

Model  
No. 1160  
Daisy Mfg. Co.  
Plymouth  
Mich.

BEFORE THE  
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE NO. 1718

TRANSCRIPT OF HEARING

JULY 8, 1959

I N D E X

<u>WITNESS</u>	<u>PAGE</u>
CLIFF MATHIS	
Direct Examination by Mr. Kellahin	3
Questions by Mr. Nutter	17
Cross Examination by Mr. Christy	21
Redirect Examination by Mr. Kellahin	29
BARNEY VACHAL	
Direct Examination by Mr. Kellahin	31
Questions by Mr. Nutter	43
Questions by Mr. Kellahin	46
Cross Examination by Mr. Christy	48
LESLIE B. PLUMB	
Direct Examination by Mr. Armstrong	56
Cross Examination by Mr. Kellahin	62
Questions by Mr. Nutter	66
Questions by Mr. Kellahin	69
Questions by Mr. Armstrong	70

<u>EXHIBITS</u>	<u>MARKED FOR IDENTIFICATION</u>	<u>OFFERED IN EVIDENCE</u>	<u>ENTERED</u>
Samedan's Ex. No. 1	8	17	17
Samedan's Ex. No. 2	8	17	17
Samedan's Ex. No. 3	11	17	17
Samedan's Ex. No. 4	11	17	17
Samedan's Ex. No. 5	33	42	42
Samedan's Ex. No. 6	36	42	42
Tennessee's Ex. No. A	57	62	62
Tennessee's Ex. No. B	59	62	62



in the case, if it is in order at this time; I would like to enter an appearance, R. M. Anderson, Sinclair Oil and Gas Company. I have a statement to make at the conclusion of the testimony.

MR. NUTTER: Other appearances to be made in this case?

MR. CHRISTY: Sim Christy, Hervey, Dow and Winkle for Tennessee Transmission Company. We may have a few questions of the witness, and matters to present.

MR. NUTTER: Would you proceed, Mr. Kellahin?

MR. KELLAHIN: If the commission, please, the exhibits which are being posted on the board are the original exhibits which we would like to have offered in the record in this case, the others being reproductions which I don't believe are quite as good, and lacking in some of the details.

MR. NUTTER: Your exhibits on the board will be marked as the official exhibits in the case.

MR. KELLAHIN: That's what we request, yes, sir.

CLIFF MATHIS

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Cliff Mathis.

Q By whom are you employed, Mr. Mathis, and in what position?



A Samedan Corporation; I am their division geologist.

Q And in what division are you in charge of?

A The West Texas-New Mexico division.

Q Mr. Mathis, have you ever testified before this commission?

A No, I have not.

Q Will you state briefly your educational and experience qualifications as a geologist?

A I graduated from Southern Methodist University with a B. S. degree in 1940, and after World War 2, I attended the University of Oklahoma for two years and did graduate work. I was employed for the Western Company from about 1948 to '53 as a geologist doing sub-surface and field work in West Texas and New Mexico; and for the past five years I have been employed by Samedan Oil Corporation as their division geologist doing field work and sub-surface work in southeastern New Mexico and West Texas.

Q Mr. Mathis -- If the commission please, are the witness' qualifications acceptable?

MR. NUTTER: Yes, sir, they are.

Q (By Mr. Kellahin) -- are you familiar with the application in Case 1718?

A Yes, sir, I am.

Q Will you state briefly what is proposed by the applicant in this case?

A We are asking for an unorthodox location in exception



to the Kemnitz field rules. The application concerns itself with the  $E\frac{1}{2}$  of the  $SE\frac{1}{4}$  of Section 20, Township 16 South, Range 34 East.

Q Now, under the field rules, what would an unorthodox location be in that field?

A An unorthodox location under the field rules would be located in the  $NE\frac{1}{4}$  of the  $SE\frac{1}{4}$  of Section 20.

Q Now, what location are you proposing in this application?

A We are proposing to drill a location in the  $SE\frac{1}{4}$  of the  $SE\frac{1}{4}$ , Section 20, 660 feet from the lease line, section line.

Q Now, referring to what has been marked as Exhibit No. 1, will you explain that exhibit, please?

A Exhibit 1 is a structural, geological structural map of the Kemnitz area, concerning itself directly with the acreage that is in question. The Kemnitz field is primarily a stratographic trap as you can see; it is perhaps a gentle nose and the field itself is due to porosity development in the Wolfcamp; to the northwest we have a decrease in porosity and permeability, to the south the field is limited by a water table, to the west which has not been completely delineated to the extent of the field there is evidence of a definite porosity-permeability pinch out.

Q Which is the high part of the structure there, the upper portion of the exhibit?

A The upper portion of the exhibit is the high part of the field; and to the East the field has not been completely



delineated, it will probably be similar to the West in that you will have a porosity-permeability pinch out.

Q Now, the contours shown on that exhibit, are they on the top of the formation, or on a marker, or what?

A The contours as shown on the map are what we call the Kennitz 10,600-foot zone, it is immediately above the pay zone, 40 to 50 feet above the pay.

Q Now, Mr. Mathis, referring to the exhibit, that shows the structural position of the acreage involved in this application, does it not?

A Yes, sir.

Q Is there any substantial change in the structure through that?

A There is actually, from the South location that we propose to drill to the North location, there is very little difference in the structural position of those two locations. As I pointed out before, the porosity decreases to the North, and a location drilled on the North would probably encounter a very poor zone. We think that the entire acreage is productive. It is offset to the North by Ohio's S. A. 1 and their S. A. 2, both Kennitz-Wolfcamp wells; to the East it is offset by Tennessee State 1-C, Wolfcamp-Kennitz zone well; to the West it is offset by Tennessee's Western State Number 1; to the South it is offset by Tennessee's Western State Number 2.

Q Now, referring to those wells which you have just

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



mentioned, there is a figure appearing just below the well. What does that indicate?

A This is the sub-sea Kemnitz zone marker.

Q That is the same marker on which you have contoured?

A That is the marker on which the marker is contoured, yes.

Q Is there any difference between, for example, Tennessee's well immediately to the South of the subject acreage, and the Ohio well immediately to the North of the subject acreage?

A There is approximately, well, the Ohio well to the North is a minus 6370, the Tennessee's well to the South is a minus 6458, approximately 80 feet.

Q In your opinion, is that a substantial difference in this area?

A That should not affect actually the, so far as the structural position those are both well above the water line; we are not concerned with the water, our water problem there, the difference is that in this area here you have much better permeability.

Q Which area are you referring to?

A I am referring to the main part of the field through Section 25 in 16,33, Section 30,16,34, and the  $N\frac{1}{2}$  of Section 29 in 16,34.

Q And I interrupted you in describing the permeability, would you continue with that, please?

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



A The productivity of these wells here indicates that the permeability in this area is extremely poor; we will point that out as we go along perhaps a little better.

MR. NUTTER: You are referring to the Ohio wells?

A To the two Ohio wells where the apparent productivity of this well and of the -- I say this well, let's say the Tennessee State Western Number 2, and the Tennessee State Western Number 1, the permeability in that area appears to be very good, both are top allowable wells, and actually we feel that both of these wells are draining, effectively draining the  $S\frac{1}{4}$  of the subject acreage. In addition to that this well of Tennessee's which is the State 1-C, is approximately a hundred barrels a day, and we feel that that well is effectively draining the acreage in question.

Q (By Mr. Kellahin) Mr. Mathis, I don't believe the number has been marked on that exhibit; would you kindly mark it on the lefthand corner?

A Exhibit 1?

Q Yes, sir.

A (Witness complies.)

Q Now, have you made a study of the net pay section in this area?

A Yes, we have.

Q Referring to what has been marked as Exhibit Number 2, and will you kindly mark it as Exhibit 2, please?

A (Witness complies.)

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



Q Would you explain that exhibit, please?

A Generally, we have shaded in the Samedan acreage in green, and this actually is our net pay map of the microlog porosity as indicated on the various logs. You will note that the Ohio S. A. 1 has 26 feet of net pay indicated on the microlog; the Ohio State, S. A. State Number 2 has 21 feet; the Tennessee State Western Number 1 has 27 feet; the Tennessee State Western Number 2 has 58 feet; the Tennessee State 1-C has we say 18 feet, and the interesting thing about this, as we have stated previously, we think that all of the acreage is productive. Our isopac map indicates that it is productive, that the entire 80 acres is productive, but the interesting thing about this map here is that here you have 26 feet of net pay, this well has 21 feet of net pay, this well has accumulated production of approximately 72, barrels.

Q Which well is that?

A That is the Ohio S. A. State Number 1, it is at present making 30 barrels a day; the Ohio S. A. State Number 2 has an accumulated production of approximately 41,000 barrels, that well is reported to be making 29 to 30 barrels a day.

Q Are those two wells presently on the pump?

A Yes, sir, both of them are on artificial lift, as so reported.

Q Continue with your comparison of the other wells.

A The Tennessee State Western Number 1 has 27 feet of



net pay indicated on the microlog. This well has, as of April had cumulative production of a hundred and twelve thousand barrels, I believe, and it is currently a top allowable well, yet you have almost the same interval of net pay, indicating that this area here will effectively drain an 80-acre tract. The same is true here, this one is a top allowable well, and of course it is in excess of the number of feet.

Q Would you specify each time you refer to a well, which well you are referring to, please, for the record?

A I will. The Tennessee State Western Number 2, Western State Number 2 -- so we feel that we are being drained here by the three wells, the Tennessee State Western 1, 2, and the Tennessee State 1-C, that these wells will effectively drain 80-acres. In this area here, we do not feel that these wells, I think the production history and the bottom hole pressure decline which Mr. Vachal will give you in a few minutes, will indicate that these wells will probably not drain 80-acres.

