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

REGULAR HEARING

IN THE MATTER OF:

Application of Phillips Petroleum Company for an order promulgating special rules and regulations governing the drilling, spacing, and production of wells in the Ranger Lake-Pennsylvanian Pool, Lea County, New Mexico, including the establishment of 80-acre proration units for wells in said pool. CASE 1668

BEFORE:

Mr. Murray Morgan
Governor John Burroughs

TRANSCRIPT OF HEARING

MR. PAYNE: We will proceed to Case 1668, which is an application by Phillips Petroleum Company for an order promulgating special rules and regulations governing the drilling, spacing, and production of wells in the Ranger Lake-Pennsylvanian Pool, Lea County, New Mexico, including the establishment of 80-acre proration units for wells in said pool.

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

MR. SPANN: Charles C. Spann of Grantham, Spann and Sanchez, 904 Simms Building, Albuquerque, New Mexico, representing the Applicant, Phillips Petroleum Company; and I have associated with me Mr. Carl Jones of Midland, also with Phillips Petroleum

Company, who will conduct the questioning in the cases.

We have two witnesses in support of the application.

This is a hearing to have some temporary rules made permanent and we did have a hearing on the temporary rules. I assume that the record in that hearing, since this is the same case, will be considered by the Commission in connection with the determination of whether permanent rules should be promulgated.

MR. PAYNE: That's right, Mr. Spann, that record will be a part of this case.

MR. SPANN: Thank you.

MR. JONES: If it please the Commission, our first witness will be Carl F. Lawrence.

MR. PAYNE: Let's swear both witnesses in at the same time.

(Witnesses sworn.)

MR. SPANN: For the record, I would also like to introduce Mr. R. M. Williams, also of Phillips, an attorney from Bartlesville, and enter his appearance.

(Whereupon, Applicant's Exhibits 1 through 5 marked for identification.)

CARL F. LAWRENCE

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

DIRECT EXAMINATION

BY MR. JONES:

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

A Carl F. Lawrence.

Q Where do you live, Mr. Lawrence?

A Bartlesville, Oklahoma.

Q You are employed by Phillips Petroleum Company?

A Yes, sir.

Q In what capacity?

A Regional Southwest Development Geologist.

Q In that capacity, have you had occasion to study the Ranger Lake-Pennsylvanian Pool in Lea County?

A Yes, sir, I have.

Q As a matter of fact, Mr. Lawrence, did you not testify at the last two hearings on this field, one on February 19, 1959, and the other on May 13, 1959?

A Yes, sir, I did.

MR. JONES: Any questions about his qualifications?

MR. PAYNE: No, sir.

Q (By Mr. Jones) Mr. Lawrence, have you had occasion to make a further study of the Ranger Lake Pool since the last hearing of May 13, 1959?

A Yes, I have.

Q In connection with that study, have you prepared certain exhibits?

A Yes, sir.

Q And on the board is what is marked Exhibit No. 1, and

will you explain to the Commission what that is, please?

A Exhibit No. 1 is an east-west cross section across the Ranger Lake Field, going in an east-westerly direction. It starts in the west with the Tidewater No. 1 "K" State, located in the Northeast of the Northeast of Section 27, east of the Phillips No. 10 Ranger; further east, the Phillips No. 5 Ranger; and then terminating in the east with the Phillips No. 2 Ranger located in the Northwest Northwest of Section 23.

On the cross section the top upper red shaded line is the top of the Ranger Lake pay zone. The lower wavy line shaded by blue is the original oil-water contact. The various logs run on the well are indicated on this cross section showing the completion interval by perforations, as well as the initial flowing or pumping potential, along with the completion data of each well.

Q All right, Mr. Lawrence, what do you show the oil-water contact to be?

A Minus 6211.

Q Anything further from that exhibit?

A The cross section itself shows the continuity of the pay horizon, showing the common reservoir of each of the wells.

Q All right. Have you also prepared a north-south cross section of this reservoir?

A Yes, sir, I have.

Q Is that marked Applicant's Exhibit 2?

A Yes, sir.

Q Now on the north-south cross section, the Phillips Exhibit 2, I believe you also have a structure map of this reservoir, do you not?

A Yes, sir.

