

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 18, 1970

EXAMINER HEARING

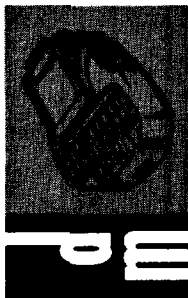
IN THE MATTER OF:

Application of Pan American
Petroleum Corporation for
expansion of pressure maintenance
project, Chavez County, New Mexico.

Case No. 4456

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING



MR. UTZ: Case 4456.

MR. HATCH: Case 4456. Application of Pan American Petroleum Corporation for expansion of pressure maintenance project, Chavez County, New Mexico.

MR. BUELL: For Pan American Petroleum Corporation for the Applicant, Guy Buell. We have one witness, Mr. Hosford.

(Witness sworn.)

(Whereupon, Pan American Exhibits 1 through 6 were marked for identification.)

MR. UTZ: You may proceed.

MR. BUELL: Mr. Examiner, I prepared about a thirty minute long opening statement, but due to the lateness of the hour, I'll shorten it greatly. This is our Application to expand a power-of-pressure maintenance program that we have been operating on our Baskett D Lease in the Cato-San Andres Oil Pool. We've had a one-well-pilot program going. We want to add two more injection wells, which with the productive limits on one side of a producing well and injection well on the other three sides will, in effect, have a five-spot-flood program and be putting the squeeze on our producing well. As you know, you can't learn too much from a one-well-pilot program. We have learned that we can put water in the reservoir.

We've had no evidence of any adverse effects, such as a channeling or a premature breakthrough in the water. By adding these additional two wells we will then be able to determine if this reservoir can be beneficially flooded.

PATRICK E. HOSFORD

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

DIRECT EXAMINATION

BY MR. GUY T. BUELL:

Q Mr. Hosford, will you state your complete name, by whom you are employed and what location and under what capacity, please?

A Patrick E. Hosford, Staff Engineer with Pan American Petroleum Corporation in Fort Worth, Texas.

Q You have testified at many previous Hearings before this Commission in New Mexico, have you not?

A Yes, sir, I have.

Q And your qualifications as a petroleum engineer are a matter of public record?

A Yes, sir. They are.

Q All right, sir. In connection with your testimony here today, will you look first at what has been identified as Pan American Exhibit 1. What is that Exhibit?

A Exhibit No. 1 is a map of a portion of the Cato-San Andres Pool, Chaves County, New Mexico. There is outlined in a dark, what you would call hashed, boundary the current project area, and there is a lighter hashed area indicated to the north part of the Cato Baskett D Lease, which will be an expansion that we recommend. This would be the North half of the Northeast quarter of Section 11 that we want to expand to the current project area.

Q How have you designated the current one-well-injection well on this project?

A The current active injection well, Pan American's Baskett D Well No. 4 is identified by a blue dot with an arrow through it. I've also identified the two proposed injectors by the red dots. These are the Pan American Baskett D No. 1 and Pan American Baskett D No. 2.

Q Would you name and locate the producing well that you feel the addition of these two injection wells will put a squeeze on, so to speak?

A Yes, sir. The well that we hope to see an immediate squeeze on is the Baskett D Well No. 8 in the Southeast of the Northeast of Section 11.

Q All right, sir. Now, in my opening statement I pointed out that we had observed no harmful effects from our

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pilot program. Would you care to comment on that briefly?

A Yes, sir. We have been injecting for approximately one year now at -- injection began in November 1969. We've injected accumulative of one hundred and twenty-five thousand barrels of water. This is produced water. Our current injection rate is about five hundred and twenty-five barrels of water per day at a service injection pressure of seventeen hundred pounds. We have not seen any indication of channeling, no indication of breakthrough. In fact, we have seen no indication of any response at all, with perhaps some minor response beginning to show up.

Q Mr. Hosford, it's always helpful to know whether or not a reservoir can be successfully flooded. Why is it of extreme importance here that we know?

