BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 17, 1961

IN THE MATTER OF: The hearing called by the Oil Conservation Commission to permit Pan American Petroleum Corporation and all other interested parties to appear and show cause why the special Rules and Regulations in effect in the Atoka-Pennsylvanian Gas Pool, Eddy County, New Mexico, should be continued beyond June 1, 1961.	Case 1669

TRANSCRIPT OF HEARING

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The hearing called by the Oil Conservation Commission to permit Pan American Petroleum Corporation and all other interested parties to appear and show cause why the special Rules and Regulations in effect in the Atoka-Pennsylvanian Gas Pool, Eddy County, New Mexico, should be continued beyond June 1, 1961.	Case 1669

BEFORE: Mr. A. L. Porter,
Mr. Murray Morgan

TRANSCRIPT OF HEARING

MR. MORRIS: In the matter of the hearing called by the Oil Conservation Commission to permit Pan American Petroleum Corporation and all other interested parties to appear and show cause why the special Rules and Regulations in effect in the Atoka-Pennsylvanian Gas Pool, Eddy County, New Mexico, should be continued beyond June 1, 1961.

MR. PORTER: Mr. Buell.

MR. BUELL: May it please the Commission, we have several large exhibits we would like to put on the board. I believe we would save time if we could have a short recess.

MR. PORTER: We will have that short recess in time.

First, I would like to call for other appearances. I would like to have appearances in Case 1669 in regard to rules and regulations in the Atoka-Pennsylvanian Pool.

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, Santa Fe, appearing for Standard Oil Company of Texas.

MR. SETH: Oliver Seth for Ohio Oil Company and Mr. Terrell Couch.

MR. LOSEE: A. J. Losee, Losee and Stewart for Yates Petroleum Corporation and Martin Yates, III.

MR. PORTER: Mr. Anderson.

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

MR. PORTER: Anyone else? At this time we'll take a short break while Mr. Buell posts his exhibits.

(Whereupon, a short recess was taken.)

(Whereupon, Pan American's Exhibits 1 through 7 were marked for identification.)

MR. PORTER: The hearing will come to order. We will proceed with Case 1669, Mr. Buell.

MR. BUELL: May it please the Commission, we have one witness, Mr. Smith, who has not been sworn.

MR. PORTER: Would you have your witness come forward, please, and be sworn.

(Witness sworn.)

MR. BUELL: While the witness is making his way up to the stand, I might briefly review the background on the case. It was first heard in May, 1959 at the regular hearing on the application of Pan American for temporary pool rules. As a result of that hearing the Commission issued Order R-1417, which adopted for a period of one year, in essence, 320-acre spacing units and the spacing regulation.

The Commission also, in that order, called the hearing again for the regular hearing in May of 1960. At that time the operators in this pool had the report to the Commission that the conditions were essentially the same, there had been no production from the pool, and we recommended that the temporary pools be continued for another year.

The Commission then issued Order R-1417 A, which continued the pool rules in effect, for one more year, and set the hearing that we're at today. We're happy to report that we believe we now have sufficient data to amply justify permanent rules for this pool.

BILLY J. SMITH

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

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Smith, would you state your full name, by whom

do you mean by unsuccessful tests?

A The data from these wells indicate that they are capable of producing gas, however, not in commercial quantities.

Q So you distinguished them in that manner from the literal word of dry hole?

A That is true.

Q In that they did give up some gas from the Atoka formation?

A In most cases they did or indicated they would be productive.

Q Go right ahead with your explanation.

A There's one drilling well currently, Pan American Lee No. 1, and it is shown as a yellow circle. The standard units are shown and red outlined throughout the field and they consist of either the North Half of the South Half or the West Half of the section.

Q Would you locate, for the record, the half section that the drilling well is in?

A The drilling well is in the North Half of Section 22, and this area is included in Township 18 South, Range 26 East.

Q Mr. Smith, did you state that each and every producing well in this pool, as well as the drilling well, has a standard unit assigned to it?

A That is true that they are standard units. Some of the

No. 3. Is that the cross section, the trace of which you were just discussing?

A Exhibit 3 is the cross section showing a trace here, it goes from AA[1] from Ohio Nix No. 1 through the field to Pan American's Flint No. 1.

Q Briefly describe what is reflected on Exhibit 3.

A Exhibit 3 is the four wells shown in Exhibit 2 that the Atoka-Pennsylvanian pay zone is colored in yellow through the cross section.

Q Mr. Smith, do you have any trouble correlating the Atoka-Pennsylvanian pay, not only on the logs on this exhibit, but throughout the field?

A The pay zone is fairly easy to correlate throughout the field, and it can be depicted with ease on the logs.

Q In your opinion is this reservoir a uniform and continuous reservoir?

A The reservoir is uniform, it is the blanket type formation lain down uniformly over the area.

Q Based on your subsurface evaluation of this reservoir, did you run across any structural impediments to the free flow of communication within the reservoir?

A No, as reflected in the structure map, and also shown on the cross section, that it is uniform and there's no such impediments.

Q So, structurally then, we certainly have the continuity for communication and effective drainage over large areas?

A That is true.

Q While we're talking about this reservoir, Mr. Smith, let me ask you this, have any cores been taken of the Pennsylvanian pay in this field?

A There have been several cores, there are three large core analyses that have been obtained in the field.

Q What do they reflect with respect to rock characteristics?

A The average porosity of the field core analysis was 12.5%, and the average permeability, 338 millidarcies.

Q Do you recall what the estimated water saturation was?

A The calculations from logs indicate that the water saturation is in the range of 18%.

Q Go now to what has been marked as Pan American's Exhibit No. 4. What data is reflected on that exhibit?

A Exhibit No. 4 is a tabulation of production from the field. The tabulation shows the production from various wells, and, it also shows the field cumulative production at any corresponding month on the left-hand side of the exhibit. That this point corresponds to the month that is cumulative to that date. The wells is the actual production during the month shown here. The field total today is 2,777,000,000 cubic feet.

Q By the date, I know you had to cut that exhibit off some time, what date did you have in mind?

A April 1st, when this was prepared.

Q April 1, 1960? A That's right.

Q Do you feel that any other comments are necessary on this exhibit, or is it fairly self-explanatory?

A It is self-explanatory.

Q Go now to what has been marked Pan American's Exhibits No. 5 and 6 and I ask you to look at both of them, because I feel that you'll be using them in conjunction with the other. What do you have plotted on Exhibit No. 5?

A Exhibit 5 shows the pressure communication throughout the Atoka-Pennsylvanian field by comparing the original reservoir pressure with initial bottom hole pressures on subsequent wells completed after discovery.

Q Exhibit 6 appears from here to simply be a face map similar to the one that you used on Exhibits 1 and 2, is that observation correct?

A That is correct.

Q You will use that exhibit in conjunction with your testimony on Exhibit 5?

A Yes, sir.

Q Go now to Exhibit 5, Mr. Smith, and discuss in detail the data you have plotted on that exhibit.

A The red dot and corresponding red line is the original reservoir pressure as recorded in Standard of Texas Everest No. 1, which was the discovery well. This pressure was at a minus 5600, datum was 3722 psi.

Q Would you locate that discovery well on your Exhibit 6 so we can see geographically where it lies in the field?

A The red code is followed over here. The well is in the Southwest Quarter of Section 14.

Q Do you use this same color code for other wells, the pressure you plotted on Exhibit 5?

A Yes, all the exhibits have the same color code, that's right.

Q So you can look at the color pressure point and go to the map and that's that well?

A That's right.

Q Now, that takes care of the original or discovery pressure. When we speak of initial pressures on subsequently completed wells, what do we mean?

A That is the initial bottom hole pressure that's recorded on completion of the well before the well is put on production.

Q Now, what point on your Exhibit 5 represents the first pressure point of a subsequently completed well?

A The blue dot represents the initial bottom hole pressure

on Pan American's Flint No. 1, and also Ohio Nix No. 1. These two pressures were reported at the same cumulative production from the field.

Q You are plotting these against cumulative production?

A That is correct. It's a bottom hole pressure from the cumulative production from the field.

Q What had been the cumulative production from the field when the pressure on Flint No. 1 and Ohio Nix No. 1 were taken?

A 225,000,000 cubic feet.

Q What was the pressure on those two wells?

A The pressure on these two wells was 3650 psia.

Q How much below the virgin or discovery pressure is that?

A That's 72 psi.

Q Would you locate on Exhibit 6 the geographical location of those two wells, please?

A Pan American's Flint No. 1 is located in the Southeast Quarter of Section 22 and Ohio Nix is located in the Southeast Quarter of Section 29.

Q While you have your pointer there pointing at Ohio Nix well, approximately how far was it from the nearest producing well at the time that initial pressure was taken?

A The Nix, the nearest production at the time this initial pressure was taken, was Standard of Texas Martin No. 1 approximately 14,000 feet to the Northeast.

Q Go now to the Flint well and, at the time the initial pressure was run on that well, how far away was the nearest producing well at that time?

A The nearest producing well to Pan American's Flint No. 1 was also the Martin well and it is 4900 feet to the north.

Q Go now to your next pressure point on Exhibit 5. I can't pick out that color from here, what color is that?

A That's orange. The orange dot.

Q Go ahead.

A It is the initial bottom hole pressure on Ohio's Noel No. 1. The pressure point was 3644 psi.

Q How much is that below the discovery pressure?

A 78 psi below the original pressure.

Q Would you locate that well on Exhibit 6 so we can see about where it lies?

A The Noel is located in the Southeast Quarter of Section 20.

Q How far was the nearest producing well to it at the time that initial pressure was taken?

A The nearest producing well was Ohio's Arnquist No. 1, 3800 feet to the Southwest.

Q Now, all of these distances we have been referring to, Mr. Smith, they show drainage far in excess of 320 acres, is that right?

A That is correct.

Q Go now to your next pressure point on Exhibit 5.

A The next pressure point is colored in brown. It's the initial bottom hole pressure on Yates Meyer No. 1. The pressure at a cumulative of 2,230,000,000 cubic feet was 3592 psi.

Q How much is that below original?

A That is 130 psi below the original pressure.

Q Would you locate that well on your Exhibit 6?

A It is located in the Northwest Quarter of 28.

Q How far was the nearest producing well to that well at the time that initial pressure was taken?

A The nearest producing well was Ohio's Noel and was 2700 feet to the west.

