 acres, and we were requesting an exception in order that we could develop our productive acreage on the basis of 80 acres.

Q I'm under the impression,I don't see it here right now, but if I'm wrong correct me; but in Mr. Spann's closing argument I believe he said that this exception was necessary in order for Phillips to obtain the oil that is under their lease. I haven't

located that statement yet. "Mr. Spann: I would like to point out that these rigid rules that were imposed are perhaps proper when you are considering the development of a pool generally, but in every instance we are faced with a situation like confronts Phillips in this case, and that is, you are arriving at the exterior limits of the Field, and inequity results if these rigid rules are not relaxed to take care of the situation that confronts you on the exterior boundaries of the pool; and certainly if they are enforced, it means that the leasehold owners on the fringes, and in this instance, Phillips, will be deprived of their fair share of the oil which lies under their acreage." Now I am asking you, do you feel that Phillips will be deprived of their fair share of the oil which lies under their acreage if they do not receive this permit?

A Well, how would you define your fair share, would be the question. It would be difficult to apply a set of conditions to this 240 tract out of the whole Field. The share has been divided on the basis of equal development throughout the Field, and on that basis we would be deprived of our fair share, not being able to compete to the same density.

Q In other words, what you are asking here is a special exception in order to get a more favorable position in the field, not to get what was originally in place under your lease, but to get more than your fair share as a result of your happening to have an undrilled 80-acre surface location, or let's say, 80 acres not allocated to a well, is that correct?

A No, not exactly. You would be faced, in a position here, on a general basis, of trying to define what was your fair share under a lease, and we wouldn't be able to apply a particular rule to Phillips acreage.

Q Your fair share is not necessarily the oil originally in place under your lease, is that correct?

A I would think our fair share would be determined on the basis of the development in the area which has been on one well per 80 acres. If it is anything else, then we would have to apply it to the field and then change our allowable every time the reserve picture changes, which might be the case. Our production history might show that your reserve picture you estimated last year was not following the trend, and it should be adjusted, in which case your fair share principle would have to be changed, also. We can measure acreage and we can measure the number of wells and the density.

Q Under the legal field rules, a person is entitled to locate a well in an orthodox location and drain as much oil as he can produce under the allowables setup, is that correct?

A That is correct.

Q Then coming in under an equitable application, as I said, Phillips is doing here, they are saying that they cannot equitably recover what they are entitled to. You are saying what they are entitled to is not necessarily what the law gives them the right to have, or the oil that originally was located in place under their

lease, but it is as much as they can produce at an unorthodox location.

A I think, like I said, that we're simply asking to develop on the basis of 80-acre spacing; because of the configuration of the pool and the fixed orders, we require an exception to be able to drill to that density.

MR. ARMSTRONG: I have no more questions.

BY MR. PAYNE:

Q It is true when you have oblong proration units, you rely on drainage and counter-drainage to actually deplete the pool?

A That is correct.

Q So that any one well doesn't necessarily produce what might be actually under the tract dedicated to it?

A Very likely it would not.

Q So if your No. 3 Well was not drilled anywhere in your proration unit, in all probability the Tennessee Well No. 1 and the Phillips A No. 1 Well would both get a portion of the oil under this proposed 80-acre proration unit?

A Yes.

MR. PAYNE: Any further questions? Mr. Houston.

BY MR. HOUSTON:

Q Phillips would agree, would it not, that if it is granted the requested exception, that other operators in the field with edge locations at which there would be an unusual dry hole risk, at a regular location, should be allowed a similar exception?

A Any ruling that was applied to Phillips would certainly be applied to any other operators.

Q Sir?

A Any ruling that would be applied to Phillips would certainly be applied to other operators.

Q You would not oppose such an application to other operators?

A Not if it was on sound ground.

Q In such a case, can you recommend any standard to the Commission for determining the shape of the unit to be allocated to the irregular location?

A No, sir. You are going to have to look at the facts that you have and the information you have and make your best decision on that basis.

Q There could be no set standard for the thing, then, at all?

A I don't see how it would be possible, no, not that would fit every case.

Q It would be a discretionary matter with the Commission at all times?

A Based on the evidence that was available.

MR. HOUSTON: That's all.

BY MR. PAYNE:

Q In answer to Mr. Houston, are you limiting your answer to areas at the edge of a pool, or would it also apply if you got a

dry hole in the middle of a pool?

A Well, there would be some reason for you getting a dry hole in the middle of a pool, and you would have to take the information you got from that well and wells in the area and determine what was an equitable basis for the immediate area. You would have to look at that particular information.

MR. PAYNE: That's all. Any further questions? If not, the witness may be excused.

(Witness excused.)

MR. PAYNE: We'll recess the hearing until 1:15.

(Whereupon, the hearing was recessed until 1:15 P.M.)

TRANSCRIPT OF HEARING

(Afternoon Session)

MR. PAYNE: The Hearing will come to order please. Does that complete your case in chief, Mr. Spann?

MR. SPANN: I would like to make one brief statement, if I may. You inquired whether Phillips would object to moving the location of this well to another point, which I understood from your question to be 2310 from the East boundary, and 1650 from the South boundary of the Section, and I'd like to state, Phillips would have no objection.

MR. PAYNE: They would have no objection?

MR. SPANN: No objection to moving the location to that point if the Commission so decided it should be done, providing, of course, 80 acres would be dedicated to the well.

MR. HINKLE: Tennessee Gas and Oil Company has two witnesses. Mr. Plumb is the first witness. By him we have six Exhibits which we have posted, A, B, C, D, E, and F.

MR. PAYNE: I will swear both of your witnesses at the same time.

(Witnesses sworn.)

L. B. PLUMB

called as a witness, having been previously duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, please.

A L. B. Plumb.

Q By whom are you employed?

A Tennessee Gas Transmission Company.

Q In what capacity?

A District Production Superintendent in Durango, Colorado.

Q Are you familiar with the Kemnitz-Wolfcamp Pool?

A Yes, sir, I am very familiar with it. I was formerly employed as Division Petroleum Engineer in Midland, Texas, for three years. I have been in Midland for a period of seven years, during which time I was familiar with the Wolfcamp Pool.

Q You have kept up with the history of the development of the Pool?

A Yes, I have.

Q You are familiar with the Engineering Committee's work?

A Yes, sir, very familiar.

Q Did you previously testify in an Examiner Hearing in this case?

A Yes, I did.

Q As a matter of fact, you testified in the original hearing for 80 acre spacing, did you not?

A Yes, sir.

MR. HINKLE: Are his qualifications acceptable?

MR. PAYNE: Yes, sir.

Q (BY MR. HINKLE) Mr. Plumb, refer to Tennessee Gas and Oil Company's Exhibit A and explain to the Commission what that is and what it shows.

A Exhibit A is an isopach map of the net pay in the Kemnitz-Wolfcamp Pool. The map shows the lease ownership, the well locations on each lease; the well designations are noted by the small, dark number above and slightly to the right of the well spots. The larger numbers immediately below the well spots indicate the net pay thickness occurring in the Wolfcamp reservoir in each well as determined from examination of the electric logs in these wells.

Q And, from what information was Exhibit A prepared?

A This information was prepared from an examination of each of the electric logs run on the wells in the field.

Q Does Exhibit A have any relation to the engineering plat or map that was prepared by the Engineering Committee for the pools?

A This was the same map that was accepted by the Engineering Committee and presented in their report to the Operators' Committee of the Kemnitz Field operators.

Q Did you have anything to do with respect to the preparation of the map?

A Yes, sir, I was intimately involved in the construction of this map.

Q Do you agree with what it shows?

A Yes, sir, I do.

Q What is the total estimated ultimate recovery under primary methods from the entire Kemnitz-Wolfcamp Pool?

A 10,700,000 barrels.

Q How was this figure determined?

A This figure was obtained by the most recent engineering calculations. These calculations were made on a material balance type of calculation, and done on electronic computers, done by several operators in the fields, and both sets of calculations came out with the same answers.

Q Was this information up to date?

A That information is effective to April 1, 1960. That was the latest production information available at the time the computations were made.

Q How much of this 10,700,000 estimated recovery has actually been produced?

A To April 1, 1960, 4,630,000 barrels of oil had been produced from the field.

Q What does this leave to be produced?

A 6,070,000 barrels, approximately.

Q Now, if you will refer to Tennessee's Exhibit B and explain it to the Commission, what that is, and what it shows?

A Exhibit B is a plat of the Kemnitz Field showing the lease ownership and the well locations. The large heavy numbers below the well spots indicate the bottomhole pressures presently in this well in June of 1960, at which time a field-wide bottomhole pressure

survey was run. It is evident from looking at this map that the pressure in the field has been drawingdown very uniformly. It is noted that there is less than a 200 PSI difference in bottomhole pressure between any of the wells noted in the field here in the area marked the South Area, which is the area below the heavy dashed line. However, in the North Area, which is above the dashed line, many of the pressures were not taken because the wells are produced by artificial lift, and it was impossible to run a bottomhole pressure bomb. However, it is known these pressures are considerably lower, and that this area is not in pressure communication, effective pressure communication, with the South Area in the field.

Q And, that line delineates the North and South portions of the field?

A That is correct; it does.

Q Has that line been generally accepted by all the operators?

A It has been accepted by all the members of the Engineering Committee.

Q What is the significance of the almost uniformity of the bottomhole pressures in the South Area?

A This uniformity of pressure indicates that the pressure drawdown in the field from an initial bottomhole pressure of approximately 3200 PSI to the current average of approximately 2,050 PSI has been very uniform throughout this area. A drawdown in bottomhole pressure can be correlated to a withdrawal of oil and a dissipation of reservoir energy. It can be seen by this map that that

has been very uniform throughout the reservoir, and it is in excellent pressure communication. This means that oil in the reservoir is free to migrate in any direction within the South Area.

Q Theoretically, one, two, or three wells might produce all the oil?

A Yes, sir; that is quite correct. A few wells in here could have produced this.

Q Is the number of acre feet necessarily significant to the amount of oil recoverable from the well on lease?

A No, sir, it is not significant to the amount of oil to be recovered from the lease. It is significant to the amount of oil in place under the lease before the reservoir was drilled. That is, the acre feet represent the pure volume rock space which is available to contain oil. That is significant only to the amount of oil originally in place under a given lease.

Q In other words, a well located in the area of excellent communication would produce the same amount as any other well located in such an area, irrespective of acre feet?

A That's correct. The wells, generally, here, have the same producing capacity. They can produce at the same rate effectively, and proration governs the amount of oil withdrawal from each lease.

Q What percentage of the total ultimate recoverable oil is located in the South Area?

A It is estimated that 93½ percent, or 5,700,000 barrels of the ultimate recoverable oil are in the South Area.

Q In your opinion, would a well located in the South Area effectively drain any of the area North of the line which you have shown on Exhibit B?

A No, sir. It will not.

MR. SPANN: May I interject? I understood that the rules applied to both the North and South Sections. If that is correct, this seems to be a collateral attack on your rules for this Pool.

MR. HINKLE: I don't think so. I think it was brought out at the original hearing that there was a different condition prevailing in the Northern part of the field. That was taken in consideration in fixing the 80 acre spacings.

MR. SPANN: It seemed to be applied uniformly throughout the two areas.

MR. HINKLE: Our only purpose with the question is to show there is a different drainage factor as far as the South Area is concerned, between that and the North Area.

MR. PAYNE: I think it would be relevant for that purpose.

MR. NUTTER: I would like to ask a question. Did you state that 93 percent of the oil would be recovered from the South Area?

A Yes, sir. 5,700,000 barrels of the remaining ultimate recovery.

Q (BY MR. HINKLE) Are you familiar with the Phillips' lease in Section 25 that covers 240 acres?

A Yes, I am.

Q Now, according to your isopach map, which is Exhibit A, a portion of Phillips' lease is productive from the South Area; is that correct?

A Yes, sir, it is.

Q According to Exhibit A, what percentage of the total acre feet of pay are located in the South Area?

A 3.4 percent.

MR. SPANN: I am going to object to this witness testifying from that Exhibit, in view of the fact that it is a map or Exhibit prepared by some engineering company.

A No, not a company, sir.

MR. SPANN: Committee, excuse me. I think they would be the proper parties to testify.

MR. HINKLE: He has already testified he agrees with the work, and that he participated in the preparation of the map.

MR. PAYNE: Mr. Spann, I believe this Exhibit was introduced in the Examiner Hearing, and that it has been incorporated in the record of this Commission.

MR. SPANN: I will withdraw my objection. I introduced it, didn't I?

Q (BY MR. HINKLE) Now, the 3.4 percent which you have testified to is to be distinguished from Phillips percentage of the total acre feet in the field; is that correct?

A The 3.4 percent is their percentage of the acre feet in the South Area, which is the area below the heavy dotted line in

Exhibit B.

Q What is Phillips' percentage of the total acre feet in the field according to Exhibit A?

A 2.8 percent.

Q According to your calculations, how much of the remaining oil will Phillips ultimately recover, based upon the present proration from its Phillips No. 1 well, situated in Section 25?

A Approximately 231,600 barrels of oil remain to be recovered by this well, effective April 1, 1960.

Q What percentage of the total remaining South Area reserves does this amount to?

A Approximately 4 percent.

Q Does Phillips have an interest in your Tennessee Gas No. 1 well, State well, located in the S. E. 1/4 of Section 25?

A Yes, sir. Tennessee and Phillips each have a 50 percent interest in that lease.

Q Practically all of this lease is situated within the productive limits of the South Area?

A That is correct.

Q Have you calculated the total number of net acre feet of pay that Phillips has in the South Area, giving Phillips credit for its 1/2 interest in your State-Phillips lease?

A Four and fifty-two acre feet.

Q Based upon your Exhibit A, which is the isopach map, what percentage of the total acre feet of pay?

A 4.6 percent of the South Area.

Q Giving Phillips credit for an undivided 1/2 production from your No. 1 State-Phillips lease, and 100 percent of the production from the Phillips No. 1 well, what percentage of remaining South Area reserves will be recovered by Phillips under primary production methods?

A 6 percent of the remaining primary reserves as of April 1, 1960.

Q How did Tennessee Gas and Oil Company acquire their interest in your lease covering the East 1/2 of the S. E. 1/4 of 25?

A This was acquired on a farm-out from Phillips Petroleum Company.

Q That was a farm-out?

A Yes.

Q Were you to get the East 1/2 of the S. E., or what acreage were you to get?

A By the original farm-out agreement, Tennessee was to receive, by virtue of drilling State-Phillips No. 1, the N. 1/2 of the S. E. 1/4 of Section 25.

Q How does it now happen that you have the East 1/2 of the S. E.?

A In order to comply with the field rules and have 80 acres to dedicate to this well, we exchanged the N. W. 1/4 of the S. E. 1/4 for the S. E. 1/4 of the S. E. 1/4 so that we could have 80 acres to dedicate to this well.

Q That would be in accordance with the existing field rules?

A That's correct.

Q You did that rather than ask for an exception?

A Yes.

Q What was the date of your original farm-out agreement with Phillips?

A May 8, 1957.

Q Were the field rules adopted after that?

A Yes, sir, they were.

Q Under your farm-out agreement with Phillips, do you have the right to earn additional acreage?

A Yes, we did, by drilling additional wells we could have earned additional acreage.

Q Did you drill any additional wells?

A No, sir, we did not, because we felt any orthodox locations under the spacing patterns would not have resulted in commercially productive wells.

Q You could have applied for an unorthodox production unit consisting of the N. 1/2 of the S. E., 25, had you elected to do so?

A Yes, we could.

Q But you elected to exchange it with Phillips rather than make an exception?

A That's right.

Q Why did you elect to do that?

A As the largest operator in the field, Tennessee was in-

strumental in having the field rules set up as they are at this time, and we felt we did not wish to set a pattern of exceptions from these field rules, which rules, we figure, are based on the best interests of conservation.

Q In the event Phillips is allowed to drill the unorthodox well for which it is seeking a permit, and in the event this unorthodox well is given a full allowable, what percent of the remaining recoverable oil would Phillips then recover by virtue of the two wells on Phillips' 240 acres?

A 437,000 barrels, or 4.7 percent of the remaining recoverable reserves.

Q What would be the percentage of the remaining recoverable oil which Phillips would recover as a result of the two wells, and its 1/2 interest in your State No. 1 Phillips well?

A They would recover approximately 553,000 barrels or 9.7 percent of the remaining recoverable reserves.

Q In the event Phillips is permitted to drill at the unorthodox location, which it is seeking, and is given a reduced allowable for only 60 acres, what would be the percentage of remaining recoverable oil within the South Area which Phillips would receive by virtue of the two wells located on its lease?

A They would then obtain 377,600 barrels, or 6.6 percent of the remaining recoverable reserves.

Q What would be the percentage of the South Area recoverable oil received by Phillips as a result of its two wells and as a re-

sult of its interest in your well?

A 493,400 barrels, or a total of 8.6 percent of the remaining reserves.

Q What was the total percentage of the acre feet of the South Area located under the Phillips' lease?

A 3.4 percent, based on the isopach map, shown as Exhibit A.

Q I believe you have already testified to that.

A That's right.

Q What is the net acre feet of the South Area pay belonging to Phillips as a result of its lease and as a result of its interest in your State-Phillips lease?

A They would have a total of 4.6 percent of acre feet based on this same isopach.

Q And, from its existing well, Phillips will ultimately recover more oil than was originally in place under its lease; is that right?

A Yes, that's right. With the existing well on their lease and our present engineering calculations, it is evident that the oil will be migrating to their lease rather than away from their lease, and they will recover more oil than was originally in place underlying their lease.

Q Mr. Plumb, in your opinion, is it proper for the Commission to consider the oil in place in making an exception to the Special Field Rules?

A Yes, sir, I believe it is. In considering applications

for exceptional locations I think exceptional information should be considered, and that in this case--

MR. SPANN: I would like to interpose an objection. I don't think it is within this witness' prerogative to give an opinion as to what this Commission should consider in connection with granting exceptions. They are bound by their own--

MR. HINKLE: I think it is proper.