Q Are you referring to the Ohio wells?

A The Ohio S. A. State 1, and Ohio S. A. State 2. We feel that a well drilled on an orthodox location will not effectively drain the entire 80-acres; we feel that that well will be quite similar to the wells to the North.

Q Now, referring to Exhibit Number 3, Mr. Mathis, would you explain that exhibit?

A Exhibit Number 3 is a copy of the microlog of the



Ohio S. A. State Number 1, and a copy of the microlog of the Tennessee Western State Number 1. You'll note that the Ohio S. A. State 1 has approximately 25 to 26 feet net pay; the Ohio State S. A. Number 1 has an accumulated production of only 72,000 barrels, is at present making 30 barrels a day. The Tennessee S. A. State Number 1 has approximately the same net microlog pay as the well referred to previously, yet this well has a cumulative production of a hundred and twelve thousand barrels, in excess of a hundred and twelve thousand barrels, and at present is still a top allowable well.

Q Will you place the exhibit number on 3, please?

A (Witness complies.)

Q Do you have any other comments on that exhibit?

A I have no other comment; that was just to indicate the net pay of the two wells.

Q Have you made a study of the productivity of the wells in the area?

A Yes, sir, I have.

Q Will you refer to what has been marked as Exhibit Number 4, and will you place a number on that exhibit, please?

A (Witness complies.)

Q Now, referring to Exhibit Number 4, will you explain that exhibit, please?

A Exhibit Number 4 shows the subject acreage in question shaded in green; it shows the various wells that are offsetting



the acreage, the cumulative production, the initial potential test, and the date of completion.

Q Would you briefly make a comparison of those wells?

A Well, as we have noted, the Ohio S. A. State 1 was completed 2-28-57; it had an initial potential of 408 barrels on an 18/64 choke; at the time of the completion, it appeared to be a very good well. The cumulative production as of 5-1-59, 72,213 barrels. The Ohio S. A. State Number 2 was completed 7-15-57, with an initial potential of 348 barrels per day on a 25/64 choke; the accumulated production on that Ohio S. A. State 2 as of 5-1-59 is 41,579 barrels. These two wells, the wells referred to, are approximately 30 barrels a day. We do not feel that that well drilled to the, on an orthodox location, will be any better or, that is, the productivity characteristics will appear to us to be the same in that area. To the South, Tennessee State Western Number 1 was completed 8-22-57, it had initial potential of 384 barrels on a half inch choke; the accumulated production on this well is 5159 -- excuse me -- cumulative production as of 5-1-59 is 11,889 barrels.

MR. NUTTER: Eleven thousand?

A 11,889. These two wells, the Ohio Number 1 and the Western State Number 1, were completed approximately six months apart; yet this well has 30,000, thirty to forty thousand more cumulative production, and is still a top allowable well; this is almost a marginal well now of 30 barrels a day. The accumulated

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



production, as I have mentioned it, on this well here --

Q (By Mr. Kellahin) That's the Ohio State --

A Ohio State Number 2 -- is 41,579 barrels. We do feel that that, a location drilled as a South offset to that well on an orthodox field location would not be a commercial well; we think that the reserves, or reserves that may be recovered by a well drilled on such a location will be on the order of fifty to sixty thousand barrels. A well drilled here on the Southeast of the SE $\frac{1}{4}$ , the exception that we are asking for, we feel will be a top allowable well, will effectively drain from sixty to eighty percent of this acreage. We know that -- we feel that it will effectively drain 40 acres, and in addition to that will drain some of the lower 40's; where a well drilled on the North end of it, we do not feel will drain more than 40-acres to the North, and is a non-commercial venture.

Q Now, Mr. Mathis, your testimony shows, or at least indicates that your structural position throughout the subject acreage is approximately the same, and it also shows that your net pay is approximately the same. How do you account for the difference in the productivity of the Ohio wells, as compared to those lying to the South of the acreage?

A Well, we feel that, and we believe that the production indicates that your permeability is becoming very poor to the North, that wells drilled in this area are encountering a very poor, poorly developed permeability in the Wolfcamp-Kemnitz pay zone.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Now, your evidence seems to indicate that a well drilled at an orthodox location would not drain the 80-acres to be dedicated to that well?

A We feel that it would not effectively drain 80 acres.

Q Based on your examination of the pool, what area would you estimate a well, located as proposed in this application, would drain?

A As proposed in this application, we believe that a well drilled on the South here will drain from, I said from sixty to eighty percent of the 80-acre unit.

Q Now, if the commission should find that a well located as proposed would not substantially drain all of the acreage to be dedicated to the well, would you be willing to accept a reduced allowable on the basis of acreage, or some other basis?

A Yes, sir, we feel that it would take an allowable of 65 to 75 percent to make a commercial venture of drilling a well.

Q Now, referring to your testimony as to whether it is a commercial venture, have you made any study of economics of the drilling of this well?

A Yes, we have.

Q Will you discuss that, please.

A Well, wells drilled in this field have ranged from, oh, 165,000 up to over 230,000, I believe, about 230,000, roughly, and we feel, I say we believe, it is indicated to us that you must have an accumulated production in excess of 80,000 barrels to



actually pay well out; and the orthodox location does not appear to be commercial. In that respect, we think that probably our top recovery would be, oh, from say 57, 60,000 barrels, on that order; where a location drilled to the South we feel that would recover approximately 200,000 barrels. We had it estimated a little higher than that initially, and due to drainage that we have experienced in that area, we have lowered our estimate.

Q Now, referring to the question of drainage, would you discuss that briefly?

A Well, we have concurred with Tennessee in the development and the spacing in the area. We believe that Tennessee's application, original application was very good, that secondary recovery, or the pressure maintenance program will benefit by drilling wells as Tennessee proposed. But, we also believe that there are going to be inequities on the North fringe of this field where an operator having 80-acres in the area may be severely penalized due to the permeability decrease to the North, that you cannot commercially drill a certain portion of your acreage, and for that reason we are asking the exception.

Q You feel then, I gather, that you have already suffered drainage?

A Yes, I think we have; I think the bottom hole pressure decline in the inner area indicate that we have suffered drainage.

Q Is there any other way you can prevent drainage, other than as proposed in this application?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A No, we cannot; we cannot commercially drill a well here, I say here on the orthodox location we cannot drill that.

Q Aside from the economics of the situation, would a well drilled in an orthodox location protect you against drainage in the southern portion of that acreage?

A No, it would not; it would not protect us from drainage. In my opinion, a well drilled on the North would drain only, or approximately the 40-acres as indicated.

Q And would a well drilled as proposed in this application, protect you against drainage?

A It would protect us against drainage to the South, and we feel that we would effectively drain a portion of that North 40 acres.

Q Now, even with a reduced allowable which might be granted by the commission as a result of your testimony, would it still protect you against drainage?

A Well, we would not be a hundred percent protected against drainage if we had a reduced allowable; I think it would adequately protect us in the area that we can anticipate draining. We would not be 100 percent protected against drainage when surrounding wells have an allowable of 193 barrels, and our well have an allowable of 153 barrels, or 160 barrels, you would suffer some drainage from that, but --

Q Do you have any other comments to make?

A No, I have no other comments.



Q Were exhibits 1 through 4 inclusive, prepared by you, or under your direction?

A They were prepared by me, or under my direction, yes, sir.

Q At this time we would like to offer in evidence, Exhibits 1 through 4 inclusive.

MR. NUTTER: Without objections, Exhibits 1 through 4 will be entered.

MR. KELLAHIN: That's all we have, Mr. Nutter.

MR. NUTTER: Any questions of Mr. Mathis?

Mr. Mathis, what do you base your opinion on, that a well drilled in the approximate location that you suggested down here in the SE SE of 20 would drain 80 percent of oil in that tract?

A Well, we actually base that on the productivity of these wells to the South, and the wells in general in the field, that most of the wells will adequately drain 80-acres; but we know that permeability is decreasing to the North, we do not know how rapidly, we feel that it will most certainly drain 40-acres, and that there is a good chance that it will drain an additional 50 percent of the North 40. That actually is just based on the productivity characteristics to the North, and the productivity characteristics to the South.

MR. NUTTER: One of the Ohio wells has produced 72,000 barrels?

A That is correct.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



MR. NUTTER: Is that the amount of oil that is under a 40-acre tract up there?

A Well, the amount of oil that was originally estimated in place was 123 barrels per net foot of pay. It does not appear that the Ohio well from that, from the calculation on that will actually drain the entire 40. Of course, that information is based on core information on wells to the South; we do not have core information in the immediate area to base our calculation there.

MR. NUTTER: Do you think the commission erred in establishing 80-acre spacing in this pool?

A No, I do not.

MR. NUTTER: But there are some wells that won't drain 80-acres?

A We feel that there are some fringe wells that will not drain an 80-acre space, yes, sir; but we do not think that the commission erred, because 90 percent of the wells will effectively drain an 80-acres.

MR. NUTTER: Do you think the commission erred in establishing a fixed spacing pattern for the pool?

A We do not. We think that the commission was correct in doing that, and that over the entire area of the pool, that more oil will be gained by the operators, but we feel that there are inequities that should be corrected.

MR. NUTTER: Well, now, you stated that your 40 acres in the SE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 20 was presently being drained by



the three wells immediately offsetting it. Now, are all three of those wells on the proper pattern for the pool?

A All three of the wells to the South are on the proper pattern, yes, sir.

