

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
December 15, 1964

EXAMINER HEARING

IN THE MATTER OF:

(Reopened and continued from the
November 12, 1964 examiner hearing) Case No.
2660 being reopened pursuant to the provisions
of Order R-2348-A, which continued the
original order establishing 80-acre
proration units for the Middle Lane-
Pennsylvanian Pool, Lea County, New Mexico, for
an additional year.

Case No. 2660

BEFORE :

TRANSCRIPT OF HEARING

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Case No. 2660

BEFORE: ELVIS A. UTZ, EXAMINER

TRANSCRIPT OF HEARING

MR. UTZ: The hearing will come to order. Case 2660.

MR. DURRETT: In the matter of Case Number 2660
being reopened pursuant to the provisions of Order Number

R-2348-A.

MR. MORRIS: If the Examiner please, I'm Richard Morris of Seth, Montgomery, Federici & Andrews appearing on behalf of Midwest Oil which was the applicant in the original Case 2660 seeking to establish 80-acre spacing in this pool and special rules and regulations for the pool. We will have one witness, Mr. Bill Baker, and I ask that he be sworn at this time.

(Witness sworn)

MR. UTZ: Are there other appearances in this case? You may proceed.

MR. MORRIS: At the outset, Mr. Examiner, we would call your attention to the request stated in the advertisement of this case where pursuant to Midwest's request, the call of the hearing was expanded to include a consideration of the vertical limits for this pool. Since the time that that request was made, Midwest has decided that at least for the present time the vertical limits of the pool should still be the entire Pennsylvanian and we wish to draw our request for a definition of those vertical limits in this hearing and our evidence will be directed to making pertinent the 80-acre proration units for the pool and for deleting the fixed well location

requirements of the order and changing the provisions of the special rules and regulations to provide for flexible well location.

BILL D. BAKER

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

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Baker, will you tell us your name, by whom you are employed and in what capacity and where you're located?

A B. D. Baker, I'm employed by Midwest Oil Corporation as a petroleum engineer in Midland, Texas.

Q Have you previously testified before the New Mexico Oil Conservation Commission or one of its Examiners?

A No, sir, I have not.

Q Would you briefly outline your education and your experience in the oil industry?

A I graduated from the University of Texas in 1953 with a degree of Bachelor of Science and Petroleum Engineering, I was employed for some eleven years by Texas Pacific Oil Company in various capacities from petroleum engineering trainee to the assistant to the manager of production. Five of these years were spent in Hobbs, New Mexico. I'm both well acquainted with Lake County, I am a registered professional engineer in

New Mexico and in Texas.

Q Are you familiar with the Middle Lane Pool and the interests of the Midwest Oil Corporation in that area?

A Yes, I am.

MR. MORRIS: Are the witness's qualifications acceptable, Mr. Examiner?

MR. UTZ: Yes, sir, they are.

Q (By Mr. Morris) If you would refer first now, Mr. Baker, to what has been marked as Exhibit Number 1 in this case and state what that is and what it shows.

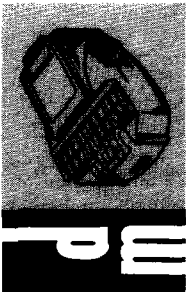
A Exhibit 1 is a structural map of the Middle Lane Area. It shows the Lane Pool to the north, the South Lane Pool in the south and in the center of it the Middle Lane Pool which we'll be primarily interested in here.

Q How many wells have been drilled in the Middle Lane Pool?

A In the Middle Lane Pool there have been three wells drilled.

Q Would you point out their locations on this Exhibit Number 1?

A The discovery well was drilled in Section 14 in the northwest of the southwest quarter by the Midwest Oil Corporation which is the LLE State Number 1. The second well was drilled by Hisson Drilling Corporation in the northwest of



the northeast quarter. The third well was the Midwest State B Number 1 in the southeast of the southwest quarter.

Q Those three wells are presently classified as being in the Middle Lane-Pennsylvanian?

A Those three wells are presently classified as being in the Middle Lane-Pennsylvanian. For a little more information, they produce at a depth of approximately 9600 to 9700. The discovery well was drilled on October 8, 1962. The producing mechanism is considered to be a combination water drive and solution gas drive. The three wells have produced a total of 32,205 barrels of oil and 216,868 barrels of water.