Q Proceed.

A The cross section No. 2 is a north-south cross section extending in a north-south direction through the center of the field. It starts in the north part of the field with the Phillips No. 4 Ranger located in the Southeast of the Northwest of Section 23. It progresses south to the Phillips No. 6 Ranger to the Number 11 Ranger to the No. 12 Ranger, and then terminates in the south with the Amerada well located in the Northwest Northwest of 35.

This cross section shows the structural relationship, as well as the continuity of the pay horizon throughout the field, and shows it on a north-south plane.

Once again the red line indicates the top of the Ranger Lake pay zone; the blue line, the lower blue line indicates the oil-water contact at minus 6211. On this cross section we've also shown a structural map contoured on top of the Ranger Lake pay zone. This is contoured on a 50-foot interval and shows the structural relationship of the field.

Q To date how many wells have been drilled in this reservoir, Mr. Lawrence?

A To date there has been a total of nineteen wells drilled since the last hearing. It makes a grand total -- there has been

a total of twenty-six wells drilled to the Ranger Lake pay zone. Of those twenty-six, there's been four dry holes and twenty-two producers. To date there are twenty-two producers in the field.

At the time of the last hearing there were seven wells drilled to the reservoir, consisting of six producers and one dry hole. So in the fifteen months since the past hearing, or since the May hearing, there were a total of nineteen wells drilled to the reservoir.

Q Of those wells which are presently producing in the reservoir, how many are owned or operated by Phillips Petroleum Company?

A Phillips operates eleven producers.

Q Mr. Lawrence, I believe the record of the prior hearing will show that it was estimated that twelve to fourteen wells would be drilled within the next year following the date of that testimony; and now you have testified that nineteen wells have been completed since that time?

A Yes, sir. Nineteen wells have been drilled. There were sixteen completed as producers.

Q Yes. In your opinion does that indicate to you that the temporary rules which have been in effect during that year have encouraged drilling, as you testified in your opinion would be the case at the last hearing?

A Yes, sir, definitely.

Q All right, now, have the wells drilled to the Pennsylvanian

reservoir in this field to date defined the limits of the field, in your opinion?

A Yes, in some areas; there are two areas which the field is not definitely delineated as yet. The first area is in the Northeast portion of the field, primarily the Northeast Quarter of Section 23, and in the Southwesterly portion of the field; namely the Southwest Quarter of Section 34. I don't feel that those limits in those particular areas are definitely delineated at this date.

We have the field limit in an east-west direction, dry holes and a pinchout of the pay. However, in the Southwesterly portion and the Northeasterly portion, I don't feel that the field is quite yet defined.

Q Will you proceed to your next exhibit, Mr. Lawrence? What is the exhibit which has been marked as Exhibit 3?

A Phillips Exhibit No. 3 is an isopaque map contoured on the net pay encountered in each of the various wells drilled in the Ranger Lake field.

We have made this isopaque on an acetate overlay so we could lay it over the structural map to see any relationship there may be or if there is a relationship between net pay and structural position?

A It's a convenient method of portraying that type of relationship and we feel that there is some relationship between net pay and structural position.

Q And is that indicated in your opinion by the overlay?

A Yes, sir, it is.

Q Have you also prepared a larger isopaque map of net pay thickness?

A Yes, sir, we have just a regular isopaque map constructed on these net pays, and it's basically the same map as the overlay, except it is on a different type of paper. That is Phillips Exhibit No. 4.

Q Do you have a further exhibit, Mr. Lawrence?

A Yes, sir. In front of the brochure there is a little regional map showing the geological location as well as the geographic location of the Ranger Lake Field. It shows the Ranger Lake Field to be on the southeast flank of the northern shelf, or on the northwest portion of the Chaves-Lea Basin.

Q From your study of this field, is it still your opinion, as it was at the time of the prior hearing, that this reservoir, that the wells in this reservoir are in communication with each other and it does constitute a common source of supply?

A Yes, sir.

Q Have you formed an opinion from your study of the field, from a geological standpoint, that the characteristics of this field are such that one well will drain 80 acres in the field?

A Yes, I definitely feel that one well will drain 80 acres.

Q Have you studied and prepared data as to the cost of drilling a well in this field?