MR. NUTTER: Isn't it true, Mr. Mathis, that in establishing a spacing pattern for a pool where the proration units are elongated as they are of necessity in 80-acre spacing, that the inequities are solved by counter-draining and drainage?

A In this particular case these are the only 80-acres that we are operating, and of course the well to the North is drilled off pattern, the Tennessee State S. A. Number 2 is drilled off pattern, but in this particular case there is an inequity to the Samedan Oil Corporation.

MR. NUTTER: Where is the inequity?

A In that we have no way to protect our drainage.

MR. NUTTER: You are not being drained on the North, are you?

A In all probability we are not being drained to the North.

MR. NUTTER: Now, is there any correlation between the porosity and permeability development in this sand, or this formation, and the structural position? Is there any correlation between structural position and porosity and permeability development?

A There appears to be; as you go updip you lose your



permeability, it becomes tight, and the, as to the downdip wells, appear to have better porosity and permeability than the structurally higher wells.

MR. NUTTER: You stated, Mr. Mathis, that there was very little difference structurally in the location of the NE $\frac{1}{4}$  of SE $\frac{1}{4}$ , and the SE $\frac{1}{4}$  of the SE $\frac{1}{4}$ ?

A Only about, we estimate about 25 to 30 feet.

MR. NUTTER: Well, essentially then, why would there be a variation in the permeability and porosity, if the structural position is nearly the same?

A Well, we are actually losing it as we go North, and we are getting a little higher going North, and your permeability is decreasing to the North and updip.

MR. NUTTER: You would expect a well in the NE of the SE of the Section 20 to possibly be better than either of the two Ohio's wells, would you not though?

A We think that it would be, yes, sir. We think that it would be a little better, but we still do not feel that it would be commercial, that you could afford to drill under any circumstances.

MR. NUTTER: Well, now, if a well drilled on your proposed location would drain 80 percent of the oil that is in place in that 80-acre tract, how is the other 20 percent going to be recovered?

A There is actually no way to recover the other 20 percent of the oil.



MR. NUTTER: Now, if a well were drilled in the NE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 20, it would drain the oil in that 40, wouldn't it?

A We feel that it would, but it would not be commercial, sir.

MR. NUTTER: And the other three wells to the South are draining the other 40-acres, are they not?

A We would be suffering drainage on that, yes, sir.

MR. NUTTER: But all the oil would be recovered?

A Well, we think that a good portion of it would be recovered, yes, that is correct.

MR. NUTTER: Does anyone have any further questions of Mr. Mathis?

MR. CHRISTY: I have a question.

MR. NUTTER: Yes, sir.

CROSS EXAMINATION

BY MR. CHRISTY:

Q Mr. Mathis, as I understand, you are not asking this unorthodox location for topographical reasons?

A No, sir.

Q There is nothing topographical about it?

A That is right.

Q I believe Ohio owns the acreage to the North, Tennessee Gas to the South, East, and West?

A That is correct.

Q Do you know whether or not Ohio was notified of this hearing?



A I don't know, sir.

Q As far as you know, they were not?

A As far as I know, they were not.

MR. KELLAHIN: If the commission, please, I think advertising by the commission constitutes notice to all interested operators, and I would say they were all notified.

MR. PAYNE: That is correct, Mr. Kellahin.

Q (By Mr. Christy) Now, sir, as I understand you, you are asking to move downdip structurally?

A Yes, sir, move downdip 25 to 30 feet according to our interpretation.

Q And as I understood you in your testimony concerning Exhibit 1, you feel the entire 80-acres will produce?

A We feel that it will.

Q Now, sir, I refer you to Exhibit 2.

A All right.

Q I note your markers here in red on Exhibit 2 which I understand to mean the net footage of pay?

A Net footage of pay as indicated on the microlog pay.

Q Who established those estimates?

A Most of those were mine.

Q Those are your estimates?

A That's my estimate of net pay.

Q Those are not the estimates of other operators?

A No.



Q Now, I assume those contours also are your estimate, correlating them to your own estimate of your own net footage of pay?

A That is correct.

Q Now, you mentioned that the Ohio S. A. 1 and S. A. 2 to the North of acreage here, has low productivity history, I believe it is down to 30 barrels?

A That is correct.

Q Now, to what do you attribute that?

A We attribute that to poor permeability in that area.

Q Could it also be attributed in part or on the whole to poor completion?

A We do not believe that; we believe that our completion technique was equally as good as anyone else's in the field.

Q And do you feel that you are being drained in the NE SE of Section 20?

A Actually we do not feel that this well here will drain more than 40 acres.

Q What porosity do you think, percent of porosity do you think we are getting up here in Ohio wells?

A I could not give you an estimate on that.

Q As far as you know, it would be lower than the porosity for example down here in the wells to the Southeast?

A No, I could not state that, as the porosity as indicated on the log appears to be about the same there as it is in



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

any other part of the area, and the initial potential indicates that the porosity in the immediate vicinity of the well was very good. These wells potentialled for 300 barrels or more; these wells to the South potentialled for 300 barrels or more. Actually, the drainage in the immediate area of the well appear to be very good initially.

Q Are you saying now the porosity is the same up here?

A No, I am not saying it is the same.

Q As I understand you think it is less porosity up in the North?

A Not less porosity; we think the permeability decreases.

Q Less permeability?

A Yes, sir.

Q Now, would the magnitude of porosity and permeability have some bearing upon the amount of recoverable oil under any given tract?

A Yes, it would; I think we feel that it would, surely.

Q And the amount of oil there?

A Yes, definitely.

Q So if you had less porosity and permeability, you wouldn't have as much oil anyway under this tract?

A If we had less porosity and permeability, that is correct, we would not.

Q Now, sir --

A We feel -- may I state --



Q Certainly.

A At the present time, we feel that this 80-acres here is actually as good as the 80-acres that Tennessee is producing here, so far as the productivity and oil under that acreage is concerned.

Q Yes, sir, but what I am getting to is, if there is eight percent porosity and permeability in this well, and you move down to the eight percent zone and some of this up in here is five percent, you will be draining off of land of which you have no eight percent porosity and permeability up here?

A Well, we don't feel that a well up here having an equal allowable, or an allowable slightly less than the offset wells, will drain the oil from the offset operator, not at this stage of the field.

Q Now, you said you looked for 50 to 60,000 barrels of recoverable oil under an orthodox location?

A Yes, sir.

Q What do you look for recoverable barrels under the unorthodox location?

A We have estimated around 200,000 barrels that you might be able to recover.

Q And that --

A That would be draining approximately 60 to 70 percent of the acreage, if you would have effective drainage up to 75 percent.



Q This recoverable differential between 60,000 in the North, and 200,000 in the South, is improved considerably by the bottom hole pressures, is it not?

A Yes, I would say that is right, bottom hole pressure and your decrease in permeability.

Q And you say the bottom hole pressures in the field are declining?

A The bottom hole pressures in the whole field are declining. Let me ask Mr. Vachal, he will cover that in his testimony.

Q Now, if this exception is granted, do you see any other exceptions that might well be asked for in the field --

A Yes.

Q -- on other locations?

A Yes, there are other inequities in the area. We feel that perhaps Sinclair might suffer here.

Q That's one.

A And there is some possibility that there are locations here. Now, you have a different situation to the South, because you are getting in water, a portion of this acreage here would undoubtedly be in water.

Q Now, you are speaking here of the  $W\frac{1}{2}$  of the SW of Section 25?

A Section 25.

Q An unorthodox location would be in water?



A We feel it would be, yes.

Q So it would be uncommercial to drill it?

A Yes.

Q But if you came on the NW SW it might be commercial?

A It might be a commercial well. Here is a well that has only five feet of effective pay.

Q So the person that owns this  $W\frac{1}{2}$  of SW of Section 25 might well come to the commission and say: "We cannot make a commercial well on the orthodox; we can make a commercial well on the unorthodox location"?

A Yes.

Q As a matter of fact, there are three or four more over here?

A Those I am not familiar with; only this portion of the field here am I familiar with.

Q But there definitely would be, if this application were granted, there would be great likelihood of additional applications?

A There is a possibility, yes, sir.

Q Now, we mentioned the drainage problem by your unorthodox location, and I believe you said you were being drained at the SE SE of Section 20 by virtue of the three wells surrounding it?

A Yes, we feel that is true.

Q Does Samedan own any interest in those three wells?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A We own an interest in Tennessee's State Western Number 1, and their State Western Number 2; and their Number 3, we have no interest at all in this well here.

Q Do a portion of this drainage you are speaking of is to yourself?

A I would say poorly protected, though Tennessee has a majority of it.

Q But you are in part being drained by yourself?

A Yes.

Q Now, you mentioned that the only way you can prevent this drainage you are suffering is to drill here?

A That is correct.

Q And the alternative would be to drill the standard location?

A The standard location is not a commercial location, and we couldn't drill that location, we cannot.

Q Mr. Mathis, I neglected to ask you one other thing. In connection with the bottom hole pressure you mentioned the field was declining. Would you like to refer this to Mr. Vachal?

A I believe that would be more appropriate.

Q Was Samedan present or represented at the original hearing at the 80-acre spacing?

A We were present and represented by Mr. Kellahin.

Q And I believe you at that time made a statement in connection with your opinion as to whether or not 80-acre spacing



was advisable.

A That is correct.

Q Do you remember what that opinion was?

A I will ask Mr. Kellahin. Did we make a statement on the original? --

MR. KELLAHIN: Yes.