Q And that information is shown on Exhibit 2?

MR. UTZ: How much water?

THE WITNESS: 216,868, that is the accumulative production to 11/1/64.

MR. MORRIS: If the Examiner please, this information is contained on Exhibit 2.

Q (By Mr. Morris) Referring to Exhibit Number 3, Mr. Baker, would you point out the pertinent features as shown on that exhibit which is entitled "Well Completion Data"?

A It shows the three wells as they have been completed in the Middle Lane Pool. The first is the Midwest Oil Corporation's LLE, the completion date is 10/9/64, that's a typographical error, it should be 10/8/62. It was completed

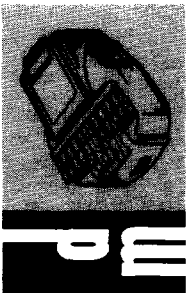
from the zone 9650 to 9654, the initial potential was 94 and 368 of water. The second well completed was the Hisson Drilling Company last on this Exhibit. It was completed in 10/16/63, initial potential was 296 barrels of oil with no water. However, this well produced only three months before it was abandoned due to 100 per cent water production. The third well being Midwest State B Number 1 was completed from a zone at 9676 to 9681 on 7/3/64, recompleted on 8/28/64 from a zone a little higher from 9616 to 9620.

Q Referring next to Exhibit Number 4, entitled, "Production History of the Middle Lane Pennsylvanian Pool," would you point out the features of that exhibit?

A This shows a month by month production history of the three wells with the field total given, in the last column it shows oil, water and gas production. The only well that there is much production history on is the LLE State Number 1, it has about two years' production history. The water-oil or the oil-water ratio during this production history has run in the neighborhood of 10 per cent. Not listed on the exhibit, but --

Q Now, referring to Exhibit 5, is that merely a graphic description of the same information?

A Yes, this is the same information for oil and water production shown graphically here. You can see that the water



production is approximately ten times the oil production, it has been for about the history of the pool.

Q Referring next, Mr. Baker, to Exhibit Number 6, entitled, "Core and Log Data," what does this exhibit show?

A This exhibit shows the entire producing zones that are present in the Middle Lane-Pennsylvanian Pool as taken from the Midwest LLE Number 1 and the Midwest State B Number 1. There is a core analysis shown for the Midwest LLE Number 1, there's a log interpretation shown for this one and a log interpretation for the Midwest State B Number 1.

Q Now, has information been taken from this core analysis and from these porosity figures that have been used in later computations that will be presented here?

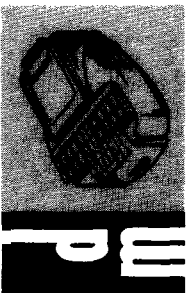
A Yes, we have used this information to determine net feet of pay porosity and the water saturation which are used in the following exhibit.

Q You also used the figure for permeability in subsequent exhibits?

A Yes, sir.

Q In making that permeability computation would you explain about it, please?

A This is a weighted average which is listed as 85.3. I'd like to point out that this does not include the foot from 9610 to 9611 which was 1,000 millidarcies. It does not include



the foot from 9615 to 16 which was .58 millidarcies, nor the foot from 9617 to 9618 which is 0.2 millidarcies.

Q In other words, those figures were so far out of line that it would have thrown your average off by far?

A Yes.

Q If they had been used, Mr. Baker, would it have increased the permeability, the average permeability?

A Yes, the average permeability would have been 142.5.

Q Now, referring to Exhibit 7, state what that exhibit is.

A This is an exhibit of the reservoir properties for the Middle Lane-Pennsylvanian Pool. It shows a net pay of 20 feet determined from the previous exhibit, a porosity of 6.2 per cent, water saturation of 33 per cent, permeability of 85 millidarcies, an original reservoir pressure of 3334 PSI, an original formation volume factor of 1.70 and a stock tank oil gravity of 45 degrees API.

Q Using these reservoir properties, have you made a calculation of original oil in place and recoverable oil for the Middle Lane-Pennsylvanian Pool?

A Yes, I have. Exhibit 8 shows volumetric calculations for the Middle Lane-Pennsylvanian Pool. The basic data is listed at the top of the exhibit which we have just been talking about. The calculations indicate a recoverable oil of 66.5

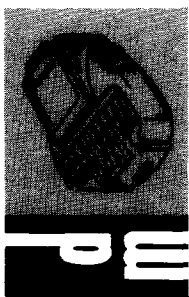
barrels per acre foot, recoverable oil of 1330 barrels per acre, which for 40-acre recovery would be 53,200 barrels and for 80-acre recovery would be 106,400 barrels.

