BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 22, 1969

EXAMINER HEARING

IN THE MATTER OF:

Application of Pan American Petroleum Corporation for a pressure maintenance project, Chaves County, New Mexico.

Case No. 4232

BEFORE: Daniel Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: Case 4232.

MR. HATCH: Case 4232. Applicant of Pan American Petroleum Corporation for a pressure maintenance project, Chaves County, New Mexico.

MR. BUELL: For Pan American Petroleum Corporation, Harry Hickman and Guy Buell. We have one witness, Mr. Wells.

(Witness sworn.)

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

MR. BUELL: If it please the Examiner, I might make a brief opening statement to point out for the record that at the present time there are 219 wells in the Cato-San Andres Oil Pool. These wells have been developed slightly less than 9,000 surface acres.

We do not know at this time whether or not the Cato-San Andres Pool will be a good waterflood prospect. The data that we do have indicate that it will be. However, as yet in this pool it has not been a proven success. There is one pressure maintenance program now in operation in the Cato-San Andres Pool that has been in operation only a short while and not sufficient fluids have been injected to prove

it a success.

We do feel that since other San Andres oil reservoirs have been successfully flooded that we should make every attempt to determine whether or not the Cato-San Andres will lend itself to a flood. Of course, if it does, as extensive as it is and with the reserves that we have, significant increase in oil recovery could be achieved.

So, that is our request here today that we be permitted to conduct this pressure maintenance program to determine whether or not we can successfully inject water and increase recovery.

BILL WELLS

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

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Wells, would you state your name, by whom you are employed, in what capacity and in what location, please, sir.

A My name is Bill Wells. I am employed by Pan American Petroleum Corporation as petroleum engineer in Fort Worth, Texas.

Q Have you testified at previous Commission hearings and your qualifications as petroleum engineer are a matter of public record?

A Yes, sir, they are.

MR. BUELL: Any questions, Mr. Examiner?

MR. NUTTER: No.

Q (By Mr. Buell) Mr. Wells, at the outset I wish you would state what your recommendations and Pan American's request here will be so that the Examiner can evaluate your testimony and exhibits in that light.

A All right. We are requesting approval of a pressure maintenance project in the Cato-San Andress Field. We are requesting approval of a project area which would comprise the east half of Section 11, Township 8 South, Range 30 East in Chaves County.

We are also requesting approval for injection into our Baskett B Well No. 4. Additionally, we are requesting approval of an allowable treatment for this project.

Q What is the recommended allowable treatment?

A We are requesting that the project area be granted an allowable equal to the sum of the current allowables of the wells therein plus a top allowable for our

injection wells -- our proposed injection wells. This is similar to past approval.

Q All right, sir. Would you look first at what has been identified as Pan American's Exhibit No. 1. What is that exhibit?

A Exhibit No. 1 is a map of the eastern portion of the Cato-San Andres Pool. On the map all producing wells shown on this map are -- by the way -- in the Cato-San Andres Pool.

We have also shown outlined in red tape our proposed project area which, again, is the east half of Section 11, Township 8 South, Range 30 East.

Q How have you designated and identified the initial proposed injection well?

A The proposed injection well, the Baskett D No. 4, is designated by a blue circle. We also have a big black arrow pointing to it. It's located in the northeast quarter of the southeast quarter of Section 11.

Q That would be Unit 1 of Section 11, would it not -- I mean Unit I?

A Right; right.

Q All right, sir. It might be of benefit to the

Examiner if you would state, as briefly as possible, the producing capabilities of the offset wells to the injection wells?

A All right. The direct and diagonal offsets to this proposed injector are the number one Baskett D, which currently produces 65 -- or currently has a capacity of 65 barrels of oil per day.

Well No. 8, which has a capacity of one hundred barrels of oil per day. Our well No. 5 with the capacity of two hundred barrels per day. Well No. 3 with a capacity of 87 barrels per day; and well No. 7 with a capacity of 44 barrels per day.

Q There's one other project in existence in this pool at this time, the Sun Project. Is the area of that project included on Exhibit No. 1?

A Yes, sir; on the left-hand side of our map, Section 16 in the same township and range within that section, Sun's State H Lease is located.

You will notice in the lower or the southeast corner or southeast quarter of the southeast quarter of the -- this section, we have color-coated their State H Well No. 13 blue, which is their injector in their pressure maintenance project.

Q Do you have any comments you would care to make at this time on the Sun Program?

A Yes, sir. As you mentioned earlier, there's really insufficient injection -- cumulative injection into the well at the current time to evaluate flooding on this lease. Sun has injected some thirty-three thousand barrels of water to date. No response has been noted as of any such date, but as I said, we wouldn't expect any at this low cumulative injection.

Q Have they noticed or observed any adverse occurrences?

A No, sir.

Q From their injection?

A No, sir; they haven't.

Q Before we leave Exhibit 1, Mr. Wells, it appears to me that in our project area that five of the remaining seven producing wells in the area are either direct or diagonal offsets to our injection well. Is that observation correct?