A Yes, sir, I have.

Q Will you give the Commission those figures, please?

A We have prepared an economic analysis, assuming a 100 percent working interest on drilling a 10,400 foot development well in the Ranger Lake Field. We compared it using 80-acre reserves as compared against 40-acre reserves.

At the previous hearing we have used as an exhibit a similar economic analysis, and I will compare the analysis at that time to our current analysis.

At the May hearing we had an 80-acre unit ultimate average primary recovery of 210,000 barrels of oil. With the additional reservoir information that we have gathered from the wells in the Field, the additional productive history that we have been able to attain on these wells, we were forced to reduce the reserve to 175,000 barrels per well.

Our initial investment for drilling a development well at the May hearing was $200,000.00. By using a different casing string, we were able to reduce that cost to $196,000.00.

MR. NUTTER: How much is that?

A $196,000.00.

MR. NUTTER: Thank you.

A Our net reserve, in other words, after we take the override out, at the May hearing was 173,700 barrels of oil. Our net reserves now, based on the new ultimate recovery, is 131,000 barrels of oil. The value of that oil is $392,000.00 under our new analysis, as compared against $475,913.00 at the May hearing.

The investment plus the lease operating and overhead costs at the May hearing was $244,000.00. Our current investment and lease operating costs are now $240,000.00. So our profit before tax then is $152,000.00. At the May hearing we reported the profit only before tax. We have since worked it out and had it worked out after taxes, the income tax and various taxes on that amount of money would be $21,000.00, leaving an ultimate profit after taxes to the operator of $123,900.00. That's an investment -- in other words, our investment then is returning 1.6 times.

Our wells now would pay out in twenty-one months at 143 barrels of oil per day, yielding the operator an annual rate of return of twenty-nine percent. That compares with the May hearing where wells paid out in eighteen months at 163 barrels of oil per day. We have had to reduce -- or increase the payout time because the wells would not make that much oil per day, so we've lengthened our payout time some three months to twenty-one months.

In comparing that against 40-acre development, our initial investment at the May hearing, again, was $200,000.00, and our initial investment on 40-acre development would still be the same, $196,000.00. Our gross reserves, however, would be cut in half. Our gross reserves at the May hearing was $145,000.00. Now our gross reserves will only be $75,000.00.

Our net reserves would be 65,500 barrels of oil, that's after we take our override out. The value of that oil is $196,000.00, less our investment and lease operating expenses of $240,000.00 gives

the operator a loss of $44,000.00.

So comparing those two, I feel that it's clear that 40-acre development is just not feasible; that with 40-acre development operators could not afford to drill wells, and I think the productive history that we've seen on the wells substantiates this analysis.

Q (By Mr. Jones) Mr. Lawrence, those figures, of course, are based on what you conceive to be an average well in the Field, are they not?

A Yes, sir, that is correct.

Q They are strictly the cost of drilling an average well?

A Yes, sir.

Q Those figures, I understand, do not include any portion of lease acquisition costs?

A That's right.

Q Or any charges for dry holes which might be drilled?

A That is correct.

Q It's your opinion, then, I believe you stated, that it's not economically feasible to drill wells in this field on 40 acres?

A That is correct.

Q Is it your opinion that to require development on 40 acres would result in the drilling of unnecessary wells in this Field?

A Yes, sir, it would.

MR. JONES: That concludes the direct testimony of this witness, and may it please the Commission, we move the admission of Phillips' Exhibits 1 through 5, inclusive.

MR. PAYNE: Phillips' Exhibits 1 through 5 will be admitted. Does anyone have a question? Mr. Nutter.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Lawrence, I believe at the last hearing some data was submitted regarding permeability and so forth of this reservoir. Do you have any new data on that aspect of it?

A No, sir, we did not core additional wells in the Field. We felt the core taken on Ranger Lake No. 2 was sufficient.

Q Have any interference tests or bottom hole pressure tests been run in this Field?

A I believe our engineering witness will have information on that.

Q How about production decline curves on the wells? Will he also have information on that?

A Yes, sir.

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

MR. PAYNE: Anyone else have a question of the witness?

BY MR. PAYNE:

Q Mr. Lawrence, what is the drive mechanism in this pool?