Q Would you explain, Mr. Baker, upon what basis you estimate 35 per cent as the recovery factor for this pool?

A This, as you say, is an estimated recovery factor, due to the fact that this is a combination of water drive and solution gas drive, it is higher than normally used in the solution of a gas drive pool. Also, from information from the Lane-Pennsylvanian Pool which is a depleted pool, they have shown a recovery of some 36 per cent. The reservoirs are similar, so I used the figure of 35 per cent for a recovery factor.

Q Referring next to Exhibit Number 9, what is that exhibit and what does it show?

A Exhibit 9 is a rate cumulative production decline for the LLE State Number 1. This information used in this exhibit is the same production history which has been presented in a previous exhibit, Exhibit Number 4. The points on this curve are three month production averages. It declined over a constant or fairly constant rate to a cumulative production of 16,500 barrels, from there it went back up again. This is due to the Bett's pump efficiency which we have obtained for use in our well. We have not made any changes in the size of our pump



or in the well itself. This part I disregarded and it declined and that decline was present up until that time. The economic limit was 175 barrels per month and this obtained a total primarily over oil recovery of 38,530 barrels which I consider to be a minimum for this particular well. This well is completed at a depth of 9650 to 9654, in a zone which has six feet of net pay. I took the 38,530 barrels which was extrapolated from this decline curve, divided that by six feet of net pay and the 66.5 barrels per acre foot recovery which was determined from the volumetric calculations to obtain an area of $96\frac{1}{2}$ acres which was apparently being drained by this well at this declining rate.

Q Now, you've got your decline curve drawn from the point of cumulative production, as you say, of 16,500 barrels. If you had taken into account the subsequent point on your Exhibit Number 9 where cumulative production reached roughly 21,000 barrels, would your decline curve have been drawn in such a way as to show an ultimate cumulative production greater than 38,500?

A Yes, higher, extrapolated from that point only the same decline as had been exhibited during the previous production it would have given a much greater recovery which in turn would have resulted in a larger drainage area. This is what I consider to be a minimum for the pool.

Q In other words --

A It could in all likelihood have been much greater than this 96.

Q Have you made any economic calculations of 40-acre verses 80-acre development in this pool?

A Yes, I have. Those are shown on Exhibit 10. The total income is \$2.84 per barrel. The working interest income is $87\frac{1}{2}$ per cent, the working interest is \$2.48 per barrel. Our operating costs and taxes amount to 75 cents per barrel which results in a net working income of \$1.73 per barrel. Applying this \$1.73 to a 40-acre recovery of 53,200 barrels, we have a total net income of \$92,000, and 400 barrels, we have a total income of \$184,000. The development cost of a well in this area is \$165,000, which includes the cost of drilling and pumping equipment to produce the well. On the 40-acre recovery this would result in a net loss of \$73,000, on 80-acre recovery it would result in a net profit of \$19,000.

Our ratio of income to investment we wouldn't have one on 40 acres, and on 80 acres, it is still 1.11.

Q From this, Mr. Baker, you can readily draw some conclusions concerning the economic development of this area on 40 acre versus 80 acre?

A Yes, sir, from this it's quite obvious that development cannot be justified on 40-acre spacing with the recovery of

53,000 barrels. Development can only be justified and being only profitable to us on 80-acre spacing and the profit will be small on 80 acres. Also, I would like to point out as has been shown in previous exhibits, we are effectively draining an 80 acre or greater area in this pool, and effectively and efficiently with the recovery factor of 35 per cent which seems to be true, this is what I would consider efficient drainage for this area.

Q Have 80-acre proration units and allowables been established on the Pennsylvanian Pools?

A Yes, sir, there are several in New Mexico. The following exhibit, number 11, compared the Middle Lane Pool to two other pools which are Pennsylvanian Pools on 80-acre spacing. The South Lane, which is on permanent 80 acres and the Allison Penn which has been reported is on permanent 80-acre spacing. I'm not positive whether that one is permanent or not. I would like to point out that the reservoir porosity is similar in these three pools. The porosity in the Middle Lane Pool is 6.2, in the South Lane Pool 7.9, and in the Allison Penn it's 5.15.