Q (By Mr. Christy) I will ask you, Mr. Mathis, if this is not correct. Speaking by Mr. Kellahin: "Samedan feels that there can be no orderly development without a definite pattern of development, and for the protection of correlative rights and the orderly development of pools, as far as alternate or staggered 80-acre well locations."

A That is what we said and we still concur with it, but we believe there are exceptions in the field which should be considered by the commission.

MR. NUTTER: Any further questions of Mr. Mathis?

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Mathis, Mr. Christy has called your attention to a statement made in behalf of Samedan Oil Corporation at the original spacing here in this case. In this pool, do you know who held the acreage which is the subject of this application, as of that time?

A As of that time, Tennessee Oil and Gas Company held that acreage.



Q And did they see fit to drill that acreage?

A No, sir, they have not; since, he has reassigned the subject acreage to us.

Q Now, referring to all the other exceptions about which Mr. Christy questioned you, the possibility of other applications for exceptions to the well locations, on examining your map would you find that any of those locations are suffering drainage which is uncompensated to the same company?

A Well, that is the location that we pointed out, Sinclair is possibly suffering drainage here. They do have a well offsetting that to the East, so they are not actually suffering as much drainage as we are; and the same is true of Phillips on the acreage to the South, that is correct.

Q In other words, they are draining their own acreage to an extent at least?

A Yes, sir.

Q Is that true of Samedan Oil Corporation?

A That is only partially true of Samedan Oil Corporation; we have a minority interest in this acreage here, and this is actually our own acreage that we have operations on a hundred percent with other associated members of Samedan, or formerly associated members of Samedan.

Q Now, referring to the Phillips acreage, would you give the location of that acreage, please?

A The Phillips acreage, the unorthodox location would

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



be situated in the NW $\frac{1}{4}$  of the SW $\frac{1}{4}$ .

Q What section?

A In Section 25, Township 16 South, Range 33 East.

Q Now, an orthodox location, I believe your testimony on cross examination showed, would be in water?

A We believe that it would be in water.

Q Well, in the event it were in water, then would all the acreage to be dedicated to that well be productive of oil, in your opinion?

A No, it would not; probably only 50 percent of it.

Q Now, does that situation apply to Samedan Oil Corporation?

A No, that does not. Samedan Oil Corporation's 80-acres, we believe, is a hundred percent productive, and we have no fear of water.

MR. KELLAHIN: That's all the questions I have. Thank you.

MR. CHRISTY: No further questions of this witness.

MR. NUTTER: Mr. Mathis may be excused.

MR. KELLAHIN: I would like to call as our next witness, Mr. Vachal.

BARNEY VACHAL

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

DIRECT EXAMINATION

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



BY MR. KELLAHIN:

Q Would you state your name, please?

A Barney Vachal.

Q Would you spell that, please, for the reporter?

A B-a-r-n-e-y V-a-c-h-a-l.

Q By whom are you employed, Mr. Vachal, and in what position?

A Samedan Oil Corporation, Hobbs, New Mexico, petroleum engineer.

Q Have you ever testified before this commission?

A No, sir.

Q Would you state briefly your education and your experience subsequent to graduating from school as an engineer?

A I graduated from University of Kansas in 1952 as a petroleum engineer. Subsequent to joining Samedan Oil Corporation in February of '59, I worked for Cities Service Oil Company for seven years in the capacity of petroleum engineer.

Q Where were you employed during that period, Mr. Vachal?

A West Texas and New Mexico.

Q Are you familiar with the application in this case?

A Yes, sir.

Q Is the area involved under the area in which you are presently working for Samedan Oil Corporation?

A Yes, sir.

Q Have you made a study of the subject matter of this

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



application?

A Yes, sir.

Q Now, referring to Exhibit Number 5, what has been marked as Exhibit Number 5, would you state what that shows?

A The exhibit includes the production on three wells; all curves are represented by the same axis, the horizontal is barrels per month produced, and it is -- rather vertical; the horizontal is years.

Q That is a 3-page exhibit showing three different wells, is it?

A Yes, sir.

Q Would you state what wells are shown on the exhibit?

A As I stated, it is a 3-well exhibit of production. Tennessee State Number 1 Western, you will note that this curve is generally flat and falls in a horizontal plane. The horizontal lines represent the monthly -- excuse, have I gotten ahead of anyone? It is Tennessee Gas State Western Number 1, the horizontal line represents the monthly production of this well since completion. Note that the producing rate falls in a horizontal plane with a slight variation caused by supply and demand. Also, this type of curve shows that the well is capable of producing top allowable, and is currently producing the same. The allowable for this well is, and for the field, is about 195 barrels per day. It varies; accumulated production here, as has been stated, is approximately 112,000 barrels.



Q Well, actually the curve shown on that portion of the exhibit is just a depiction of the allowable for that well, is it not?

A Yes, sir.

Q Now, would you go on to the other wells?

A Continuing on to Ohio Oil Company S. A. State Number 2, this curve also shows the production from completion date to current rates. Note the steep decline of this curve showing that at the time of completion this well was capable of producing 3900 barrels per month, and after producing 21 months, monthly production is 910 barrels per day.

MR. NUTTER: Per month?

A Per month, excuse me.

Q (By Mr. Kellahin) Which well was that? That was the Ohio State Number --

A Yes, sir.

Q Which one?

A State Number 2.

Q Now, would you give us the information on the Ohio State Number 1?

A If it would be possible, these are rather thick, but they will fall on the same curve, or same decline, this well is Ohio Company's S. A. State Number 1. The curve shows production since completion to present production rates; also, here I would like for you to note that upon completion the well was producing

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



6100 barrels per month, and after producing 26 months, the current production has dropped to 935 barrels per month.

Q Now, have you plotted the slope on these wells, Mr. Vachal?

A Yes, sir.

Q Could you state what that is, what that shows?

A The slope, as stated, it shows a general decline in that the well is depleting at the rate of 6100 barrels, in a period of 26 months to 935 barrels per month. As you note, the slope is rather steep.

Q Now, based on your experience as an engineer, Mr. Vachal, what ultimate production would you anticipate for the Ohio State Number 1 and 2?

A For Ohio State Number 2, we can anticipate a production of 57,000 barrels, that would be ultimate economic recovery. For Ohio State S. A. Number 1, we anticipate an ultimate economic recovery of 93,000 barrels. Also, these curves indicate productivity of the well; as noted, Ohio's S. A. lease, neither well is capable of producing top allowable.

Q Now, assuming a well were drilled by Samedan Oil Corporation on an orthodox location, which would be in the northern portion of Samedan's acreage, would you anticipate encountering a similar situation as found in the Ohio wells?

A In the NE $\frac{1}{4}$  of the 80-acres?

Q Yes, sir.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A Yes, sir, we certainly, as has been stated, anticipate probably a large acute ultimate recovery from the well in that quarter, than the wells Ohio has on their S. A. State lease.

Q Would such a well, in your opinion, be a commercial well?

A No, sir, as stated --

Q Now, have you made a study of the bottom hole pressures in this area?

A Yes, sir.

Q Referring to what has been marked as Exhibit Number 6, would you discuss that exhibit, please? Would you discuss the exhibit, please, and what it is designed to show?

A The letter numbered right below the well symbol is bottom hole pressure; the bottom hole pressure survey is due semi-annually. The black numbers indicate the survey taken during July 1958, and the red numbers indicate the survey taken during December of 1958; I think on your map it will probably be underlined with red pencil, the photostat.

Q Now, those are the last figures available to you, are they not?

A Yes, sir. There is a survey now in process, but completion pressures were not available.

Q Now, referring to the offsetting wells to the Samedan acreage, would you discuss the bottom hole pressures on those wells, including the Ohio wells and the Tennessee Gas Transmission wells.



A To start, probably over on the left or lefthand side of the field, we find that the bottom hole pressures on the periphery of the field are somewhat irregular from the bottom hole pressure within the body of the field. You will note that 2786, 2668, 2647, 2635, and 2687 --

Q What area are you reading those from, Mr. Vachal?

A We are starting from the West part of the field, and going East.

Q I see.

MR. NUTTER: Are all of those pressures computed to a common datum?

A Yes, sir, minus datum of 6500; and if you will note the continuity of pressure through the section also, as we approach the acreage in question the continuity of the pressures are still the same except for maybe the Shell well here. There are two wells that we don't have the last pressures. In all expectations, they will be comparable.

Q Referring to the Tennessee Gas Transmission Company wells offsetting the Samedan acreage, would you state what those show?

A They show that this isn't a developed 80-acres; as we all know, it is impossible for us to know what the bottom hole pressure is under these 80-acres. We can go in relation to the rest of the performance of the field; all we can do is extrapolate previous results. And, as noted, the pressures are very similar



in that they are uniform, and as production declines, or as pressure declines from survey to survey, we anticipate that that same thing happens in our location, we don't feel like we are --

Q Are you saying then that the pressures on the Tennessee Gas Transmission Company well are comparable to the pressures shown throughout the main body of the field?

A Yes, sir, with one exception; Tennessee's Western State Number 1, there is an anomaly there which we haven't been able to decide on, and possibly, I don't know whether it has been. However, there is a lot of speculation concerning that low pressure there.

Q What is the pressure there?

A The pressure is 2,010 pounds.

Q Is that the December pressure, or the July pressure?

A That's the December pressure.

MR. NUTTER: What was the July pressure?

A 2112 pounds.

MR. NUTTER: So both periods it has evidenced itself much lower than the other pressures in the area?

A In six months' period, bottom hole pressure has dropped 102 pounds.

Q (By Mr. Kellahin) Do you find the same situation, Mr. Vachal, as to the Ohio State wells Number 1 and 2, as to pressures?