MR. SPANN: --their own laws and so forth, and this is a conclusion which is improper in my opinion. I will object on the grounds it is improper and calls for a conclusion.

MR. PAYNE: Mr. Spann, I believe the Commission would like to hear, generally, whatever the witnesses opinions are on the various aspects of the case, and consider them for whatever value they feel they have in resolving the case. Therefore, the objection is overruled.

Q (BY MR. HINKLE) Do you have any objection to considering surface acreage allotments for the adoption of special field rules generally?

A No, sir, generally surface acreage is the most acceptable manner to define spacing rules and allowable locations.

Q You are not advocating a change in that?

A No, sir, I am not.

Q You did say the Commission should consider all equities in connection with exceptions to special field rules?

A Yes, I do believe that.

Q Would you care to elaborate on that?

A Well, the surface acreage to be dedicated to a well may not encompass productive acreage, and it should be determined whether or not the outstanding acreage underlying any dedicated portion of a lease to a well is productive, and if an exception is granted, will that give the Applicant an unfair advantage over the other operators.

Q Consequently, do you think that all of these equities in the different situations should be considered in connection with an exception?

A Yes, sir, I think they should consider all the evidence available.

MR. BURROUGHS: May I ask a question here of the witness, sir? It is my understanding you are advocating that in dedications, consideration should always be given to the acre feet approach, the thickness of pay?

A No, sir, not in every case. I think in cases where an exception is requested, an exception to the standard field rules and standard allocation formula, then I think that whatever evidence is available should be considered.

MR. ARMSTRONG: May I ask a question? William Armstrong, Tennessee Gas; if I understand what your position is, you are saying that for allocating production, surface acreage should be considered originally?

A Yes, sir.

MR. ARMSTRONG: For granting an exception to the spacing pattern, the net acre feet of pay should be given consideration; otherwise, how can you determine correlative rights of the other operators?

A Yes, sir, that is what I intended.

Q (BY MR. HINKLE) Mr. Plumb, refer to Tennessee Gas Exhibit C and explain to the Commission what that is and what it shows.

A Exhibit C, again, is a plat of the Kemnitz-Wolfcamp Field showing the leases and the well locations. Under each well location you will note a series of numbers. These numbers indicate the present producing status and production performance of the wells. For example, if you will take the Tennessee Gas Kemnitz No. 1, the letter "F" represents that the well is flowing; Number 206 shows that it is capable of producing 206 barrels a day; the number in parenthesis, 1695, is a producing gas-oil ratio; the number below, 10,232 is accumulated recovery attributed to this well, April 1, 1960.

Q How many wells are located in the South Area?

A Twenty-nine.

Q Would those wells, in your opinion, effectively and efficiently drain the South reservoir?

A Yes, easily.

Q Now, Mr. Plumb, refer to your Exhibit D and explain to the Commission what that is and what it shows?

A Exhibit D is another plat of the Kemnitz Field, again showing all the existing well locations as they are presently drilled;

also shown on the map, depicted by red, are possible locations that could be drilled if irregular locations are applied for by each of these operators. There are ten of these exceptional locations which could be requested in this field.

Q How many of these possible locations are within the South Area?

A All ten lie within the South Area of the field.

Q In your opinion, would the drilling of these possible locations increase the ultimate recovery from the field, the Pool?

A No, sir, they would not present any significant increase in ultimate recovery.

Q Then, in effect, to drill these wells would be economic waste; is that correct?

A That is correct.

Q How much does it cost to drill a well in the Kemnitz-Wolfcamp Pool or reservoir?

A Approximately, $200,000.00.

Q Is that to drill and equip it both?

A Yes, sir, to drill and equip.

Q Now, refer to Tennessee Gas and Oil Exhibit E and explain what that is and what it shows?

A Exhibit E is a graph representing performance of the Kemnitz reservoir. The base line along the bottom represents accumulated oil recovery in millions of stock tank barrels, the solid line midway in the graph shows the present rate of production plotted

against the accumulated oil recovery. You can see that to the effective date of the graph, April, 1960, four and a half million barrels have been produced from the reservoir, and the reservoir is producing at a rate of approximately 16,000 barrels per month.

MR. NUTTER: That would be 160,000, wouldn't it, Mr. Plumb?

A You are correct; 160,000 barrels per month. The top line on the graph shows the bottomhole pressure formation of the field. You can see the bottomhole pressure has declined steadily to its current average pressure of approximately 2,050 PSI. The dark line goes on to indicate the extrapolation of this bottomhole pressure to the abandonment point of the field. You can see the heavy dashed lines here represent predicted future performance of the field. It is shown that the field production will start to decline, and that we will reach an ultimate recovery of approximately 10,000,000 barrels of oil. Also shown on the lower line is the gas-oil ratio performance of the field. It can be seen that the gas-oil ratio is increasing up to this point, and as further evidence, performance of the field has indicated that this gas-oil ratio is increasing even more sharply at the present time. It has increased to the point where the Kemnitz Field is under gas-oil ratio penalties effective the First of August, this year, and the field is being penalized at approximately the rate of 10,000 barrels a month in allowables by high gas-oil ratios.

Q It also shows the amount of additional oil that may possibly be recovered by pressure maintenance?

A Yes, sir. The line right here marked G. I. indicates the performance of the reservoir under a gas injection program. This line carries it on at a nearly constant production rate to a total recovery of approximately 9,000,000 barrels, where it would decline to an ultimate of fourteen and a half million barrels.

Q Do you know whether or not the operators in the field have been working on a proposed unitization or repressuring project?

A Yes, sir, they have.

Q How long has that work been going on?

A This study has been under way for approximately a year and a half.

Q Who has taken the initiative in that project?

A Tennessee has been the Chairman of both the Operating and Engineering Committees.

Q Has Tennessee had representatives working on the project?

A Yes, sir, they have.

Q Has Tennessee had a man working full time on the project?

A Yes, sir. We have had an engineer devoted to this project full time for approximately a year and a half.

Q So far as you know, has Phillips made any attempt to drill another well on its lease in Section 25 since it has completed its No. 2 well as a dry hole or non-commercial well?

A Not prior to this application.

Q I believe it was testified this morning that the dry hole on the Phillips No. 2 was abandoned August 28, 1958?

A That is correct.

Q Has Tennessee had any other contact with Phillips in connection with the proposed repressuring project other than through the Engineering and Operating Committees?

A Yes, sir, we have met personally with representatives of Phillips Petroleum Company from Bartlesville, and from Midland, a number of times, both in Midland and our Houston office.

Q What was the purpose of these meetings?

A In order to repressure the reservoir it is necessary for us to obtain gas for injection purposes. All the casinghead gas now produced in the fields is dedicated to Phillips under their existing contracts. It is necessary we reach an agreement with them whereby the gas can be obtained for the unit operators for the purpose of re-injection.

Q Have you been successful with your negotiations with Phillips in this regard?

A We think so. We have reached an agreement, but have not formally entered into a contract. We would have to wait for field unitization to be signed before we could enter into such a contract.

Q Do you feel that it is imminent?

A Yes, sir, I believe so.

Q In the past year and a half, Tennessee has spent considerable time and money attempting to equitably effectuate this pressure maintenance in the Kemnitz reservoir; is that correct?

A That's right.

Q Now, if the pressure maintenance or repressuring program is to be economically feasible, it must be commenced within the immediate future?

A At the earliest possible date, yes.

Q Again, let me ask you, how many additional barrels of oil will be recovered as a result of the pressure maintenance program if it is inaugurated?

A If the pressure maintenance program is commenced in the immediate future the total field will have an increase in ultimate recovery of approximately four and a half million barrels.

Q Now, do you know whether or not all of the lands in this Pool are State lands?

A To the best of my knowledge all the lands here are owned by the State.

Q And, of course, the State would receive its proportionate part, its royalty on oil from this increase of four and a half million barrels?

A Yes, sir, they would.

Q Were all of these Exhibits, A, B, C, D, and E, prepared by you or under your direction?

A Yes, they were.

MR. HINKLE: We would like to offer in evidence Exhibits A, B, C, D, and E.

MR. PAYNE: Is there any objection to Tennessee's Exhibits A through E?

MR. SPANN: I would like to ask a question about Exhibit A, if I may. Mr. Plumb, isn't it a fact that there have been at least two revised maps of that particular type, isopach maps, and that which is in this Exhibit is not now the current map made acceptable by the Committee?

A That is essentially correct, yes, sir. There have been a number of revisions in the isopach map, sir.

MR. SPANN: So that map doesn't represent the consensus of opinion, at this time, as to the material that is on it? I mean, there have been changes?

A Well, it still represents the consensus of the opinions of the engineers.

MR. SPANN: But it has been revised, hasn't it, somewhat?

A Yes, sir, very slightly.

MR. SPANN: I would like to object to it. I'd like to see the revised map.

A Well, it has been entered as our Exhibit, not a Committee Exhibit.

MR. SPANN: You left the impression with me it was a Committee Exhibit. In other words, it is your opinion, not this Committee's opinion, is that correct? It represents your judgment rather than that of the Committee?

A It does represent my opinion, but I don't say it does not represent the opinion of the Engineering Committee.

MR. SPANN: But the Engineering Committee's opinion has

been revised and a new isopach map has been prepared by them, is that right?

A No, sir, that is not correct.

MR. SPANN: What is the fact?

A We are still using this; essentially, this same map.

MR. SPANN: Well, I would like to know if there is a later revised map that is different from this one?

A Not to my knowledge; there is not incorporated in the Engineering Reports any later map than this one.

MR. SPANN: And, that represents a consensus of their opinion, is that correct?

A That is the best of my knowledge, yes.

MR. PAYNE: I think it should be admitted, Mr. Spann, for whatever relevancy it may have.

MR. ARMSTRONG: May we ask him something else, please?

MR. PAYNE: Yes, sir.

MR. ARMSTRONG: In an effort to form an agreement by all parties in the field, there was a reconsideration of the acre feet, but no new map was ever agreed on?

A Yes, sir.

MR. ARMSTRONG: That was for the purpose of trying to effectuate an unitization program?

A Yes.

MR. PAYNE: Tennessee's Exhibits A through E will be received in evidence.

MR. PAYNE: Any questions of Mr. Plumb?

CROSS EXAMINATION

BY MR. SPANN:

Q Mr. Plumb, you are not changing your testimony that you gave at the time of the Examiner Hearing in any particular, are you?

A I have testified, I think, the same answers to the same questions.

Q I understood at that time you felt that there should be no change in the Commission's policy of prorating production on an acreage basis in this field, or any other field?

A As a general policy, that is correct.

Q And, you are not changing your views in that regard, I take it, from your testimony here today?

A I don't think my testimony indicates any change in that regard.

Q Well, on that basis, of course, Phillips should receive, having 160 productive acres, should be entitled to an additional well and produce an additional 80 acre allowable.

A No, sir, not under the premise that for an exceptional location, then all the evidence should be considered and down here, on the edge of the field, to protect the correlative rights of the operators, other evidence must be considered besides dedication of surface acreage.

Q But the result of that is that Phillips is not being treated the same way as the other operators insofar as prorating

and an additional 80 acres dedicated to the well?

A I don't understand.

Q If Phillips has 160 productive acres and have only an 80 acre allowable, they are being treated differently, isn't that true?

A Since they have only one well.

Q They are being treated differently.

A The field rules require only 80 acres to be dedicated to a well.

Q Do you know of any other instance where an operator with 160 productive acres only has an 80 acre allowable?

A Yes, I do. There are several locations on Tennessee's leases where, for instance, the S. W. 1/4 of Section 30, can reasonably be considered productive of oil according to my Exhibit A. We are not receiving any acreage dedication except one 80 acre location in that quarter, so we have 160 productive acres which are only receiving an 80 acre allowable.

Q You, of course, could come in and apply for an orthodox location and non-standard as Phillips has done?

A If we chose to do so, yes.

Q In that connection, and referring to your Exhibit D, I believe it is, it shows the possible unorthodox locations. Are you saying, or telling the Commission, that in each instance there are 80 productive acres which could be dedicated to those wells which you have designated in red?

A I believe so, yes.

Q You believe so?

A Yes.

Q And, they are similarly situated to Phillips in that regard?

A Yes, sir, I believe so.

Q There are other wells in the field that, if permitted to produce as they are, will produce a disproportionate share of oil from the field, using your calculations as to the amount of oil in place actually under the individual acreage; isn't that right?

A That's correct. You can see that, for instance, Tennessee's Kemnitz "A" No. 4 will produce a disproportionately small amount of oil because we have 73 net feet of pay there and have much more oil in place than we will be allowed to produce.

Q Would you suggest the Commission go back and re-evaluate each well to determine what percent of oil from the reservoir it should be entitled to produce?

A Only in the case of exceptions.

Q Only in the case of Phillips?

A Exceptions.

Q You do not intend by these Exhibits, or otherwise, to change your testimony given at the prior hearing that Phillips does have 160 productive acres in that lease?

A There are 160 acres which could reasonably be considered to be productive.

MR. SPANN: I believe that is all.

MR. PAYNE: Any further questions of Mr. Plumb?

REDIRECT EXAMINATION

BY MR. ARMSTRONG:

Q I would like to ask you, Mr. Plumb, Phillips asked you whether or not they were being treated the same as other operators in the field?

A That's right.

Q Do you know of any other unorthodox locations in the field, exceptions that have been granted?

A There have been none drilled under the present field rules.

Q Would you look at the S. W. 1/4 of Section 24 where Sinclair has a dry hole? Does your isopach show that Sinclair has any productive acre feet of pay in the S. W. 1/4 of Section 24, for which they are receiving no allowable credit?

A Yes, sir, they do.

Q Then, would you say Sinclair is being treated the same as Phillips?

A Yes, sir.

Q Do you feel that for a person to be treated unfairly they would have to be deprived of the right to recover the amount of oil originally in place under their lease?

A That is my opinion, yes.

Q You testified, I believe, that Phillips had 160 productive acres for which they were only receiving credit for one well, is that right?

A Exhibit A, the isopach, indicates that on Phillips 240 acre lease there are probably 160 acres which could be considered reasonably productive. There is only one well on this lease. Therefore, they receive only one 80 acre allowable.

Q Would you say that a well located anywhere on Phillips lease would drain the entire lease, or would you say that the entire productive feet of pay under Phillips' lease was contiguous; in other words, in your opinion, is the porosity in Phillips No. 2 well the same porosity from which Phillips No. 1 well is producing?

A No, in my opinion, it is not the same as the productive interval presently producing in New Mex No. 1. It is present in the No. 2 well, but it is below the oil-water contact.

Q (BY MR. HINKLE) I have one question, Mr. Plumb. Are you familiar with the findings of the Commission in the Order which was issued when this was originally tried, or heard before the Examiner?

A Yes, sir, I am.

Q Finding No. 9 provides as follows: "While the commercially productive limits of an oil pool do not necessarily follow section lines, quarter section lines, or quarter quarter section lines, in the absence of a deviation in the U. S. Public Land Surveys, it simply is not feasible from an administrative and regulatory standpoint to approve non-standard oil proration units which do not consist of a portion of a standard unit and are not in the shape of a square or rectangle."

Do you agree with that?

A Yes, sir, I subscribe to that.

RECROSS EXAMINATION

BY MR. PAYNE:

Q Mr. Plumb, I'd like to pin down exactly, if I might, the position of Tennessee in this case. In an Examiner Hearing, in response to a question by the Examiner as to whether you thought Phillips would be entitled to a 40 acre allowable on the location they propose, your answer said, "Yes, sir, I think there are 40 acres to be dedicated to a well in that location which are to be considered productive of oil, and a 40 acre allowable can be granted."

Then I asked a question, unfortunately somewhat ambiguous, "How about 60, it would be 60?" You said, "Yes, sir, it would be approximately 60 according to my Exhibit." Did you mean to say the 60 acre unit, which the Commission subsequently adopted, to be productive of oil from this Pool?

A Let me explain a little on that question. This outline here represents the zero isopach line on the map. Now, we have no control for this line South of the Phillips New Mex "A" No. 1, except that this porosity zone did not occur in the New Mex "A" No. 2. The zero line, therefore, cannot be any further South than that. It could be slightly North of it, and absolutely no more than 60 acres in this West 1/2 of the S. E. 1/4 of 25 could be considered productive from the same reservoir.

Q It still is Tennessee's position you wouldn't object to a 40 acre allowable at this proposed well location?

A Well, sir, we object to this location in exception to the field rules.

Q Are you saying you object to them drilling any well on this lease except the one they presently have?

A Yes, sir.

Q Even though the acreage is productive?

A We feel they will recover at least their fair share of the oil by the existing wells, which they obtain credit from, and that no further wells are necessary for them to obtain their fair share or their protection of their correlative rights.

Q Do you feel, assuming the Commission could do this legally, that an operator should be denied the right to drill a well on his particular acreage?

A Can I say I don't believe there should be a well drilled on this particular acreage?

Q For the reason it would be unorthodox?

A No, sir, it entitles Phillips to more than its fair share of oil originally in place under this reservoir.

Q If you had other productive acreage in this reservoir, and you have testified one well will drain in excess of 80 acres, do you think the Commission should prohibit Tennessee from drilling an additional well?

A Not if we could drill within the present field rules.

Q Would you have any objection--I assume you would--but would your objection be as strenuous if the proposed location of

this well were 330 feet East of the boundary of the standard unit that Phillips has on its No. 1 well, and 330 feet South of the proposed location; in other words, so it wouldn't be crowding Tennessee near as much?

A No, sir, it wouldn't be crowding us near as much and I am not at liberty to state my Company's position on something like that.

Q As I understand it, then, it is Tennessee's position that Phillips should not be allowed to drill a well on this acreage inasmuch as there is no standard location available which is productive?

A That is correct.

MR. PAYNE: Any further questions of Mr. Plumb?