A Solution gas.

Q Does Phillips anticipate this pool will be waterflooded

in the future?

A My own personal opinion on that is that it probably will be in the future, yes, sir.

Q From a geological standpoint, would you expect to get more, less, or the same amount of oil on secondary recovery, whether this pool is drilled up on 40 or 80 acres?

A I believe our engineering witness will have information in regard to the secondary recovery aspects of the Field.

Q Does Phillips have any undrilled acreage left in what you consider the productive limits of the pool?

A Yes, sir. We feel that we have probably two additional locations left in the Field; one to the south in the Southeast of the Northwest of Section 34, or somewhere in the 80-acre tract; and also we feel we have productive acreage in the Northeast Quarter of Section 23.

Q Now, if my memory serves me correctly, this pool is the one that has one well in it that has 40 acres dedicated to it with a so-called special allowable?

A Yes, sir.

Q It's the recommendation of Phillips that the rules enacted on a temporary basis be made permanent, including a provision relative to that well?

A Yes, sir, I believe it is.

Q And all of your wells are no longer top allowable wells?

A That's correct, yes. We have, I believe, one or two

there that are still top allowable, but that's all.

MR. PAYNE: Any further questions of the witness? He may be excused.

(Witness excused.)

MR. JONES: Our next witness will be Mr. W. R. Bohon.

W. R. BOHON

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

DIRECT EXAMINATION

BY MR. JONES:

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

A W. R. Bohon, B-o-h-o-n.

Q Where do you live, Mr. Bohon?

A I live in Bartlesville, Oklahoma.

Q You are employed by Phillips Petroleum Company?

A Yes, sir.

Q In what capacity?

A I'm the supervising area petroleum engineer for the Western Area, that encompasses Southeastern New Mexico and the Permian Basin Area of West Texas.

Q In such capacity do you have supervision of and have you made a study of the Ranger Lake-Pennsylvanian Pool in Lea County?

A Yes, sir, I have.

Q You testified, I believe, at the first hearing on this Field on February the 19th, 1959?

A That's correct.

MR. JONES: Any questions about his qualifications?

MR. PAYNE: No, sir, they are acceptable.

Q (By Mr. Jones) You did not testify at the last hearing on this Field on May the 13th, 1959?

A No, I did not.

Q Who did present the hearing testimony on that occasion?

A Mr. B. W. Berthelot, who at that time was our Division Engineer assigned to Midland, Texas.

Q Have you read the transcript of that hearing and Mr. Berthelot's testimony at the prior hearing?

A Yes, sir.

Q Are you in general agreement with the factual data which was presented by him?

A Yes.

Q Have you made a continued study of the Ranger Lake-Pennsylvanian Pool since the date of the last hearing?

A Yes, sir.

Q Have you prepared certain exhibits and data in connection with the Field and its performance since May 13, 1969?

A I have.

(Whereupon, Phillips' Exhibits 6 through 12 marked for identification.)

Q Will you proceed?

A I have prepared a brochure which was passed out; the first page or the first exhibit, which I assume will be Phillips

Exhibit No. 6, is essentially the same that was submitted at the previous hearings, but has been brought up to date and changed where necessary. I'll limit my comments to new data and to changes over that which was presented at previous hearings.

Under Item No. 1-A, which is the average, approximate average porosity, this has been reduced to 6.7 percent from 8.7 percent which was shown on the exhibit at the previous hearing. This reduction was necessitated by the additional information obtained by drilling the nineteen wells referred to by Mr. Lawrence. The information is the same as shown on the original exhibit until we get down to the statistical data, Item No. 5; this data was taken from the New Mexico Oil and Gas Engineering Report. There is a correction that needs to be made on this particular exhibit. There are actually twenty-one producing wells in the Ranger Lake-Pennsylvanian Field as of 6-1-60. The reason for the exhibit showing only twenty was that one of the wells, the American Trading well, was carried in the New Mexico Oil and Gas Engineering Report under an undesignated classification rather than in the Ranger Lake-Pennsylvanian Pool. The inclusion of that well would also necessitate the changing of the accumulated production. It should be for the oil 1,239,486 barrels. The water production should be changed to 23,162 barrels.