A Yes, sir, bottom hole pressure, there has been one



taken, both wells are on pump, the pressure taken on July '58 was 1040 pounds, that is on Ohio's S. A. Number 1.

Q Now, that is considerably lower than the rest of the field?

A Yes, sir. Also, at the time of the completion of this well, drill stem test shut-in pressures revealed 3500 pound bottom hole pressure, which is comparable to pressures in the rest of the field at initial completion date. However, if you will note, 3500 pounds down to 1040 pounds is a comparable pressure drop.

Q Would you consider that a rather rapid pressure drop?

A Yes, sir, I would.

Q To what would you attribute it?

A I would attribute it to reservoir characteristics in that area, reservoir characteristics of the, probably of permeability, effective permeability, and of the effective porosity also.

Q Does that indicate then that it would have any effect on the drainage of those wells?

A Yes, sir, drainage, I think we are all familiar with it, that it has a direct relationship to permeability and porosity in bottom hole pressure. As established in this area, we must have a channel, or a medium, or interval, here we seem to have that, and here for some reason we have tremendous pressure drop in the immediate vicinity of the well bore, which would indicate poor

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



productivity, or a low productivity.

Q Would you anticipate finding a similar situation, were a well drilled on the northern portion of Samedan acreage?

A Yes, sir. We have no way of knowing what the bottom hole pressure is on the acreage in question, however, we do know that the production on all wells in the north part of the field through here have been questionable wells, have been marginal wells, and possibly no pay. In the same respect with Tennessee's State C. Number 2, which would be in direct line to our location, it is a West offset with two locations, it has a cumulative production of 37,000 barrels.

Q Would a well drilled as proposed in this application, protect you against drainage, in your opinion?

A I beg your pardon, sir?

Q I say would a well drilled as proposed by Samedan Oil Corporation in the southern portion of their acreage, afford protection against drainage?

A Yes, sir, it would. As established, we have uniform bottom hole pressure, and that same function goes North; as we note here on Sinclair's production, the bottom hole pressures there are very comparable, I think, to the main body of the field.

MR. NUTTER: What is the bottom hole pressure on that Tennessee Gas State S. A. Number 2?

A Bottom hole pressures, they weren't available to us. If you will excuse me a minute, sir, if I might -- No, sir, we



don't have the bottom hole pressures, I thought I had another sheet here.

MR. NUTTER: Do you have the pressure of the well on the SW of the NW of the Section 21?

A Southwest --

MR. NUTTER: Of the Northwest.

A This one here?

MR. NUTTER: Yes, sir. I don't see any pressure labelled on the exhibit, do you have the pressure?

A No, sir, that's a well producing from the Pennsylvanian, it isn't completed in the Wolfcamp.

MR. NUTTER: All these wells then are not Wolfcamp wells, is that correct?

A That is correct.

MR. NUTTER: How about the well in the SW of the SW of 21, is that a Wolfcamp well?

A This one?

MR. NUTTER: Yes, sir.

A Yes, sir, that's a Wolfcamp. It has a bottom hole pressure of 2571 pounds.

MR. NUTTER: Well, is that other well in Section 20, the one in NE of the SW that you said you didn't have any pressure on, do you think that maybe is a Wolfcamp, or a Pennsylvanian well?

A That is a Wolfcamp, yes, sir.

MR. NUTTER: It is a Wolfcamp well?



A Yes, sir, the last report I had, it is a Wolfcamp.

Q (By Mr. Kellahin) Referring to the well which Mr. Nutter questioned you about, which you said was a Pennsylvanian well, do you know whether the drill stem test showed oil in the Wolfcamp?

A Yes, sir, it did. This well is given -- I would have to refer to the exhibit or net pay map which shows the approximate net pay this well has, however, it is believed to be not commercial.

MR. NUTTER: It never has produced from the Wolfcamp then?

A No, sir.

Q (By Mr. Kellahin) Were exhibits 5 and 6 prepared by you or under your direction and supervision?

A Yes, sir.

MR. KELLAHIN: At this time we would like to offer Exhibits 5 and 6.

MR. NUTTER: Without objection, Samedan's Exhibits 5 and 6 will be entered.

Q (By Mr. Kellahin) Mr. Vachal, based upon your experience, would a well located in the southeastern portion of Samedan's acreage, as proposed in this application, effectively and economically drain the acreage to be dedicated to it?

A A well drilled in the SE $\frac{1}{4}$  of the E $\frac{1}{2}$ , E $\frac{1}{4}$ , would effectively drain our acreage to the extent of this border line in here.

Q What is the significance of the different coloration



which you have placed on that exhibit, Mr. Vachal?

A The significance would be the yellow or orange has been a transition zone between effective permeability and permeability. We believe here that this, there is a gradation here, that it isn't a sudden pinch out, because of the productivity of the Ohio well. It is a gradual pinch out, and we believe that because of the production of these wells along this line, that this is where our permeability becomes less effective.

Q Now, you heard Mr. Mathis testify to the effect that in his opinion a well drilled at a location as proposed in this application would effectively drain from 75 to 80 percent of the acreage, do you agree with that?

A Yes, sir.

MR. KELLAHIN: That's all the questions I have.

MR. NUTTER: Any questions of Mr. Vachal?

A (No response.)

MR. NUTTER: Mr. Vachal, I believe you were here awhile ago when Mr. Marshall was discussing his structure map of this pool.

MR. KELLAHIN: Mr. Mathis.

A Yes, sir.

MR. NUTTER: Did you note that the structure lines seem to trend more North and South on this 80-acre unit that we have in question here today than they do East and West?

A I beg your pardon there, sir.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



MR. NUTTER: Do you think the general trend of lines, the structure line, the contour lines, would be more North and South than it would be East and West on this exhibit?

A The structural lines, this is a Kemnitz marker map which indicates only the top, this would indicate a dip in the general North-South, I may be wrong, the terminology.

MR. NUTTER: It is also dipping East and West, however, too, isn't it, dipping to the East, actually it is dipping to the Southeast, is that correct?

A Dipping to the Southeast.

MR. MATHIS: In that immediate area, you do have a change. This dips, yes, sir.

A Yes, sir.

MR. NUTTER: You are acquainted with the permeability and the porosity of various wells in this pool, are you not?

A Yes, sir.

MR. NUTTER: Is there a general correlation between permeabilities and porosities and the structural position of the wells?

A Nothing, well, to answer that, sir, we have nothing to establish any correlation on except production data and logs; there have been gamma ray neutron logs on 50 wells, but I stand to be corrected there, with practically no correlation with core analysis; we have micrologs, the interpretation of them as to porosities no one attempts to do that.



MR. NUTTER: Has it been your general experience to find that the wells, located high structurally, have the poorer development as far as permeability and porosity is concerned?

A Yes, sir.

MR. NUTTER: Well, now, do you think that since these contour lines trend North and South on your 80-acre tract, that perhaps your transition zone there would be from East to West, rather than from North to South on your Exhibit Number 6? You show the transition being from the South end to the North end, couldn't there be a transition running North and South, and the better part of permeability and porosity being on the East side of the unit, and the poorer being on the West?

A Yes, sir, that could be possible. However, we find that, by investigating this map, the same situation occurs on the West, and the same type of development is on the West as we have on the East; the productivity of these wells in Section 20, Tennessee State C Number 1 and Number 2, indicates that there is a permeability reduction -- not in Number 2, Number 2 is a Pennsylvanian well.

MR. NUTTER: It must not have been very good though, or they would have completed it in the Wolfcamp?

A Yes, sir.

MR. NUTTER: What I'm driving at, Mr. Vachal, is that the pool, the development of the permeability and the porosity in this reservoir in this area that we are considering, being the



E $\frac{1}{2}$  of Section 20, the change seems to be towards the East rather than towards the South, is that correct?

A Yes, sir, and -- yes, sir, that is true.

MR. KELLAHIN: Mr. Nutter, may I ask a question that I think may clarify the situation?

QUESTIONS BY MR. KELLAHIN:

Q In regard to Mr. Nutter's questions, Mr. Vachal, and referring to Tennessee Gas Transmission's well Number 2, as compared structurally with the location of Ohio's State Well Number 2, would you say that the permeability pinch out would tend to fall to the East, or North and South?

A There we have a very comparable situation, wherein Tennessee's State C Number 1 has a, is now producing 105 barrels per day. It is not a top allowable well, and by the same token, Ohio S. A. lease, neither of those wells are top allowable wells, pinch out seems to be to the East, and by the same token as to the North. The development here is to the top of the Kemnitz marker, we find that minus 6400 is there close to Ohio's Number 2 well, their minus 6375 falls practically on the Ohio Number 2 well, and it does fall into the areas which are good wells.

Q What is the most easterly well in this pool?

A Pure's well is.

Q Are those Pure wells in the E $\frac{1}{2}$  of Section 21 Wolfcamp wells?

A Yes, sir.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



MR. PAYNE: What about that Number 3, is that a dry hole in the Wolfcamp?

A Excuse me, sir, I stand to be corrected there. Pure State E is not -- State E Number 1 is not a Wolfcamp well. I decline to answer that, I don't have the information.

Q (By Mr. Kellahin) You don't know what the limits of the pool are then to the East?

A No, sir.

Q Well, now, Mr. Vachal, you stated that Ohio State S. A. Number 1 well, I believe, or was it the Number 2 well, that had the shut-in pressure of 10,000?

A Number 1 well.

Q Do you think perhaps the reason that well has such a low bottom hole pressure is because that wasn't a fully built-up pressure due to poor permeability in that well?