REDIRECT EXAMINATION

BY MR. ARMSTRONG:

Q I'd like to ask one more question. The proposed location that Mr. Payne questioned you about, it would not crowd Phillips' lease line there; if that well is completed in the common reservoir, Phillips will produce just as much oil from that well as it would from its well in the Phillips requested unorthodox location, is that correct?

A It is my opinion they will. I think there is no co-relation between the net feet of pay in the well and the ultimate recovery from the well. If it is connected to the main reservoir it is in a competitive drainage position with the rest of the field and should produce just as much oil as any well in the field.

Q Do you feel Phillips should be granted an unorthodox ex-

ception in order to get more oil than was originally in place under its lease?

A No.

RECROSS EXAMINATION

BY MR. JONES:

Q Carl Jones, representing Phillips. Mr. Plumb, you spoke of the porosity zone in the No. 2 well as not being the same porosity as the pay zone in the rest of the field. Do you mean by that that porosity zone in the No. 2 well is not in communication with the Kemnitz Field?

A Yes, sir, that is my position.

Q You mean that is a separate porosity zone, separated entirely from the Kemnitz Field?

A It is separated by an impermeable section from the main porosity zone which is producing throughout the major part of the Kemnitz Field.

Q Do you have any way of knowing whether or not that porosity zone is in communication laterally in another area of the field, with the main Kemnitz pay zone, as you term it?

A I believe so. I believe that the examination of the electric logs here indicates that the porosity there which produced the oil on the drillstem tests in the New Mex "A" No. 2 is considerably higher in the structure than is the porosity zone in the rest of the field, and it is, in all probability, not connected in any place to the main reservoir.

Q Would it be your position, Mr. Plumb, if a well were drilled on that undrilled portion of the Phillips' lease and were completed as a commercial well from that porosity zone, that it would be completed from a separate reservoir?

A If it were completed from that upper zone, but that would be in the vertical limits of the Kemnitz-Wolfcamp Pool.

Q Would it be in connection with the rest of the Pool?

A No, sir, I don't believe so.

MR. JONES: All right, sir. That is all.

Q (BY MR. PAYNE) Mr. Plumb, if you feel it wouldn't be in communication with the rest of the reservoir, then perhaps Phillips wouldn't need any exception here inasmuch as it is a different pool?

A No, sir. I believe I stated it would occur within the vertical limits of what is designated as the Kemnitz-Wolfcamp pay. I did not state that if they were to drill in the requested location that they would not encounter the Wolfcamp pay. I believe they would if they were permitted to drill in the exceptional location.

REDIRECT EXAMINATION

BY MR. HINKLE:

Q Their well went through the main reservoir, the Wolfcamp, did it not, and did encounter a pay in the main reservoir?

A The New Mex No. 2 didn't encounter any porosity.

Q What they did encounter was in the stringer above that?

A Yes.

MR. PAYNE: Any further questions?

MR. HINKLE: One more.

REDIRECT EXAMINATION

BY MR. HINKLE:

Q Now, since your testimony there was that what they encountered was in the stringer above the main Wolfcamp pay zone, in your opinion is any part of the S. W. of the S. E. 1/4 productive, any part of the forty acres on which the well was drilled productive in this zone, in the main zone?

A No, sir, with as much control as we have here, I have no reason to think it is.

Q How much oil was recovered from the drillstem tests in the Phillips "A" No. 2 well?

A If I may refer, the information I have indicates that in the Phillips New Mex "A" No. 1, drillstem test number 1, covering 10,641, to 10,835, recovered 2,252 feet water, three gallons free oil, and one twenty foot slightly oil and gas cut mud.

Q And, that was the interval Mr. Czirr testified this morning was the one where the oil was recovered and the other drillstem tests recovered oil?

A That is correct.

Q And, the main producing interval in the Kemnitz-Wolfcamp is the very prolific producer, is it not?

A Yes, sir, it is.

MR. PAYNE: That is all. The witness may be excused. Call your next witness.

W. T. WELLS

called as a witness, having been previously duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, please.

A W. T. Wells.

Q By whom are you employed?

A Tennessee Gas and Oil.

Q In what capacity?

A I am Division Production Superintendent.

Q Are you a petroleum engineer?

A Yes, I am.

Q What school are you graduated from?

A Texas A & M.

Q What year?

A 1948.

Q Have you practiced your profession since you graduated?

A Yes, I have.

Q Are you familiar with the history and development and production from the Kemnitz-Wolfcamp Pool?

A Yes, I am.

Q You are familiar with all of the Engineering Reports and all of the engineering work that has been done in connection with the field?

A I am familiar with the results of that work, yes, sir.

Q Have you previously testified before the New Mexico Oil Conservation Commission?

A No, I have not.

MR. HINKLE: Are the qualifications acceptable?

MR. PAYNE: His qualifications are acceptable, Mr. Hinkle.

Q (BY MR. HINKLE) Are you, Mr. Wells, familiar with the history of the proposed unitization and repressuring program being considered in connection with this Pool or field?

A Yes, sir.

Q When did that work first commence?

A In the early part of 1959.

Q Who has taken the initiative in connection with that?

A Tennessee Gas, as a major operator, assumed the burden of taking the initiative of the reservoir study of the Pool.

Q Do you remember when the operators first met to consider the work of the Engineering Committee?

A That was March 22, of this year.

Q When did Phillips make the application for an additional well in the Kemnitz Pool?

A It was after the first operators' meeting, I believe the testimony this morning indicated April, the following month.

Q I believe that it has already been testified to that the completion date of the No. 2 well was August 28, 1958?

A That's right.

Q Then, Phillips went from August, 1958, until after March 22, 1960, before deciding to make that application to drill another well?

A They went that long before this decision became apparent, yes, sir.

Q What was the result of the meeting held by the Kemnitz operators on March 22, 1960?

A The general agreement was had by all operators that some form of pressure maintenance was necessary to secure optimum recovery. However, at that time, they referred it back to the Engineering Committee for more study, particularly to put more effort into the discussion regarding water flooding of the reservoir.

Q Was this additional study undertaken by the Committee?

A Yes, sir, it was.

Q What was concluded by the Engineering Committee during its supplemental study and what recommendations did it come up with?

A I have here a copy of the conclusions and recommendations submitted to the Operators' Committee.

Q Will you please read those into the record?

MR. SPANN: May I inquire as to the purpose of this?

MR. HINKLE: To show the work that has been done, the study that has been made, and that unitization is imminent and how this location, and other locations, may affect the ultimate recovery of the field, and constitute waste.

A "Conclusions: The Kemnitz-Wolfcamp reservoir is behaving as a solution-gas reservoir. A study of the stratification indicated

there were no correlative zones of high permeability continuous through the reservoir. A model study will not aid in determining reservoir conformance to water injection. An analysis of past performance and present history of the individual wells indicates there is an area of good pressure communication and an area of poor pressure communication in the reservoir. Pressure maintenance calculations were made for the area of good pressure communications only. The area of poor pressure communication will probably not respond favorably to pressure maintenance. Based on available data, this study indicates that pressure maintenance by gas injection will yield a greater profit than primary and waterflood operations."

"Number 7: Continued study of the reservoir should be made, particularly to determine the feasibility of supplementing gas injection with water injection."

Those were the conclusions of the Committee. Their recommendations are as follows:

"Number 1: It is recommended that the Kemnitz-Wolfcamp Pool be unitized to protect correlative rights and achieve efficiency and economy of operation. It is recommended that pressure maintenance by gas injection in the South Area be initiated as soon as possible. It is recommended that the study of this reservoir be continued, particularly with regard to the supplementing of gas injection with water injection."

Q Have the operators met again to consider the Engineering Committee's Supplemental Report?

A Yes, sir, they met July 29, this year.

Q What was the result of this meeting?

A All parties present were in agreement to unitize the Pool for the purpose of initiating gas injection, and we are presently balloting all of the operators in the field on a participation formula suggested at that meeting.

Q In your opinion, can the repressuring program be successfully effectuated if the field remains in its present status quo?

A In my opinion, yes, sir. The rights of the parties are pretty well fixed, and the Engineering Committee has evaluated each lease's potential in the field at present.

Q In your opinion, then, in the event Phillips receives a permit to drill at the requested unorthodox location, what are the chances for successful completion of the repressuring and unitization project?

A I think they would be considerably worsened should Phillips receive a permit to drill another well in the reservoir. It is my belief they would request a larger participation factor in the unit than what they presently have. I feel other operators in the field would object to this. I believe this would be our position. Also, all the other field operators would have to consider whether to protect their present producing positions in the field by requesting unorthodox locations.

Q It could, then, conceivably cause a great deal of delay or, in fact, it might cause the project to be abandoned or dropped?

A I think there is a very good chance that could transpire as a result of the granting of the unorthodox location.

Q In your opinion, how much additional oil can be recovered from the Pool in the event repressuring is effectuated?

A According to the report, we can recover four and a half million barrels of oil by initiating gas injection on September 1, this year.

Q Mr. Well, refer to Tennessee Oil and Gas Company's Exhibit F. I believe you have distributed copies to all the members of the Commission?

A Yes, sir. Exhibit F is a simple bar graph made to show the effects of delay of initiation of the gas injection program. As you can see, if we could begin September 1, 1960, we estimate we can recover four and a half million barrels of oil. It is our estimate that we will lose a half a million barrels of oil by delaying initiation of gas injection for six months. This half a million barrels of oil would be approximately a million and a half dollars worth of oil. Twelve months delay, on the other hand, would result in the loss of 1,300,000 barrels of oil, with a consequent reduction of $3,900,000.00.

Q Now, upon what do you base these conclusions?

A We are particularly fortunate in the Kemnitz Pool in that we have a fluid sampling taken early in the life of the reservoir before it had been produced, and these conclusions are based on the results of pressure depletion of the reservoir, on the viscosity

and the shrinkage and loss of gas from the reservoir.

Q In the event the Phillips' Application is denied, does Tennessee intend to drill an additional well on its unorthodox location available in the S. W. of Section 30, or at any other location in the reservoir?

A Tennessee Gas and Oil will not drill any more wells if Phillips' Application is denied.

Q According to the isopach map previously introduced, which has been referred to as Tennessee's Exhibit A, has it a productive location that is undrilled, that Tennessee has?

A Yes, sir.

Q Why would you not develop that location if Phillips' Application is denied?

A There are two reasons why we do not choose to drill the orthodox location available to us. The first one is, it is our conclusion there are an ample number of wells to efficiently drain the reservoir at the present. Secondly, the incentive to get early gas injection going into the reservoir far outweighs any value we might place upon an individual well.

Q Do you know whether or not Tennessee contemplates additional development if Phillips receives the permit it is now seeking?

A That is very difficult to say. That would depend, in part, upon the results of studies by other operators as well as ours; also, it would result in a very close economic study by our Engineering Department. By and large, the problem would become one of eco-

nomics.

Q Was Exhibit F prepared by you or under your direction?

A Yes, sir, it was.

Q I would like to offer in evidence Exhibit F.

MR. PAYNE: Any objection to the introduction of Tennessee's Exhibit F? It will be admitted.

MR. HINKLE: That is all we have.

CROSS EXAMINATION

BY MR. SPANN:

Q Mr. Wells, in connection with your efforts to unitize this field, I assume that there are all sorts of factors that determine whether you are able to, or not able to get an agreement between the operators, isn't that true?

A That is always the case.

Q You have to iron out a lot of problems before you finally arrive at an agreement that everyone will accept?

A That is true.

Q As to the granting of this Application, that is just one factor that might affect it?

A Not at all. In my opinion, we cannot consider other factors so long as development is proceeding in the Pool. We cannot begin to iron out other problems until we have development stopped in the reservoir.

Q Well, are the limits of this reservoir completely limited and all the development concluded except for this? Are you saying

that?

A I am saying ample development has taken place to efficiently drain the reservoir, yes, sir.

Q There will be, or could be, additional development?

A I think it is most unlikely.

Q I am not asking you if it is unlikely, but if it could be done.

A Well, you are asking me if it could be done; that implies economic considerations. In my opinion, it could not be done. I think that any Company, using sound judgment, would very likely not drill any more locations in the Kemnitz Pool at this time.

Q Well, in any event, you do not intend to testify here, do you, that the granting of this application would be the sole factor that might delay the unitization of this area?

A Not the sole factor, but the major factor.

Q But you couldn't say positively if this application were denied that you would go ahead and unitize and save all this oil you were talking about, and that sort of thing?

A I can definitely say we would bend every effort to do so.

Q I understand that, but you are giving the impression here that this is the critical factor; that if granted, the saving of oil will not occur and that sort of thing, and that isn't true, is it?

A In my opinion that is critical, and I think it could well result in considerable loss.

Q But other factors could enter in and cause this loss?

A Those are possible. However, none of those factors have appeared at the present time. There is substantial agreement on the type of participation formula to be used.

Q All you would have to do to avoid this situation you are afraid of, in other words, the loss of oil through delay in initiating the program, would be for the operators to agree that Phillips would have some consideration for that additional well based on the acreage they have there that is productive, and you would go right along as you intend to anyway?

A Provided we could secure agreement from the operators; Tennessee's position would be, they are not entitled to consideration for that undrilled location.

Q In other words, Tennessee would hold up the arriving at an agreement?

A Not at all. There has been no statement made as to the position of the other operators with regard to Phillips getting additional credit for the undrilled location. In fact, they have no undrilled orthodox location.

Q Assuming that were granted, everyone might agree, and you could go right along with your plans?

A I can stipulate definitely that, in all likelihood, we would not agree and, in my opinion, other operators would not, since many of them have unorthodox locations they would insist on receiving credit for.

Q It would mean the loss would be the result of your refusal?

A Not at all.

Q You could prevent it by merely agreeing.

A The point is, I can in no way stipulate what the actions of the other operators would be. That is, there is no assurance the other operators would agree.

Q I just wanted to make it clear that you sort of left the impression that if this were granted this loss would occur and waste could result, and so forth, which would all be Phillips' or the Commission's fault in granting the application, but it would be your fault in refusing to recognize that they have this productive acreage and make allowance for it.

A If the application were granted, the well would have to be completed, would it not? So our refusal to grant credit for a well which has not been drilled, but does have a permit, would be a little premature.

Q But all Phillips would ask you to do would be what they are asking the Commission to do, recognize the fact they have 160 productive acres and recognize they should be treated like everyone in the field and be given an allowable based on that acreage.

A Well, Phillips is asking--I don't know that Phillips has made any request of the Operators' Committee; if I understand your question, for additional credit. Certainly this was not brought up at the July 29 meeting as to fixing equity in that unit. By and large, Operators' Committees and Engineering Committees consider the

original amount of stock tank oil in place. Our formula is an expedient to arrive at some consideration of that equity.

Q Well, then, if that was true, it wouldn't make any difference if they got an additional well or not as far as your ability to enter into a unitization agreement is concerned, would it?

A Only in the event Phillips insisted on vested participation. I find it unlikely they would spend $200,000.00 and accept the same participation we are offering them.

Q You are speculating?

A It would appear to be self-evident, but maybe I am speculating.

Q (BY MR. PAYNE) Mr. Wells, I take it the proposed participation formula has no acreage factor in it at all?

A It has none.

Q Is it Tennessee's position that the status of the Pool should be held constant from the time first efforts towards unitization of that Pool has been entered into?

A No, sir, that is not my position. My position is as I was testifying, that the granting of an unorthodox location might very well delay unitization. If an operator could prove he does not have an equitable situation, we are of the opinion he is entitled special relief, and we define an inequity as recovering less oil than he is entitled to by reason of the lease he holds.

Q If I understood your testimony, you testified you didn't feel any additional wells were needed in this pool to efficiently

drain the pool?

A That's right.

Q Therefore, to go ahead and drill any additional ones would simply delay unitization?

A I believe that to be correct, yes, sir.

Q You feel that way despite the fact that, presumably, one well in here will drain efficiently only 80 acres?

A It has been our position that one well will drain far more than 80 acres.

Q After one well was drilled in this pool, would you, at that time, have recommended that all other locations be denied because you could unitize the pool and that one well would drain it?

A I think insufficient evidence would have existed at that time to take that position.

Q Do they have more than one well in this pool at this time?

A One and a half.

Q At the flank of the pool, so to speak, aren't they?

A Well, that's a little bit difficult to say. In my opinion they are not; they are in the area of best pressure communication. They are, in fact, in the fairway. Cumulative recoveries from our State-Phillips No. 1 appear to me to indicate that well is as well off as the other wells in the reservoir.

Q There are no Kemnitz-Wolfcamp Pools to the South of those, are there?

A No, sir.

Q As a matter of fact, we have found that some of the acreage in this immediate area is actually dry?

A Commercially dry, yes, sir.

Q Doesn't that indicate to you these wells are near the edge of the Pool?

A They are near the edge, yes, sir. The reason I objected to the term "flank wells" is that, normally, that means less productive than in the center of the reservoir. In this case, that is not the case at all.

Q Would it be possible and feasible for the other operators in this Pool to go ahead with their plans for gas or water injection regardless of what position Phillips might take?

A It would be possible. There is a very good possibility that because of the excellent pressure communication, because of the demonstrated ability of the oil to migrate some distance, that the unit would be in the position of giving Phillips an unfair advantage; that is, they would be sharing in production generated by our secondary recovery operations and would not be contributing to it.

Q Unless you have an agreement with them to form some sort of a barrier.

A Unless we could have an agreement.

MR. PAYNE: Any other questions?

Q (BY MR. NUTTER) Does the participation formula that has been submitted to the operators for approval contain a factor where-

by a Company gets credit for having a well?

A No, sir.

Q So Phillips wouldn't have an increased well factor; there is no well factor by virtue of having an additional well?

A That's right.

Q Just what factors are considered in the participation formula, stock tank, oil in place, and wells?

A That was not one of the factors. If I implied that it was, I was incorrect. The actual participation formula that the Committee is now balloting the operators on was one propounded by Shell Oil Company and provides as follows: "That the remaining primary production is to be divided upon the Engineering Committee's calculations for remaining recoverable primary oil as of 4/1/60, until such time as we have reached their calculated ultimate primary production. That is one half of the formula. The other half specifies that secondary recoverable oil will be split up, based on ultimate primary; that is, recovery before April 1, 1960, and recovery after April 1, 1960.