A Yes, sir. Our proposed injector is an interior location on the lease and as such it does have five direct or diagonal offsets.

Q Do you have any other comments you care to make

on Exhibit No. 1?

A No, sir, I don't believe I do.

Q Would you turn then to Exhibit No. 2. What is that exhibit, Mr. Wells?

A Exhibit No. 2 is a performance curve from our Baskett D Lease showing a historical plot of GOR oil and water producing performance.

Q That is lease performance and not Cato Field performance?

A Yes, sir; true. This is the Baskett D Lease.

Q Would you briefly comment on any of the curves on that exhibit which you think would be pertinent to this hearing?

A All right. We show that during July of 1969, the most recent month shown on the curve oil production averaged 380 barrels of oil per day.

We also show that the corresponding water production to this oil production was 150 barrels of water per day. As of August 1, 1969, we had produced some 310,000 barrels of oil from the lease. Additionally, our GOR is approximately 975 cubic feet per barrel and there now -- as shown on Exhibit 1 -- eight producing wells on

the lease.

Q All right, sir. Turn now if you will to Pan American's Exhibit 3. What is that exhibit?

A Exhibit 3 is a schematic diagram of our proposed injector, the Baskett D Well No. 4. On this diagram, we have shown the mechanical set-up of the well as it would be equipped for injection.

We show that we would -- our injection string would be two and three-eighths inch plastic-coated tubing. It would be set in a tension packer at approximately 3400 feet.

Our injection interval would be the current producing interval which is 3514 to 3557 and 3584 to 3628. We also show that our anulus would be filled with an inhibited fluid and that we would have a pressure gauge on the surface.

Q All right, sir. Turn now if you will to Exhibit 4. What is that exhibit?

A Exhibit 4 is a gamma ray neutron log from this well from the proposed injector. We have shown the top of the San Andres correlative marker on this log in red pencil.

We have also shown the current producing interval

which, again, is the proposed injection interval.

Q In other words, we will be injecting directly into the proposed zones, the San Andres Zone in this area?

A Yes, sir; and this is the main San Andres pay in this portion of the field.

Q What about the offset wells on the Baskett Lease? Are they open in relatively this same interval?

A Yes, sir, they are.

Q Do you have any other comments on the log Exhibit No. 4?

A No, sir, I don't.

Q Turn please to Exhibit No. 5. What is that exhibit?

A Exhibit No. 5 is a pertinent data sheet showing various factors concerning our application. I would like -- I believe the data sheet is pretty much self-explanatory.

I would like to emphasize that the water to be injected into the injection well, the D No. 4 Well will be produced San Andres water from the Baskett D Lease.

Q At this time, Mr. Wells, do you have any idea of what the possible increase in ultimate recovery might be from this pressure maintenance project?

A No, sir. Due to the complicated nature of the

rock and the matrix in this field we are not able to make an accurate determination of any estimate of increased recovery due to this waterflood. As you mentioned in your opening statement, due to the large reserves or the large amount of reserves in this field, we feel that we need to evaluate waterflooding here.

There is an additional factor. There is no fresh water which could be used for waterflooding in this area. It would be about twenty miles south before we could find any and the cost of bringing water up to this area for flooding on a field wide basis would be very costly; so, we would like to evaluate, on a small-scale, the flooding potential of this reservoir prior to make any substantial investment.

Q And in that test using produced water as injective flood?

A Yes, sir. Now, basing just a rough estimate on our current estimate of ultimate primary from this lease, we feel that within or just considering the direct offsets to our injector alone increased recovery could range in a minimum of -- well, in the range of a minimum of 27,000 barrels to 55,000 barrels. As I said, this is a rough

estimate based strictly on our estimate of ultimate primary.

Q All right, sir. Now, what if we would expand the flood from a one well injecting pressure maintenance program to cover the entire project area. What, then, would you anticipate should pressure maintenance prove successful?

A Assuming that it does prove successful, which would be required before we would expand this, we estimate that on a minimum we would recover some 300,00 barrels additional recovery from this lease alone.

Q In other areas many San Andres reservoirs have been proven good waterflood or pressure maintenance prospects, have they not?

A Yes, sir. Yes, sir.

Q In view of the fact that in the Cato-San Andres Oil Pool we do not know yet whether we can successfully conduct a pressure maintenance program, does Pan American plan any monitoring of this program should the Commission approve it?

A Yes, sir. We will maintain a real close serveil-lance of production from the wells on the lease. This would include testing at least once monthly. Additionally, Pan

American in the majority -- in fact, in all of our other waterflood projects run a series of injection well tests from which we are able to predict and evaluate some of our waterflood performance.

This series of tests would be run on well number four here. In other words, we would very closely scrutinize the performance of this small flood.

Q Monthly tests on producing wells and performance tests on the injection well?

A Yes, sir.

Q In view of the safeguards that we have incorporated into this program and the close watch that we will keep on it, do you see how the correlative rights of any owners of interest in this pool could in any way be adversely affected?

A No, sir, I don't.