Q Mr. Smith, we have been talking about effective communication being reflected by the fact that the initial pressure prior to any production on the subsequent wells was considerably lower than discovery. Assuming the converse of that, say we didn't have effective pressure communication, what would you have expected these initial pressures on these subsequent wells to have been, assuming no effective communication?

A If you had no effective communication between the wells, the subsequent completions, after discovery, would have approximately the same bottom hole pressure as the discovery.

Q To you, as a reservoir engineer, the actual physical

fact that they came in much lower than discovery, can that mean anything to you other than effective pressure communication?

A That is true that the withdrawals of fluid from the reservoir resulted in their decreased pressures.

Q Go now to the next point on your Exhibit 5, what well is that reflected by?

A The last point is the initial bottom hole pressure on Yates Gushwa No. 1. The initial pressure on that well was 3561 psi at a cumulative of 2,757,000,000 cubic feet.

Q What color is that?

A That is green.

Q How much lower than original pressure was that initial pressure?

A The Gushwa pressure was 161 psi below the original pressure.

Q Would you now locate that well on Exhibit 6?

A The Gushwa is located in the Southeast Quarter of Section 21.

Q I notice you have a red circle around that well, it appears to be in the center of that circle. Mr. Smith, what does that indicate?

A The red outline is a circle that contains 320 acres.

Q Why did you draw a circle around this well and you didn't draw any around any of the other wells?

A This particular well was closer to an offsetting well than any other wells. The others were greatly in excess of this. The nearest to the Gushwa is Olsen Townsite. It is located about 2100 feet away, which would be a radius of a circle 320-acre drainage.

Q The nearest producing well was so located that it showed exactly, I shouldn't say exactly, I should say a minimum drainage acre of 320?

A That is true that the nearest well that could have drained 320 that had communication with this well was the Dayton Townsite well. However, at this time, that the Dayton well has not produced appreciable quantities of gas, that's in the range of 30 to 40 mile.

Q Would you suspect, then, that some of the interchanges experienced in the Gurbwa well was caused by wells even further than 2100 feet away?

A That is very likely since the other wells have produced appreciably more gas than the Dayton well.

Q But all of your data reflected on Exhibits 5 and 6 show that a well in this pool will effectively drain in excess of 320?

A That is true, that the data conclusively shows that it will drain greatly in excess of 320 acres.

Q Go now to what has been marked as Pan American's

Exhibit No. 7. What is that exhibit and what does it reflect?

A Exhibit No. 7 shows the theoretical pressure performance, Pan American's Flint No. 1, assuming a 320 acre drainage as compared to the actual observed pressure performance.

Q What do you mean by theoretical predicted performance, assuming drainage of only 320 acres?

A By knowing the reservoirs under the 320-acre tract that you can calculate the pressure at any volume of withdrawal.

Q You plotted these curves against cumulative?

A That's correct.

Q You mean you reservoir engineers can ascertain the reservoirs under 320 acres around our Flint No. 1, and, ascertaining those reservoirs, you can predict the performance at any given cumulative given production figure, assuming that that well is draining only that 320 acres?

A That is correct.

Q What color is the curve that represents that predicted performance?

A The theoretical pressure performance is shown in green and is the lower curve on the exhibit.

Q How have you shown the actual observed performance we gathered on this well?

A The actual observed performance is shown in red and is the upper curve.

Q Let's compare the end points of the two curves. At what cumulative figure was your most recent pressure on the Flint No. 1?

A The latest pressure survey on the Flint was taken with a cumulative production from the well of 772,000,000 cubic feet.

Q Let's look at the actual observed performance, what pressure was obtained on that well at that cumulative production?

A The actual observed was 3514 psia after the cumulative of 772,000,000.

Q Let's compare that pressure with what you have predicted the pressure to be, assuming the Flint well was only draining 320 acres.

A By assuming that the well is draining only 320 acres, the calculated bottom hole pressure was 3,092 psia.

Q At the same cumulative?

A At the same cumulative.

Q How much higher was actual observed pressure?

A The actual observed pressure was 558 psia above the calculated pressure.

Q As a reservoir engineer, what conclusion do you draw from that?

A That the data shows that this well is certainly draining at the present time greatly in excess of 320 acres.

Q Do you know, based on these data, actually what that

well was draining at the time these data were gathered?

A The theoretical calculations show that it will drain in excess of 700 acres.

Q Now, in calculating the reserves under 320 acres around our Flint No. 1, what method did you use, Mr. Smith?

A Just a straight pore volume calculation.

Q Do you feel that is a realistic method of ascertaining reserves?

A Yes, sir, it is.

Q Usually it's on the high side, isn't it, when you later compare it with the present completion?

A In most cases it is an optimistic view, but it's a practical way and useful way of obtaining reserves.

Q I wonder, has a recent field-wide survey of pressures been taken?

A There was a cooperative bottom hole pressure survey taken the first part of this year in February, March and April on seven of the wells in the field.

Q Have you tabulated that in exhibit form, Mr. Smith?

A I have a rough draft only that I have tabulated in on.

Q Let me have that. Do you have a pen or pencil?

A Yes.

Q Let's take Exhibit 6 and I'll call these off and will you write as legible as you can, I will also give the date, but

you don't need to put that on the map. Would you locate the Standard of Texas Everest well?

A The Standard of Texas Everest No. 1 is located in the Southwest Quarter of Section 14.

Q On April 4th, 1961, a pressure was taken on that well of 3573. Would you jump now over to the Standard of Texas Martin well and on March 22, 1961, a pressure of 3591 --

A Was taken on that well.

Q Drop down now to Pan American's Flint, on March 21, 1961, a pressure was taken on that well of 3514. Now, on over to the Ohio Nix No. 1, and on March 15, 1961 a pressure was taken on that well of 3544. Now, jump up to Ohio's Noel Well No. 1, and on March 15, 1961 a pressure of 3,591. On the Yates Gushwa, No. 1, the initial pressure on that well taken on April 28, 1961 was 3561.

Now, go to the Yates Meyer No. 1 Well and the initial pressure on that well on February 15, 1961 was 3592.

Mr. Smith, looking at those pressures over that large geographical area, all of them taken at approximately the same time within a month or so of each other, it appears from here that the pressures are relatively uniform, would you agree with that observation?

A That is true, that the pressures over the whole area show very close agreement.

Q It would be an extremely fortuitous occurrence, would it not, if data such as this did not indicate a very effective communication?

A That is true, especially in view of the fact that some of the wells have produced considerably greater, more gas than some of the others. The Gushwa has no production well, take these two--

Q At which point?

A At the time the pressure was taken. It has a bottom hole pressure of 561. The Pan American Flint No. 1 has a bottom hole pressure of 3419 after 772,000,000 feet of gas was produced, and the close agreement shows that it is in very good communication.

Q As I recall, in your testimony, I believe you said that in your opinion a well in this reservoir will effectively, efficiently and economically drain in excess of 320 acres. Is my recollection correct?

A That is correct. We have shown by three methods that I will summarize very quickly, that there's very good communication, and that the wells can d rain in excess of 320 acres. I call your attention to Exhibit No. 5, it shows the pressure communication by comparing the original pressure with subsequent initial bottom hole pressure after the discovery well.

In Exhibit 7 we show the theoretical pressure performance on the Pan American Flint No. 1 as compared to the actual

observed performance. This, again, shows very good communication.

In Exhibit 6, the very close agreement with the bottom hole pressures after considerable gas had been produced. These exhibits conclusively prove that the reservoir is in very good communication.

Q In your opinion, as a reservoir engineer, Mr. Smith, if this pool is developed on any greater density than 320 acres, would it be through the drilling and completion ofmany unncessary wells?

A Yes, sir, anything less than 320 acres would certainly result in drilling quite a number of unnecessary wells and result in a considerable expense.

Q Certainly, then, your recommended unit size of 320 acres would prevent waste?

A It certainly would.

Q Now, looking at the other side of the coin, do you feel that your recommended rules for this pool will protect the correlative rights of all owners of interest?

A The good communication that it would, that it would protect the correlative rights.

Q Do you have anything further you would like to add at this time, Mr. Smith?

A That's everything.

MR. BUELL: May it please the Commission, that's all

the direct we have. I might formally offer at this time Pan American's Exhibits 1 through 7 inclusive.

MR. PORTER: Without objection, Pan American's Exhibits 1 through 7 will be admitted to the record. Any questions of the witness?

MR. MORRIS: Yes.

MR. PORTER: Mr. Morris.

CROSS EXAMINATION

BY MR. MORRIS:

Q Mr. Smith, you have recommended that the temporary rules that are in effect in the Atoka-Pennsylvanian Gas Pool at the present time be made permanent, is that correct?

A That is correct.

Q That includes a provision for what we call a rigid pattern, meaning that the wells would have to be completed in either the Northwest Quarter or the Southeast Quarter of the section?

A That is true.

Q In looking at your Exhibit No. 1, I note only two wells, unless I have overlooked some, that are off pattern. One was drilled before June the 5th, 1959 and the other, the Olsen Dayton Townsite Well, for which an unorthodox location has been approved by the Commission. Do you concur with my observations?

A That is correct.

Q Why are you recommending a fixed pattern rather than a flexible pattern in this pool?

A We feel that the fixed pattern would adequately result in development of the field. Of course, the rules provide for exceptions, and that is the rule is written that the field will essentially be developed on a uniform pattern.

Q Do you feel that development along the edge of the pool, let's say, particularly toward the northwest or the southeast, would be impeded by adherence to the rigid pattern?

A Of course, you are getting out in the area of questionable production when you get into the extreme part in either direction, and this direction does not control, it's wide open. I feel that development on the standard locations would not impede development of the field, if necessary that there can be exception and drilled unorthodox locations.

Q Do you feel that the Commission should be liberal in granting exceptions to the location requirement of the rule?

A Only if the data justifies the exception.

MR. MORRIS: Thank you, Mr. Smith, I have no further questions.

MR. PORTER: Mr. Nutter.

BY MR. NUTTER:

Q Mr. Smith, do you have initial pressures for the wells which you didn't give initial pressures for?

A Those were the only wells that had initial pressures. There were some other pressures available, however, they were taken after the wells produced certain quanitites of gas.

Q Ohio didn't take an initial bottom hole pressure on their Arnquist well?

A It was not available to us.

Q Did Olsen take an initial bottom hole pressure on the Dayton Townsite well?

A No, sir, it's my understanding that he did not.

Q I presume there wasn't any available on Pan American's Martin No. 1 well?

A There was no initial bottom hole pressure available on the Martin.