Q Do you anticipate, or has Phillips shown an interest in joining this unit you have proposed for the Pool?

A Phillips has attended all the meetings.

Q You don't have anyone actually committed to this thing yet, do you?

A We have received an affirmative reply from the Pure Oil Company. However, that is the first Company that has responded.

Q Does the unit agreement provide that the unit operator, who I assume will be Tennessee--

A We have made no agreements regarding unitization agreements. It was our belief that the proper way to approach unitization was to agree on a formula. Then we could sit down and write a unitization agreement.

Q Do you anticipate the agreement will provide the unit operator can drill additional wells if he sees fit?

A Subject to the approval in the unitization.

Q That would be subject to the approval of the majority of the working interest owners in the agreement?

A Yes, sir.

Q Assuming Phillips' acreage was dedicated to the unit, and that Tennessee saw fit to drill another well, to fully recover the amount of oil that is under the Phillips' tract, I suppose then Tennessee would have the right to drill the well, providing it had concurrence of the other operators in the unit, would it not?

A That would be correct. Of course, we don't think that the drilling of another well is required to recover all the oil under the Phillips' tract.

Q In other words, if you did later on determine an additional well was necessary, you probably would have the right to do something?

A Yes, sir. The only reason I can think of would be we had initiated water injection on the Southwest flank of the field, in

which case Phillips' No. 2 would be of some value because it does have good porosity below the contact.

REDIRECT EXAMINATION

BY MR. ARMSTRONG:

Q In negotiating any operating agreement, such a situation as that could be avoided; in other words, we could be prevented, in order to secure Phillips' joinder in any such operating, we could give up the right to produce a well on Phillips' lease, could we not?

A That would be incorporated.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Wells, if Phillips joins the unit, then they would get credit for the acreage they now want to drill?

A There is no provision specifically provided for acreage in our formula. As I mentioned, the remaining primary is to be based on engineering calculations as of April 1, 1960, so that remaining primary would accrue to Phillips on estimated production on our State-Phillips No. 1, in which they own a half interest, and their No. 1 well, and each of those, 231,000 barrels of remaining primary recoverable oil. Their secondary participation would be based on the ultimate recovery from those two wells. In other words, the participation formula now being circulated only has production in it for use as parameters. It was the belief of our Company and also of Shell, I believe, that the production fairly represented

each operator's position in the reservoir, that is, production to date and ultimate recovery on primary means. It was our belief that the formula would give them credit for the acre feet of pay which they had, and represent fairly their position in the reservoir, but no acreage factor, as such, is provided in the formula.

Q You said there was a reserve factor, did you not?

A Yes.

Q Recoverable oil in place?

A No, sir. I said that the formula used was an expedient to arrive at that position, and it is our belief that the recovery on 2/4/60 added to the recovery after 4/1/60 represents the positions of the operators in the reservoir, in position of stock tank oil in place. For our information, we have calculated what our position would be. We have approximately 46 percent of the acre feet in the South Area. The formula that will be used will give us approximately 42 percent of the remaining primary and secondary.

Q I am not sure if you have answered my question or not. Will Phillips get credit for the oil in place they have on the acreage they are asking to drill?

A As far as we are concerned, the formula represents it, although there are no direct calculations for that.

Q And, how would you handle such instances as the Shell WD State 1 where, according to your Exhibit A, about half the acreage was dry in that unit; would they get credit for that dry acreage?

A Again, I would like to point out that the formula is based

solely on production, but the Shell acreage you are talking about, WD No. 1, if you will observe there are two unorthodox locations available to Shell, at least two, actually three, so that the granting of full credit to their WD No. 1 is a recognition of the original stock tank oil in place lying in the East-West plane under that lease.

Q And, by virtue of that they would also get credit for their productive acreage or stock tank oil in place in the S. E. 1/4 of Section 29?

A Would you mind rephrasing that question, please?

Q I say, they would also get credit for the oil they have in place in the S. E. 1/4 of Section 29, even though they haven't drilled a well there?

A To the extent that production from the State WD is proportional to that oil in place over there, that would be true.

MR. PAYNE: Any further questions?

Q (BY MR. JONES) Actually, Mr. Wells, the effect of it is that the participation formula which you are now considering, and in the field where Tennessee will own some 42 to 46 percent interest, depending on the formula agreed upon, the effect is to freeze Phillips as of April 1, 1960.

A Along with all other operators in the field.

Q And, I understand Tennessee feels that is fair to Phillips and it is unfortunate that Phillips doesn't agree. That is the fact, isn't it, Phillips will not get credit under it for the undrilled acreage?

A That is not correct at all, Mr. Jones. Our position is that the formula used will actually give them more credit as testified to by Mr. Plumb, as that acreage would be entitled to credit based on a volume acreage.

Q But there is no acreage factor, as such, that would give credit to the undrilled acreage.

A It is our position it is reflected.

Q Nevertheless, there is nothing that gives credit to the acreage as such.

A Neither to ours nor to Phillips.

MR. PAYNE: Are there any more questions of this witness?

REDIRECT EXAMINATION

BY MR. ARMSTRONG:

Q Let me ask you a couple of things. When was this proposed participation formula first submitted for consideration?

A The one on which we are now balloting?

Q Yes, before or after Phillips filed this Application?

A I would have to assume it was after they had filed.

Q Is it true it was at the July 29th meeting?

A Yes.

Q Then, it is certainly not as a result of any dissatisfaction with the formula?

A That would appear to be the case.

Q In effectuating a secondary recovery program, isn't it always true that all parties must compromise their competitive posi-

tions in order to accrue the benefit that will accrue to them?

A Yes, sir, Tennessee feels very strongly that is the case. That is the reason we have elected not to drill our orthodox location available to us. It is the reason we have not used net acre feet as a parameter.

MR. PAYNE: Any further questions of this witness? The witness may be excused.

(Short recess.)

MR. PAYNE: Come to order, please. You may proceed, Mr. Hughston.

MR. HUGHSTON: This witness has not been sworn.

(Witness sworn.)

MR. HUGHSTON: R. F. Hughston, appearing for Shell Oil Company.

PATRICK W. HUBER

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

DIRECT EXAMINATION

BY MR. HUGHSTON:

Q What is your name, please?

A Patrick W. Huber.

Q By whom are you employed?

A Shell Oil Company.

Q In what capacity?

A I am Division Production Geologist, Roswell Division.

Q What education have you had for your specialty, Mr. Huber?

A I received a Bachelor of Science degree from Pennsylvania State College in 1950. I went on and got a Master's and graduated in 1951; also Petroleum Natural Gas Engineering. I was employed by Shell Oil Company in May of 1950. I have served four years as a general exploitation engineer in the Gulf Coast area. This is the combined group now, Gulf Coast area, Rocky Mountain area, mid-Continent area. I have had about five and a half years experience as a production geologist. My experience has been in the mid-Continent area and the Permian Basin, Southeastern New Mexico, specifically.

Q Have you made any study of the geological and production data available with reference to the Kemnitz-Wolfcamp Pool?

A Yes, sir. We have studied this Pool thoroughly in conjunction with our development program, or the development program in the field. Our interpretation has been reviewed from time to time as data has become available, and we have reviewed the field again with respect to this Application.

Q You made a particular study of the 240 acres that are affected by the Application here, being the Phillips' 240 acres in Section 25; is that right?

A Yes, sir.

Q MR. HUGHSTON: Are this witness' qualifications acceptable?

MR. PAYNE: His qualifications are acceptable.

Q (BY MR. HUGHSTON) As a result of the study that you have made of it, in connection with the Phillips' Application that is the

subject of this hearing, have you formed an opinion, Mr. Huber, as to how much of the unit proposed by Phillips for the irregular location involved is not productive from the main producing zone of the Kemnitz-Wolfcamp Pool?

A Yes, sir.

Q Have you prepared some Exhibits with reference to that?

A Yes, we have.

Q Would you state, specifically, what the Exhibits are in brief form, and then we will let you explain your reasoning for whatever opinion you have reached?

A Starting here--I left Tennessee's isopach on--this is Shell's Exhibit 1. It is a cross section, North-South cross section approximately through this area, similar to Tennessee's geography. We have projected the alternate 40 acre wells geographically into the line of cross section as we proceeded from North to South, so this cross section and the alternate wells includes 40 acre tracts that are actually removed from the North-South line of the cross section.

Q Shown thereon are the electric logs which are official records filed with the Commission here in connection with those wells?

A That's correct. Marker "A", our top line, is a very well defined correlative marker in the area. It goes beyond the lines of the Kemnitz-Wolfcamp field. Marker "B" is another reasonably correlative marker. It also represents the top of a rock unit which

we would like to go into a little further on in the testimony, and the shaded interval between these two lines, which we have chosen to call the fairway porosity or reservoir proper, represents a rock unit which we consider constitutes the major portion of the Kemnitz-Wolfcamp reservoir, and exhibits in excess of 90 percent of the ultimate reserves of the field. The darkened areas near the center of the log strips are intervals where microlog has indicated porosity. We do not have micrologs on cross section, but we have transposed from a microlog and indicated the log characteristics on this cross section.

Q Is the oil and water contact shown on that Exhibit?

A The oil-water contact, estimated at 6,670 feet, is shown by this little line.

Q Would you identify the wells, the logs of which are shown there?

A This northernmost well is Sinclair Oil and Gas Company's Seman Unit No. 3, starts right here; Sinclair Oil and Gas Unit No. 5, projected; Tennessee Gas Transmission State "AA" Kemnitz, "B" No. 1, which is on the section; Kemnitz "B" No. 4, Tennessee, which is again projected into the section; Tennessee's State-Phillips No. 1, which is right here; Phillips' Petroleum Company New Mex "A" 2, which is the plugged and abandoned well on the Southeast end of the field; it is just a North-South line through there. We have projected these wells in primarily to show that this reservoir has continuity and the fairway area can be illustrated by using those wells

to a little better advantage, I think.

Q From the co-relation of those electric logs, how much of the main producing zone in the Kemnitz-Wolfcamp in the unit which Phillips has proposed for the irregular location that is the subject of this hearing, would be productive from that main producing zone?

A We would like to show that there are two separate rock types in this total interval; that actually the Kemnitz fairway porosity is confined to this zone, and that at the point where the zone enters it below the oil-water contact we are approximately 620 feet South of the Tennessee Gas and Oil Phillips-State No. 1, which would keep the accumulation on the 40 acre tract occupied by this well, or a well that would be located there.

Q Would you describe the characteristics of the two different zones and compare them?

A Yes, sir. I'd like to speak first about the zone that we call the reservoir proper, the fairway. It is an elongated mound-shaped accumulation of fragmental carbonate debris. It is approximately three-quarters of a mile wide through this area. The lateral extent is shown to be a little over four miles by present drilling. The porosity is indicated to be deteriorating, both to the East and to the West. We believe the reservoir is reasonably well-delineated, and that the rock unit is also delineated with respect to its porosity development, or at least, its commercial porosity development.

Now, northward this unit interfingers into and grades with a dense lime. As you go North into this zone that we consider is not

connected to the reservoir proper, the wells behave differently, and they do not have the same pressure response or productivity response. Now, on the South side of the field this rock thins very abruptly right after you reach the area just north of the centerline of Sections 29, 30, 25, and dips below the water level at approximately 6,670 feet sub sea, which defines the southern limits of the field.

Q Describe the rock and the main producing zone.

A I would like to go on a little farther with the rock, specifically. This interval shown in the shaded area contains from 30 to 50 percent fossil fragments with varying amounts of spar, secondary calcite, and some lime-mud matrix. The debris contains abundant fossil fragments of brachiopods, ostracods, foraminifera, cephalapods, crinoids, and algae growths. It is a grain-supported rock, which means that the fossil fragments are actually in contact with one another, and some of the original porosity has been preserved as in clastic-type rock. The rock has been altered by some secondary factors. There has been some leaching which created new porosity and actual cementation with spar, calcite, which destroyed some of the original porosity. You will notice that in this zone there are these bands of light. The light bands in the center of the well section show no porosity development. These are thin deposits of non-porous limestone. We believe they are originally lime mud. They are local deposits. They have no lateral continuity. The fragmental porous zones are predominantly the continuous phase. We can't co-relate our dense areas to any extent. The only place where

they are continuous is here in the northern area where you get back to the portion of the reservoir that does not behave as the unit. This rock has good diagnostic electrical log properties. Comparison of our logs and core analyses show good agreement between microlog indicated porosity and our permeable intervals. We get a high S.P. response, showing quite a clean rock and also that there is, possibly some permeability in the rock.

Now, I'd like to go further and talk some about the zone overlying the area that we call the reservoir proper or fairway. We believe this is a separate rock unit. It is approximately 100 feet thick over the center of the field. Down where your fragmental limestone thins, this becomes quite thick, reaching approximately 170 to 180 feet in thickness. It is essentially a blanketing feature. It has characteristic facies, which sets it apart from this. I think it is a separate rock unit. We have some core control in a well, W. D. 1, to be exact, in the N. E. of the S. W. of 29, which actually penetrates some of this rock. It is a dark brown to black, dense argillaceous to siliceous limestone. It is a relatively deep water facies compared to this. We believe it has encroached over the main porosity zone or mound as it has developed, and actually covered it and acts, in effect, as a permeability and porosity barrier. Now, within this section there are a very few thin porous intervals, but in this case they constitute the discontinuous phase of the rock, whereas the mud or dense type limestone is the continuous phase. We believe there is very little lateral continuity in it.

The rock is characteristic of a mud-type deposit. There are a few fossils, but they are not supporting one another as they are here, and we believe this persists over the top of the reservoir. We have good control on the log character and we think it is reasonably co-relatable. We can find no firm evidence to show that any of the porosity development, for instance, the only porosity in this cross section that occurs in this zone is in Tennessee Gas Transmissions State "AA" Kemnitz "B" No. 1, and in Phillips New Mex State "A" No. 2.

Q There are some thin streaks of porosity in there?

A Yes, sir, there are.

Q No evidence of any connection?

A No, sir.

Q No evidence of any connection with the main porosity of the fairway zone?

A No, sir. This rock unit has also good diagnostic rock properties. It has a depressed S. P., as you see here, with respect to the fairway. It shows it to contain a high quantity or high percentage of clay and shale-type minerals.

Q Would you point out on the Phillips "A" 2, the zone of porosity which Mr. Czirr said this morning was the zone Phillips thought was the productive zone from that well where the three barrels of oil were recovered?

A He identified the interval as 10,747 to 10,757, which is right at the top of the "B" marker, right in this little zone where

we do have an S.P. kick, and we have a microlog indication of porosity in that zone where they recovered the oil.

Q Where is the main producing zone; where did it show up in the Phillips' "A" 2 well?

A The Phillips' "A" 2 well appeared at 10,925 feet, approximately.

Q Is that above or below the oil-water contact?

A About 75 feet below the oil-water contact in the field. This is the oil-water contact, this is the top of the porosity in the fairway zone, which we attribute to Phillips' New Mex "A" 2.

Q Where is the oil-water contact?

A 6,670 sub sea for the oil-water contact. Further than this depressed S.P. you see along here, that goes with the rock unit. The Gamma Ray has a high response that also shows your high percentage of shaley or dirty minerals.

Q Based on that particular Exhibit, your study in connection with it, did you have any opinion as to how much of the proposed unit for the irregular location, which is the subject of this hearing, would be productive in the main producing zone?

A I believe the main producing zone goes no further than 620 feet from the center of Tennessee Gas Transmission's State-Phillips No. 1, which is located N. E. 25, 16 S., 34 E. The structure in this area is generally parallel with the Township lines. We have structure maps to show it, that the location on the 40 acre tracts comprising the N. W. of the S. E. of 25, occupies a similar

position in the fairway.

Q In other words, the productive interval would extend no further than 625 feet South of the center of the N. W. of the S. E. of 25?

A 620.

Q Do you have any other reason for such a conclusion?

A Yes, sir. We believe that this is a generally impermeable bed. We could see no place where the porosity in this, where Phillips recovered the oil, can be co-related either laterally or North-South into the fairway.

Q Is there anything in connection with the pressure disclosed by the Phillips' well that confirms your idea?

A Drillstem tests, I think that has been quoted before, drillstem test number 1 from that covered the interval shown through from marker "A" through a portion of marker "B", through a portion of zone "B", had a bottomhole pressure of 1,715 PSI on a fifteen minute buildup shut in. That was considerably below the reservoir pressure at the time. That is about all we can conclude from the upper test. The lower test, I don't have the exact depth, from approximately 10,828 to 11,005, recovered substantial water. The reservoir pressure in this drillstem test on a fifteen minute shut in was 2,975 pounds.

Now, I'd like to go to Exhibit No. 2.

Q What is it, now?

A Exhibit No. 2 is entitled "A Prediction of Reservoir Per-

formance in the South Area of the Kemnitz-Wolfcamp Pool Under Primary Depletion." The only curve I wish to point out is the reservoir pressure curve which is plotted in pounds per square inch versus time in the reservoir. Now, in late August of 1958 when this well was drilled and tested, the average reservoir pressure in the field was approximately 2,800 pounds. We had about 175 pounds difference between this zone and the reservoir proper at the time of the test. Further than that we have approximately 170 feet of separation between the probably porous zone, which produced this oil, and the porosity that was shown to be connected to the Kemnitz-Wolfcamp reservoir.

Q What percentage of the oil which will be produced from the Kemnitz-Wolfcamp will be produced from the main producing zone, the one you have shaded on your Exhibit Number 1?

A Well, I think Tennessee testified as to the oil produced; the only thing I can base my figures on is a weighted average porosity within both of these zones. The upper zone over the entire field contains less than 10 percent of the microlog porosity in the field. The fairway zone has over 90 percent of the total porosity in the field on a weighted average per well porosity basis.

Q What are Shell's Exhibits 3, 4 and 5?