Under the General Reservoir Mechanics, we have of course additional history on this Field. This history indicates that this reservoir is now operating under a solution gas drive mechanism and

will operate under a solution gas drive mechanism until depletion. We have no evidence to date of a water drive.

The next exhibit is a tabulation of the production data for the Ranger Lake-Pennsylvanian Pool. As I said, this information was taken from the New Mexico Oil and Gas Engineering Report. This information that's tabulated is also shown graphically on the following exhibit, which will be Phillips Exhibit No. 8. I think it will be easier for us to see the performance of this Field from this graphical presentation, rather than from the tabulation.

At the time of the last hearing, there were six wells completed in the Field. The information that I have tabulated and plotted here runs to June 1st, 1960, at which time there were twenty-one producing wells in the Ranger Lake-Pennsylvanian Pool. At the time of the last hearing, the Field gas-oil ratios was approximately 650 cubic feet per barrel. It has increased to approximately 1350 cubic feet per barrel. The monthly oil production at the time of the last hearing was in the order of 25,000 barrels per month. Currently it is approximately 67,000 barrels per month. This production of 67,000 barrels a month, incidentally, would compare to a top allowable for all of the wells in the Field of something in excess of 120,000 barrels per month. The wells are actually producing about half of what the top allowable for this depth well on 80-acre spacing would be, if they were capable of making it.

The next exhibit is a tabulation of the bottom hole pressure data available in the Field. This is marked Exhibit 9 and

is an exhibit that has been brought up to date from the previous hearings. The bottom hole pressures are tabulated under each well, showing the date, the hour shut in, and the bottom hole pressure at the reservoir datum of minus 6,050 feet. Again the following exhibit is a graphical presentation of the tabulation shown on Exhibit No. 9, I believe; Exhibit No. 10 then being the graphical presentation of the bottom hole pressures by wells plotted versus time.

At the time of the last hearing, the initial pressure on the Phillips Ranger No. 6 had been presented; thus all of the bottom hole pressure information subsequent to May, 1959, is new bottom hole pressure information. It is pertinent to observe that the wells closer to the older area of development are, generally speaking, coming in with lower initial bottom hole pressures. These pressures are following fairly rapidly to the order of magnitude of the pressures encountered in the older wells. Wells further removed from the area of older development are coming in with higher initial bottom hole pressures, and they aren't declining as rapidly. This is exactly what you would expect in a field of this configuration and with this development that has been experienced.

Exhibit No. 11 is a tabulation of the initial bottom hole pressures measured in the wells completed. Opposite the pressure spot on this exhibit is the name of the well the pressure was measured in, and immediately below that is the date of the pressure measurement, and in parenthesis following that is the date that the well

was completed. The red line running across the top of this exhibit is the estimated original bottom hole pressure. It is pertinent to note in this exhibit that all of the wells completed since the last hearing, and those are all of the wells since the Phillips Ranger No. 6, show a considerable pressure decline from the original reservoir pressure. The maximum initial reservoir pressure measured was 2,903 pounds. This pressure is still some 707 pounds below the original reservoir pressure of 3,620.

Now this pressure was measured in the Pan American State A.S. Well No. 1, which if you will refer to a map you will see is on the farthest side of the Field from the area of the older development. I think this is conclusive proof that we have experienced communication and drainage over rather large areas, considerably larger than what we are asking for here in 80-acre spacing.

The next exhibit is again a plot of bottom hole pressures versus the cumulative production on the Phillips Ranger Lease. This is an up to date exhibit of one presented by Mr. Berthelot at the previous hearing. I think that the additional data that has been obtained has corroborated our contention that drainage is occurring and that a well will efficiently drain on 80-acre spacing.

Q All right, Mr. Bohon, you heard Mr. Lawrence's testimony as to the cost of drilling and the anticipated recoveries and profit to be expected from wells on 80-acre spacing and 40-acre spacing. Are you in general agreement with those figures?

A Yes, sir, I am.

Q Do you have anything to add to Mr. Lawrence's testimony in that regard?

A No, I do not think that a well can be drilled from an economic standpoint on 40-acre spacing. As pointed out by Mr. Lawrence, these costs on the average well do not include leasehold acquisition cost, do not include a pro rata share of the dry holes that have been drilled in this area; and the data presented actually would be an optimistic picture.