Q And Pan American didn't take an initial bottom hole pressure on its Martin well?

A We did take an initial pressure on Pan American's Martin No. 1. However, it was not considered reliable. It was greatly below the other pressures and it was not considered a reliable pressure.

Q How about the well in the Northwest of Section 27, is that a gas well in that pool?

A I believe it's Nearburg and Ingrams Lee Well, possibly, in the Northwest of 27.

Q Yes.

A Yes, that is their Hawkins No. 2.

Q Was there any bottom hole pressure available on completion of that well?

A No, sir, there was not available to us.

Q Have you plotted the only bottom hole pressures that were available to you on your Exhibit No. 5?

A With the exception of the Martin, as pointed out earlier, that the pressure was not considered reliable at all, but these are the initial bottom hole pressures on the field that were available.

Q The pressure on Pan American's Martin well wouldn't have fitted on the general curve that's drawn from the red point on Exhibit 5 down to the green point on the Gushwa well, is that correct? It would have been below that line?

A As well as I remember, the pressure was in the range of 3500 in the earlier stage of depletion, and it was not considered reliable.

Q What basis did you use for drawing the red line on this other exhibit? I don't know what the number of it is.

A The red line is actually, we observed a pressure at a cumulative of 772,000,000 cubic feet, a bottom hole pressure was taken on the well at that time.

MR. BUELL: Identify the exhibit, Mr. Smith.

A Exhibit 7. The red line connects the initial bottom hole pressure on the Flint to the observed pressure at the

later date.

Q What data did you use for drawing the green line?

A The green line is theoretical calculation, taking a pore volume reserve in the 320 acres and calculating the pressure at a cumulative of 772,000,000 cubic feet.

Q This data that you gave on the cores that were available was used in making that computation?

A That is correct.

Q Which wells were the wells that were cored, Mr. Smith?

A The cores that I had available to me were the, had a core analysis on Yates Gushwa, on Olsen Dayton Townsite, and on the Everest well. That is the Standard of Texas Everest well.

Q What thickness did you use for the sand on your Flint No. 1?

A Twenty feet.

Q Did you use the 12½% porosity that you mentioned earlier?

A Yes, sir.

Q And 18% water saturation?

A Yes, sir.

Q Now, the 20 feet, I presume, was taken from your log and used in correlation with the logs which were available on the cored wells?

A That is correct.

MR. NUTTER: I believe that's all, thank you.

MR. PORTER: Mr. Utz.

BY MR. UTZ:

Q What pressure did you use for your pore volume calculation?

A Well, actually calculated the pressure, took the initial pressure and then calculated the second pressure at a cumulative of 772,000,000 cubic feet with the pore volume formula.

Q Do you recall your reserve per acre?

A In this study, why calculate a recovery per acre that actually with this calculation that you calculate your recovery over a certain pressure period, a pressure completion period. So, this is the recovery, the pressure at a recovery of 772,000,000 cubic feet.

Q You didn't come up with an accurate pore volume reserve?

A Not down to abandonment pressure, no, sir.

Q What datum, in reference to your pressures on Exhibit 5, what datum did you use?

A All of the datums are minus 5600 feet.

MR. UTZ: That's all I have, thank you.

MR. PORTER: Mr. Nutter.

BY MR. NUTTER:

Q Mr. Smith, did you have bottom hole pressures maybe on drill stem tests on the non-productive wells which are shown as dry holes on the exhibit?

A The pressures, I did not use those on the dry holes, no.

Q How much gas did these gray wells make on this exhibit?

A They varied, if I recall correctly, that the Cary well, I believe, flowed around 200 MCF per day, in that range. I believe the Nix-Curtis in the Northwest Quarter of Section 32 had a flow rate around 300.

Q And you don't know the pressures?

A No, I don't know the pressures on those.

MR. NUTTER: Thank you.

MR. PORTER: Does anyone else have a question of Mr. Smith? He may be excused.

(Witness excused.)

MR. PORTER: Does this conclude Pan American's testimony?

MR. BUELL: We have no other witness.

MR. PORTER: Does anyone else desire to present testimony in this case? I'll call for statements at this time. Does anyone have a statement to make in the case? Mr. Kellahin.

MR. KELLAHIN: Jason Kellahin for Standard of Texas. Standard of Texas concurs with the recommendations which have been made by Pan American and recommends that the order of the Atoka-Pennsylvanian Pool be made permanent with 320-acre spacing units. Standard feels that the evidence amply justifies 320-acre spacing pattern and clearly shows that one well will drain

not only 320 acres but quite a bit in excess of that amount, and that another well on the same unit would result in waste.

MR. PORTER: Mr. Gordon.

MR. GORDON: J. C. Gordon, Socony Mobil. Socony Mobil, as an interest owner in the field, concurs with the recommendation made by Pan American Petroleum Corporation for permanent 320-acre spacing units in the Atoka-Pennsylvanian Field.

MR. PORTER: Mr. Losee.

MR. LOSEE: Yates Petroleum and Martin Yates, III, are the owners of working interests in five wells, and Martin has a riding or overriding in eight other wells in the Atoka-Pennsylvanian.

In this pool Yates feels that each well will satisfactorily drain at least 320 acres, that any spacing pattern less than 320 is uneconomical from the operator's standpoint, and is unnecessary to protect the correlative rights of any other interest parties.

We recommend that the Commission make permanent its temporary order for 320-acre spacing.

MR. COUCH: The Ohio believes that the evidence and testimony presented by Pan American very definitely establishes that wells in this pool will drain in excess of 320 acres, and that the drilling of additional wells, drilling the pool to an additional density, would be the drilling of very unnecessary

wells. We definitely recommend and join with the Pan American, that the existing order be made permanent.

MR. PORTER: Mr. Anderson.

MR. ANDERSON: R. M. Anderson, Sinclair Oil and Gas Company. We wish to concur with Pan American in their recommendations here today.

MR. PORTER: Anyone else have a statement to make in the case?

MR. MORRIS: Mr. Commissioner, we have a telegram from Gulf Oil Corporation urging the Commission to continue in effect the special rules and regulations for the Atoka-Pennsylvanian Gas Pool.

MR. PORTER: If nothing further to be offered in the Case 1669, the Commission will take it under advisement and take up next Case 2276.

STATE OF NEW MEXICO)
:
COUNTY OF BERNALILLO)

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

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 22nd day of May, 1961.

Notary Public-Court Reporter

My commission expires:

June 19, 1963.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE NO. 1669

TRANSCRIPT OF HEARING

MAY 14, 1959

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
3-6691 5-9546

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
MAY 14, 1959.

IN THE MATTER OF:

CASE #1669 Application of Pan American Petroleum Corporation for the promulgation of temporary special rules and regulations for the Atoka-Pennsylvanian Gas Pool in Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order promulgating temporary special rules and regulations for the Atoka-Pennsylvanian Gas Pool in Eddy County, New Mexico, to provide for 320-acre spacing units and for well location requirements.

BEFORE:

Mr. Murray Morgan
Gov. John Burroughs
Mr. A. L. Porter

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: Next case on docket is 1669.

MR. PAYNE: Case 1669. Application of Pan American Petroleum Corporation for the promulgation of temporary special rules and regulations for the Atoka-Pennsylvanian Gas Pool in Eddy County, New Mexico.

MR. PORTER: I would like to call for appearances in this case.

MR. NEWMAN: Kirk Newman of Roswell, New Mexico, and Guy Buell, a member of the Texas Bar, representing Pan-American Petroleum Corporation.

I N D E X

NUMBER	EXHIBIT	FOR IDENTIFICATION	OFFERED
Pan American's 1	Proposed Rules & Regulations	3	16
Pan American's 2	Plat	6	16
Pan American's 3	Cross Section	8	16
Pan American's 4	Compilation of Information	10	16
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MR. ANDERSON: R. M. Anderson, and A. M. McDonald, Junior, Sinclair Oil and Gas Company; and I have a statement I would like to make at the close of the case.

MR. BUELL: May it please the Commission, we have one witness, Mr. Currans, who has not been sworn.

(Witness sworn.)

DANIEL R. CURRANS

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

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Currans, state your full name, by whom you are employed, at what location, and in what capacity, please.

A Daniel R. Currans, employed by Pan American Petroleum Corporation as petroleum engineer, Lubbock, Texas.

Q Mr. Currans, you testified at prior Commission hearings, have you not?

A Yes, sir.

Q Your qualifications, are they a matter of public record?

A Yes, sir.

MR. BUELL: Any questions, Mr. Porter?

MR. PORTER: No questions concerning the witness' qualifications, they are acceptable.

Q (By Mr. Buell) I direct your attention, Mr. Currans, to what has been marked as Pan American's Exhibit 1, what is that?

A Exhibit Number 1 is a set of proposed rules and regulations for the Atoka-Pennsylvanian Gas Pool.

Q Are these the rules that you are recommending the Commission adopt for this pool?

A Yes, sir, and I would like to state at the outset that I would recommend that these rules be adopted for a period of a minimum of one year.

Q On a temporary basis of at least one year?

A Yes, sir.

Q All right, sir. In order, Mr. Currans, that everyone can analyze and evaluate your testimony and exhibit from your standpoint of your recommended rules, I would like you to take Exhibit 1 and briefly summarize each rule you are recommending.

A All right, sir. Starting with Rule Number 1, this rule would define the wells that would be considered to be in the Atoka-Pennsylvanian Gas Pool, those wells a mile or less from the outer boundaries would be governed by the rules of the Atoka-Pennsylvanian Gas Pool; those one mile or farther away would be considered wildcat wells.

Rule 2 provides for orderly development in that it requires that wells be located in the Northwest or Southeast quarter section of a governmental section, and that they be on a tract of 320 acres, which would be two contiguous quarter sections. In Rule 2-B, the outline for a method of exception to rule 2-A is given.

Q Are these normal exception provisions, Mr. Currans?

A Yes, sir. In fact, I based this rule on rules from an existing Pennsylvanian Gas Pool for 320-acre spacing, which is in effect.

Q And essentially these rules reflected on our Exhibit 1 are simply a copy of those rules?

A Yes, sir, essentially.

Q All right, go ahead.

A In Rule 3, the footage locations are outlined in 3-A, that wells will be located 990 feet from a quarter section line, and given tolerance of 200 feet for topographic conditions. In Rule 2-B, a method for exception to Rule 2-A -- beg your pardon -- In Rule 3-B, a method for exception to Rule 3-A is outlined for the footage locations for recompletion of an existing well, or some other such contention.