Q Do you see how this could be a conservation benefit, conserve conservation if it were revealed to not only Pan American, but to the other operators in this pool whether or not the Cato-San Andres reservoir is a good pressure maintenance project?

A Yes, sir. If we -- from the results of this one evaluation we can prove that the Cato field can be

flooded. This could lead to the recovery of several hundred thousand barrels of reserves which we couldn't recover under primary means. I think this is necessary out here. We need to evaluate waterflooding in this area.

Q Do you have anything else that you care to add to your testimony at this time, Mr. Wells?

A No, sir, I don't believe I do.

MR. STARKS: May it please the Examiner, that's all we have by way of direct evidence.

At this time, I would like to formally offer Pan American's Exhibits 1 through 5, inclusive.

MR. NUTTER: Pan American's Exhibits 1 through 5 will be admitted in evidence.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Wells, what's your estimated ultimate primary recovery from this lease?

A Mr. Examiner, we are -- based on -- this is actually a minimum number -- but, based on declined curve analysis assuming that we will go on decline right now or I believe August, '69, was the last month's production we had, we estimate we will recover some 1680 barrles of oil

per acre on primary from this lease.

MR. STARKS: What does that figure out to altogether?

THE WITNESS: I don't have that exact number. I can multiple it out for you.

Q (By Mr. Nutter) That's 1680 barrels per surface acre?

A Yes, sir.

Q It's a 320-acre lease?

A Yes.

Q But, you have up to now recovered approximately 310,000 barrels through July?

A Yes, sir.

Q Now, you mentioned the producing capacity of the five offsetting wells to the injection well. What is the capacity of the injection well at the present time?

A The injection well at the current time makes about one hundred barrels of oil per day.

Q How about those two wells at the north end of the lease?

A Those would be the Baskett D No. 2 located in the northeast of the northeast which makes 49 barrels of oil per day and the Baskett D No. 6, which is in the northwest of the northeast which has a capacity of about 80

barrels per day right now.

Q So, you have three wells which, under the present allowables, would be classified as top allowable wells being your number six, your number eight and number three?

A Yes, sir; that's true.

Q You are requesting a project allowable to be equal to the sum of the allowables of the various wells plus top allowable for the injection well?

A Yes, sir.

Q I think, Mr. Wells, if you will review the normal type of order that the Commission has entered in a pressure maintenance project that the injection wells usually receive an allowable equal to the allowable that was determined by a 72-hour test prior to putting the well on injection.

A I see. I'm sorry. I was misinterpreting something, I think. This would be fine with us.

MR. STARKS: May it please the Examiner, I am the person that misled him because it was my understanding that the Commission would allow you to transfer a top allowable from your injection well even though it might not be able to make it.

MR. NUTTER: There may be some orders that make

that provision, but I think the majority of them make a provision that the allowable would be based on the final twenty-four hours of the 72-hour test, Mr. Buell.

MR. STARKS: I will have to admit that the pressure maintenance orders that I am intimately familiar with were some of the earlier orders.

MR. NUTTER: I see. Are there any further questions of Mr. Wells? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Buell?

MR. BUELL: No, sir, but I believe Mr. Perdue with Union Texas has a statement he would like to make.

MR. NUTTER: Does anyone have anything to offer in Case 4232?

MR. PERDUE: I am Howard Perdue with Union Texas Petroleum from Midland. Union Texas supports Pan American's request for their authority to institute a pressure maintenance project with the injection of water into the Baskett D 4 Well.

In view of the possibility that directionally oriented permeability exists in this reservoir, Union Texas requests that any order authorizing this project

would contain two provisions; one of them would be monthly tests on the surrounding wells, which I believe has already been indicated by Pan American that they plan to do. We would also like for the Fisher Federal Wells to be included in the testing since they are offsetting this project to the east.

I believe Fisher Federal Wells No. 1 and 2 are in Section 12 and we would also request that a provision for review hearing approximately six months from the initiation of the water injection be set up to review the results of the water injection and the well testing. That's all.

MR. STARKS: May it please the Examiner, on behalf of Pan American we certainly have no objections to these requests of Union Texas. In fact, as Mr. Perdue pointed out we intend to do the very thing.

The Fisher Federal Wells that he mentioned are Pan American Wells, and we do intend to test them on monthly basis, also. We would have no objections at all to coming back to the Commission six months after we start injecting water to review not only with the Commission but other interested operators in the pool just what has occurred in the interim period.

We anticipate that it will take us from one month to forty-five days after the Commission issues its order to start injection operation.

MR. NUTTER: Thank you. Thank you, Mr. Perdue.

Does anyone else have anything to offer in Case 4232? We will take the case under advisement and call Case No. 4240.

I N D E X

E X H I B I T S

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, GLENDA BURKS, Court Reporter in and for the County of Bernalillo, State of New Mexico, 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.

Glenda Burks
Notary Public

My Commission Expires:

March 12, 1973

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4232 heard by me on 10/22 1969.

, Examiner
New Mexico Oil Conservation Commission