A Well, this particular San Andres pay in a Cato field is a little different from what we normally consider San Andres pay. It's fairly shallow; it's quite tight. There are some questions as to how much matrix porosity you have. It's in more of a fracture-type porosity. And there are a lot of unanswered questions of the Cat-San Andres Pool. It's a large pool, two hundred and fourteen wells, I believe. It's currently on the allowable schedule. It's an isolated area, somewhat isolated from what you might consider sources of

water for waterflooding. And our concern is that we feel like we need to get some experience in this field to prove or disprove that a waterflooding or pressure-maintenance operation will be economically beneficial before we spend large sums of money to go out to gather water to bring into this area for a full field or full scale field program.

Q In a field wide program or semi-field wide program, say on a five-spot pattern basis, about how many wells would be converted?

A On a five-spot pattern basis you normally have a one to one ratio of injector to producer, so this would be approximately one hundred injection wells. And at a five hundred barrels of water per day, which we see we can put into our well and to other wells in the reservoir, this would be a water requirement on the order of fifty thousand barrels of water a day. And you just don't find this kind of water in this part of New Mexico.

Q Incidentally, where are we getting the water that we will put in our two wells that we're getting ready to convert, should the Examiner and the Commissioner approve it?

A Well, we've entered into a contract with Shell to bring water from their lease in Section 26, Township 8, South,

Range 30 East, and this is right off the map, right below Section 23 at the base of the map. This is a distance of about three miles from our project.

Q Is it salt water?

A Yes, sir. It is produced salt water.

Q And we're buying it?

A Yes, sir. We are buying it.

Q All right, sir. Do you feel that the addition of these two injection wells will prove whether or not the reservoir can be successfully flooded?

A Yes, sir. I feel like it will give us much more information than what we've been able to see thusfar with a one well pilot. There are always a lot of unanswered questions on a one well pilot. You don't have a backup operation and expanding this pressure maintenance program to add the two wells. As I mentioned, we put a backup condition on Well No. 8. It will allow us to evaluate the pressure maintenance operations and benefits of water injection at a much earlier date than what would be possible if you would ever see it from a one well pilot. So we feel like that the addition of these two wells really is essential, not only for our lease, but for the field as a whole, to determine whether this is a beneficial or economic operation.

Q All right, sir. Do you have any other comments on Exhibit 1 before we go to your cross section?

A No, sir, I do not.

Q You do have a trace of the section on Exhibit 1, do you not, sir?

A Yes, sir. The Trace AA prime.

Q All right, sir. That has been identified as Pan American Exhibit 2. Would you comment on it briefly, please?

A Exhibit No. 2 is a cross section, AA prime, through two of the Baskett D Wells. The Baskett D No. 8 on the extreme right-hand side, the Baskett D No. 1, which is a proposed injector, Pan American Baskett B No. 1, which is a West offset to the proposed injector. And then Union Texas Baskett No. 2, which is the double-West offset to the proposed injector. This section is designed to show the nature of the pay, the continuity of the pay across this part of the field. It shows the perforated intervals on the section, and there is other pertinent data at the bottom of the cross section. I don't know how much detail we need to go into as far as information on the wells, but I might mention just very quickly for the record that the latest production tests that we do have on the wells involved, Baskett D No. 8 is

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pumping 48 barrels of oil per day with five barrels of water and a gas-oil ratio of 96 to one. The Baskett D No. 1, which is a proposed injector is pumping 15 barrels of oil per day with two barrels of water and a gas-oil ratio of three to seven. Pan American Baskett B No. 1 on last test pumped 51 barrels of oil per day with 12 barrels of water and a gas-oil ratio of 24-35. And then I don't have a test on the Union Texas Baskett No. 2, but the well does carry a 50 barrel oil per day allowable on the latest schedule.

Q All right, sir. Let's turn now to Exhibit No. 3. What is that Exhibit?