A Due to poor permeability in the well, yes, sir.

Q And perhaps if it had been shut in longer, it would have had a pressure build-up there that would have given it a higher pressure reading, do you think so?

A No, sir, within a reasonable length of time, I would think -- I would think a reasonable length of time, probably 72 hours.

Q Are all of those bottom hole pressures that are reflected there on your Exhibit Number 6 taken within the same length of shut-in time --

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



A Yes, sir.

Q -- regardless of the permeability of wells?

A Yes, sir.

MR. NUTTER: Does anyone have any further questions?

CROSS EXAMINATION

BY MR. CHRISTY:

Q Mr. Vachal, in response to Mr. Nutter I thought I understood you that there was a correlation in ~~these~~ wells in the field between the porosity and permeability and structure, is there correlation there?

A Yes, sir.

Q And you are going downdip structurally according to your map?

A Yes, sir.

Q Now, you were asked to estimate the recoverable oil under the Ohio S. A. 1 well, which I believe you estimated at 93,000 barrels?

A Yes, sir.

Q And under the Number 2 at 57,000, is that correct?

A Yes, sir.

Q Now, what do you estimate would be the recoverable oil under the orthodox location on the land in question?

A From the -- in the same token that we have that these wells are low productivity wells, we believe that this well drilled on this location will have essentially the same production as



possibly Tennessee's State C Number 2.

Q And that is what, sir?

A That is 37,000 barrels to date. It presently is producing 60 barrels of oil.

Q What do you feel the ultimate recovery will be from an unorthodox location?

A Using the **values** that we have determined here from offsetting wells, it would be very difficult to say an exact figure; it could possibly be between 50 and 60,000 barrels.

Q So you feel that the production would be somewhere between fifty and sixty thousand barrels on an unorthodox location, despite the fact that to the North of you, which you say has less permeability and porosity, you estimate 57,000, and over here to the Northwest you estimate 93. I can't quite understand how you come up with less in the unorthodox location, you are going to the better pay, aren't you?

A Would you excuse me a minute, I would like to look up -- Let's see, I had stated that Number 2, ultimate economical recovery of 57,000 barrels, and that Ohio S. A. State Number 1 has ultimate economic recovery of 93,000 barrels.

Q And you estimate down here in the orthodox location between fifty and sixty thousand?

A Yes.

Q Now, sir, I note that you keep using the word, "economic recovery oil", are you speaking of primary only? What

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



do you mean by "economic"?

A Economic recovery oil, these wells are producing from a depth of 10,000 feet, some wells. Mechanical equipment to pump a well at 10,000 feet, affords considerable expense in pumping cost operations, that may constitute 10 barrels of oil per day; a well producing from 2,000 feet may have considerably less maintenance due to the equipment in the hole.

Q Yes, sir, so this will reach a point earlier where it is not economical to produce primary?

A Yes, sir.

Q But your figures do not include secondary recovery that may be made from the well?

A No, sir.

Q And secondary may throw you over the hump so to speak on whether it is a profitable investment or not?

A There is that possibility, sir; I would like to qualify that.

Q Certainly.

A In effect, that at the present time there is a study being conducted to possibly evaluate the possibility of a secondary recovery movement in this area. However, for us to drill a well on a possibility of a secondary recovery movement, we would of course be very reluctant.

Q Is the lease about to run out on this, or something?

A No, sir.



Q Now, you mentioned that down in the SE SE on your proposed unorthodox location -- what is your estimate of economic recoverable oil, the same definition as you have used on these other three that you have mentioned?

A 210,000, sir.

Q And by that 210,000, what percent of the oil in place under these 80-acres do you feel can be recovered? Did I understand you to mention the figure 75 to 80 percent of the primary recoverable?

A I would like to qualify that statement; there is 210,000 as estimated at the first of 1959 --

Q All right, sir.

A -- January 1st.

Q Now, was I correct in my estimate of 75 to 80 percent recoverable by the well being located here?

A Yes, sir.

Q Now, could I have the same percent, please, your opinion as to that, as to what percent of oil in place under the 80-acres can be recovered primarily by a well drilled on an orthodox location?

MR. NUTTER: Mr. Christy, do you mean the percent of the original oil in place, or the percent of recoverable oil?

Q (By Mr. Christy) Percent of the recoverable oil, the same figure percentagewise in the orthodox, which you previously testified in the unorthodox?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A Some few minutes ago, I made a statement concerning the possible recovery from this, from the orthodox location.

Q Primary recoverable in the number of barrels?

A Yes, sir. And you are asking me the same question?

Q No, sir. Down here in the unorthodox location, I believe you estimated that percentagewise you could recover from the oil in place -- I am not saying this quite right -- from the oil in place by your primary recovery, you could recover by your primary method, you could recover 75 to 80 percent by the well being located here, is that correct so far?

A Yes, sir.

Q Now, what is the percentage up here in the orthodox location, would it be the same?

A Percentage would depend, the percentage of the recoverable oil would depend -- because of our limited information due to where this permeability streak enters -- as to how much oil actually exists in this 40-acres, and what recovery we could expect from it other than from the results of Ohio S. A. Number 1 and 2, and Tennessee's State A Number 2.

Q You mean we don't know --

A We don't know.

Q -- because we don't know how much recoverable oil there is, do we, in the 80-acres?

A We know that for the general -- we don't know, as in the oil business is very general, development of wells in proven



fields, possibly 20 percent of them are dry holes. However, it is anticipated that they are productive, we believe that this is productive, to our surprise it may not be.

Q Now, one or two more questions. You've mentioned that the bottom hole pressures are declining in the wells surrounding the acreage in question, as a matter of fact they are declining in the field in general, that is correct, isn't it?

A Yes, sir.

Q Now, as the bottom hole field pressure declines, there will be less recoverable oil from any location?

A That's correct.

Q So the longer you wait to drill, the less recoverable oil you will have?

A That is right.

Q And how long have you had that lease, do you know?

A No, sir.

Q Approximately six months?

A Mr. Mathis, our geologist from the Land Department would be able to answer that.

Q So as I understand your testimony, sir, what you want is to recover more oil as an exception, that's the only purpose of moving down here?

A No, sir.

Q You don't feel that economics is the primary purpose?

A Yes, sir.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



Q That is the primary purpose, the economic betterment?

A The primary purpose wouldn't be solely economics.

Q What would the primary purpose be?

A As a unit primary purpose, I doubt if we could state that we have one primary purpose, we have --

Q Is economics a major?

A Yes, sir, it is a major.

MR. CHRISTY: Thank you very much.

MR. KELLAHIN: For prevention of drainage is also a major purpose, is it not?

A Yes, sir. Of course, we being the sole operators and having the sole 80-acres, we are handicapped with 80-acre spacing in that we aren't offsetting other acreage.

MR. NUTTER: Any further questions of Mr. Vachal? You may be excused.

MR. VACHAL: May I make one comment, sir?

MR. NUTTER: Yes, sir.

A Concerning this possibility statement that I made in our NE $\frac{1}{4}$  acreage in question, I would like to -- let's see, I stated that would recover fifty to sixty thousand barrels, did I?

MR. PAYNE: That's correct.

A I believe I made that statement before I looked at my notes here, and find that this well has now a 37,000 barrel cumulative production, and that it is producing --

MR. NUTTER: You are referring to which well, Mr. Vachal?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A Tennessee State A Number 2.

MR. NUTTER: The State -- Tennessee State A Number 2 in the NE of the SW of Section 20, is that the well you are referring to?

A Yes, sir.

MR. NUTTER: And that has accumulated production of --

A 37,000 barrels, and it is now producing 60 barrels of oil.

MR. NUTTER: Do you have anything further you wish to add?

A In stating the 50 to 60,000 barrels that I originally stated, I would like to amend that to the extent that this well, the well here, the probability of being a comparable well to the wells in that area.

MR. NUTTER: Do you have anything further?

A No, sir.

MR. NUTTER: Any further questions? Mr. Vachal may be excused. Do you have anything further, Mr. Kellahin?

MR. KELLAHIN: No.

MR. NUTTER: Do you have anything further?

MR. CHRISTY: Nothing further.

MR. NUTTER: Does anyone have anything further they wish to offer?

MR. CHRISTY: Sim Christy of Hervey, Dow and Hinkle, for Tennessee Gas Transmission Company, one of the operators in



question. We have some witnesses. At this time I would like to present to the Examiner, Mr. William Armstrong who is an attorney from Texas, and has previously practiced before the Railroad Commission; I would ask the Examiner to allow the attorney to examine the witness for this case.

MR. NUTTER: Yes, sir. Proceed, Mr. Armstrong.

I think we will take a 10-minute recess before we proceed with this next witness.

(Short recess.)

MR. NUTTER: The hearing will come to order. Please proceed, Mr. Armstrong.

(Witness sworn.)

LESLIE B. PLUMB

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

DIRECT EXAMINATION

BY MR. ARMSTRONG:

Q Will you state your name, occupation, and capacity in which you are employed, please?

A Leslie B. Plumb, P-l-u-m-b, employed as Division Petroleum Engineer by Tennessee Transmission Company in Midland, Texas.

Q Have you previously qualified and testified before this commission in matters of oil and gas?

A Yes, I have.



Q Is the Midland Division in charge of -- what areas is the Midland Division in charge of?

A It includes West Texas and Southeast New Mexico.

Q Are you familiar with the matter sought in the application in Case Number 1718, and the wells in the Kemnitz-Wolfcamp pool?

A Yes, I am.

Q Will the Examiner accept the witness' qualifications?

MR. NUTTER: Yes, proceed.