Q It is your opinion then that this Field and reservoir can be efficiently and economically drained on 80-acre proration units?

A Yes, sir.

Q Will you express briefly the reasons shown in that brochure showing the communication which warrants the development on 80-acre proration units?

A I think the most significant exhibit that we have in point is the fact that all of these wells that have been completed recently have come in with initial reservoir pressures considerably below the original reservoir pressure, concrete evidence that drainage has occurred, considerable drainage, and over rather long distances. To my knowledge there is no better proof of drainage than this.

Q Is it your opinion that to require development of this reservoir on 40-acre proration units might cause the drilling of unnecessary wells?

A Yes, sir, I think that it would.

Q Is it your opinion that to require development of this reservoir on 40-acre proration units might impede further development in the pool?

A Yes, sir, I do.

Q By the way, Mr. Bohon, what is the stage of depletion, in your estimate, of this reservoir?

A I would estimate the stage of depletion of this reservoir from a third to a half.

Q At the date of the last hearing there was no market for gas from this Field. Is there now a market and is gas being sold from the Field?

A Yes, sir, there is. I believe the casinghead gas is being sold to Warren Petroleum Company. I know on Phillips Lease we started selling gas in June of 1959.

Q You heard Mr. Lawrence's testimony that nineteen wells have been completed in this pool since the date of the last hearing, as contrasted with an estimate of twelve to fourteen wells which it was then thought would be drilled during the following year. Does that indicate in your opinion that the temporary rules have encouraged the development of this pool?

A Yes, sir, it does.

Q The application which is the subject of this hearing is that the temporary rules now in effect for the pool be made permanent. Will you express briefly for the Commission the temporary

rules which are now in effect and which this application requests be made permanent?

A Well, very briefly, the rules now in effect require 80-acre spacing and 80-acre proration units, with the wells to be located within 150 feet of the center of either the Northwest Quarter or the Southeast Quarter Section of a governmental Quarter Section.

Q One moment, if you please. I believe they specify 80-acre proration units, but it does not specify 80-acre spacing. An operator may, if he chooses, can drill more than one well on an 80-acre unit, but would receive only the 80-acre allowable. Is that now the effect of the order as it now reads?

A That is correct. I beg your pardon.

Q If you will continue, please.

A Basically, that comprises the temporary rules now in effect.

Q Now the order also assigns to the, permits the Gordon Cone well, which is on a 40-acre tract, an 80-acre allowable, and it is the position of the applicant, Phillips Petroleum Company, at this hearing that insofar as the applicant is concerned, that well may continue to receive an 80-acre allowable?

MR. PAYNE: I don't believe that's correct, a 40-acre allowable.

Q (By Mr. Jones) 40-acre allowable?

A Yes, sir.

MR. JONES: If it please the Commission, that concludes

the direct testimony of this witness, and the applicant moves the admission of Exhibits 6 through 12 inclusive.

MR. PAYNE: Were these exhibits prepared by Mr. Bohon or under his supervision?

A Yes, sir.

MR. PAYNE: They will be admitted. Does anyone have a question? Governor.

CROSS EXAMINATION

BY GOVERNOR BURROUGHS:

Q You give the cost of a completed well as $196,000.00?

A That's correct.

Q What would be the approximate cost of a dry hole, a well not completed?

A Governor, I do not have those figures with me.

Q You don't have an approximate idea what it might be?

A It would depend on whether or not you basically set your casing string to test it before you abandoned it as a dry hole. In, I know in No. 8, which was a dry hole, the cost of that well was considerably in excess of a producer, because we attempted to make a completion out of it and were unable to, and the cost did exceed the cost of a normal completion.

MR. PAYNE: Mr. Nutter.

BY MR. NUTTER:

Q Mr. Bohon, this last page in this brochure of yours shows plots of twelve Phillips Ranger wells, and the curve seems to

be bottom hole pressure versus cumulative oil production. Is this the total production from each of these wells at the time this bottom hole pressure was taken?

A No, sir, this is not. This has been plotted, the cumulative production from the lease.

Q From which -- oh, this is from the lease?