A Exhibit No. 3 is a performance curve of the Baskett D Lease. Now, this is not restricted to just the pressure maintenance area, project area, but it is for the entire lease.

Q And the entire lease is the East half of Section 11, is it not?

A Yes, sir. The East half of Section 11. Looking first of all at the oil production colored in green, oil production peaked out on this lease somewhere in the range of three hundred and eighty barrels of oil per day back in 1969, mid 1969, and current oil production is down to 21.5 barrels of oil per day. We're seeing, perhaps an indication

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of a slight flattening towards the tail end here, the last three months, but this really isn't any appreciable yet that we could say as a result of our injection operations. Looking at the gas-oil ratio curve, ratio has been climbing and reached a peak of 2100 to one in August, 1970. The ratio is back down to 1780 to one in October. Now, this could be due to both cool weather and the fact that, again, we may be seeing some beneficial results in injection. However, I don't have too strong a feeling on it to this time.

Looking at the water production at the bottom of the curve, the lease is currently making 30 barrels of water per day, and has been as high as on instantaneous months of about 175 to a 180 barrels of oil -- barrels of water per day. Again, this thing, the water curve does reflect that we have not had any significant increase in water production as a result of our injection operations. And the last pertinent curve on there is the injection curve colored in blue at the top. And this reflects that injection began in November 1969. And the injection rate has been steadily increasing. This is Pan American policy on the injection projects to start our wells out fairly slow, give them a chance to build up a water saturation and then go ahead and increase injection rates on up to an optimum level,

current injections about 525 barrels of water per day.

Q All right, sir. Turn to your Exhibit 4, please.

A Exhibit 4 is a schematic of the Baskett D No. 1 showing the proposed completion as an injection well with a plastic coated tubing, the tension packer and the annulus to be filled with an inhibitive fluid. The perforations are listed, along with pertinent casing information and note the pressure gauge on the annulus to reflect any kind of a breakthrough or water breaking around a packer that might cause some trouble at -- we could pick it up with this pressure gauge to see any foreseeing angling pressure.

Q Is Exhibit No. 5 a similar or identical Exhibit?

A Yes, sir.

Q With respect to Baskett D No. 2?

A It's Baskett D No. 2, exactly the same type of Exhibit.

Q Do you have any comments you want to make on it?

A No, sir, I do not.

Q All right, sir. Look now to Exhibit 6, if you will. What is that?

A Exhibit 6 is a pertinent data sheet for these two proposed injectors, the D Well No. 1 and D Well No. 2. Again, we have just itemized in written form the perforated intervals.

The source of our injection water, as I said, would be produced water from Shell's salt-water disposal system. We anticipate injecting a total of about 700 to 1,000 barrels of water per day for the two wells. Would you very briefly summarize again your recommendations that you are making to the Commission?

A Yes, sir. Our recommendation is that the Commission approve the conversion of Baskett D Well No. 1 and Baskett D Well No. 2 to pressure maintenance water injection and that they further expand the project area to include the North half of the Northeast quarter of Section 11.

Q All right, sir. Do you have anything else you care to add at this time?

A No, sir. I do not.

MR. BUELL: May it please the Examiner, that's all we have by way of Direct evidence. I would like to firmly offer Pan American's Exhibits 1 through 6, inclusive.

MR. UTZ: No objections, Exhibits 1 through 6 will be entered into the record of this case. As yet you have received no response, whatsoever.

MR. HOSFORD: (The Witness) We have received some indication, perhaps, of the beginnings of response on Well No. 5, but nothing that we could really testify to as

being definite response. It looks like our oil production is beginning to flatten out a little bit and the gas-oil ratio indicates it may be coming down on No. 5.

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

MR. HATCH: This well was originally approved as a water disposal well?

THE WITNESS: No, sir. It was pressure maintenance.

MR. BUELL: Pressure maintenance from the beginning.

MR. HATCH: Pressure maintenance from the beginning?

THE WITNESS: Yes, sir.