Q (By Mr. Armstrong) Will you please identify and explain Exhibit Number A on the board?

A Exhibit A is an isopac map of net pay in the Kemnitz-Wolfcamp field, net pay as determined from the microlog of the wells in the field.

Q By whom was this determination made?

A The pay thickness as indicated by the map, the well spots on the map were determined by an engineering committee made up of engineers representing all the operators in the field.

Q And that included Samedan Oil Corporation, a representative from Samedan Oil Corporation?

A That is correct.

Q How does this pay thickness reflected on your map, correspond with the areas, the pay thickness of various wells represented in Mr. Mathis' isopac map, Exhibit Number 2?

A There are several differences in the map, the out-



standing difference I believe being the Tennessee Transmission State Western A Number 1. On Mr. Mathis' is given 27 feet of pay, on this map it is given 24 feet of pay. Also, Mr. Mathis' map does not include the net pay in the Pure Oil Company E Number 3 in the  $W\frac{1}{2}$  of Section 21, nor the Humble B. B. Number 1 in the SW of the NW of Section 22.

Q From the figures reflected on your map, in the two Tennessee wells offsetting the proposed location by Samedan, and the Ohio wells on the North offsetting the orthodox location, judging from those figures then would you say that there was a difference in pay sand thickness between 19 and 30 feet --

A That is correct.

Q -- maximum?

A Maximum difference.

Q In other words, approximately 11 foot difference in that area?

A Between the Ohio S. A. Number 2 and the Tennessee State Western Number -- excuse me, between southern-most boundaries of the lease in question.

Q Now, then, spread throughout the entire quarter section, would there be an appreciable difference at any location in the sand thickness between the regular location and the proposed location?

A No, sir, not from this map as shown; this map shows an area of outstanding equal thickness, and that there should be



very little difference between the thickness of pay encountered in the orthodox location, and the thickness of pay encountered in the unorthodox location.

Q Now, will you identify and explain Exhibit B reflected on the board?

A Exhibit B is a plot of bottom hole pressures in the Kemnitz-Wolfcamp field versus time. There are several lines on the map which I might explain: The top horizontal lines show the initial reservoir pressure of the field to be approximately 3800 PSI; the upper dashed line is the line of bottom hole pressures of several side wells, as determined from drill stem test data taken from these wells as they were in the status of completion; the lower solid line is the line of bottom hole pressure taken in wells subsequent to their completion, or their averaged bottom hole pressures taken from groups of wells subsequent to their completion. It is pointed out that we have available, we have had available to us the most recent bottom hole pressure survey which was just completed last week; this information was not available to Mr. Vachal because the tests were only completed yesterday, and I was able to pick up the information, and in no way reflects on his not having the information, but it does show that the extrapolated pressures on the solid line is continuing at the same rate which has been indicated by previous pressure survey determination. It might be noted from this well that nearly all of the individual wells were completed with a bottom hole pressure slightly higher

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

than the average field reservoir pressure; up until very recently you could not -- on Exhibit B, in September of 1958, the Humble B.B. Number 1 bottom hole pressure on completion falls almost exactly on the extrapolated line, and in March of 1959 Tennessee Gas State D Number 1 bottom hole pressure falls about 15 PSI above the field average at the time of its completion.

Q In other words, the line, the curve was projected earlier and the subsequent drilling confirmed the original projection?

A That is correct.

MR. NUTTER: Is the point shown in late June, the test period that was just concluded?

A Yes, that is correct.

Q (By Mr. Armstrong) Based upon all of this information then, would it be your conclusion that there is an excellent pressure communication in the entire reservoir, and that a well drilled anywhere within the reservoir would encounter the same approximate bottom hole pressure?

A That is correct. A well drilled anywhere within the limits of the field, as shown by the zero line on the isopac, it is indicated that it will encounter the reservoir pressure at the field average pressure which now exists throughout the reservoir.

Q Mr. Mathis testified, I believe, that they did not have title to the tract in question when the original field rules were adopted, and therefore had no occasion to raise.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

any objection or make any comment along this line at that time.  
Who did have the drilling privileges on this tract at that time?

A The lease was held by Tennessee Gas Transmission Company.

Q And why did Tennessee Gas Transmission Company not elect to drill at the regular location, or make application for an exception to the spacing rule?

A Because it was our evaluation of the acreage that a commercial producer could not be drilled on the lease.

Q And based upon what general information was that based upon?

A At the time the well was completed, it was estimated there were one hundred -- approximately 126 barrels per acre foot of oil in place in the reservoir. As the bottom hole pressure has been depleted, the oil has migrated from under the undrilled locations, and at the time that it was our choice to elect whether to drill or not to drill the subject lease, it was our opinion that the field bottom hole pressure had depleted sufficiently that there could not be a commercial well drilled on the lease.

Q In your opinion then, one location, the orthodox location in question is just as good as the proposed exception?

A That is correct.

Q Let me ask you this: When were your calculations made, was your decision based upon those calculations not to drill the quarter section?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A This decision was made in, I believe, January of this year.

Q And that was at that time when the average field pressure was substantially higher than it is now?

A Yes, the average field bottom hole pressure in 1959 was approximately 2620 PSI.

Q And that is when we released it to Sandean?

A That is correct.

Q Were Exhibit A and B prepared by you, or directly under your supervision?

A Yes, sir, they were.

MR. ARMSTRONG? We would like to offer Exhibit A and B.

MR. NUTTER: Without objection, Tennessee's Exhibits A and B will be entered.

MR. ARMSTRONG: This concludes our testimony.

MR. NUTTER: Does anyone have any question of Mr. Plumb?

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Plumb, on your pressure decline survey, as shown on your Exhibit A, I mean on Exhibit B, is it?

A Yes, sir.

Q That does not include the Ohio State well, does it?

A Yes, sir. The Ohio S. A. Number 1 is shown in March



of 1956.

Q That's its initial pressure?

A Yes, sir, that's its initial pressure. The Ohio S. A. 1 is not included in the average. It is a pumping well and cannot run a bottom hole pressure bomb into it.

Q As a matter of fact, the pressure decline around the periphery of the field has been no more rapid than in the center of the field, has it?

A There are some lower bottom hole pressures in the periphery of the field, yes.

Q Then you do not quarrel with the testimony given by Mr. Vachal in regard to the pressure decline on those two wells, do you?

A No, sir, there is no contest of that. The pressures in Ohio S. A. wells is probably lower than the field average pressures, although it might be stated that were the wells given sufficient time to build up before permeability, they might communicate with the reservoir, it would then --

Q How much time do you think it would take to build up the bottom hole pressure?

A That is entirely a function of the permeability of the well, and the bottom hole pressure available to you.

Q Now, do you have any information on that, Mr. Plumb?

A No, sir, I do not have any information on field average permeabilities.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



Q Now, you stated that in your opinion a well drilled at an orthodox location on the Samedan acreage would be as good as one drilled on the proposed location, that is correct?

A That is correct.

Q Do you think that a well drilled on an orthodox location on that acreage would be as good as your Western States well Number 1?

A I would like to make a qualifying remark on that.

Q Go ahead.

A That a well drilled there at this time will recover the same amount of oil that the State Western A Number 1 will recover from this time forward; the cumulative production from the State A Number 1 must be discounted because the bottom hole pressure was higher during the period of its production.

Q Do you think that a well drilled on an orthodox location would encounter the same reservoir pressure as shown by the present average?

A Yes, sir, I do.

Q Is that the case in the Ohio State wells?

A No, sir, they were approximately 100 PSI lower than the field average.

Q I am talking about their present pressures, as shown by the last pressure information available on the two wells.

A Would you restate your original question, please, I don't believe I understood it.



Q You have the pressure information on the Number 1 well, do you not?

A The Ohio State S. A. Number 1?

Q Yes, sir.

A That pressure is over a year old, it is quite an old pressure.

Q I understand that, but it is considerably lower than initial reservoir pressure?

A Yes, it is, but I am not fully convinced that the well had built up to static bottom hole pressure at the time the survey was completed.

Q That would be a function of the permeability?

A In the vicinity of that particular well, you are correct.

Q Now, Mr. Plumb, your testimony tends to show that you have good communication throughout the major portion of the field?

A That is correct, yes.

Q Then that would certainly indicate that the Samedan acreage is suffering drainage, is it not?

A I can say that it is indicated that there, that there was oil under that acreage at the beginning of the field, and since there has been no well drilled on there, then the oil has migrated to some other location; that is to be assumed, yes.

MR. KELLAHIN: Thank you very much, Mr. Plumb.

MR. NUTTER: Any questions of Mr. Plumb?

A (No response.)



MR. NUTTER: Mr. Plumb, your company has drilled quite a number of wells in this pool. What is your average cost of drilling a well here?

A Approximately \$160,000.00.

MR. NUTTER: How many barrels of oil must be recovered from a well in order to pay for the well, and cover the cost of operating the well?

A I would estimate that a recovery of 100,000 barrels of oil would be sufficient to pay out the drilling cost of the well. The operating cost will be a function of whether or not the well is a flowing well, or a pumping well, and then your economic figures will have to be governed accordingly.

MR. NUTTER: What is your State Western Number 1, is that a flowing well, or a pumping well?

A Yes, it is a flowing well.

MR. NUTTER: How about your State C Number 1, in the SW SW of 21?

A Yes, that is a flowing well also.

MR. NUTTER: And is your Western State Number 2 a flowing well?

A Yes, sir.

MR. NUTTER: How long have the Ohio wells been on the pump?

A Since very soon after their completions.

MR. NUTTER: So despite the original high potentials that they had, they ceased to flow fairly early in their life?