Rule 4 states that each gas purchaser in the Atoka-Pennsylvanian Gas Pool shall take ratably from all of the wells on an acreage basis.

Rule 5 provides that the gas production from each well will be separately metered, and that gas and the liquid hydrocarbon production will be reported in accordance with the Commission rules and regulations that are applicable.

Rule 6 is injected to make the now existing Atoka-Pennsylvanian wells standard as to their location, the quarter section in which they are located, and their footage locations.

Q Mr. Currans, I direct your attention now to what has been marked as Pan American's Exhibit Number 2. What is that exhibit?

A Exhibit 2 is a plat of the area in and around the Atoka-Pennsylvanian Gas Pool.

Q Now, have you designated on Exhibit 2 the wells which have penetrated this Pennsylvanian Gas?

A There are four such wells designated, they are encircled in blue.

Q All right, sir, for the benefit of the record, I wish you would name and locate the wells that have penetrated this Pennsylvanian Gas zone and are capable of commercial production.

A The first one is in Section 14, all of these are in Township 18 South, Range 26 East. Starting in Section 14 in the NW¼ of the SW¼ of Section 14 is the Standard of Texas Everest Number 1.

Q Was that the discovery well?

A Yes, sir, it was. In Section 15 in the NW¼ of the SW¼ of Section 15 is the Standard of Texas Martin Number 1. In Section 22, in the NW¼ of the SE¼ of Section 22 is Pan American's Flint Number 1.

Q All right, sir, that's three, what about the fourth well?

A The fourth well, while it tested gas from the Pennsylvanian, it was not completed as a commercial well.

Q Would you name and locate it, please?

A That fourth well is in Section 15 in the SE¼ of the NW¼ of Section 15, the Standard of Texas Terry Unit Number 1.

Q Now, Mr. Currans, you are recommending the adoption of 320-acre proration units. In view of that, let me ask you this, does present development lend itself to the assignment of such an amount of acreage?

A Yes, sir, it does.

Q Have you in any way on Exhibit Number 2 shown the possible acreage assignments that could be achieved?

A Yes, sir.

Q Briefly state for the record what those possibilities are.

A Well, in Section 22 where our Flint Number 1 is located, we show outlined in red and shaded in red the S½ of that section. This would be the acreage that we propose to dedicate to our Flint Number 1.

In Section 15, for the Standard of Texas Martin Number 1, you'll see that two dashed outlines are shown, one of them the S½ of Section 15, the other the E½ of Section 15, showing two possibilities there that could be dedicated to that well.

Q Why have you shown two possibilities on this well, Mr. Currans?

A Well, that's not one of our wells; I don't know what the operator would propose to dedicate to that well, which of these,

these are the two possibilities.--

Q Excuse me, go ahead.

A -- that would be in conformance.

Q Either of the two could be assigned?

A Yes, sir, either could be.

Q All right, sir, what about the other wells?

A In Section 14, the Standard of Texas Everest Number 1 we have shown the S½ outlined, of Section 14, outlined in one color, dashed line around the W½ of Section 14 in another color showing the two possibilities for assignment there.

Q Well, certainly then, Mr. Currens, it is obvious that present development will lend itself to the assignment of 320-acre proration units?

A Yes, sir.

Q All right, sir, I direct your attention now to what has been marked as Pan American's Exhibit Number 3, what is that, please?

A Exhibit 3 is a cross section including the three commercial completions in the Atoka-Pennsylvanian Gas Pool.

Q Do you show a trace of that cross section on your Exhibit Number 2?

A On Exhibit 2, a solid blue line from the Standard of Texas Everest Number 1 to Pan American's Flint Number 1, is shown with a dashed blue line intersecting it, brining the Standard of Texas Martin into that line.

Q On Exhibit 3, how have you distinguished the producing formation?

A We have a blue line showing the top of the Atoka-Pennsylvanian sand, the sand from which the Atoka-Pennsylvanian Gas Pool produces. In addition, to show the entire interval of the sand, we have a shaded yellow zone, showing the sand thickness in the particular wells.

Q All right, Mr. Currans, from the standpoint of the purpose of this hearing, primarily with respect to your recommended proration unit size, what is the significance of Exhibit 3?

A Well, Exhibit 3 shows the sand to be continuous in these three wells, no breaks anywhere that we can see in these three commercial completions. We have a common source of supply, in other words.

Q In your subsurface evaluation of this reservoir, Mr. Currans, did you see any data that would indicate to you that there would be any structural impediment to the free flow in this reservoir?

A I don't know of anything right now in the Atoka-Pennsylvanian Gas Pool that would impede the flow of gas through the reservoir; I see no reason why these wells should not be in communication.

Q All right, sir, I direct your attention now to what has been marked as Pan American's Exhibit Number 4. What is that exhibit?

A Exhibit Number 4 is a compilation of general and background information on the Atoka-Pennsylvanian Gas Pool, and on the wells that have penetrated the sand in this particular area.

Q All right, let's do this, Mr. Currans, in order to save time, and expedite the hearing, instead of reading the material contained in Exhibit 4, I will as you questions to what I think are of the most pertinent data that is included in there.

A It is just background information, generally.

Q What are the structural features of this reservoir, Mr. Currans?

A Well, the prduction is from a sand body that is generally considered to trend from Northeast to Southwest through the area. It is continuous sand, the production is from a stratigraphic trap in this particular pool, and on those are the general information about that.

Q Have any cores been cut in this?

A Yes, one core was taken.

Q What did the core analysis reveal with respect to the reservoir rock we are dealing with?

A From the core analysis it was shown that, it could be seen that an average porosity through the portion that could be considered in that net pay would be nine and a half percent, and that the average permeability was 51 millidarcies.

Q Are all three of these commercial wells, gas wells, Mr. Currans?

A Yes, sir.

Q What is the approximate gas-liquid ratio?

A Well, liquid reserves of 11 to 17 barrels per MMCF have been reported.

Q Are any of the wells connected to a market?

A No, sir.

Q Has there been any production from the pool?

A There has been a small amount primarily for rig fuel, drilling other wells in the area.

Q What has been the cumulative production of gas?

A The cumulative gas production has been 222 MMCF

Q What about liquids?

A The liquid production has been 3,278 barrels.

Q I notice in Exhibit 4, Mr. Currans, the last four pages contain pertinent data on each of the completions that appears to be self-explanatory, do you have any comment on that?

A No.

Q Mr. Currens, with the small magnitude of cumulative production which you just testified to would indicate that you probably have no production data to indicate the drainage area of a well, is that correct?

A We have no data of that sort now that would firmly establish that.

Q Isn't that a primary purpose of this request to obtain pool rules on a temporary basis until we can accumulate such data?

A That's correct, sir.

Q From an economic standpoint, Mr. Currans, has your study of this pool revealed to you whether or not it would be economical to develop it on 160-acre basis?

A I don't believe that 160-acre development of this pool would be economical.

Q All right, sir, let me ask you this: Based on your study and your knowledge of this pool, and I'll ask you to make a prediction for me, do you feel that subsequent data when we do acquire it will show, will physically show that one well completed in this pool will effectively drain any size up to 320?

A Yes, sir, I believe that subsequent data will show that.

Q I direct your attention to what has been marked Exhibit 5, what is that?

A Exhibit 5 is a tabulation entitled, "Economic Data".

Q Just how, Mr. Currans, do you engineers when you are trying to ascertain an economic development pattern, how do you go about it?

A We look at the reserves we could attribute to the wells, and the cost to develop those reserves, and make that comparison on that basis.

Q I notice on your Exhibit 5 your first heading over reserves, is this exhibit more or less outlining some of the steps you would go through in making such an evaluation?

A It outlines the data that would be used, yes, sir.

Q Why don't you do this, Mr. Currans, just simply for each heading you have here, give a comparison as reflected on Exhibit 5, for a 320-acre well, and 160-acre well?

A All right, starting with reserves for 320-acres, average gas reserves are 8,553,000 MCF; distillate reserves would be 94,000 barrels. For 160 acres, 4,277,000 MCF of gas, 47,000 barrels of liquids.

With the next main heading, the price that we could expect to receive from these would be the same in either instance, 10 and 3/4s cents per MCF for the gas, $2.79 a barrel for the liquid.

Our total income, and if you'll note here this is based on a 7/8ths working interest or standard lease, the income from the gas on 320 acres would be $805,000.00, from the liquids $230,000.00, or a total of $1,035,000.00, for 320 acres. For 160, the total income would be $518,000.00 for rate of payout, or rate of income during payout, the value of gas, again on a 7/8ths basis, and distillate for 320 acres totals $131.00 a day, for 160 acres $66.00 per day.

Q Mr. Currans, I notice the next heading you are getting ready to go into operating expenses, shows a hundred dollars for 320, and $100.00 for 160, why is that?

A Operating expenses of $100.00 for a well would be essentially the same for a well, be constant, one well costs a certain amount to operate.

Q This is on a per well basis?

A This is on a per well basis, yes, sir.

Q So if you had two 160-acre wells on a 320-acre tract, the total expense would be $100.00 a month?

A That's true, yes.

Q Again, in the case of the next heading which is Investment, this is on a per well basis also, $170,000.00 for a well cost, $8,000.00 for surface equipment, or a total of $178,000.00 for one well?

A That's one well, whether it be on 320 or 160.

Q All right, sir, I direct your attention now to what has been marked as Pan American's Exhibit Number 6, what does that include?

A Exhibit 6 is a series of economic calculations, based on the data of Exhibit Number 5.

Q I notice your first heading is "Payout", what do you mean by that, Mr. Currans?

A Well, this is a computation of the length of time that would be required to recover our investment for drilling and equipping the well, and it's the investment divided by the return, less the operating expense for the well.

Q What kind of a payout do you get on a 320-acre well?

A For 320 acres would be 51.2 months, that's a little over four years.

Q All right, what about a 160 acre well?

A For 160, 104 months, that's a little less than nine

years.

Q All right, sir, I notice your next heading, this is "Return on Investment", is that what your engineers refer to as "ROI"?

A Yes, sir.

Q What do you mean by that?

A Well, this is a comparison of the net return versus the cost of, the net return from this well or property, versus the cost to develop it.

Q How does the 320 acre well and 160 well compare on an ROI basis?

A For ROI on 320 acres we would have 4.1; on 160 acres, 1.48.

Q Mr. Currans, is it your opinion that the pool rules you recommend here will serve conservation as well as adequately protect the correlative rights of all parties in interest?