MR. BUELL: For some reason or another, Mr. Hatch, I had the same impression, and I checked the file and my impression was wrong, so that's the reason I can answer you so readily.

MR. HATCH: Well, I had the impression that this started out as a -- and that there was a Hearing to change it from a salt water disposal to a pressure maintenance.

MR. BUELL: Our file does not reflect that to be the case.

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MR. UTZ: Your Application was for expansion of pressure maintenance project?

THE WITNESS: Yes, sir. Yes, sir.

MR. BUELL: Incidentally, the original Order is Order R-3867, dated October 29, 1969.

MR. UTZ: Further questions? The witness may be excused. I neglected to ask for appearances at the beginning of this case. I'll ask for those appearances at this time. Let the record show there are no appearances; however, there is one letter from Union Texas Petroleum Division which the attorney might like to read in the record.

MR. HATCH: This is dated September 11, 1970. It's a copy of a letter really written to Pan American Petroleum Corporation and sent to the Commission advising Pan American. "This is to advise that Union Texas Petroleum is opposed to the expansion of this project at the present time." I think perhaps this was written before the case was set for Hearing, wasn't it? When they --

MR. BUELL: Yes, sir. Actually, Mr. Hatch, we made an Administrative Application, and when Union Texas sent this letter of opposition we, of course, set it for Hearing.

MR. HATCH: A meeting of the working-interest owners in the Cato Field has been scheduled for September 23rd, 1970 to consider the feasibility of unionization and possible

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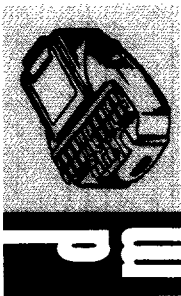
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waterflooding. And any expansion should at least await the outcome of this meeting. It should also be pointed out that interference tests conducted in the early part of 1967 indicated that Baskett D No. 1, one of the proposed injection wells, showed a high degree of communication with some Union Texas wells, as well as some Pan American wells in the vicinity. Union Texas addressed sustained damage to a producing well with the water in Baskett D No. 1. They, therefore, respectfully request the delayment of expansion of the Cato-Baskett Pressure Maintenance Project be temporarily suspended in consideration of conditions outlined above." Signed, Oriole Stover, District Production Manager.

MR. BUELL: If I may briefly answer to that letter, Mr. Examiner, first with regard to the field-wide unit, Pan American feels that we need to know whether the reservoir can be successfully flooded before we undertake the expense and the time of negotiating a field-wide unit. As Mr. Hosford mentioned in his testimony, water is going to be a very primary concern in this particular area of New Mexico. There is no fresh subsurface water in the area at all. There is no known deep economical source of salt water, so the water is going to have to be imported. So before time and money and effort are expended on a field wide study,

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that's the reason we want to go ahead with this project at our own expense to determine for the benefit of all in the pool whether or not it can be flooded.

With regard to the interference test, yes, we conducted those under authority of the Commission, and, yes, they did show communication. It would be impossible to conduct a successful flood unless you did have communication. And we do have communication between wells here, and we're grateful for it. As far as any possible damage to Union Texas, as you will note on the cross section in Exhibit 1, the map, we have a producing well intervening between our proposed injection well and the Union of Texas Well. So, if there is any channeling or any adverse effect from injection, we will experience it first in our producing well and, certainly, I shouldn't even need to say this, that if that does occur, we'll shut her down right quick. So for those reasons I'd like for the Commission to more or less ignore the comments of Union Texas and approve our project as we requested it.

MR. UTZ: You have close to no detour signs around your well now, as I understand.

MR. BUELL: Yes, sir.

MR. UTZ: Are there other statements? The case will be taken under advisement.

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, LINDA MALONE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Linda Malone

I do hereby certify that the foregoing is a complete record of the proceedings of the Hearing held at Case No. 44-56, dated by me on May 15, 1970.
[Signature], Reporter
New Mexico Oil Conservation Commission