A Shell's Exhibits 3, 4 and 5--they are pretty small--are micrologs of the three wells in the area of immediate concern. Exhibit Number 3 is Phillips' New Mex State "A" 2. Exhibit Number 4 is Tennessee Gas Transmission's State-Phillips No. 1, which is the

other northern well, and Phillips Petroleum Company's New Mex "A" 1, which is one of the northern wells.

Q Is anything particularly informative about them, or are they corroborative of the shaded zones on Exhibit Number 1?

A They are corroborative in that these are the micrologs of the wells in point. We have transferred this over to this one. It shows the general arrangement of the zones. These are the two northern wells; this is the southern well on the left. Exhibits 4 and 5 are the northern wells; Exhibit 3, the southern well. Marker "A" is very clear cut. It is this feature here; marker "B" has reasonably good co-relation. I think we can follow it through from Gamma Ray and S.P. and resistivity. All three logs can be used for co-relation. At the top of the fairway zone we have shown the difference between where the maximum or the thick buildup in the porosity is. Up in this area near the center of Section 25 and the appearance of the porosity as it goes off of the mound and passes below the water level; it is thinning at the same time. To go back to this point here, this is a gradation from this type of porosity down to this porosity here. Now, on the basis of the evidence we have, we believe that none of the Kemnitz reservoir proper is present above the water level anywhere South of the Northern tier of 40 acre tracts in Section 25.

Q All of the N. W. of the S. E. of the proposed unit would be productive within the main producing zone?

A That is correct.

Q Would it be equitable to allow a well to be completed in that zone and attribute to it acreage not productive from that zone?

A No, sir, I don't believe it would.

MR. HUGHSTON: That is all.

CROSS EXAMINATION

BY MR. PAYNE:

Q Both the zones are within the vertical limits of the Kemnitz-Wolfcamp Pool, aren't they?

A Yes, I believe that is correct.

Q And, you feel that 40 acres of the proposed 80 acre unit is productive from the main zone?

A Yes, sir.

Q Now, is the unitization going to encompass the main zone as well as the other zone, or rather, the other zone as well as the main zone?

A To my knowledge, the only well that is producing out of this upper zone is Forrest-State "A" 2.

Q Do you propose, under your participation formula, to give that well the same credit for past production and future production as you do other wells in the Pool, even though it is not producing from the main zone?

A Yes, sir.

Q And, do you intend to conduct secondary recovery operations in both zones?

A Could I correct that last statement? I am not a member of

the Committee, and I have not proposed a participation factor, but I understand it is included in the plan of unitization.

Q Do you know if the intention is to use gas injection and/or water injection in both the main zone or other zone, or whether it will be limited in the main zone of porosity?

A I believe it will be limited to the main zone of porosity. As far as I know, there are no wells completed in that zone except the Forrest Well.

Q (BY MR. JONES) Mr. Huber, you say you would assign 40 acres to the well for which the unorthodox location is requested; is that true?

A I said I believed that 40 acres is productive of oil, yes.

Q And, no other requested unorthodox unit is productive?

A Yes, sir.

Q Mr. Huber, what type of reservoir do you consider this reservoir to be; is it a detrital reservoir or a reef-type body?

A We have some reefy fabric. It does not look like it is in place. I don't like to say whether it is detrital, in place, or transported. It could have been destroyed in place by wave action, but it is not the reefy structure we can find in the position that it would be found.

Q Do you consider it unusual to have erratic porosities and permeabilities in a reservoir of this nature?

A To what extent? If you consider this erratic, with the small variations, yes.

Q You consider it unusual or usual?

A It would be usual, I think.

Q A reservoir rock of this nature to have erratic porosity and permeability, that is not unusual, is it?

A It would depend, probably, on subsequent secondary factors in the reef, in the mound buildup. I would say that if it were not altered by other factors that occurred after deposition, I would not expect it to be erratic. If it were altered, many things can happen to the porosity.

Q Are there any other wells besides the Phillips' No. 2 well which encountered the zone of porosity in what you consider the upper part of the Wolfcamp formation and which you say is not in the fairway; were there any wells drilled in the field which encountered that porosity?

A Yes, sir. We have one over here, two locations separated; this dark interval at 10,630 feet and Tennessee Transmission's State "AA" Kemnitz "B1" is such.

Q Are there any others?

A Yes, sir, there are; I don't know offhand what they are, but in going over them we encountered several other wells which had porosity up here, but only to the extent it covered one or two feet of thickness.

Q But it was encountered in other wells. I will ask you specifically about the Tennessee Gas State 1 "B", did it encounter the porosity zone in the upper section?

A Yes, sir, it did.

Q I believe you testified the Tennessee-State "B"2 did, and you pointed that out, did you not?

A If I did I made a mistake. It should be State "B"1.

Q How about State "B"2, did it not encounter the porous zone in the upper section of the formation?

A I don't remember whether it did or not.

Q How about the Tennessee-State 1"C"?

A Just a minute. I have some notes that may help me here. Tennessee-State 1"C", when you asked me if it was in this zone, I am including the total interval from here to here, not necessarily the correlative point at the top of marker "B". Now, I can take care of the other questions you ask now, too.

Q Let's try the Tennessee-State "B"2.

A Yes, sir. It had two feet of pay.

Q Tennessee-State 1"C"?

A Three feet.

Q Tennessee-State "B"3?

A We have three feet in that well.

Q Now, Mr. Huber, how do you know that this upper portion in which this zone of porosity or zones of porosity are encountered are not in communication with what you refer to as the main fairway of the field out somewhere away from the well bores of these different wells?

A There is a very diagnostic unit of rock. It is siliceous,

hard, dense; it has a high concentration of clays. There is no interval between two wells in the field where we can show that this grades down through the dense zone.

Q Is there any way you can show it does not?

A No, sir, I don't think so. It is implication.

Q Your judgment, as distinguished from being based on any firm evidence?

A I believe the rock type is pretty firm evidence. It is a different genetic unit from this, and I cannot see, conceive of how porosity will migrate through a rock unit like that. I believe the porosity that did occur in there are minor deposits of the same type of debris that we have in here, but I do not believe they are extensive.

Q Mr. Huber, are you working on this Committee that the witnesses for Tennessee Gas and Oil Company referred to, studying possible unitization of the field?

A A gentleman working for me is a member of the Committee.

Q Are you familiar with his activities on this Committee?

A Yes, sir.

Q Now, I will ask you if these zones of porosity which you refer to as an upper section of the Wolfcamp formation are being used by this Committee as productive in their calculations in regard to possible unitization and possible participation factors?

A Yes, sir. They are being used in this isopach. They are included in the volume analysis of the reservoir.

Q And, Shell is a member and serving on that Committee?

A Yes, sir.

Q Now, Mr. Huber, reference has been made to a North and South zone in this field, and I will ask you whether or not--as I understand it, the point is made that there is little, if any, communication between the North zone and the South zone?

A I believe that is so, yes, sir.

Q There are wells, are there not, which have units assigned to them which are traversed by that particular line, are they not?

A Yes, sir.

Q Where part of the unit will be out of the line, or in the South zone, and part North of the line and in the North zone?

A That is correct.

Q Are you proposing that the portion of those units North of the line be removed from the acreage dedicated to those particular wells?

A Are you speaking for allowable purposes or for volumetric consideration?

Q Let's take allowable.

A Allowable purposes, no.

Q How about for calculations in regard to the unitization and participation factor in case of unitization?

A I believe the formula is set up to take care of that contingency. The primary recovery of the wells is a factor, and the secondary reserves, based on the primary ultimate, is the other fac-

tor, and I think that is compensated for in the well formation.

Q They are given credit, then, that is the effect of your answer with regard to possible unitization and the participation factor, the area North of it?

A I have not seen the ballots, but I understand they are being voted on for inclusion in the unit.

Q Do you know what the present producing rate of the Phillips 1"B" well, 1 New Mex-State well, is?

A I believe it is a top allowable well.

Q It is now. It was re-worked, was it not?

A Yes.

MR. JONES: I believe that is all I have.

MR. PAYNE: Any further questions?

Q (BY MR. NUTTER) Mr. Huber, on your cross section, which is the horizontal scale?

A You may have gotten one in error. We had only three copies with the correct scale, horizontal is 1 inch to 200 feet.

Q You kept referring to the area South of your State-Phillips No. 1 as being 620 feet South of that well. That would be above the water-oil contact. Now, that line isn't running straight South, is it?

A The cross section; yes, sir, it is a geographical projection of these other wells into a North-South line, actually.

Q Now, it runs from your "B" No. 4 to the State-Phillips No. 1, which is southeasterly, and then from the No. 1 State-Phillips

southwesterly to Phillips No. 2 dry hole, doesn't it? In other words, the cross section has a significant sag, hasn't it?

A Yes, sir, these wells setting on the West side--let me explain it this way. The cross section we have prepared essentially to illustrate a North-South section normal to the mound development. We have projected intermediate wells into the section geographically. We scaled it for this, for the North-South line.

Q It does have a North-South scale?

A Yes, sir.

Q And, then we projected these in just horizontally, geographically, into the line of the section? I didn't see the copy of your plat that shows the way you did that.

A I intended to prepare one, and we got caught short for drafting, and I used Tennessee's Exhibit for my illustration.

Q So the North-South direction is scaled, and the distance from the State-Phillips No. 1 to the water-oil contact, assuming a uniformity, would be 620 feet?

A Yes, sir.

MR. NUTTER: Thank you. That is all.

MR. PAYNE: Any further questions of this witness? If not, he may be excused. Does anybody have further testimony in this case? Any statements?

MR. ANDERSON: R. M. Anderson, Sinclair Oil and Gas Company. I'd like to make the same statement that I made at the original hearing on this matter. I'd like to preface it with the obser-

vation that Sinclair is opposed to changing the rules after the game has been played, and that, essentially, amounts to our position.

We proposed flexible spacing rules for the Pool at the original hearing, May 16, 1957, at the same time Tennessee Gas Transmission proposed rigid spacing rules. Subsequently, the Commission adopted the rigid spacing rules and Sinclair completed the development of their properties in the Pool under the rigid rules. We drilled three more producing wells; we drilled one dry hole, and we left two undrilled locations. Subsequently, on November 13, 1958, Sinclair supported the continuance of rigid spacing rules when the matter of the temporary rigid rules was reviewed, as we believed, at that time, development was in a very advanced stage and it was no time to come in and change the rules. On July 8, 1959, Sinclair formally objected to Samedan Oil Corporation's request for an exception to rigid spacing rules. We feel that in this field, by granting one exception, that the Commission will open the door for additional applications and additional exceptions. There will be as many as eight or ten additional possible exceptions to these rigid rules, and if those wells are drilled they will result in nullifying the rigid spacing rules adopted by the Commission. We feel it will end up with flexible development, which is exactly how we proposed that the field be developed in the first place. However, we will be unable to compensate for the dry hole we drilled in following the rigid pattern. We will be unable, now, to compensate for the drainage that has occurred by virtue of the fact we did not feel justi-

fied in drilling two proration units that we have in the field to being forced to drill on the poor end of the 80 acres if it were developed.

So, at this time, we feel our correlative rights would be violated by a relaxation of these rigid rules that we have all been living under, and at the same time we can see where our investment in this area would be, in part, confiscated by relaxation of the rules. We feel the field has been developed.

MR. NUTTER: Mr. Anderson, I would like to ask you one question. Did you state you drilled a dry hole as a result of following the rigid pattern?

MR. ANDERSON: Yes.

MR. NUTTER: Where is that hole, please? I see a dry hole in the S. W., S. W. 1/4 of Section 24.

MR. ANDERSON: A better location would have been the East, the location due East of that well, and the subsequent redesignation of the 80 acre assignment.

MR. PAYNE: Any further statements?

MR. KELLAHIN: Jason Kellahin, representing Samedan Oil Corporation. As has been stated, Samedan made a similar application; the facts in the case were identical to those in this case. At this time Samedan is in agreement with Tennessee Gas and Sinclair and Shell in opposition to this proposed location for the reason the Pool has been substantially developed, and to now approve an exception of the type sought by Phillips Petroleum Company it is felt

will impair the correlative rights of the operators in the Wolfcamp Pool.

The Samedan case was predicated upon the premise that the orthodox location was not commercial. We have the same identical situation here. It is clear the orthodox location on Phillips' acreage is non-commercial and, therefore, they want the unorthodox S.E. 1/4 of the S.E. 1/4 in Section 25, 16 S., 34 E. That is basically the location Samedan proposed to drill in, and the acreage is quite comparable to that of the Phillips. Phillips can't drill on regularly spaced locations. Samedan did not feel they could, and did not drill. The Commission entered its Order, incidentally, we were opposed by a number of these Companies who are here today, and Mr. Plumb testified very convincingly, and on the basis of the case heard by the Commission, I would like to read just two of the findings which were made by the Commission in Order R-1455. That is Finding Number 5. It says that the establishment of 80 acre proration units in said Kemnitz-Wolfcamp Pool on a fixed spacing pattern, requiring the drilling of wells on diagonal 40 acre tracts was based on the drainage and counter-drainage. Number 6 said that the Kemnitz-Wolfcamp Pool has been largely developed. R-1011 and R-1011-A, the exception requested by the Applicant, would violate the principal of drainage and counter-drainage and these impair the correlative rights. I feel the same reasons now apply.

MR. NUTTER: What is the date of that Order?

MR. KELLAHIN: August 1, 1959, Case Number 1718.

MR. PAYNE: I take it, Mr. Kellahin, that in Samedan's position it makes no difference whether or not you have attempted to drill on a standard location?

MR. KELLAHIN: I think an operator is entitled to determine, in advance, where the productive or non-productive zone is, and that is what Samedan's did. In Phillips' case they apparently thought it would be productive and it turned out not to be.

MR. HINKLE: On behalf of Tennessee Oil and Gas Company, I concur with the statement made by the gentleman from Sinclair, that it would be unfair to change the rules after the game has been played. As Mr. Kellahin has pointed out, this field has been substantially developed for a good long time. The limits of the field have been practically delineated. I think this is a very important case, not only from the standpoint of the parties, but also from the standpoint of the State of New Mexico, as far as State lands are concerned, because it is all State land. I think it also an important case as far as the policy of this Commission is concerned in considering what is to be taken into consideration in allowing exceptions to general field rules. It has been urged, of course, and will be urged that you should stick to the surface allocation. I think the policy of the Commission should be to consider all equities which might be involved in connection with any exception to field rules. It is an entirely different situation where you are making an exception to specify 80 acre spacing units. I think it is necessary that you take into consideration all possible factors, includ-

ing correlative rights and, also, as to whether or not the Applicant who is seeking the exception will get some undue consideration or advantage. The evidence in this case clearly shows that Phillips has delayed an unreasonable length of time in requesting this exception. The field, as I have pointed out, has been pretty well defined and developed for a long time. A delay from August 19, 1958, until June, 1960, after they drilled the dry hole, to make this request for an exception. They also delayed at a time when the negotiations for unitization of the field and inauguration of a pressure maintenance project have been substantially completed. It has also been pointed out, evidence shows that if an exception is granted in this case there are likely to be others requested which will cause an undue delay, maybe six months or a year. The evidence clearly shows, and it is uncontradicted, that if there is a delay there will be considerable loss and waste of oil that will never be recovered and the State stands to lose a considerable royalty as well as the operators, which might be caused by granting this application.

Tennessee Gas and Oil would like to urge that the application be denied because of these things, and then, also, on the additional ground it would be extremely difficult for the Commission to administer the proposed exceptions here of irregularly shaped units.

MR. HUGHSTON: May the Commission please, we agree with the ideas expressed that it is most unfair to change the rules after substantial investments and positions have been taken on the strength of the original rules. As has been most strikingly pointed out here,

Tennessee turned loose of the 40 acres on which the subject well is now proposed to be drilled at a time when it had it, because it was relying on the original rules. If it had any idea that the rules were to be changed, or exceptions granted very readily from those original rules, it might have taken a very different position. The production and development of an oil pool is a dynamic thing. It is changing constantly. What a person will do when a field is first opened and after it is partially developed differ from what he can afford to do and will do after it is developed to a great extent and has been produced for a number of years. Those things have to be made, and for those reasons changes should not be made or exceptions readily granted. You should not say it should never be done. In some cases so much waste would result that the State should be interested and ought to make a change, but there ought to be clear and convincing evidence of substantial waste, or that the rules as originally promulgated will interfere considerably with the correlative rights of an operator before a change is made. People have taken too many positions on the strength of the original rules. For that reason, if an exception is granted here, there probably will be other applications for exceptions, and that is going to be true if the Commission takes up governing by exceptions, shall we say. It is going to take up an enormous amount of time of this Commission and an enormous amount of time of the industry, geologists, engineers. It is better to stay with the rules, some flexibility, particularly with reference to where 80 acre locations are provided,

and we would suggest that in making provisions for 80 acre locations hereafter in the pools, that the Commission consider allowing operators to drill on unorthodox locations at their option, provided that the well at the unorthodox location should have only one half of the allowable of the well drilled at a regular location. That would start everybody off evenly and it would not constitute a change after the field had been thoroughly developed, and it would be hard to put the parties back on an equal basis.

Then, for another reason, the Commission ought not to enter into governing by exceptions. That is, you can easily get into a position of where an abuse of discretion is either made or considered to be made. I know the Commission would, at all times, try to be governed by what it thought was fair and right, but at the same time, if it is in a position of governing by exception, where discretion is involved, it could be thought by a great many people that it abused that discretion and that would undermine confidence in this Commission, and we think too much of the Commission for that situation to develop. We think it would be very unwise for it to start governing by exceptions.

Finally, if the Commission should think the exception should be granted, we think the unit which is allowed the irregular location should be limited to the regular 40 acre subdivision on which it is located, because it has been very well shown, and certainly there is no clear and convincing evidence on the other side, which the Commission should require before it makes a change in its formula,

that the main producing zone does not extend beyond that 40 acre subdivision, and the fact that this was taken into consideration, that there is a main producing zone is shown by the findings of this Commission at the time these Pool rules were formulated.