Q Mr. Baker, I don't think we need to detail all the information here since it's shown on the exhibit, but the reservoir characteristics of these two other pools do compare to the Middle Lane?

A Yes, sir, they are similar throughout the three pools.

MR. MORRIS: Mr. Examiner, we will have another witness to testify very briefly concerning the proportion for it with respect to the rules, so this is all we will have of this witness. We prefer to question the preparation of the exhibit.

Q (By Mr. Morris) Were Exhibits 1 through 11 prepared by you or under your direction?

A Yes, they were.

MR. MORRIS: We offer Exhibits 1 through 11 in evidence.

MR. UTZ: Without objection Exhibits 1 through 11 will be entered into the record of this case. Does that conclude your questions?

MR. MORRIS: That's all I have of this witness at this time.

CROSS EXAMINATION

BY MR. UTZ:

Q How does the net pay compare in your number, or in the Hisson well, rather, as compared to your well?

A The net pay in the Hisson well is somewhat less than we have in our wells due to the fact that the lower zone was all water, they were completed only in the upper portion of

what I have considered net pay which was approximately 12 feet.

Q What do you consider the net pay in your well?

A 20 feet, the same intervals are present in the Hisson well but the lower interval was all water and from production it appeared that the upper interval is also 100 per cent water at this time.

MR. UTZ: Are there other questions of the witness? The witness may be excused.

MR. MORRIS: Our next witness will be Mr. Norbert McIntyre and I neglected to ask that he be sworn at the beginning of this hearing.

NORBERT MCINTYRE

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

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. McIntyre, please state your name, by whom you are employed and in what capacity and where you are located.

A My name is Norbert McIntyre, I'm employed by Midwest Oil Corporation as staff geologist working southeast New Mexico.

Q Where are you located, Mr. McIntyre?

A In Midland, Texas.

Q And you have testified before this Commission and

your qualifications have been accepted and are a matter of record?

A That's correct.

Q You testified in one of the previous hearings on this case?

A Yes, that's true.

Q Would you state what Midwest's proposal is concerning the rules and regulations for the Middle Lane-Pennsylvanian Pool?

A At the present time our temporary field rules in the Middle Lane Pool are 80 acres. At this time development drilling has indicated as shown on the plate Exhibit 1 that we have drilled on the east flank and at our near oil-water contact and both the Midwest 1B State in Section 11 and also the Midwest 11 East State in Section 14 in the northwest southwest. Now, the structure as it would now appear would be defined by oil-water contact on the east in those two wells and an updip to the west to the Haskinsetal Ranch Unit in the north. Continental 9 Ranch which is in the northwest southeast of Section 9, both of which have penetrated these pay zones and found them to be tight. At this time no porosity development was presented in either one. Then, it would appear that whatever structure we may see for future developments in the future would be confined only to an area probably of 640 or

possibly slightly more than that in Section 10 and 15. The confirmation of this pool is beginning to resemble the Lane Pool to the north structurally and lithologically compares favorably. So our proposal is to request that we be granted permission to drill on 80-acre spacing nonfixed location, so that we might have a little flexibility in picking our locations on this small feature which has very little vertical closure apparently, and is quite limited in that extent.

Q Would it enter into the reasons for your proposal that the wells in this pool are relative poor wells and not top allowable production wells?

A They are, economically, so far we have found that we have something less than prolific production. However, we feel that there is a good chance further development would likely develop some production comparable to that of the Lane Pool.

Q Is the gist of it, Mr. McIntyre, that you think you're on a feature here, that is, limited area and your fairly poor wells and in order to justify further development you feel that you must have greater flexibility on your well location?

A Yes, that's correct.

Q With the exception that you just mentioned concerning the well location requirement what is your proposal concerning the present rules for the Midland Pennsylvanian Pool?

A The temporary rules that we have now?

Q Yes.

A Well, our proposal would be to change those rules to permanent rules on 80 acres of nonfixed locations.

Q Do you feel that any further development in this pool would give you any substantial better information to justify 80-acre spacing than you have at the present time?

A From a structural standpoint that's quite likely, as far as reservoir data I wouldn't say that it would.

Q Again, does the fact that the wells in this pool are not top allowable enter into the lack of reservoir data that might be obtained during the future?