A Yes, sir.

Q Assuming along with me, if you will, Mr. Currans, that the Commission adopts your recommendation, and contrary to what you expect, subsequent data shows that we need to develop that pool down to 160-acres to deplete the reserves, assuming that now, would any harm be done, would any waste result because we produced for a year on a 320-acre basis?

A No, sir, I see no way that it could; on the contrary, if we developed on 160 initially, and ultimately could see that we

can efficiently drain the 320, then economic waste would have resulted from the drilling of additional wells.

Q All right, sir, under this same hypothesis, would anyone's correlative rights be damaged in any way because we operated for a year on 320 acres basis?

A No, sir.

Q Then actually all we are asking for is just the opportunity to produce under these temporary rules until sufficient data can be acquired to permanently adopt proper rules for the pool?

A That's correct, yes, sir.

MR. BUELL: That's all we have at this time, and I formally offer Pan American's Exhibits 1 through 6.

MR. PORTER: Without objection, Pan American's Exhibits 1 through 6 will be admitted into the record.

Any questions of Mr. Currans?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Currans, I was not here for all of your testimony, but did you offer any evidence that one well will drain 320 acres in this one pool?

A We have no definite proof at this time, however, there is every possibility that given some time to gather some data, we can prove that.

Q One of the wells in the pool has produced considerable gas to date, has not it?

A Not too large an amount; the individual well production is a 125 MMCF for the Standard of Texas Everest 1, and 70 MMCF for the Standard of Texas C. R. Martin Number 1.

Q What was the date of completion of that Everest Number One?

A The completion date on the Everest was October '57, I believe, yes.

Q And what was the completion date on the C. R. Martin Number 1?

A It is shown as July '58.

Q Is the C. R. Martin Number 1 the closest well to the Standard of Texas well?

A The C. R. Martin is a Standard of Texas well.

Q I mean, is it the closest well to the discovery well?

A Yes, sir.

Q Do you have any idea how much production had come out of the Everest well at the time the C. R. Martin well was brought in?

A I believe that the bulk of the production from the Everest well was used to drill the C. R. Martin, or I may be incorrect.

Q So the Everest well had produced very little up until the time the C. R. Martin well was completed?

A Yes.

Q Now, is there a well up in the SE of the NW of

Section 15 completed in this pool, or is that a dry hole?

A This well which is the Standard of Texas Terry in the SE of the NW of 15, was not completed as a commercial Pennsylvanian Gas producer, it did test gas on drill stem test from this Atoka-Pennsylvanian sand.

Q They didn't feel it was a commercial quantity gas?

A I believe it was about 215 MCF a day.

Q How does that compare with the normal drill stem test?

A In the Everest Number 1, a drill stem test flowed 1,600 MCF a day.

Q How much?

A 1,600. Later the perforations were drill stem tested at rates of 3,320 MCF a day.

Q Prior to any treatment?

A It is a natural completion. And 6,140 MCF a day. The C. R. Martin I have no drill stem test shown. The W. E. Flint, we tested at a rate of 5,800 MCF a day on drill stem test.

Q Now, when was your W. E. Flint Number 1 completed?

A In January of 1959.

Q Had the other two wells produced the bulk of their gas by that time?

A I believe all that production was at the time of the completion of the Flint.

Q Now, how does the initial pressure on the Flint compare with the initial pressures on the Everest and the C. R. Martin?

A Our drill stem test on the W. E. Flint, we had a shut-in pressure of 3750; the Everest was 3747, if I recall correctly. It had a drill stem test pressure of as high as 3747 has been reported as the initial pressure.

Q The drill stem test?

A Yes.

Q How about the C. R. Martin Number 1?

A The C. R. Martin had no drill stem test that I know of.

Q Do you have any initial bottom hole pressure?

A No, sir, I don't have any initial pressure information on that well?

Q Do you think there is any evidence here at all that there is any communication between the Everest and the W. E. Flint?

A I don't think we have any data as yet to prove that interference, prove it conclusively, that's what we are asking time for.

Q What rate of production do you anticipate from these existing wells in the one year intervening time period?

A Well, we don't have a connection as yet, but we have estimated a take of 1,070 MCF a day for a well.

Q For each well?

A Yes, sir.

Q And when do you expect you'll be able to start producing that?

A I can't say, sir, I don't know.

Q Will it be within the year?

A We certainly hope so.

Q So you have no idea what percent of reserves that underlie this acreage would be produced during the intervening time period while the pool was on 320-acres?

A No, sir, I don't.

MR. NUTTER: I believe that's all. Thank you.

MR. PORTER: Anyone else have a question? The witness may be excused. Anyone else have testimony to present in this Case? Any statement?

MR. KELLIHAN: If the Commission please, Jason Kellihan of Kellihan and Fox, Santa Fe, appearing on behalf of Standard Oil Company of Texas.

Standard Oil Company of Texas is in concurrence with the recommendations which have been made by Pan American Petroleum Corporation for adoption of 320-acre units in the Atoka-Pennsylvanian Gas Pool, and we are in accord with the field rules as they have been proposed by Pan American.

Standard believes, I might say continues to believe, that one well in this pool will adequately drain and develop 320 acres. We cannot economically justify, and I believe the record clearly shows, the drilling of wells at less than 320-acres units, and if adequate development is to be achieved in this pool, it is going to be essentially putting it on 320-acre basis. In connection with the proposed rules, of course, Pan American is proposing an

exception for present locations of the wells, and I might point out that this would apply in particular to the J. H. Everest unit well Number 1, which is the discovery well in the pool, that well being located 1980 feet from the South line, and 660 feet from the West line of Section 14.

If the Commission determines to approve this application, we would also request that the units be created by adjacent quarter sections. If it is determined by the Commission that those should lie in a particular direction, that is N½, W½, or E½ or S½, Standard Oil Company of Texas requests that for their J. H. Everest unit well Number 1, 320-acre unit assigned to the well consist of the W½ of Section 14; and as to their C. R. Martin unit well Number 1, that the units should consist of the S½ of Section 15. The reason for this being that in order to achieve development which Standard of Texas felt was necessary in this pool, it is necessary to unitize these areas, and those are committed to unit agreements, so we request that the units be formed in such manner that those units would be recognized.

MR. ANDERSON: R. M. Anderson with Sinclair Oil and Gas Company. Sinclair has a hundred and sixty acres in this pool, consisting of the S½ of the S½ of the N½ of Section 22, just North of the Pan American well. Sinclair wishes to concur with Pan American in the proposed field rules in all respects except one, and we believe that the best interest of all parties concerned would be served by the adoption of a flexible well

location rule, and that would tend to amend Pan American's rule 2. We believe that an operator should have the leeway to locate his well in either quarter section of the 320-acre unit. Pan-American's well location rule 3-A, under flexible location rule, would still require that the wells be no closer than 1980 feet apart, and we feel that's reasonable in this case.

MR. PORTER: Mr. Newman.

MR. NEWMAN: If the Commission please, we have here a telegram from Carper Drilling Company, addressed to Neil S. Whitmore, who is the District Superintendent of Production for Pan American in charge of this area, or any Pan American engineer, addressed in care of New Mexico Oil Conservation Commission, Santa Fe, New Mexico. We would like to read the text of the telegram for the record, which is:

> "Concur with temporary 320 acre spacing requested by Pan American in Atoka Pennsylvanian Gas Pool Eddy County would appreciate housing commission approve said application. Carper Drilling Company, Incorporated, Marshall Rowley".

I might say that Mr. Rowley is Superintendent of Carper Company, and on behalf of Western Union, we would like to amend this telegram by striking the word "housing", and putting in "Conservation".

MR. PORTER: Mr. Payne is suggesting it means "having" instead of "housing". I have not looked at it.

MR. NEWMAN: I think the opinion of Carper Drilling

Company is clear.

MR. PAYNE: We also received a statement here from Malco Refineries, Incorporated, concurring in the application of Pan American. The letter in its entirety will be incorporated into the record.

MR. PORTER: Anyone else have a statement or document in this case?

MR. NUTTER: I would like to ask a couple of questions. Mr. Kellihan, do you have any idea, as far as the Standard Oil Company of Texas, when a pipeline to the gas produced in this area will be available?

MR. BUELL: I might say for Pan American, we are currently negotiating for a contract; how long it will be, I don't know. The nearest pipeline is seven miles from the pool, it belongs to Southern Union.

MR. NUTTER: Is it anticipated that the well will have connections within one year?

MR. BUELL: We certainly hope so, we may be overly optimistic in thinking that; that's the reason we said for a minimum of at least one year, but in the event our contract negotiations --

MR. KELLIHAN: Mr. Nutter, as far as Standard of Texas is concerned, they are presently negotiating sales of contract, it is contemplated in there, this contract as it now stands, that it will become effective in December. Now, for us to predict that

actual physical takings in December, would begin in December, would be a little presumptious in this case, but they are working, making every effort for finding a market by that date.

MR. NUTTER: Do you think you will be selling the gas from this pool within one year?

MR. KELLIHAN: All we can do is make the very best estimate; on the information we have, we would say yes, it will probably be selling gas in one year, but here at the end, we can't make a definite commitment.

MR. NUTTER: Thank you.

MR. PORTER: Any further comments on this case? Take the case under advisement.

(Whereupon the taking of testimony in Case No. 1669 was concluded.)

C O P Y

M A L C O R E F I N E R I E S, I N C.,
P. O. B o x 6 6 0
R O S W E L L, N E W M E X I C O

May 8, 1959.

State of New Mexico
Oil and Gas Conservation Commission
Capitol Building
Santa Fe, New Mexico

Gentlemen:

Malco Refineries, Inc. owns leases in the vicinity of the Atoka-Pennsylvanian Gas Pool, Eddy County, New Mexico. We respectfully urge you to approve the application of Pan American Petroleum Corporation for an order for temporary 320 acre spacing in this gas pool.

We feel that one well will adequately drain much more than 320 acres. It is our considered opinion that 320 acre spacing in this gas pool is the absolute minimum spacing and will eliminate waste, protect correlative rights and will tend to make the pool more economical to develop and produce to its maximum areal extent.

Very truly yours,

MALCO REFINERIES, INC.

(Signed) DONALD B. ANDERSON
by J.R.Jr.
Donald B. Anderson
Vice President

DBA/ik

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 8th day of June, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Joseph A. Trujillo
NOTARY PUBLIC.