Finding Number 5, "That development of the subject common source of supply indicates that it is possible there are other productive zones in the Wolfcamp formation in addition to the zone in the lower portion of the formation from which the aforementioned Tennessee Gas Transmission Company, State "AA" Kemnitz "A" Number 1 Well is presently producing."

Finding Number 6, "That underground waste might result if the other zones referred to in Finding Number 5 are opened simultaneously with the known productive zones discovered by the said Tennessee Gas Transmission Company, State "AA" Kemnitz "A" Number 1 Well is presently producing."

Rule Number 4 of those rules, which is, "That no well shall be opened to any other zone of the Wolfcamp formation simultaneously with the productive zone in the lower portion of the formation from which the Tennessee Gas Transmission Company, State "AA" Kemnitz "A" Number 1 Well is presently producing until it has been established, after Notice and Hearing, that the same can be accomplished without causing underground waste."

We recommend the application be denied in its entirety, but that in any event the unit be limited to the 40 acre subdivision on which it is located.

MR. SPANN: I would like to make a brief statement. All sorts of dire consequences have been predicted in the event the Commission allows this application, from public confidence in the Commission being undermined down to tremendous loss to the State through failure to produce oil, and all sorts of things, none of which has anything to do with the issue before the Commission. That is what, generally, the opposition has interjected here, the extraneous issues. Shell faced up to it partially, at least, by attempting to show there were only 40 productive acres in the proposed unit. Of course, that is disputed by this so-called Engineering Committee that the operators established and permitted to function generally, and I understand, approved this action. This Committee I am talking about, the report of that Committee was to the effect, as testified to by Tennessee, that there was in excess of 80 productive acres in the 120 productive acres in the Phillips' lease. So we are faced, then, with this proposition: Is Phillips to get credit for productive acreage, as you have allowed other operators, in fixing allowables and prorating production. It is that simple.

Tennessee suggests that there should be some sort of different formula or treatment when you are granting an exception as distinguished from when you are granting or formulating stock rules in the first instance, and I simply do not understand the logic of such a position. If you are going to prorate production on an acreage basis, as you have done here in promulgating your rules, then it follows as logically, and there is no escape from it, that if you

have a certain number of productive acres which entitle you to a certain rate of production, then you should get it just like anyone else does and that, of course, is our position and we submit, under the formula you have used here, that we are entitled to this additional well and approval of this non-standard unit.

MR. PAYNE: Any further statements?

MR. HUGHSTON: Have Shell's Exhibits 1 through 5 been admitted into evidence?

MR. PAYNE: The record shows that Shell's Exhibits 1 through 5 have been admitted into evidence.

The Commission will take under advisement Case Number 1947, and proceed to Case 1979.

***

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, JUNE PAIGE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record, to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and Notarial Seal this 29th day of August, 1960.

June Paige
NOTARY PUBLIC-COURT REPORTER

My Commission Expires:

May 11, 1964

BEFORE THE
OIL CONSERVATION COMMISSION
Mabry Hall
Santa Fe, New Mexico
July 13, 1960

REGULAR HEARING

IN THE MATTER OF:

Application of the applicant, Phillips Petroleum Company, and the protestant, Tennessee Gas and Oil Company, for a hearing de novo in Case No. 1947, Order No. R-1683, relating to the application of Phillips Petroleum Company for two 80-acre non-standard oil proration units and one unorthodox oil well location in the Kemnitz-Wolfcamp Pool, Lea County, New Mexico.) CASE 1947

BEFORE:

Mr. A. L. Porter, Jr., Secretary-Director
Mr. Murray Morgan

TRANSCRIPT OF HEARING

MR. PORTER: Mr. Errebo, just one minute, sir. Before we get into Case 1641, I would like to call Case 1947.

MR. PAYNE: Mr. Commissioner, Counsel for both parties involved in Case 1947 have recommended this case be continued to the August Regular Hearing, inasmuch as one of them was absolutely unable to be present today.

MR. PORTER: Is there objection to Counsel's motion for continuation of Case 1947 to the Regular Hearing?

***

STATE OF NEW MEXICO)
) SS
COUNTY OF BERNALILLO)

I, LEWELLYN NELSON, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing was reported by me in Stenotype, and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

DATED this 25 day of July, 1960, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Lewellyn F. Nelson
NOTARY PUBLIC

My Commission Expires:

June 14, 1964

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
APRIL 30, 1960

IN THE MATTER OF:

Application of Phillips Petroleum Company for the establishment of two 80-acre non-standard oil proration units and one unorthodox oil well location. Applicant, in the above-styled cause, seeks an order establishing two 80-acre non-standard oil proration units in the Kemnitz-Wolfcamp Pool, Lea County, New Mexico, each consisting of a portion of the S/2 of Section 25, Township 16 South, Range 33 East. Applicant further seeks approval of an unorthodox oil well location in said Kemnitz-Wolfcamp Pool, the location to be in the center of the NW/4 SE/4 of said Section 25.

Case 1947

BEFORE:

Elvis A. Utz, Examiner.

TRANSCRIPT OF PROCEEDINGS

MR. UTZ: Case 1947.

MR. PAYNE: Application of Phillips Petroleum for the establishment of two 80-acre non-standard oil proration units and one unorthodox oil well location.

MR. SPANN: Charles C. Spann, Grantham, Spann & Sanchez, Albuquerque, representing the applicant. We have one witness, Mr. Don Czirr.

MR. UTZ: Any other appearances?

MR. CHRISTY: Christy, Hervey, Dow & Hinkle.

MR. FEDERICI: William Federici, for Shell Oil Company.

MR. ANDERSON: R. M. Anderson, Sinclair Oil and Gas Company.

(Witness sworn.)

DIRECT EXAMINATION

BY MR. SPANN:

Q Will you state your name for the record, please.

A Don L. Czirr, C-z-i-r-r.

Q And have you previously testified before this Commission and had your qualifications accepted?

A No, sir; I have not.

Q Would you briefly, then, state your educational background and experience in the oil business, Mr. Czirr.

A I graduated, University of Oklahoma, 1950, B.S. degree in Petroleum Engineering. Since that time, except for a two-year tour with the Army, I have been employed by Phillips Petroleum Company in the West Texas-New Mexico area; currently employed by Phillips in Bartlesville, Oklahoma. My area of responsibility is the West Texas-New Mexico area; reservoir engineer.

MR. SPANN: Any further questions?

MR. UTZ: No further questions; he is qualified.

Q (By Mr. Spann) Mr. Czirr, you are familiar with Phillips' application for the two non-standard 80-acre proration units and the unorthodox well location in the Kemnitz-Wolfcamp Pool; is that

correct?

A That is correct.

Q Now, are you also familiar with the Exhibit A that is attached to the application; are you familiar with that exhibit?

A Yes, I am.

Q Now, we have a copy of that exhibit there?

A Yes, sir.

Q Would you have that marked Exhibit 1, Applicant's Exhibit 1? Directing your attention to that exhibit, what does it purport to show?

A It is a plat of the Section 25, Township 16 South, Range 33 East, Lea County, New Mexico, containing the Phillips New Mex "A" lease which is described as the south half of that section lease, the east 80-acres. It shows the proration units that Phillips is requesting today. It shows the location of the No. 3 Well that we are also requesting permission to drill. It shows the location of the Phillips New Mex "A" No. 1, a producing well. It shows the location of the Phillips No. 2 well, a well which we abandoned.

Q Now, the total acreage in your lease is 240.7 acres; is that correct?

A That is correct.

Q And you are seeking to dedicate 160 acres of that to producing wells?

A That is correct; two 80-acre tracts totalling 160 acres.

Q Now, you are familiar with the special rules adopted for this field, I take it?

A Yes, I am.

Q And at the time those rules were adopted, do you know whether or not you had drilled your Phillips No. 1?

A At the time the rules were first adopted we had not drilled any wells on this particular lease.

Q Do you have the date on which the Phillips No. 1 well was drilled?

A Yes, sir. It was completed for potential 6/19/58.

Q Now, how about your No. 2 well?

A 8/28/58.

Q I believe you stated that was a non-commercial well; is that correct?

A That's correct. We did not run casing on it or attempt to complete it.

Q And why was that?

A The pay zone deteriorates in the southern portion of the lease. We felt that, while there was some pay exhibited in this well -- we recovered a show of oil on drillstem tests, we had a show of oil plus 120 feet of oil-cut mud at that depth -- we did not feel that we could afford to run casing, pumping equipment, and operate the well. We abandoned without attempting completion.

Q What depth are those wells producing, approximately?

A 106 to 107 hundred feet.

Q And what is the approximate cost of it?

A In excess of $200,000, I am sure; $220, $230,000.

Q The well No. 1, that was drilled on pattern, I take it?

A That is correct, the pattern being established as the proration unit being the east half or west half of a governmental quarter section, with the wells specified to be in the northeast quarter or southeast quarter of the quarter section. Our No. 1 well, and for that matter, our No. 2 well, were both drilled in accordance with the Kemnitz-Wolfcamp Field rules; 80-acre spacing.

Q And your proposed No. 3 well, that is located in the center of a 40-acre tract; is that correct?

A That's correct. It is unorthodox in accordance with existing field rules, not an erratic location. It doesn't crowd any particular lease line; it is a center of a 40-acre tract.

Q Would you just tell the Examiner why it is that you feel it is necessary that you establish these two units and the non-standard location?

A Yes. If I could, I would like to submit a contour map.

Q Would you mark that Exhibit 2? And it would possibly be well to submit the isopach Tract, Exhibit 3, cross section.

Directing your attention to Exhibit 2, which is a contour map.

A It is contoured to the top of the Kemnitz pay as estab-

lished in various hearings before this Commission. We show that to show that the structure trends to the south and to show the position of the oil-water contact, being 6,665 sub-sea. In other words, the intersection of the oil-water contact with the Kemnitz top does occur off and to the south of the Phillips lease. Then, as to Phillips' reason for asking this particular exception to the field rules, I would like to discuss for a moment an isopach showing the net Kemnitz pay. I believe that is Exhibit 3.

MR. SPANN: That is No. 3, isopach map.

MR. UTZ: This is 2, contour map, No. 2.

A The isopach map which we submitted as Exhibit No. 3 shows the net feet of Kemnitz pay, shows that the pay section deteriorates, gets tighter, on the south portion of the Phillips lease, and, as we stated, we followed the field rules and drilled our No. 1 and No. 2 wells,and in the case of our No. 2 well we encountered a show of oil, but not sufficient.

It shows, I believe, on the isopach that we have a 240-acre lease there, generally productive, the south portion not being as good as the balance of the lease, and we feel it is necessary for us to drill in the location we propose for us to recover our fair share of the oil underlying this lease. We would not be deviating from the spacing pattern, for that matter, as we have asked for 80-acre spacing, which is set up. The geography of the particular lease requires that the proration units be somewhat unorthodox.

Q Now, what does Exhibit 4 show?

A Exhibit 4 is a cross section of wells in the north-south direction showing the general trend of the structure there and of the pay section of the Kemnitz zone. It also shows the location, the proposed location of the Phillips A well No. 3, and the Kemnitz zone section that we anticipate we will encounter at the proposed location.

Q Now, does Exhibit 3 show where the cross section was taken from?

A Yes. It is designated by the red line in Exhibit 3, in the north-south direction from the Sinclair to Tennessee Gas Kemnitz lease, and then on the south to the Phillips New Mex A well No. 2.

Q Now, in your opinion, is there any other location that could be drilled that would protect your correlative rights under that lease and prevent waste?

A In a case such as this, where our lease is not uniformly productive, we feel this is the best location to insure that Phillips will be able to compete effectively for production that may underlie our lease.

Q Is there any alternative location that you know of?

A No, sir. I do not believe so. I believe this would be as good or better than any from the standpoint of spacing. Any location we would select would involve a certain amount of -- would

be unorthodox and this fits equally distant between the adjacent wells and doesn't crowd a property line, and we feel that the location at this point will protect Phillips from any adverse drainage.

Q Do you feel it will adversely affect the adjoining operators in their ability to produce their proportionate share of the oil in this field?

A The productive area around the Phillips lease is fully developed, I believe, at the present time, so the fact that this well is drilled should not affect particularly the other operators. They are completely developed.

Q Will the drilling of a well in this location result in waste, in your opinion?

A No, sir; not at all.

Q Now, do you recall what Phillips' position was at the time of the hearing on these special rules for this pool insofar as location of wells was concerned?

A I believe there were two proposals at that time. One was a more or less flexible program proposed, I believe, by Sinclair, and the other was by Tennessee Gas. The Commission put both proposals together; Phillips, I believe, concurred with the Sinclair proposal that a well would drill 80 acres, but that the Sinclair proposal did not specify a quarter-quarter section for a particular well, or proration unit, as I recall. Theirs was the more flexible of the two.

Q And if that flexible rule had been adopted you, of course, would have been permitted to locate this particular well at least so far as well location is concerned. The question of whether you could have established these units is something else, of course.

A The specific well location, or uniform pattern, is certainly in the interest of conservation if, in fact, when the facts of the case show it necessary, that exceptions are made to protect the correlative rights. With a fixed pattern in any pool, sooner or later you would arrive at a point in one or two leases that would require exceptions for an equitable development by a particular operator. In this case it happens to be Phillips.

Q Do you believe that these two, the No. 1 well and the proposed No. 3 well, will efficiently drain the acreage dedicated to these respective wells?

A Yes, I do.

Q Now, at the time these rules, the hearing on these special rules, was had, did Phillips have the information you have testified to here today concerning the formation and the possibility of of non-commercial wells on this fringe, as you described it here?

A No, sir; we, of course, hadn't drilled our wells and, by necessity, the field rules, to be of full value, have to be established as early in the field as possible, and it would not be possible or practical to wait until these various conditions had

been established. The field rules were early in the life, before we developed our property, sir.

Q Now, these Exhibits 1, 2, 3 and 4 you have testified to, did you prepare those or cause them to be prepared?

A That is correct.

Q And the information contained on them is accurate to the best of your knowledge?

A To the best of my knowledge it is correct, sir.

MR. SPANN: I would like to move the admission of Exhibits 1, 2, 3 and 4.

MR. CHRISTY: Mr. Utz, we have no objection to the admission of the exhibits, However, we would like to reserve the right to cross-examine concerning the correctness of them. I didn't want to waive that right.

MR. UTZ: Without objection the exhibits will be accepted. Are there any questions of the witness?

MR. SPANN: May I just ask one further question? Do you know if the adjoining operators or offset operators were notified of this application?

A Yes, sir; they were notified. Forest and Tennessee are the only two operators, I believe. I am sure they were notified.

CROSS-EXAMINATION

BY MR. PAYNE:

Q Mr. Czirr, I would like first to get the footage de-

scription of the location on your No. 1 and No. 3 well.

A As to the footage of the Phillips New Mex A, No. 1, it is located 1983 from south line, 2313 from west line, Section 25, 16 South, 33 East; as to the location of No. 3, we have just recently staked that location, it being described only as the center of the 40-acre tract. I do not have the surveyors' actual footage measurements.

Q Center of 40-acre tract?

A Yes, sir.

MR. UTZ: That should be 1980, 1980?

A Yes, sir; undoubtedly it will vary a foot or so.

Q (By Mr. Payne) Do you presently have the north half of the southwest quarter dedicated to the No. 1 well?

A No, sir. The No. 1 was drilled in accordance with field rules with the 80-acre tract running north and south, that being the east half and west half of a quarter section.

Q I see.

A So we will have to file new plats for the No. 1 well or the No. 1 well proration unit will be changed.

Q Now, when you get a productive well in the Kemnitz-Wolfcamp, -- you presume that 80 acres is productive, I would imagine, don't you? The 80 acres you are dedicating to the well?

A Well, based on all the information we have with which to make our conclusions, yes.

Q One well successfully drilled in 80 acres, then you have 80 productive acres dedicated; when you get a dry hole, wouldn't it be reasonable to turn that around and say the 80 acres was dry?

A I think in any case where you are evaluating an 80-acre tract you would have to use all the information available in evaluating. For example, your cross section show that you could not consider that 80-acre tract dry; you consider the fact you had only a very small oil section in the No. 2 well and it was not considered commercial at that depth, but you certainly know the entire lease -- we have a 240-acre lease here with an average oil pay thickness of 20 feet. We would not, for example, expect to drill all our wells in the better part of the pool and dedicate possibly the 240 acres, but of that 240 acres we feel that 160 acres dedicated for production is a modest request in view of the information we have interpreted.

Q So you would feel you are entitled to a full 80-acre allowable for the No. 3 well?

A Yes, sir.

Q Why did you design this unit in such a way, the ones you propose to dedicate to the No. 3 well, that it jogs off to the northwest at 675 feet?

A There was more section there within our isopach line. Certainly it came out uneven, the 80 acres. Based on our interpre-

tation how you might swing this ten-foot isopach contour, it gives us some room on the conservative side there.

Q It wouldn't follow the isopach if you had taken your 1930 foot line further west and then gone straight north, and still get 80 acres; is that right?

A Well, 1930 feet straight west and then straight north would be a little short, really, of the full 80 acres.

Q Well, not if you draw your line far enough.

A No, sir; you are correct. We could do that.

Q All you are interested in is 80-acres dedicated to the No. 3 well?

A We feel there is actually more productive acreage than what we have requested for, really.

Q You feel in your 240-acre lease you probably have more than 160 acres?

A In excess of 160 acres commercially productive. Due to the rules, that are in general very good rules from the standpoint of development, it just so happens that two out of our three wells were located on the flank of the structure. Excuse me; two out of three normal locations would be away from the better part of our lease.

BY MR. NUTTER:

Q Do you think you could drill a commercial well anywhere in either one of these units you are proposing?

A It is reasonable to think so; certainly that is our interpretation.

Q How far away from this dry hole does that line run, here by this boot-shaped unit?

A I am not able to scale it for you. One hundred fifty feet, maybe. It was intended to be just north of our No. 2 well; that was the intention of it, when we were drafting the isopach.