A Yes.

Q What is the lease, the Ranger Lake Unit?

A Yes.

Q That's most of the pool, then?

A Yes. At the time that Mr. Berthelot made this exhibit it was essentially all of the pool. With the additional development that has been experienced in this Field, why, it of course no longer comprises such a large portion of the Field; and of course, the additional development and production from these other wells would tend to make this particular exhibit at this time not as significant as it was at the time Mr. Berthelot was testifying from it.

Q What was the cumulative production when Mr. Berthelot was testifying; in other words, where on this curve would it have been?

A Well, the No. 6 well, which would be approximately, oh, 450,000 barrels of oil produced.

Q I see. We don't have any curves that show the decline of the pressure in the wells versus the cumulative production as far as individual wells is concerned, do we?

A No, sir, I have not prepared those.

Q What is the maximum amount of oil that any well has produced?

A That will take me just a minute. The maximum amount of oil was produced by the Phillips Ranger No. 1, the initial completion in the Field, and as of June 1st, 1960, the accumulated production to that well was 220,853 barrels. That well, of course, has had the advantage of draining a large area and was, of course, the first completion in this Field.

Q Do you think that this pressure decline that was encountered down here on Pan American's lease when these wells were completed resulted from some oil having migrated from their well up to the Ranger No. 1 Well?

A To that general area, yes, sir.

Q So these later wells wouldn't make as much recovery as the older wells in the pool, then?

A No, sir.

MR. NUTTER: I believe that's all.

MR. PAYNE: Anyone else have a question of Mr. Bohon?

BY MR. PAYNE:

Q Mr. Bohon, have you made a general comparison of this pool with the Allison-Pennsylvanian and the Bluett-Pennsylvanian Pool?

A No, sir, I haven't.

Q You are not familiar with the range of porosity and

permeability?

A I am not familiar with those fields.

Q This pool has been developed on a fixed spacing pattern?

A Yes.

Q Has the subsequent development of the pool made you feel that the diagonal pattern as required by the rules is correct?

A The purpose of a fixed location is for uniform development in a field, but admittedly, as you get to the edges of the field, this fixed location does work hardships on certain operators. This is a rather narrow field. We have lived within the fixed location, Phillips has lived within the fixed location and have developed their properties along that line. I would have no objection to its removal.

Q Do you feel that flexible well location patterns on oblong units results in approximately the same amount of oil recovery as a fixed pattern?

A Yes, sir.

Q Inasmuch as when you get to the edge you may have some wells that are not drilled on a fixed pattern?

A That's true.

Q Do you believe that there will be substantially the same amount of oil recovery from this pool if it's developed on 80-acre proration units?

A As opposed to 40?

Q Yes, sir.

A Yes, sir, I definitely do.

Q If Phillips waterflooded this pool, would you recommend to your management that it drill infill wells?

A Not necessarily. The experience and the pressure history to date would indicate that infill wells would not be needed.

Q In other words, you believe you would get the same amount of recovery on secondary whether this pool is developed on 40's or 80's, substantially the same amount?

A Yes, sir. Further, if you were to require the indiscriminate drilling of 40-acre locations, not indiscriminate, but the drilling of 40-acre locations, you would have to drill 40-acre locations along the perimeter of the field, too, and I think they would be useless to you in a secondary recovery project, unless you were going into a pattern type flood.

Q Of course, that might indicate then, might it not, that on primary on these edge wells, you are dedicating 80 acres but only 40 acres are productive?

A No, I did not mean to say that. I don't believe I said it. What I meant to say was that if you were, if additional wells are needed in a secondary recovery prospect or project, the specific location should be left to the operators of that waterflood and not just say, "We're going to drill all 40-acre locations," because first of all, it's not economic to drill 40-acre locations, and secondly, you would drill a lot of unnecessary wells, a lot of wells that wouldn't be useful even in a secondary recovery project. At the present time there is no indication that we will need to drill

infill wells.

MR. PAYNE: Thank you. Any further questions of the witness? If not, he may be excused.

(Witness excused.)

MR. PAYNE: Do you have anything further, Mr. Jones?