My Commission Expires:

October 5, 1960.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
MAY 18, 1960

IN THE MATTER OF:

CASE 1669 In the matter of the application of Pan American Petroleum Corporation for the promulgation of special rules and regulations for the Atoka-Pennsylvanian Gas Pool in Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order promulgating special rules and regulations for the Atoka-Pennsylvanian Gas Pool in Eddy County, New Mexico, to provide for 320-acre spacing units and for well location requirements, as authorized on a temporary basis by Order No. R-1417, dated June 5, 1959.

BEFORE:

Mr. A. L. Porter.
Mr. Murray Morgan

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: The hearing will come to order. The Commission will consider next Case 1669.

MR. PAYNE: Case 1669. In the matter of the application of Pan American Petroleum Corporation for the promulgation of special rules and regulations for the Atoka-Pennsylvanian Gas Pool in Eddy County, New Mexico.

MR. PORTER: First, I would like to call for appearances in the case.

MR. NEWMAN: Kirk Newman of Roswell, representing Pan American Petroleum Corporation and the Ohio Oil Company, and have

associated in this case Mr. Guy Buell, member of the Texas Bar, for Pan American; Terrell Couch, member of the Texas Bar, for Ohio.

MR. PORTER: Mr. Buell.

MR. BUELL: May it please the Commission, the current rules have been in effect on a temporary basis for the Atoka-Pennsylvanian Gas Pool for almost a year. At the time of the prior hearing, it was our hope that during that year's time we could develop a market and obtain some production experience. Unfortunately, that has not been the case. There has been no market developed. Production from the field has been in very minor volumes, mainly for drilling fuel purposes, so actually at this time the conditions are substantially the same as existed at the time of the last hearing. Because of that I would like to move that the current rule be extended on a temporary basis for another year's time, and I sincerely hope that in that period of time we can obtain a market and produce sufficiently to obtain the data necessary to recommend to the Commission permanent rules. There has been some additional development in the field, and in that connection, and as a matter of information, I would like to offer as Pan American's Exhibit 1, a map of the area contoured on top of the Atoka-Pennsylvanian sand. As Exchibit 2, a cross section running generally through the field and including some of the newer completed wells. And as Pan American's Exhibit 3, I would like to offer a brochure that contains pertinent field information and pertinent completion information of each well.

(Whereupon, Pan American's Exhibits Nos.1,2 and 3 offered in evidence.)

MR. PORTER: Mr. Buell, would you establish by whom these Exhibits were prepared?

MR. BUELL: These Exhibits were prepared by Mr. Bill Smith, who is a petroleum engineer in our Lubbock District office. They were prepared especially for the purposes of this hearing here today.

MR. PORTER: Is there any objection to the admission of these Exhibits? The Exhibits will be admitted to the record.

(Whereupon, Pan American's Exhibits Nos.1,2 and 3 received in evidence.)

MR. PORTER: Mr. Couch.

MR. COUCH: If it please the Commission, Terrell Couch, representing the Ohio Oil Company. Since the last hearing on this pool, the Ohio has completed two producing gas wells in the Atoka-Pennsylvanian sand approximately a mile and a half south of the present horizontal limits of the pool. There have been a total of seven wells drilled in the area in what we consider to be Atoka-Pennsylvanian sand since this last hearing. We consider it appropriate and reasonable, and in this case, really necessary that the Commission consider here and include in its determination concerning the extension of these pool rules the question of the area to which the extended rules will apply. It is for that purpose that the Ohio will present testimony and Exhibits today. We will attempt

to be as brief as possible and to repeat as little information as possible. We'll try to confine ourselves principally to the new information that has developed since the last hearing. We're asking the indulgence of the Commission; this is the way we would like to proceed.

MR. PORTER: Would you have your witness sworn?

(Witness sworn)

ROY M. YOUNG,

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

DIRECT EXAMINATION

BY MR. COUCH:

Q Will you please state your name, by whom you are employed and in what capacity?

A My name is Roy M. Young. I am employed by the Ohio Company in the capacity of reservoir engineer.

Q About how long have you been in that position, Mr. Young?

A Approximately nine years.

Q Have you testified before the Commission and are your qualifications and education and training part of the records of the Commission in prior hearings?

A Yes, they are.

MR. COUCH: Are there any questions?

MR. PORTER: No questions.

Q (By Mr. Couch) Mr. Young, in preparation for this hear-

ing, and as a part of your duty as a reservoir engineer with Ohio, have you made a study of the available data of the area of the Atoka-Pennsylvanian Gas Pool in Eddy County, New Mexico?

A Yes, I have.

Q To what have you directed your studies principally in carrying out this study?

A I have directed my studies towards the feasibility of extending the horizontal pool limits of the Atoka-Pennsylvanian Pool to include the south half of Section 21 and all of Sections 28 and 29, Township 18 South, Range 26 East.

Q The area that you refer to is the area in which Ohio has two newly completed wells, is that right?

A Yes, it is.

(Whereupon, Ohio's Exhibit 1 marked for identification.)

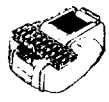
Q Will you please look at what has been marked Ohio's Exhibit 1?

A (Witness complies)

Q All right, Mr. Young, looking at Exhibit 1, would you please describe briefly what it is and what it shows?

A Ohio's Exhibit No. 1 is a map of the Atoka-Pennsylvanian Gas Pool, located in Township 18 South, Range 26 East, Eddy County, New Mexico.

Q I see an area surrounded by a red line. What is that area?



A The solid red line is the horizontal limits as presently defined by this Commission of the Atoka-Pennsylvanian Gas Pool.

Q And adjoining that red line is an area surrounded by a dashed red line. What is that area indicated to be, Mr. Young?

A The area outlined by the dashed red line is the area which I recommend to be included in the Atoka-Pennsylvanian Gas Pool horizontal limits.

Q And the area that's included in the red line is comprised of the Sections you mentioned a while ago?

A It's the south half of Section 21 and all of Sections 28 and 29.

Q You heard my opening statement that there are seven wells drilled since the last hearing, which have penetrated the Atoka-Pennsylvanian sand in this area. Will you point them out briefly, starting with the Standard of Texas Well in the northeast corner of the map designated Exhibit 1?

A The well that you just referred to is the Standard of Texas, Everest Unit 2, Well No. 1 in the southeast corner of Section 14. That well was completed as a dry hole and was plugged and abandoned.

Q That was in February of 1960?

A That is correct.

Q And it is outside of the horizontal limits?

A Yes, it is.

Q Now, coming south from there in Section 23, in the north-

...structure to Section 33, ...same symbol, a red circle around the ...well been drilled to the Atoka-Pennsylvanian sand since the last hearing?

A The well you refer to is the Campbell-Cleveland Well No. 1, located in the northeast quarter of Section 33. That well is an old well that has been drilled deeper by slim hole techniques. It is my understanding that the well has been carried to ... encountered the Atoka-Pennsylvanian ... reports indicate th...

east quarter of Section 29. The other well is the Ohio Andrew Arnquist Estate No. 1 in the northwest quarter of Section 29.

Q I see way down in Section 36, southwest quarter of 36, off to the left side of our Exhibit. Will you identify that well?

A Yes. That's the Gulf State "AC" No. 1 located in the southwest quarter of Section 36, Township 18 South, Range 25 East.

Q The wells that are shown on the map by red spots, Mr. Young, what are those? Are those completed as producing wells?

A Those have been wells that have been completed as producing wells in the Atoka-Pennsylvanian gas reservoir.

Q We have mentioned that those with the red circle are those that may not be finally completed at the present time. There are two of those that we have mentioned?

A Yes.

Q Then you have a third well symbol, a red circle with a cross through it?

A Those are dry holes that have been drilled in the area, yet have penetrated the Atoka-Pennsylvanian sand.

Q Those wells are shown on your map in connection with your structural control and were used by you, all of these wells that we have mentioned to prepare the structure map, all except the two drilling wells?

A Yes, that is correct.

Q How did the two drilling wells appear in connection with

the structure map that you made?

A From our last test scout reports, the Campbell-Cleveland No. 1 in Section 33 encountered the Atoka-Pennsylvanian pay at approximately minus 5845.

Q Is that about where it appears on your structure map?

A Yes, it is.

Q What about the Campbell Well?

A That was the Campbell Well we just discussed.

Q I mean the Pan American Well. I beg your pardon.

A The Pan American Martin in Section 23 encountered the Atoka-Pennsylvanian pay at minus 5751, which is approximately the location that I have on the Exhibit No. 1.

Q I see a lot of shaded area on this map, blue shaded area.

A All of the shaded area, which amounts to approximately forty-five hundred acres, is acreage that is under leasehold by the Ohio Oil Company.

Q Mr. Young, you have identified this area that you are recommending be included in the horizontal limits of the Atoka-Pennsylvanian Pool. State your opinion as to whether that area can reasonably be deemed to be productive of gas from the Atoka-Pennsylvanian Pool.

A It is my opinion that the geological and engineering data throughout this area indicate that the reservoir in which the two Ohio wells are completed is the same reservoir that the wells that are now classified as being in the Atoka-Pennsylvanian Pool are

producing from. It is also my opinion that the area in between is continuous and productive of gas.

Q From the same reservoir?

A From the same reservoir.

Q And that all the area in Sections 28, 29 and the south half of 21 is reasonably deemed to be productive of gas?

A Yes, sir.

Q Will you then describe for us briefly your opinion as to this reservoir, what it is and just a physical description of it, very briefly?

A As a physical description of this reservoir, it appears to be a typical Pennsylvanian sand lens. The porosity and permeability in the sand pinches out both updip and downdip of the formation. This is evidenced by the four wells in the northeast portion of the Exhibit 1, beginning with the Standard of Texas, Everest Unit No. 2 in the southeast quarter of Section 14, that was a dry hole although the sand was present. But it lacked porosity and permeability. And then progressing updip, we find that the Standard of Texas Everest No. 1 in the southwest quarter of Section 14 had approximately thirty-four feet of net pay. Progressing on updip, we find that the Standard of Texas Martin No. 1 had approximately fifty-two feet of net pay. Then progressing still further updip, the Standard of Texas Terry No. 1 in the northwest quarter of Section 15 was completed as a dry hole; thus showing that from downdip the porosity and permeability had pinched out

and the porosity and permeability then built up to thirty-four feet, to fifty-two feet, and then pinched out again as we went up-dip, showing that this is a stratigraphic trap.

Q This condition that you have described, you described it rather graphically to me as we were discussing this case the other day. Tell them how you got it in my mind, what it looks like, how it pinches out on one end and fattens up and pinches out on the other side.