A That is correct.

MR. NUTTER: Do you think that a well drilled in the SE $\frac{1}{4}$  of the



SE $\frac{1}{4}$  of Section 20 would produce a hundred thousand barrels of oil?

A No, sir, it is my opinion it would not; not at this time from this date forward.

MR. NUTTER: Do you think that a well in the NE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 20 would produce a hundred thousand barrels?

A No, sir, I do not. But a well drilled in the North-east of that section --

MR. NUTTER: Yes, sir, the orthodox location?

A -- it will have as good a chance of recovering oil as an unorthodox location.

MR. NUTTER: Do you prescribe to the theory that was proposed here, that a well in the NE $\frac{1}{4}$  of the SE $\frac{1}{4}$  would by virtue of low permeability drain only that 40-acre tract, but that a well drilled in the SE $\frac{1}{4}$  of the SE $\frac{1}{4}$  would drain more than a 40-acre tract?

A No, sir, I cannot fully subscribe to that theory.

MR. NUTTER: Do you think -- now, you stated that you didn't think a well in either one of these two locations would produce a hundred thousand barrels of oil, which would be necessary to pay for the cost of drilling a well?

A Yes, sir.

MR. NUTTER: Do you think that that fact, that it wouldn't be a paying proposition, should be the basis for denying an operator the opportunity to drill a well?

A No, sir, I don't think that should be the basis. The basis is that one, in my opinion, one location is as good as

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



another, and that as much oil can be recovered from an orthodox as from an unorthodox location.

MR. NUTTER: Do you think that the Ohio S. A. Number 2 well is draining the NE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 20?

A Since its productivity is in the magnitude of 20 barrels a day, it is not draining at a rapid rate; but it is in pressure communication with the reservoir, and therefore assume it to be drawing from the reservoir, and therefore drawing from whatever undrilled acreage is around it.

MR. NUTTER: Well, do you think that your Western State Number 1, or your Number 2, or your Tennessee Gas and Transmission State C Number 1, are draining the SE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 20?

A Since there is pressure communication in the reservoir, it is drawing oil from the entire reservoir, yes.

MR. NUTTER: Do you think that if a well had been drilled in the NE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 20 earlier in the life of the pool that it would have made a hundred thousand barrels of oil?

A Had it been drilled early enough, I think that is correct.

MR. NUTTER: Do you think either one of those Ohio wells are going to pay out?

A I believe that the Number 1 will probably pay out the drilling and completion costs of the well, yes.



MR. NUTTER: Anyone have any further questions of Mr. Plumb?

MR. KELLAHIN: May I ask a couple of more, please?

QUESTIONS BY MR. KELLAHIN:

Q Mr. Plumb, you said that had a well been drilled in the NE $\frac{1}{4}$  of the SE $\frac{1}{4}$  early in the life of the field, it would have been a commercial well, is that correct?

A That's my opinion.

Q Do you know who had control of the acreage at that time?

A Tennessee had a farmout from Samedan Corporation.

Q They did not drill it?

A No, sir, it did not fit into our development plan of the field, and we did not get to evaluate that acreage until such a time as the bottom hole pressure was depleted until we thought it was uneconomical to drill.

Q Now, on your Western State Number 1 well, you had accumulated production of some 36,000 barrels, is that --

A State Western Number 1?

Q Let me rephrase that, Mr. Plumb. On that well, that Western State Number 1, is it not true you had produced 36,000 barrels with a pressure drop of 102 pounds?

A I'll not contest that statement; I do not have all of those numbers in my head, and don't have those figures prepared.

Q Assuming that is correct, wouldn't that indicate that



a well drilled as proposed by Samedan, could be a commercial well, assuming that to be true?

A Defining a commercial well, it will produce at a rate which will more than pay operating expenses for awhile, but whether its cumulative production would be sufficient to pay out the entire cost of drilling, it is my opinion that it will not.

MR. KELLAHIN: That's all the questions I have.

MR. ARMSTRONG: I have one more question, if I may?

MR. NUTTER: Mr. Armstrong.

QUESTIONS BY MR. ARMSTRONG:

Q Judging by your decline curve up there, would you say that your pressure declined on a straight line, or would you say that it was progressive?

A The bottom hole pressure decline is very uniform, as shown here; I think with great accuracy it can be extrapolated onto the ultimate life of the field, I think you can plot the pressure decline, oh, as far into the future as you care to.

MR. ARMSTRONG: That's all.

MR. NUTTER: Any further questions? Mr. Plumb may be excused.

MR. CHRISTY: Mr. Examiner, that's all we have for Tennessee Gas in this hearing.

MR. NUTTER: Does anyone have any further testimony they wish to offer in this case? Does anyone have any statement they wish to offer?



MR. ANDERSON: R. M. Anderson, Sinclair Oil and Gas Company. Sinclair would have preferred the development in this field would have proceeded on flexible rules; however, at the last hearing in November, 1958, Sinclair concurred with retaining the alleged spacing rules in this field for the reason that the field limits have been established, and that practically all of the development in the field was over and completed; in fact, all the wells had been drilled under the rigid rules, and we could see no reason to change the spacing rule at that late date, and we still feel the same way. We feel that all the operators have developed under the rigid rules, and we feel that an exception granted at this time to an operator will invite further exceptions, which will in effect nullify our rigid spacing rule after all of the development has essentially taken place, and therefore we are opposed to application and request that the commission deny it.

MR. NUTTER: Anything further?

MR. KELLAHIN: If the Commission, please, we feel that we have presented a case which shows that for whatever reason it might have been, and we do not quarrel and do not want to be understood to be quarreling with Tennessee Gas as to why or why not they did not drill this acreage, the facts of the matter are the acreage was only recently turned back to Samedan, and it was turned back undrilled. We feel that we have shown that due to a permeability pinch out, the acreage to the North is not productive to the extent that it would justify economically a well drilled on



an orthodox location, whereas a well drilled to the South, we have shown would be economical.

Now, lest we be accused of basing our case purely on economics, as was inferred at one point in this case, our main purpose in this case is to prevent the drainage of acreage held by Samedan. This being the only acreage held by Samedan in this vicinity, and we have shown it is already subject to drainage; the witness offered by Tennessee Gas has testified that it had been subject to drainage, and in order to protect the interest of the applicant in this case it is necessary that a well be drilled on this acreage. Now, in order to drill a well on this acreage, we would like to get a commercial well, and the only point, as our testimony shows, where we can drill a commercial well is at the location proposed in this application, and a denial of that right would result in damage to the correlative rights of Samedan Oil Corporation. Thank you.

MR. CHRISTY: Mr. Examiner, we would like to make one comment on the closing statement of Mr. Kellahin. He has accurately summed up his side of the case. However, we find when we look at the exhibits, that there is a difference in the, particularly in the isopathic, there is a difference of opinion as to the pay thickness in this 80-acre tract. We believe that the determination by all of the operators in the field would be entitled to great weight by this Commission. This is not the figures of one personal opinion, this is the figures of all the operators in the area, the subject committee in charge of determining that question.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Therefore, we feel that the isopathic map presented by Tennessee Gas is entitled to great weight in that respect. You may, from those particular net pay sections, see that the 80-acres in question has approximately a 19 to 20 pay thickness running almost unbroken through the entire 80-acres; it does vary some here and there, but what they are asking for is to drill a location which from the evidence as we can see it, would not be productive regardless of where they drilled it, as productive as we speak of productive being commercially productive.

They may, in fact, be being drained, as a matter of fact it is obvious if they have undrilled locations in a reservoir pool, that that oil underneath it will be drained. The primary drainage, according to their witness, appears to be down in the Tennessee's two wells to the South and the one over here; they are all three Tennessee wells, I believe, surrounding it, which I believe they testified that they were an undivided owner in those two wells, so in part they are being drained to themselves.

Now, if they wish to drill a well on what we believe is unproductive in the economic sense, we do not feel that at this late date they should come in and ask the Commission for exception to a frozen pattern that has been established in this field for several years. If you do that, if you allow it once, you are going to almost of necessity have to allow it in four or five other instances, or you will be granting a privilege to one and not the other. Therefore, we feel that if such a matter of exceptions were to be



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

found, they should have been early in the game, so to speak, that this is too late in the history of the field to now start allowing exceptions to the rigid rules, we have all lived with them for many years. We feel that if Samedan wants to take a chance on an orthodox location, that that is fair, but we don't feel it is fair for them to drill in an unorthodox location when all the operators have lived with the regulations and rules through all these years to now allow someone else a privilege that we did not have.

MR. KELLAHIN: I just want to make this observation. While there is some difference in the entire presentation of the net pay as between the evidence presented by Tennessee Gas and that presented by Samedan, I would like to point out that at no place did we say that there was distinct variation in the porosity between the North and South of our acreage; it is approximately the same, and the structure is approximately the same. I think it is highly significant, however, that no evidence was offered to rebut our contention as shown by the production history in the area, that there is a pinch out to the North and that permeability is the significant factor involved in this case.

MR. NUTTER: Does anyone have anything further for Case 1718? We will take the case under advisement.

(Whereupon the hearing on Case 1718 was concluded.)



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

STATE OF NEW MEXICO )  
 ) ss.  
COUNTY OF BERNALILLO )

I, J. A. TRUJILLO, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript by me and/or under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill, and ability.

WITNESS my Hand and Seal, this, the 15th day of July, 1949, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

*Joseph A. Trujillo*  
NOTARY PUBLIC

My Commission Expires:

October 5, 1960.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1718 heard by me on 7-8, 19 59.

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