Q What was the location of the No. 2 well?

A 660 from the south line, 1980 from the east line, Section 25.

Q Well, then, this Exhibit No. 1 indicates that the east boundary of that odd-shaped unit is 1980 long, so assuming this would be a standard half section that would be 2640 feet long. It would appear that line would intersect the location of that dry hole, wouldn't it?

A That was our intention, certainly, to go just right by the No. 2 well in the drawing of the proration unit. We could, as Mr. Payne pointed out, we could have moved that line up and carried it further west and still come out with the same 80 acres.

Q Mr. Czirr, you stated that the outline of this unit was based on a isopach thickness, or contour line. Just what isopach thickness or contour line is it based on? What do you consider the number of feet of net pay you could have in one of these wells and have a commercial well?

A On 80-acre spacing, somewhere on the order of, oh, possible 12, 15 foot, something of that nature, would give you a profitable well. I believe the Commission has other testimony along the same line.

MR. NUTTER: I believe that is all. Thank you.

BY MR. CHRISTY:

Q Turning to Exhibit 1, Mr. Czirr, as I look at that it appears that your No. 1 New Mexico A is in the center of that 80-acre tract. As I understand your testimony on the lines, actually that well is within 229 feet of the west half, southeast, of Section 25. There are 2,642 feet in that particular half section; it is an oversize section, I believe -- instead of 5280 it is 5284.

A It is somewhat oversize.

Q If we subtract 3,013 feet it means you are crowding that east line? As a matter of fact, you got an exception in order to do it, did you not?

A Was not that a topographical exception?

Q I believe it was; and you did get an exception?

A As I recall it there was a reason we could not drill that well on the designated location. As I recall it was topographic. I have not been on the lease; I understood it was a dry lake bed, something of that nature that would involve an abnormal amount of surface expense.

Q That is over-crowding the line?

A It was not drilled on location.

MR. UTZ: Which well are you speaking of?

MR. CHRISTY: Phillips New Mex A, No. 1 well.

Q Now, sir, as I understand Exhibit 1, you are not only asking for an exception to the normal spacing of 80 acres, on an east-west portion under the Kemnitz Pool rules, but you are also asking for additional exception to the standard provision of allocating 40-acre tracts or lots, that is this gerrymandering type of 80-acre unit; is that correct, sir?

A If I followed the question, we are drilling our well in the center of 40 acres; we are not proposing it on the location as specified in the field rules, and our proration unit does not agree with those set out in the field rules.

Q Nor do they agree with normal quarter-quarter sections, this 80-acre tract you are proposing to dedicate?

A Due to the situation we find ourselves in on our lease we had to do that.

Q This is all under a State lease?

A That is correct.

Q Is it one State lease?

A Yes, sir.

Q Are the beneficiaries the same?

A Our files only show a single lease number, to the best of my knowledge. It would be something for our Land Department to

go through, but to my knowledge there is nothing unusual royalty-wise, ownershipwise, in this in any respect.

Q I am not speaking of the royalty. I am speaking of the beneficiary of the royalty. Do you have a copy of the lease with you?

A No, sir.

Q New Mexico Institute might be the beneficiary on the well site, and the common schools might be the beneficiary under the southeast southwest.

A I believe we would have designated anything unusual about the lease in our normal lease jacket file, and there was no such designation. Detailed testimony of that nature would have to follow an investigation by our Land Department.

Q Do you propose that testimony here today?

A No, sir. I am the only witness. Certainly we would not prepare a single unit that would involve any payments that we couldn't handle accountingwise.

Q Your lease files customarily show beneficiaries on State leases?

A Anything that would affect the operation of the lease, the location of the wells or proration units, or anything like that is normally designated on our lease jacket file which I have available to me. Again, any complete testimony as to the ownership, beneficiaries or anything of that nature would have to

follow a normal search of our records.

Q Now, referring to your Exhibit 2, which is a contour map, where did you encounter the top of the Kemnitz zone in your State Phillips A, No. 2 well?

A We could probably show that on our exhibit, I believe it was No. 4. Around 10740.

Q What minus would that be?

A 6476. We show our elevation on the same exhibit there.

Q Well, perhaps I am not clear. From your Exhibit 2, I notice a contour line of minus 6600 which is south of that No. 2 well, and the next contour up is minus 6500. Did I understand you right that the well is at minus 6476 at the top of the Kemnitz?

A In our contour it appears we called it minus 6571. Well, sir, I'd like to apologize for my addition and subtract from 10740, 4164, which we show on our Exhibit as being our elevation; that would be 6576. My apologies for poor arithmetic.

Q So the two exhibits are correct?

A They are correct.

Q On Exhibit 3 I notice beside each well a little red figure. For example, in No. 1 well, figure 29, dry hole. No. 6, etc. What do those figures represent?

A Those are our net pay thicknesses we used in constructing isopach.

Q That is not the footage in the entire formation but just

net footage?

A No, sir; just the net oil pay that you normally consider in an isopach.

Q Who determined these figures?

A Oh, something like this, it is carried on with a development of the field. It was done partially in our geological section; I worked with those people in determining what we would or would not select. The actual work of drafting the particular contours and preparing exhibits as shown was by our Mr. Luck.

Q Did you work with your Mr. Freburg on that?

A I did not. Mr. Freburg is in Venezuela.

Q You did have a committee in this Kemnitz Pool of the operators, an engineering committee?

A There is a unitization committee sponsored by Tennessee Gas.

Q And that is composed of engineers from the various operators?

A That is correct.

Q Do you know whether or not the engineers committee had arrived at a net pay thickness for these various wells?

A I know they have submitted an engineers report; I received a copy. Whether it represents a particular operator's opinion or anything as to a particular property, of course it does not. It represents a basis that they can reach common ground on.

As you know, we are directing all of our efforts any more toward some type of secondary recovery, and whether or not a net pay is calculated on the particular basis is immaterial so long as it is consistent throughout the pay. I think that would be our position in the Engineering Committee. I am sure it was Tennessee's.

Q These figures, then, are Phillips figures?

A They are Phillips figures only.

Q And you gave six net feet of pay to your drill hole?

A I am going to refuse to call that a drill hole. It had a show of oil; that is as close as we can come.

Q Plugged and abandoned?

A Non-commercial.

Q With reference to the offset operators you mentioned before, let's take the wells around. You say Phillips owns the New Mexico A well, which is to the west of your proposed location; you own that 100 per cent?

A That is correct.

Q The well to the north, marked on your Exhibit 2 as the No. 4 Tennessee Kemnitz B well; is that Tennessee Gas's well?

A Yes, according to my records.

Q Now, the Tennessee No. 1 well to the east of the proposed location; whose is that?

A I believe that is Tennessee's operation certainly.

Q And doesn't Phillips own 50 per cent of it?

A As I recall, we have an interest in that lease.

Q As a matter of fact you own 50 per cent of that well, and you own 100 per cent of the well to the west; isn't that correct, sir? And Tennessee owns 100 per cent of the well to the north and 50 per cent of the well to the east; is that correct?

A O.K. -- I'm not going to testify on that.

MR. SPANN: I am going to object. He said Phillips had an interest. If he knows what interest, fine. I don't think it should be presumed.

THE WITNESS: No, I couldn't say for sure; I believe we have an interest in it.

Q (By Mr. Christy) Now, what net thickness of pay do you expect to encounter in this proposed location? You testified, I believe, earlier, 12 to 15 feet would make you a payable or commercial well.

A We would reasonably expect, according to our isopach, to cut roughly a 30 foot, slightly less than 30 foot of net pay.

Q And you have encountered non-commercial production in the south portion of that 80?

A That is correct.

Q Now, what recovery do you expect out of this well you are going to drill? How many barrels of oil do you expect to recover?

A I don't have a ready figure for you on that; somewhere

around 70, 75 barrels per acre foot would be a reasonable figure for that pay, I believe.

Q Out of this 20 or 30 feet you expect to encounter?

A Per acre foot.

MR. UTZ: Is that for the unit you propose here; for the entire unit?

A Yes, sir. I have not made a calculation on that; I feel that is in the area.

Q (By Mr. Christy) Within this field, Kemnitz Field, how many other unorthodox locations are there similar to the one you now propose?

A My map shows -- certainly not all the wells are drilled in the northeast southwest coordinative arrangement. These wells very likely were drilled at the time the field rules were being considered. I really had trouble seeing, I started to look it up and felt that the case of this should stand on its own. The position another operator might have in another part of the field -- they might have a reason.

Q Now, did I understand you right that the proposed well has already been staked?

A To be perfectly exact, the surveyor has been instructed to stake it.

Q I see. Now, one final question. In the event the Commission should authorize you to drill this unorthodox location,

but would require you to stay to the fixed proration unit (that is the west half of the southeast of Section 25, under the rules), what do you feel would be a fair allowable for you to have on that well?

A Well, sir, we are drilling to almost 11,000 feet on a lease having 240 acres with an average pay thickness in the range of 20 foot. It would be necessary for us to have a full allowable to obtain a proper return or our fair return on this particular well and to be able to develop this 240-acre lease equitably.

Q And you feel it would be fair to give you the full 80-acre allowable even though you stayed in your unit? Your unit was composed of the west half, southeast, the standard 80-acre unit area.

A There you are in a position of including into that 80-acre unit acreage that possibly is marginal, to wit, our No. 2 well. You are including acreage that is not marginal, that is good, to the west. How the proration unit is actually designed wouldn't have any effect on the recovery. The well is going to operate the same regardless of the geography of your prorationing, if I understood what you meant.

Q Yes, sir; I understand your answer sufficiently. You do feel that the south portion of the southeast quarter is non-productive, do you not, that area below your No. 2 well?

A We couldn't operate it; don't feel we can run a casing,

pump and operate the well at close to 11,000 foot for some six foot of rather tight pay, although it very likely could contribute to the overall production of wells in that area.

MR. CHRISTY: Thank you very much.

MR. UTZ: Any other questions of the witness?

BY MR. UTZ:

Q Mr. Czirr, are you familiar with the Forest State No. 2A, Section 26?

A I have seen some information on it; yes, sir.

Q Is that a marginal well or top allowable?

A It is not a top allowable well.

Q Do you know what it produces?

A I believe its top allowable is in the range of 300 or so barrels.

Q What month?

A February.

Q Do you consider that a commercial well?

A Well, I don't know that much about its past production to know whether it is commercial. It is certainly approaching some very tight economics when you get down to 2 or 300 barrels from that depth. It would depend on their operating cost experience and things of that nature.

Q I believe you said that about 15 foot of net pay would be, in your opinion, commercial?

A That is correct.

Q Can you, from your Exhibit 3, could you dedicate out of that lease of 240 acres 160 acres to the two wells, namely your proposed location for your No. 3 and your No. 1, New Mex A, No. 1? Could you attribute to those two wells 160 acres of contour in excess of 15 feet?

A That would average 15 foot; yes, sir. Just glancing there it looks like our 240-acre lease would average something less than 20. Where you have portions of your leases with upwards of 30 net foot that would give you a plus factor in your reserve calculations; certainly on an average, which is the way I was thinking of this in giving you the footage, I would think 12 to 15 foot would give you a reasonable set of economics there.

Q You would admit, would you not, that some of your proposed unit is considerably less than 15 feet?

A Yes; our isopach shows that some of it is better, some worse; some of it more, some of it less than this 12 to 15 foot. I think that our whole point is that we do have a 240-acre lease there that was generally productive; for us to participate in just 160 acres of this 240-acre lease we do require this special action.

Q You could arrange your units, couldn't you, or could you, so that you would have 80 acres to the No. 3 well that would be in excess of 15 feet of net pay?

A I believe we could; I couldn't say, but just looking at it here, it looks like we surely should be able to. Certainly on

an average we are well above this minimum we are talking about on average pay.

Q It would look better, would it not, to dedicate productive acreage rather than acreage that is very questionable, to oil, even though your allowables would be the same?

A Our position today is simply to adjust off of the basic field rules to obtain permission to drill a well as proposed on No. 3, and to obtain an 80-acre proration unit. The rest is pretty much immaterial to us. We feel we have acreage left over after we have taken the necessary acres out. We can adjust it as the Commission would feel desirable.

Q Adjust the shape of the unit?

A If it would be desirable, certainly.

MR. UTZ: Any other questions of the witness?

MR. SPANN: I have another question or two.

REDIRECT EXAMINATION

BY MR. SPANN:

Q Mr. Czirr, you feel that you have more than 160 productive acres in this lease; is that correct?

A That is correct.

Q And you merely desire to drill two wells, from which you will produce that acreage and dedicate the appropriate units to those wells?

A Today we are simply asking for permission to deviate from

the pattern to drill our second well, our third well, on this lease.

Q And, as you have described these units on Exhibit 1, they merely appear to be the most reasonable or feasible units to generally indicate productive acreage dedicated to that particular well?

A That is correct. The exact shape of any proration unit like this is largely arbitrary where we have acreage left over.

Q There is no plan of additional wells or additional units being established, or additional wells drilled on this lease?

A At this time I know of none; no, sir.

MR. SPANN: That is all.

MR. UTZ: Any other questions?

RECROSS-EXAMINATION

BY MR. CHRISTY:

Q In other words, you would not plan to come back to the Commission and ask for another well in the west half, northwest section of 25?

A To my knowledge there would be no such plans.

Q You do not contemplate drilling a well in that area?

A To my knowledge we do not.

MR. CHRISTY: Thank you.

MR. UTZ: Any other questions, statements?

MR. SPANN: That is all we have.

MR. UTZ: If there are no further questions the witness

may be excused.

Did you enter your exhibits?

MR. SPANN: I believe I did, subject to their objection for right to cross-examine.

MR. UTZ: Is there other testimony to be put on in this case?

MR. CHRISTY: We have one witness.

(Witness sworn)

L. B. PLUMB,

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

DIRECT EXAMINATION

BY MR. CHRISTY:

Q Would you please state your name, address and occupation?

A L. B. Plumb, employed as Petroleum Engineer, Midland, Texas for Tennessee Gas Transmission.

Q Mr. Plumb, have you previously testified before this Commission as a petroleum engineer and had your qualifications accepted?

A Yes, sir.

Q Are you familiar with Kemnitz-Wolfcamp Pool in Lea County, their production and history?

A Yes, I am.

Q Are you familiar with the matter sought in this appli-

cation?

A Yes.

MR. CHRISTY: Does the Examiner have any questions concerning the qualifications of the witness?

MR. UTZ: No, sir.

Q (By Mr. Christy) Now, Mr. Plumb, let us start with what has been marked as Tennessee's Exhibit A, which I believe is an isopach map of the pool in question here. Will you please explain that to the Examiner in reference to the lines I see running all over the map?

A This isopach map is a presentation of the pay thicknesses in each of the several wells in the field, and the connecting lines are designed to show the conformation of this pay section into a structure.

Q On what basis was this prepared? Who prepared it?

A The net pay thicknesses as shown on this map were picked by a committee of men composed of representatives from each operator in the field.

Q And those net pay figures; are those the little numbers below the wells?

A Yes, they are the numbers below the well numbers.

Q I see, sir. What do the various lines, 10, 30, etc., indicate?

A They show the thickness of the net pay section in the

Wolfcamp reservoir as determined by this committee, and the lines were also drawn by members of that committee.

Q I see. Could you tell us what the initial ultimate recovery of this reservoir is?

A It is estimated that the predicted ultimate recovery from the reservoir is approximately 7.5 million barrels of stock tank oil.

Q How much has been produced to date; say to April 1?

A There have been approximately 4.6 million barrels produeced to April 1, 1960.

Q This leaves about 2 million --

A Two million nine hundred thousand barrels of remaining reserves under primary producing practices.

Q Now, I wish you would please identify, briefly tell us what Exhibit B is.

MR: PAYNE: For the record I would like to inquire what you are testifying from, and are these exhibits the result of this group of engineers getting together and arriving at the conclusions you are testifying to, or are these figures and conclusions those of your company?

THE WITNESS: Only the map is an exhibit that was prepared by the Engineering Committee. Our company, and I, myself, subscribe fully to the picture as shown here on this map. It is my opinion that this does depict accurately the Kemnitz-Wolfcamp reservoir

as it is under the ground. Any further testimony will be engineering work done by Tennessee Gas.

Q (By Mr. Christy) Now, turning to Exhibit B, I will ask you if you will please explain to the Examiner what that is, sir.

A Exhibit B is a map showing the bottomhole pressures of the wells in the field, effective date of December, 1959, as required by field rules. They are semiannual bottomhole pressure surveys run on all wells in the field in which it is possible to run bottomhole surveys, and these large numbers are the bottomhole pressures effective December, 1959.

Q I notice a dash-line around here which has been marked "stabilized pressure area."

A This indicates the area of the field which is in effective pressure communication; that is to say, that it is the one contiguous to the reservoir and the bottomhole pressure in each of these wells is effective from well to well in there. You will notice along the north side of that line there is one well with a decidedly lower bottomhole pressure, and it is possible that well is not in what we consider the stabilized pressure area.

Q It is not in the fairway?

A Yes, sir; it is not in the fairway.

Q What per cent of the wells in the pool are in this fairway or stabilized pressure area?

A There are --

Q Excuse me; not the number of wells, I should say the amount of recoverable oil?

A We estimate that 75 per cent of the remaining reserves to the field will be recovered from this area, in the stabilized pressure area designated the fairway area.

Q Now, I believe Phillips Petroleum owns a 240-acre lease in Section 25 which has been previously testified, a portion of which shows in this fairway area?

A That is correct.

Q Now, sir, what per cent of feet in this fairway is encompassed in Phillips 240 acres?

A By perimetering --

Q Which map?

A The isopach map, Exhibit A, it was determined that within the Phillips New Mex State lease it is estimated that four per cent of the total field acre-feet underlie that lease.

Q Now, have you calculated, based on present proration, what the recovery will be from Phillips No. 1 New Mexico State lease?

A Yes.

Q In terms of percentage of fairway production?