A Well, taking a cross section through the four wells that I just discussed, I picture the cross section of the reservoir as being very similar to the cross section of an airplane wing when it gradually tapers up and becomes thicker and then on the leading edge of the airplane wing, it abruptly pinches out to zero.

Q Now, that's a description of this zero as it exists through the Standard wells up there through the northeastern part of Exhibit 1. Will you move down to the area where the Ohio wells are located, and starting with the Campbell Well where the sand was found in an attempt for slim hole completion but had shown to be pinched out, according to our information, come up-structure from there and describe the reservoir in there? Is it similar to what we found in the northeastern portion of the reservoir?

A In my opinion, it is very similar as to the condition that I just described in the northeast portion of Exhibit 1. The Campbell Well, from our last test scout reports, is non-productive in the Atoka-Pennsylvanian gas sand, although the sand is present.

Then, in the two Ohio Wells encountered net pays of sixty-two and fifty-eight feet each, and it would be my opinion as we go further to the northwest, the sand will pinch out as we go updip.

Q Now, this structure map was drawn, using the logs of wells that you personally examined the log, all except these two wells that are shown with the red circle around them, is that right?

A Yes, sir, that is correct.

Q You had how many wells that you were using for control on the structure map?

A I believe there's ten.

Q Looking at this structure map, I would like you to give us your opinion, based on the information which it shows, which in turn is based on your personal examination of the logs. What's your opinion as to whether there is any lack of continuity or any faulting in between the present horizontal limits of the Atoka-Pennsylvanian Pool and the area which you are proposing to be included in the pool?

A It would be my opinion that there is definitely reservoir continuity between the two areas as just described.

Q Is there any available data that you have found or seen that indicates that there is any faulting or that there is any separation in those two areas?

A No, sir, there is not.

(Whereupon, Ohio's Exhibit 2 marked for identification.)

Q Will you look, now, at the document you prepared, that's marked the Ohio's Exhibit 2? Exhibit 2 is a southwest northeast cross section, is it not, Mr. Young?

A That is correct.

Q Its location on the ground is shown on Exhibit 1 in what manner?

A By yellow line marked "X" to "X" prime.

Q How many wells are included in this cross section, Exhibit 2?

A There are six wells included in the cross section. All six of these are producers.

Q You've reproduced on this cross section the electric log of each of those wells?

A That is correct.

Q Would you briefly describe Exhibit 2, the data that is on it, for example?

A Exhibit 2, as we said, is a cross section, southwest northeast cross section, and is made up of the [illegible] of the various wells.

Q Name--

A The name, elevation and location of each well is shown above its log on the cross section along with the completion data of the well.

Q That completion data is shown below each of the logs, is shown on the well, is that right?

A The completion data is the last data shown above the log of each well.

Q The completion data was taken off the total depths?

A The completion data is shown below each well.

Q The yellow strip running across the cross section, starting on the right side with the Texas, coming down to "AC" Gulf No. 1, what does that yellow strip represent?

A That yellow zone is the Atoka-Pennsylvanian gas sand.

Q The heavy line at the top of the yellow zone is what?

A The top of the Atoka sand.

Q What are the thinner lines? There are two shown above the yellow zone, and one shown below. What do those show?

A Those are other correlation points included in the cross section to further substantiate the continuity of the structure through this area.

Q Those lines represent points that you have picked in these logs that are ascertainable in each of the logs showing the same structure continuity?

A That is correct.

Q Both above and below the Atoka-Pennsylvanian sand?

A Yes, sir.

Q Does the yellow zone show the perforated interval of each

of the wells?

A Yes, it does.

Q I notice that the yellow zone on Exhibit 2 runs rather steeply up and down and up along the way here. Does that indicate the way you think the top of the Atoka-Pennsylvanian sand runs from up in the northeast down to the southwest, or does it show something else to us?

A No, sir. It shows the dip between each well on the cross section. If you'll note, on the right-hand side of the cross section, we begin with the Standard Oil of Texas,Everest No. 1, and proceed to the Standard of Texas Martin No. 1, and in doing so, if you will note, on the structure map we go updip. Then, from the Standard Martin No. 1 we proceed downdip to the Pan American Flint No. 1. Further downdip, the Nearburg & Ingram Hawkins No. 2. From that point, then, we proceed updip to the Ohio Oil Ralph Nix No. 1, and further updip to the Gulf State "AC" No. 1.

Q Then, actually, what does this indicate with regard to the thickness of the pay as it relates to the structural location of the well? Is there any relation between those two?

A We have noticed a definite relationship between the net pay and the location of the well on the structure. That is more vividly shown on Exhibit No. 1 where,in the parenthesis below each well, we show the net pay for each well.

A Now, for example, the Ohio Ralph Nix No. 1, what's the pay thickness that's shown on there, on Exhibit No. 1?

A That's sixty-two feet.

Q What is its structural location? What's the top of the sand?

A Minus 5635.

Q How is it located structurally with relation to the Standard of Texas Martin No. 1?

A The top of the Atoka-Pennsylvanian sand in the Standard Martin No. 1 is minus 5614, so, therefore, it is practically flat with the Ohio Nix No. 1.

Q So shown on the structure map, being in the same contour area?

A Yes.

Q The pay thickness there in that well?

A In the Standard Martin No. 1 it is fifty-two feet.

Q Actually looking, then, at Exhibit 2, we can observe that those same two wells are shown on that Exhibit, are they not?

A Yes, sir.

Q They're shown there to be virtually flat with each other, are they not?

A Yes.

Q These logs, Exhibit 2, were lined on a subsea datum point, were they?

A Yes, we used minus 5700.

Q In your opinion, does this cross section show anything about the continuity of the pay of the Atoka-Pennsylvanian reservoir

throughout this area?

A Yes, sir, I believe the Exhibit No. 2, the cross section shows the continuity of the Atoka-Pennsylvanian pay throughout this area.

Q Mr. Young, summing up the information that you gained from your study of this pool, and as you have depicted it on Exhibits 1 and 2, will you state in your opinion whether the Atoka-Pennsylvanian reservoir is one continuous reservoir throughout the present horizontal limits of the pool and the proposed extension that you have recommended here?

A Yes, sir, I believe it is.

Q You think that's one common source of supply that would be within those pool boundaries?

A Yes, I do.

Q Is it possible or probable that the pool will extend outside those lines in other directions?

A I personally feel that the Atoka-Pennsylvanian Pool will extend even further southwest than the horizontal limits that we areproposing today.

Q And if the temporary rules are made applicable by including your proposed area, would they then extend to all operations within a mile of the proposed extension?

A Yes, sir.

Q Mr. Young, in previous hearings, the records of which you have seen in connection with this pool, expert witnesses have testi-

fied that one well completed in the Atoka-Pennsylvanian Pool is capable of efficiently and economically draining three hundred twenty acres. What is your opinion with regard to that testimony?

A I concur in all that testimony.

Q And it's also been recommended that those temporary rules be continued in effect for a period of a year. What is your opinion about that?

A I also concur in the recommendation to extend the temporary rules for an additional year.

Q Is it your definite understanding that that is the position of the Ohio Oil Company?

A Yes, it is.

Q In addition to being your personal opinion--

A Yes.

Q --what can you tell us about the Ohio's situation insofar as the sale of its gas is concerned?

A The Ohio Oil Company has contracted to sell its gas to Transwestern Pipeline Company. The latest indications are that Transwestern will have its line completed soon, and gas delivery should commence in the relatively near future.

Q After a year, assuming that these deliveries commence in the relatively near future and that the other operators obtain markets within the relatively near future, what is your opinion about the status of this matter a year from now?

A Sufficient production data should be available at the

end of another year which I believe will completely justify three hundred twenty acre spacing and permit the adoption of permanent pool rules.

Q Your recommendation that the pool rules be applied, extended for another year and that the pool limits be extended to include Sections 28, 29 and the south half of Section 21, have you considered those recommendations in the light of correlative rights and matters such as that?

A Yes, I recommend that this Commission extend the horizontal pool limits to include that area which you just mentioned. The approval of this recommendation will result in the orderly and economic development of this gas pool, and at the same time protect correlative rights and prevent waste which might otherwise result from the drilling of unnecessary wells. It will also hasten the ultimate development of the field and the establishment of the productive limits of this pool.

Q Mr. Young, in the event you are in the wrong, in the event of production history that shows one hundred sixty acres would be correct, in your opinion, could that be resorted to without damaging correlative rights in the area, so far as you can see now?

A Yes, sir, I believe it could.

Q But if the wider spacing is not followed here, then it would be impossible to go back to wider spacing when production should establish that that was proper, is that right?

A That is correct.

MR. COUCH: I have no further questions.

MR. PORTER: Does anyone have a question of Mr. Young?

MR. NUTTER: Yes, sir.

MR. PORTER: Mr. Nutter.

CROSS-EXAMINATION

BY MR. NUTTER:

Q Mr. Young, I believe you stated that it appears that whether a well encounters net feet of pay or not depends a lot o the structural position of the sand.

A There is a correlation between its position on the structure and its net pay that has been encountered.

Q Up in the northeast end of the pool, a well high on th structure encountered no pay--

A That's the point I'm making; as you go way up high on the structure, it will pinch back down. I tried to give the analogy of the section of an airplane wing.

Q Now, down at the extreme southwestern end of the po this well that encountered pay was down in the middle of the What do you attribute that to?

MR. COUCH: You are speaking of the well in Secti

MR. NUTTER: I am speaking of Pan American's Matl 1 Well.

A That well encountered the sand, but there was nc and it actually is one well that does not fall into the c that I previously mentioned.

Q Will there be a possibility of drilling a well in Section 28 that wouldn't fall into the correlation?

A There is always a possibility of that, Mr. Nutter, but in my opinion, it would not be in this case.

Q Do you know at what depth the Campbell Cleveland No. 1 Well encountered the Atoka-Pennsylvanian pay?

A That was a slim hole well, an old well drilled deeper by slim hole techniques, and they had difficulty in logging the well as deep as the Atoka-Pennsylvanian sand was. However, our scout reports indicate that the sand was present, but did not have any porosity and permeability. In fact, so far as I know, the operators could not complete in it.

Q You don't know what the top of the pay was there, then?

A Our scout reports indicate it was approximately 5850, minus 5845.

Q Which would be in about the proper location--

A Yes, sir.

Q --as far as your contour lines here?

A Actually, it influenced my contour in that area, Mr. Nutter.