MR. JONES: Yes, sir. I offer as Phillips Exhibit 13 a letter from Amerada Petroleum Corporation stating that Amerada will appear at the hearing and make a statement in support of this application.

I offer as Phillips Exhibit 14 a letter from Joseph I. O'Neill, Jr., stating that they agree that this Field should continue to be developed on 80-acre proration units. The letter, however, further states that this operator believes that the rigid spacing requirements should be eliminated from the rules.

Offer as Exhibit 15 a letter from Pan American Petroleum Corporation stating: "We plan to have a representative present at the hearing to make a statement in support of your application for permanent 80-acre spacing."

I offer as Phillips Exhibit 16 a letter from Mobil Oil Company stating that they were included on the mailing list by mistake and have no interest in this pool.

(Whereupon, Phillips' Exhibits 13 through 16 marked for identification.)

MR. JONES: If it please the Commission, that concludes our testimony.

MR. PAYNE: Anyone desire to present any further testimony? Anyone desire to present statements?

MR. CAIN: G. W. Cain, Pan American. Pan American recommends that the existing temporary rules for the Ranger Lake-Pennsylvanian Pool be made permanent.

MR. WHITE: Charles C. White, Gilbert, White and Gilbert, appearing on behalf of Texaco and Sunray-Midcontinent. Texaco last month completed its State Well "M" Well No. 1 in the subject area in the Pennsylvanian. This well flowed 222 barrels of oil in twenty hours on a 36/64-inch choke. Texaco feels that one well will efficiently and economically drain the area, and we seriously urge the Commission to adopt a permanent 80-acre basis.

Sunray-Midcontinent is the owner of one-half interest in the acreage, and they also urge the granting of the application.

MR. PAYNE: Any further statements?

MR. CHRISTY: R. S. Christy, Amerada. Amerada has one well in this Field, and we believe that the testimony shows that the present temporary order should be made permanent.

MR. COUCH: Terrell Couch of The Ohio Oil Company. I'll have to say that we are somewhat like Mobil, we are not actually in the field. We still have hopes, we have some acreage adjacent to it. I think that the testimony and the new data presented here and the production history since the last hearing certainly underlines the wisdom of the Commission in adopting the temporary rules, and definitely supports the proposition that they should be made permanent.

MR. PAYNE: Anyone else?

MR. JONES: I would like to make a brief closing statement, if I may.

MR. PAYNE: All right.

MR. JONES: If it please the Commission, we believe that the testimony presented here, which shows the development and the history of this pool since the date of this last hearing, has shown that the Commission has acted wisely in establishing temporary rules for this pool, and we feel it substantiates the fact that these rules should be made permanent.

We believe that the testimony at the last hearing and at this hearing has shown that one well can efficiently and economically drain 80 acres in this reservoir, at least 80 acres.

We feel that the testimony further shows that it would be economically unfeasible to drill to 40-acre proration units in the Field, and that the cost of the wells and the reserves to be anticipated establish that fact, and that 40-acre proration units would result in the drilling of unnecessary wells.

We believe that the fact that this pool is now, as it has been testified, one-third to one-half depleted, within the space of less than four years since the date of the completion of the first well, established the fact that certainly this would not be the time to require 40-acre proration unit drilling in this Field.

We respectfully submit that the evidence fully substantiates the fact that permanent rules should be adopted providing

for 80-acre proration units in the Field.

MR. PAYNE: If there is nothing further, the Commission will take Case 1668 under advisement and recess for ten minutes.

(Recess.)

MR. PAYNE: The hearing will come to order, please. We would like to reopen Case 1668 for the purpose of taking an additional statement.

MR. CAMPBELL: If the Commission please, I am Jack M. Campbell, Campbell and Russell, Roswell, New Mexico. I would like to enter an appearance in Case 1668 on behalf of Texas Pacific Coal and Oil Company, which owns a 42.8 percent in the Ranger Lease operated by Phillips.

Texas Pacific Coal and Oil Company would like to have the record show that it concurs and supports the application of Phillips in Case 1668.

MR. PAYNE: Case 1668 will be taken under advisement.

The Commission would like to advise at this time that the oil allowable decision will be deferred until later in the week.

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

DATED This 22nd day of August, 1960, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My commission expires:

June 19, 1963.