A Because of the excellent pressure communication in the fairway area, it is estimated that each well in the fairway area will now share equally in the remaining reserves attributable to the field. That is to say, the proration keeps the production

rate constant. Therefore, each well, regardless of pay thickness or location, as long as it is in good pressure communication with the field, will recover the same amount of oil as any other well. One hundred seven thousand barrels per well remaining reserves estimated right now.

Q Do I understand you that from the Phillips New Mexico A well, it will recover that four per cent of fairway production that you mentioned?

A Phillips well, we estimate, will recover one hundred seven thousand barrels of oil, and that will amount to approximately 4.7 per cent of the remaining field reserves.

Q Slightly in excess of this 4 per cent you have mentioned?

A Slightly in excess of the 4 per cent of productive acre feet of pay underlying that lease.

Q Now, should Phillips be allowed to drill the unorthodox well in the northwest southeast of Section 25, and place it on production within a reasonable time, have you made any estimates as to what per cent of the remaining recoverable oil within the fairway, or stabilized pressure area, Phillips would then recover by virtue of the two wells on that 240-acres?

A Yes; since each well remaining will recover the same amount it is estimated that they will recover the same amount of oil. Then we would merely take the remaining ultimate reserves and divide by one additional well, so that would give Phillips

Petroleum Company approximately two hundred thousand barrels of additional reserves, or approximately nine per cent of the remaining reserves under the fairway area.

Q How many wells are there presently in the fairway?

A Twenty-one.

Q Are there any more orthodox locations within that stabilized pressure area?

A There is one possible orthodox location remaining, in my estimation.

Q Now, I will refer to what has been marked Exhibit C and ask you if you will briefly identify and explain it.

A Exhibit C is a production statistics map which shows the present producing status of each well in the field. This map is effective as of April 1, 1960; from it can be observed that each of the wells as shown being in the fairway area is capable of producing at the maximum field allowable rate, or very nearly at the maximum field allowable rate.

Q Would you identify these symbols or figures by each well, please, sir; tell us what they mean?

A Yes, sir. Under each well number are several figures. First you will see letter F or P, flowing or pumping; next number, in the case of Tennessee Gas Kemnitz A No. 5, you see the figure 214, which indicates the current capacity is 214 barrels per day. The number in parentheses, 1575, is the current gas-oil ratio; the

number below the line, 168,643, cumulative oil production attributable April 1, 1960.

Q You mentioned there was one other, I believe, possible orthodox location in this fairway portion of the pool; in addition to the Phillips application for unorthodox, are there any other possible unorthodox locations to which 80-acres could be attributed?

A There are possibly eight additional unorthodox locations which we show on Exhibit B. On this map the circles which are filled in in red indicate unorthodox locations to which 80 productive acres could be attributed.

Q All within the fairway?

A All within the fairway limits of the field; yes. Incidentally, I might add that these wells, the drilling of these eight wells, would not increase the remaining ultimate reserves to be recovered from the field.

Q Simply share the pie? Shear the pie in more pieces? Now, if you take it -- as I understand you, if you take the eight possible unorthodox, the twenty-one present ones, the one possible orthodox, you would have a total of thirty wells sharing in the remaining 2.9 million barrels to be recovered?

A Yes.

Q I believe it was testified previously that wells in this area cost about $200,000 to drill, complete and equip. Are you in

concurrence?

A I agree with that figure.

Q Now, referring you to what has been marked Exhibit E, will you please identify and explain that to the Examiner?

A Exhibit E is a performance curve depicting the performance of the Kemnitz-Wolfcamp Pool insofar as it pertains to bottomhole pressure, oil production rate, and gas-oil ratio. It is shown there that the bottomhole pressure of the wells is declining along a straight line. It can be interpolated into the future, and future performance in the field can be predicted with a high degree of certainty as to the amount of recoverable oil remaining. This indicates that this type reservoir is behaving as a typical gas-drive reservoir does behave.

Q Does that explanation on Exhibit E correlate with your previous explanation on bottomhole pressures in Exhibit B?

A I believe it does. The pressures, if they were written on the map like this, would show a very close degree of concurrence in numbers with the bottomhole numbers in any well on the fairway area.

Q What does that indicate?

A Pressure communication and, therefore, the energy available within the reservoir from well to well is in excellent condition. That is, oil can migrate freely to the low pressure area as long as you have a well bore open to produce oil; that the

oil can migrate to it regardless of structural position.

Q Now, it was mentioned earlier that a committee worked on pressure maintenance study; is that correct? Is there a pressure maintenance study now being made?

A There is a committee formed, at the direction of the operators of the Kemnitz Field to study the feasibility of a pressure maintenance or similar conservation project in the Kemnitz Field.

Q Would there be anything in reference to that study, or the proposed plans, that might have reference to the matters sought in this application?

A The proposed study is very nearly complete. The engineering report has been submitted to the operators one time, and the operators requested additional study. That additional study is nearly complete, and we are ready to go back to the operators to proceed with the unitization procedures. Then, should these unorthodox locations be drilled in here, it will naturally delay each operator from wanting to participate in such a study to such an extent that the pressure maintenance program would be unfeasible due to the excess of decline of bottomhole pressure at which it could be started.

Q Do you feel now is the time to commence a pressure maintenance?

A It is urgent that such pressure maintenance be conducted

at the earliest possible date to prevent a great amount of shrinkage of oil in the reservoir, and a large amount of physical waste could occur if there is no pressure maintenance project initiated in this field.

Q Now, we have mentioned the preparation of Exhibit A by the Committee, and that you concur in the matters set forth in this exhibit; is that correct, sir?

A Yes.

Q Were Exhibits B, C, D and E prepared by you or under your direct supervision?

A Yes.

MR. UTZ: Questions of the witness?

CROSS-EXAMINATION

BY MR. NUTTER:

Q Did I understand you correctly, sir, that you said that Phillips 240-acre tract contained 4.7 of the total reserves in the area, or that this well would withdraw 4.7 of the total reserves in the area?

A It is our estimation that this well, currently existing well, will withdraw 4.7 per cent of the remaining reserves in the fairway area.

Q Have you made any estimate as to what percentage underlies Phillips' acreage?

A I testified approximately four per cent is my estimation.

Q So, in other words, you feel they have got four per cent of the total reserves in the fairway, but their well would withdraw 4.7 per cent of the production?

A Yes, that is my estimation. This is, if I may explain a little bit, the well is capable of producing at maximum allowable, and it will continue to maintain this capability as long as any well in the field. Therefore, wells which have a much thicker pay section which are producing at the same capacity, although they have more reserves underlying them, will only recover the same amount.

Q About how many acres would you estimate underlie the fairway acres on Phillips' lease?

A I have not made an estimate of the number of productive acres attributed to that. I had it in acre-feet, but did not have the number of productive acres.

Q Does the dotted line on Exhibit B correspond with zero feet of pay line on Exhibit No. A?

A Yes, sir.

Q Is everything north of that line area which has some pay, and everything south, in your opinion, has no pay?

A That is correct.

Q The four per cent of total reserves in the area, you calculate, is a calculation considering the thickness of the pay from this line north?

A It is based on a combination of volume of reservoir and a material balance combination; I have estimated the total field reserve by material balance, and we have said each well will produce an equal portion.

Q I didn't mean how much this well would produce; I mean your estimate of the total reserves.

A It is based on volumetric.

Q That is a volumetric share of the material balance reserves?

A Yes, sir.

Q Is it your opinion that all of the acreage dedicated to Tennessee State, Phillips No. 1 well is productive of oil?

A Only down to the zero isopach line.

Q Are there some acres south of this line non-productive?

A This map indicates so, and that would be my personal opinion; yes.

Q You think the allowable to Tennessee's well there should be adjusted on account of non-productive acres being dedicated to it?

A I don't care to make an estimation as to whether or not that should be done.

MR. NUTTER: I believe that is all. Thank you.

BY MR. PAYNE:

Q Referring to your Exhibit D, I believe you testified as

to these possible unorthodox locations. There were 80 productive acres that would be dedicated to each of these. What 80 acres is it that you are going to dedicate to Phillips Well No. 3, is it shown as one of these?

A Well, sir, I would have to then adopt a proration unit in similar shape to the one which they have submitted.

Q What you are saying then, there is a way to arrange the acreage dedicated to the No. 3 well so that it would have no dry acreage dedicated to it, and they would still have 80 acres?

A I would prefer to say that this map indicates that there are at least 160 acres under the Phillips New Mex State lease which could reasonably be considered productive, and by some means or other these could be divided in two.

Q I take it from that that Tennessee's chief objection is not the acreage dedication but well location?

A That is correct.

MR. PAYNE: Thank you.

MR. UTZ: Any other questions?

BY MR. SPANN:

Q Mr. Plumb, if Phillips has 160 acres or more of productive acres within this so-called area, they would be entitled to produce either one or two wells sufficiently to make up that amount of acreage; in other words, they should be entitled to that much allowable attributable to that acreage?

A I do not know how much they should be entitled to. If I were stating on that fact I would say we could consider volumetrically not only acreage productivity but feet of pay productive in each well and if an adjustment were going to be made, then such an adjustment would be reasonable to me.

Q But the allowable is based on acreage, not on feet of pay, isn't it?

A That is my understanding.

Q The State law contemplates that you increase or decrease depending on the acreage in the unit, over 80 or under 80, you get a percentage of variation there based on acreage?

A Yes, sir.

Q So that is all we can consider in this application, isn't it; whether Phillips has sufficient acreage that is producing to justify two wells, based on 80-acre proration in the field?

A I feel that is the problem to be resolved by the Examiner and the Commission.

Q You are not suggesting that this Commission start considering thickness of pay and so forth in fixing allowables, are you?

A No, sir; I wouldn't propose that at all.

Q Now, you testified to the percentage of oil, or percentage of reserves attributable to the acreage in Phillips' lease, which is within this fairway area, and also you testified to the

percentage that this particular well would produce. Do you know the figures as to the percentage of reserves underlying Tennessee's acreage in the field?

A I do not have them in that exact detail. Tennessee right now, produces approximately 42 per cent of the reserves; 42 per cent of the production from the field; that is our current status.

Q What I am getting at is, do you have any figures to show whether Tennessee is producing more than their fair share of the reserves as a result of the way their wells are producing, based on the reserves attributable to their acreage?

A No, sir; I do not.

Q You do not have that; you just have it on Phillips?

A Just on this well in question.

Q So, for all we know, this additional well may be necessary on the part of Phillips to offset an advantage you already have in producing from this field; is that correct?

A No, sir; I don't feel that is correct, but I have no figures. In the immediate area of the subject location Phillips right now has the same number of net wells draining that area as Tennessee has.

Q That is based, again, on acreage rather than on thickness of pay, and these other things you used in determining the percentage of reserves under Phillips acreage and the amount they would produce? You used something other than acreage in arriving at

those figures, didn't you?

A Yes.

Q But when you just gave your present opinion, it was considering acreage only and the location of wells?

A No, not entirely, because the thickness of pay underlying the Tennessee leases is greater than the thickness of pay underlying the Phillips lease.

Q Well, that isn't true in every case, is it?

A No, sir; it is not true in every case.

Q Now, you understand that under the law of New Mexico an operator is entitled to recover his fair share of oil underlying his acreage; is that correct?

A Yes; that is correct.

Q And based on the acreage that Phillips has, which you feel is producing, and considering the spacing that is in effect in that field, they would need one additional well to complete or drain their acreage which is producing; is that correct? Regardless of what kind of unit is established they would need one additional well?

A They are entitled under the law to one additional well.

MR. UTZ: You mean on an acreage basis?

A On an acreage basis.

Q (By Mr. Spann) And do you know of any instance when the Commission has ever considered anything other than acreage basis

in approving locations of wells and spacing rules?

A No, sir; I do not.

BY MR. UTZ:

Q Mr. Plumb, do you believe that acreage proven to be dry should be dedicated to a well?

A No, sir; not acreage proved to be dry.

Q According to your calculations Phillips will recover from two wells 9 per cent of the pool reserves?

A Yes.

Q And they actually have under their acreage 4 per cent of the pool reserves?

A Four per cent of the volume of the reservoir, which should be correlative to reserve.

Q And still, on the other hand, you admit they have 160 acres, productive acres?

A I don't deny there would be 160 acres within the zero isopach line of this map which could be reasonably productive of oil.

Q Actually, what you are saying is, there is a fallacy in straight acreage allocation, then?

A No, sir; I don't say there is a fallacy in that. I don't believe there is.

Q Well,then, if there is no question, shouldn't they be entitled to drill their 160 acres of productive acres?

A Well, sir, they have drilled two wells which should have

proved up 160 productive acres. Now, if they can drill wells in conformance with the field rules, then they are entitled to it.

Q Do you think they would be entitled to 40-acre allowable on the location that they propose?

A Yes, I think there are 40 acres to be dedicated to a well in that location which could be considered productive of oil and a 40-acre allowable could be granted,then.

MR. PAYNE: How about 60 acres, Mr. Plumb? It would be about 60 according to your exhibit.

A Yes, sir; it would be approximately 60 according to my exhibit.

MR. UTZ: Any other questions of the witness?

BY MR. CHRISTY:

Q Mr. Plumb, you have been mentioning productive acres here all along. I believe on previous examination the statement was made, in order to pay out, the well would have to produce from about 12 to 15 feet of pay thickness. Would you concur in that statement as to pay thickness?

A At this time I don't know exactly what pay thickness to pay out a well is. It is my opinion that a well with five feet of pay in good communication with this reservoir could effectively drain 80 acres; pressure and energy well distributed, five feet of pay could drain 80 acres and the pay thickness is not necessarily relevant to the recoverable reserves.

Q And as I understand you, within the fairway portion of

the Phillips lease it has approximately four per cent of the remaining recoverable oil under that tract?

A That is my opinion; yes.

Q The Phillips New Mexico A well No. 1 will produce about 4.7 per cent of that reservoir?

A Yes.

MR. CHRISTY: That is all.

MR. UTZ: Any other questions? If not, the witness may be excused.

MR. CHRISTY: That is all we have. We would like to offer in evidence Exhibits A through E, Tennessee's A through E, inclusive.

MR. UTZ: Without objection Exhibit A through E will be accepted.

MR. ANDERSON: R. M. Anderson, Sinclair Oil and Gas; we have a closing statement. We have been active in this field from the very beginning and May 16, 1957, we proposed flexible spacing rules for this field. Tennessee Gas Transmission Company, at that same hearing, proposed rigid rules which were subsequently adopted. Sinclair then developed under the rigid rules by drilling three more producing wells and one dry hole, and leaving two undrilled locations.

Subsequently, on November 13, 1958, Sinclair supported the retention of the rigid spacing rules, as we believed at that time

that the field was in an advanced stage of development, and we felt it was not proper to go in and change the development rules after the development had occurred. Subsequently, on July 8, 1959, Sinclair formally objected to Samedan Oil Corporation's request for an exception to these same rigid spacing rules. We believe that in granting this exception that has been asked for today, it will probably result in eight or ten additional requests, and will, in effect, nullify the rigid spacing rules we presently have in this field. Accordingly, we wish to object to the Phillips application as we feel that it would be in violation of Sinclair's correlative rights and would result in the confiscation of investment in this field. Thank you.

MR. FEDERICI: Bill Federici, Shell Oil Company. I have a statement. Shell Oil Company is opposed to the application by Phillips Petroleum Company to establish two non-standard proration units, located in the south half of Section 25, Township 16 South, Range 33 East, as well as for an unorthodox well location in the northwest corner of the southeast corner, Section 25, Township 16 South, Range 33 East.

With regard to the non-standard units, we believe any departure in governmental subdivisions as legal boundaries for oil proration units would set an undesirable precedent. Subsequent applications for unorthodox proration units could lead to a most difficult situation in providing for effective and impartial rules for

development of hydrocarbon accumulations. Surveillance of such practices would tax the administrative capacity of the State regulatory system far out of proportion to the possible benefits that would follow from such action.

With regard to the unorthodox well location, we believe permission to drill at this location would set a precedent for granting a number of exceptions around the periphery of the Kemnitz-Wolfcamp reservoir limits, thereby violating the orders R-1011 and R-1011A which imply protection of correlative rights by the principle of drainage and counter drainage. R-1455, which denied an application for a similar request for an unorthodox location in the southeast corner of the southeast corner of Section 20, Township 16 South, Range 34 East.

MR. UTZ: Are there other statements?

MR. PAYNE: We have received a communication from Forest Oil Corporation which states as follows:

"Forest Oil Corporation objects to the application by Phillips for a non-standard proration unit and an unorthodox well location as outlined in their letter to the Commission dated April 6, 1960."

"Their letter" refers to a letter from Phillips, I presume.

MR. UTZ: Any other statements?

MR. SPANN: I would like to make a brief statement. On behalf of Phillips Petroleum Company, the applicant here, I would like to point out that these rigid rules that were imposed are

perhaps proper when you are considering the development of the pool generally, but in every instance we are faced with a situation like confronts Phillips in this case, and that is, you are arriving at the exterior limits of the field and inequity results if these rigid rules are not relaxed to take care of the situation that confronts you on the exterior boundaries of the pool and certainly if they are enforced, it means that the leasehold owners on the fringes, and in this instance Phillips, will be deprived of their fair share of the oil which lies under their acreage. Unfortunately, these oil pools don't follow section lines and governmental subdivisions, and, therefore, it seems to me that the surveying or staking of a unit, as we have done here, which generally conforms to the best engineering information we have as to the pool and results in the dedication of what appears to be the real productive acreage to this unit, it is only proper and should be recognized by the Commission. But, in essence, the fact is here that Phillips has, by everyone's admission, sufficient productive acreage to have two wells on the space in this field, producing, and we respectfully submit that under the statute of New Mexico, which requires this Commission to recognize our rights to produce from our productive acreage, we are entitled to two wells, producing wells, and appropriate acreage dedicated to them.

MR. UTZ: Any other statements? Case will be taken under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, the Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

June Paige
Court Reporter