A I think it very definitely does.

Q Does Exhibit Number 12 reflect the proposed rules and regulations which you request be made permanent in this pool?

A Are these the rules, I haven't read this particular set of rules right here. Are these the ones we outlined for the nonmixed pattern?

Q Yes.

MR. MORRIS: We offer Exhibit Number 12 into evidence as our proposal for the permanent rules to be adopted by the Commission for the Middle Lane-Pennsylvanian Pool on a permanent basis.

MR. UTZ: Without objection Exhibit 12 will be admitted into the record in this case.

MR. MORRIS: That's all I have of this witness.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. McIntyre, then as far as the current rules are concerned, the only change that you are requesting in those rules other than the fact that they be made permanent, is the spacing requirement?

A That's right.

Q As an engineer, do you feel that wagonwheeling in the--

A Sir, I'm a geologist, not an engineer.

Q Are you a geologist?

A Yes, sir.

Q We got a geologist testifying on rules and an engineer on spacing.

A I think a nonmixed pattern would certainly promote development in the area.

Q Do you mean from the standpoint of recovering more oil or dedicating more dry acreage?

A Well, sir, if I might, I would like to point back once more to the Lane Pool which was developed on nonmixed 80-acre pattern and which has been depleted from both the Bow and the Bow Diesel on that pattern and I would think from the information we have, just structural information, that what we will see here will most likely be the same circumstance.

Q This is going to be a pretty small pool and quite a marginal operation. How many more wells do you anticipate will be drilled?

A Now, I would say one more and based on performance of that well, possibly more. Actually what we have done so far in our exploratory drilling and development drilling is define the eastern limits of a pool which might or not exist to the west.

Q It's your intentions to move it to the west now?

A Yes.

MR. UTZ: Any other questions of the witness?

MR. DURRETT: I have a question, please.

CROSS EXAMINATION

BY MR. DURRETT:

Q Mr. McIntyre, I should direct this question to your engineer; if you desire, I will do so. But I believe it was testified on Direct that the wells in this pool are not capable of making an 80-acre top allowable, is that right?

A No.

Q What is the 80-acre allowable?

A 5310 barrels per month, I think that's about 1768 per day.

Q About 1768 per day?

A Yes.

Q Not making that, would you make a 40-acre allowable?

A These things fluctuate, I don't know.

Q Can you answer me on that question?

A Well, the LLE will not make a 40-acre allowable, it produces approximately 35 to 40 barrels per day at best. The State B, of course, is still young, we only have some three months' production history on it. It is declining rapidly and at the present time it will make a 40-acre allowable.

Q Now?

A Yes, it will now; if it continues on its present decline it will not in the very near future.

Q Only one well involved?

A Only two producing wells.

Q Only two?

A Yes, sir.

Q And the second well you are requesting and now making a 40, which one is it?

A That is the well in Section 11, Midwest Oil Corporation State B Number 1.

Q Well, one other question I have and either one of the witnesses may answer, it would be fine. Where would you propose to drill if your 80-acre flexible spacing request is granted?

A If it were granted, someone would drill in the southeast corner of Section 10.

Q In the southeast corner of Section 10?

A I wouldn't say, well, I can't go any farther than that because of the land situation.

MR. DURRETT: That's all I need to know. Thank you.

MR. UTZ: Any other questions of the witness?

MR. MORRIS: Yes, I have a couple more questions.

REDIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. McIntyre, if a well were not drilled in the southeast, extreme southeast corner of Section 10, might a well be located in the extreme southwest corner of Section 11?

A Yes.

Q But such a well would not be possible under the present circumstances?

A That's correct.

Q Now, in each one of those two locations, would you hope to get away from the severe water problems that you have at the present time?

A Yes.

Q Now, if you could get away from the water below, would that enable you to produce or would you hope to produce a substantial higher percentage of your allowable?

A I think definitely so, our reason for drilling Midwest Number 1 State B in the location it's drilled was

because of this pattern to start, we would have preferred to drill a well in the southwest corner of Section 11 but because of the temporary rules we were forced to stay within that unit it was drilled.

MR. MORRIS: That's all.

MR. UTZ: Any further questions of the witness? The witness may be excused. Any other statements in this case? The case will be taken under advisement.

I N D E X

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E X H I B I T S

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