Q You did use that, then?

A Yes, sir, I did. I also have used a uniform dip throughout the map.

Q Well, now, Mr. Young, your proposal here to include certain acreage in the limits of the pool, is there a possibility that the southwest quarter of Section 21, being located as it is

structurally, might be dry acreage?

A As I said a while ago, Mr. Nutter, it's possible that it may not be productive.

Q How about the southeast quarter of Section 28?

A It's always possible, but I feel like it's all productive.

Q Mr. Young, you stated that you concurred with the previous testimony that one well in this pool would drain three hundred twenty acres. What do you base your concurrence on?

A The previous testimony, I believe, will show what core analysis is available on this pool is approximately 51 millidarcies. In my opinion, a sand with 51 millidarcy permeability is capable of draining far in excess of three hundred twenty acres.

Q Did Ohio take cores on their wells?

A No, sir, we did not.

Q You stated that you expected Transwestern Pipeline to be completed soon and purchases of gas to be made in the relatively near future. Would you define what soon is, and what relatively near future means?

A It is my understanding that the Transwestern Pipeline will be completed and in service by mid-July.

Q Mid-July.

A When we will get our pipeline connection, I could not ascertain.

Q Has Transwestern indicated to you when they will be buying gas in this pool?

A No, sir.

Q Now, the mid-July date is the date of completion of the trunk line to the West Coast, I assume?

A Yes, I believe that's correct.

MR. NUTTER: I believe that's all.

MR. PORTER: Mr. Payne.

BY MR. PAYNE:

Q Mr. Young, in the event a dry hole was drilled in Section 28, the Ohio Oil Company wouldn't be adverse to the Commission's looking at these pool boundaries again at that time, would it?

A No, sir.

MR. PAYNE: Thank you.

MR. PORTER: Mr. Utz.

BY MR. UTZ:

Q Your Ohio Andrew Arnquist Well in the northwest quarter of Section 29, what kind of a well did that make?

A Preliminary tests indicate it was a very good well.

Q Is that quite a nice section of pay in there?

A Yes. Fifty-eight feet of net pay.

Q The southwest quarter of Section 28 that Mr. Nutter inquired about, do you think there might be a possibility that that would be dry in view of the Campbell Cleveland Well being a dry hole?

MR. COUCH: You said the southwest quarter of--

MR. UTZ: The east quarter, I mean.

MR. COUCH: Inquired about the southeast.

A It could possibly be dry, Mr. Utz, but a well drilled on the southwest of 28 would also be structurally in the same position as the Nearburg & Ingram Hawkins No. 2 in Section 27. Therefore, it's, in my opinion, very possible that the southeast quarter of 28 would be productive.

Q Well, from looking at your pool map here and your contours, it looks as though, does it not, that the permeability of the pool seems to cut across the contours as they go updip. In other words, as the pool progresses to the southwest.

A I didn't understand your question.

Q Looking at your contours and the productive wells that are within the pool limits that you have suggested here, does it not look as though there's a good possibility that the permeability or the pool limits cut across the contours as the pool progresses to the southwest? In other words, the pool goes updip across contours?

A If I understand your question correctly, I do not mean that this pool would probably pinch out along a certain contour. These pinch-outs don't necessarily follow a contour. Therefore, in answer to your question, yes, the permeability could pinch out across contours.

Q The way it's going, it looks like it might leave that southeast quarter section of 28 dry. Does that look like a possibility?

A A portion of the southeast quarter of Section 28 could very easily be dry or non-productive.

Q Does Ohio intend to drill any more wells in the near future?

A Yes, sir.

Q Do you know now what location you plan for the new wells?

MR. COUCH: Mr. Porter, I would like to say that I think Ohio's plans as to what additional wells will be drilled and what locations they will be depends on whether the Commission would extend the horizontal limits. At least, that would influence our management's decision. As I might point out, in order to conform to the Atoka-Pennsylvanian rules for the present time, we felt like we were in that reservoir. The Arnquist Well did not conform specifically with the Atoka-Pennsylvanian rules, but this Arnquist Well, we did change for the very purpose. We do plan to drill other wells in the area. Just when and where would depend on the outcome of the hearing.

Q (By Mr. Utz) Assuming that you continue to have temporary three hundred twenty-acre spacing, would you answer the question?

A It would be my recommendation to my management to drill in the southeast quarter of Section 30. Just exactly where the management will decide to drill the next well, I do not know at this time.

Q You don't know of any other wells that may be drilled be-

tween Section 29 and the pool as it is now delineated?

A No, sir, we havw no acreage in Section 28.

Q I knew you didn't have any acreage. I thought you might know of some projected holes.

A No, sir, I don't know of any.

MR. UTZ: That's all.

MR. PORTER: Anyone have a question?

BY MR. PAYNE:

Q Mr. Young, I presume that the Ohio and Gulf Oil Corporation will communitize that south half of Section 29, should three hundred twenty-acre spacing be established?

MR. COUCH: Might I answer that question, Mr. Payne? I think my information on it might be a little more up-to-date than Mr. Young's. He has been working on what this reservoir looks like. I have had something to do with the contract work about it. The Gulf has contacted us and we are in the process of working out a unit with them for the purpose of completing the entire south half of Section 29. Our lease on the one hundred sixty acres on which the well is located contemplates three hundred twenty-acre spacing. The eighty acres is a separate lease of the Ohio and contains pooling provisions, but it will be necessary for us to force pool or get concurrence from the mineral owners. It is our plan to form a full unit down there.

MR. PAYNE: Thank you.

MR. PORTER: Anyone else have a question? Did you

offer your Exhibits?

MR. COUCH: Not yet. I want to ask one or two more questions, if I may.

MR. PORTER: I see. You may proceed.

REDIRECT EXAMINATION

BY MR. COUCH:

Q With regard to the dry hole or plugged and abandoned well of Pan American down in Section 1, southwest corner of our map, Exhibit 1--

A Yes.

Q --somewhere this reservoir is going to stop, isn't that right?

A Yes, sir, it is.

Q This may be an indication that that's the tail end of it down there?

A Yes, sir.

Q There are other wells drilled in this middle of the reservoir up through here, as shown on your map that aren't dry holes, and that's a certainty, isn't it?

A Yes, sir.

Q It is true there are many fields in the State of New Mexico, particularly in the Pennsylvanian sand, where due to localized conditions, dry holes are drilled within pool limits?

A Yes, sir, that's true.

Q Now, with regard to the Campbell Well, you did not have

an electric log on that because, according to what we understood, they couldn't get the logging device down the seven and two-eighths casing.

A That's right.

Q I use the casing word advisedly.

A Yes.

Q That is why we didn't log it, and that is why we used it as one of the wells you started to log on in preparing this Exhibit?

A That's correct.

Q Is there anything else, Mr. Young, that you would like to add to your testimony in connection with this hearing?

A I don't believe there is.

MR. COUCH: We offer in evidence Ohio's Exhibits 1 and 2.

MR. PORTER: Without objection, the Exhibits will be admitted.

(Whereupon, Ohio's Exhibits 1 and 2 received in evidence.)

MR. COUCH: Mr. Porter, if I may, I would like to make a brief closing statement.

MR. PORTER: The witness may be excused. You may proceed with your statement.

(Witness excused)

MR. COUCH: It's going to be short and it's going to be quick.

I'm holding the rules of the Commission that state: "'Pool' means an underground reservoir containing a common accumulation of crude petroleum oil or natural gas or both."

The Commission knows these rules better than I do, but when we are thinking in terms of having to move a mile or mile and a half from a present horizontal limit line to another area, I can see the need for the reluctance and being cautious about these markets. However, the Commission in applying three hundred twenty-acre spacing in one area and in considering whether it should be applied in another, and in a case like this where all available evidence indicates that, notwithstanding the fact there have been some wells drilled in between, this is one continuous structure and is one common reservoir and is one common accumulation, we think it is very obvious that correlative rights will be protected only, only by including all of this area within the horizontal limits of this pool; and that the application of 320 spacing to a portion of it through the temporary continuation here should also extend to the additional part of the same reservoir that has the same characteristics. Thank you.

MR. PORTER: Anyone else have a statement?

MR. KELLAHIN: Jason Kellahin of Kellahin & Fox, representing Standard Oil Company of Texas. Standard Oil Company of Texas is the operator of two shut-in gas wells in the Atoka-Pennsylvanian Gas Pool. Standard concurs with the recommendations and motion that was made by Pan American Petroleum Corporation for

continuance of the present temporary rules in the Atoka-Pennsylvanian Gas Pool. Standard believes that one well will drain in excess of three hundred twenty acres, and that drilling of wells on less than three hundred twenty acres would be uneconomical. Standard Oil Company of Texas has executed a gas purchase agreement for the area with Transwestern Pipeline Company dated December 3rd of 1959. This application for a Certificate of Public Convenience and Necessity is currently on file with the Federal Power Commission.

MR. PORTER: Anyone else have a statement to make? Mr. Buell.

MR. BUELL: I might state with respect to Ohio's request to extend the pool limits, it is the opinion of our reservoir engineers that the Ohio wells are completed in the same Atoka-Pennsylvanian sand as the other wells in the field.

MR. PORTER: Mr. Payne, do you have some correspondence concerning this case?

MR. PAYNE: Yes, sir. The following companies concur in Pan American's application to continue the three hundred twenty-acre spacing in this pool for another year: Gulf Oil Corporation, Nearburg, Carper Drilling Company, Sinclair, and six mineral interest owners, individuals.

MR. PORTER: I will concur in the continuation of the present pool rules for another year.

MR. NUTTER: Mr. Buell, has Pan American's acreage been

dedicated to any gas purchasing company?

MR. BUELL: We are currently negotiating a contract with Transwestern and Southern Union. As yet, we have not executed a contract with either. We feel it is imminent.

MR. PORTER: Does anyone else have anything further to offer in the case? The Commission has decided to continue the present pool rules in effect for a year from the date of the expiration of the present order. We have also decided that the pool should be extended to include the two Ohio wells. Now, we are not just sure yet whether all the acreage as proposed by Ohio will be included, but enough acreage will be included in the extension to take in these two Ohio wells.

MR. COUCH: As far as Ohio is concerned, it was our effort in outlining the recommended area to recommend what we thought to be the most reasonable area. Certainly, whatever the Commission does on that will meet with our entire approval.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, 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 machine shorthand and reduced to typewritten transcript 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 7th day of June, 1960, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My Commission expires:

June 19, 1963