STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF MEWBOURNE OIL COMPANY TO INCREASE INJECTION PRESSURE, LEA COUNTY, NEW MEXICO

CASE NO. 11,520

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

May 2nd, 1996

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, May 2nd, 1996, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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A P P E A R A N C E S

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By: JAMES G. BRUCE

* * *

WHEREUPON, the following proceedings were had at 8:23 a.m.:

EXAMINER STOGNER: At this time I'll call Case Number 11,520.

MR. CARROLL: Application of Mewbourne Oil Company to increase injection pressure, Lea County, New Mexico.

EXAMINER STOGNER: At this time I'll call for appearances.

MR. BRUCE: Mr. Examiner, Jim Bruce from the Hinkle law firm in Santa Fe, representing the Applicant.

I have one witness to be sworn.

EXAMINER STOGNER: Any other appearances in this matter?

Will the witness please stand to be sworn at this time?

(Thereupon, the witness was sworn.)

KEVIN MAYES,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name for the record?

A. My name is Kevin Mayes.

Q. And where do you reside?

A. I reside in Tyler, Texas.

Q. Who do you work for and in what capacity?

A. I work for Mewbourne Oil Company in the capacity of EOR project engineer.

Q. Have you previously testified before the Division?

A. Yes, I have.

Q. And were your credentials as an expert petroleum engineer accepted as a matter of record?

A. Yes, they were.

Q. And are you familiar with the engineering matters pertaining to this Application?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Mayes as an expert petroleum engineer.

EXAMINER STOGNER: Mr. Mayes is so qualified.

Q. (By Mr. Bruce) Briefly, what is it that Mewbourne seeks in this case?

A. Mewbourne Oil Company seeks to increase the injection pressure at our Querecho Plains-Bone Spring Sand waterflood project from 2000 p.s.i. to 2320 p.s.i.

Q. Now, referring to Exhibit 1, would you identify that for the Examiner and give a short history of the Querecho Plains-Bone Spring unit?

A. Exhibit 1 is a land plat which outlines the

Querecho Plains-Bone Spring unit and identifies the injection and producing wellbores. The unit covers 2400 acres of federal -- all federal lands in Lea County.

The triangles colored in red represent five recently conducted step-rate tests, the blue triangles represent injectors associated with a thief zone, and the green is a dual completion between the Bone Spring and the Queen formation.

In 1992, Mewbourne received permission to conduct injectivity tests in two wells in the unit to determine the feasibility of a waterflood. This permission was granted by Order R-9737.

The injectivity tests were favorable, and Mewbourne unitized the Querecho Plains-Upper Bone Spring Pool by Order R-9985.

The unit became effective November of 1993, and waterflood authority was granted by Order R-9737-A. This allowed for injection into 15 wells with a surface injection pressure of 2000 p.s.i.

Q. Would you discuss how you arrived at the 2000 p.s.i. injection figure and why 2320 p.s.i. is appropriate at this time? And I would refer you to your Exhibit 2.

A. The top half of Exhibit 2 -- i.e., items 1 through 5 -- was our original Exhibit 26, used in testimony at our original waterflood hearing, and that supported

granting the 2000 p.s.i. at that time, even though this was well below parting pressure, according to ISIP data.

The data at the bottom of the exhibit -- i.e., items a, b and c -- summarize the basis for our 2320 p.s.i. figure, and it's based on our step-rate testing.

And the Examiner can go through this, but I wish to point out that the step-rate testing results generated a fracture gradient of .73 p.s.i. per foot, and the ISIP data reflected in item 3 resulted in a frac gradient of .74 p.s.i. per foot, a very good agreement between those two numbers.

Q. Currently, how many wells are being used for injection?

A. Currently, there's only 14 wells being used for injection. One well was converted back to production after being diagnosed as the main contributor to our thief-zone problem.

Q. What are the current unit producing --

A. The unit currently produces 225 barrels of oil per day, which is up from 100 barrels per day at the start of the flood.

We're producing 275 barrels of water per day, which is up from -- approximately 50 and is mostly due to that thief-zone problem.

And it produces 325 MCF per day. That calculates

out a current GOR of 1400, which is down from the original GOR of 7000.

Q. In your opinion, will the increased pressures that you've requested be beneficial for the waterflood operation?

A. Yes, I do, I think it will accelerate production of the secondary oil reserves.

Q. Okay. Let's move on to your Exhibit 3. Would you identify those plots for the Examiner and discuss the results of the step-rate tests?

A. Exhibit 3 represents the individual plots of the five step-rate tests that we recently conducted, and I'll go through them one by one with you.

The first one, the title block reads, the "E-10 Step Rate Test". The E-10 represents the old well name, and I corrected that the QPBSSU 7A-10, which is the new name for that well. You can see that step-rate test broke over at 2250 pounds.

The next test was the QPBSSU 12E-1, which broke over at 2530 pounds.

The next one is the 12D-2, which broke over at 2250 pounds.

The next one is the E-11 -- or, I'm sorry, the 11-1, which broke over at 2240 pounds.

And the last one is the 12B-3, which broke over

at 2330 pounds.

Q. What is it specifically that you request in this Application?

A. We would request that the injection pressures for these five wells be approved at their breakover point, and for the remaining injectors in the unit we request that an injection pressure of 2320 pounds, which represents the average of those five tests, be granted.

Q. Is there a potential for further injection pressure increases?

A. Yes, as the pore pressure increases around the injectors it's documented that the frac gradient can increase, and further applications may be requested after appropriate step-rate testing in the future.

Q. Does Mewbourne request that Order R-9737-A be amended to allow any future pressure-increase requests to be processed administratively?

A. Yes, we would.

Q. And did you give notice of the request for the increase in injection pressure to the offset operators?

A. Yes, we did. I believe submitted as Exhibit 4 is my affidavit of notice, with the notification letters and return receipts attached.

Q. Okay. And it was not only to the offset operators, but it was also to the BLM and mineral and

surface owner?

A. That's correct.

Q. Were Exhibits 1 through 4 prepared by you or compiled from company business records?

A. Yes, they were.

Q. And in your opinion, is the granting of this Application in the interests of conservation and the prevention of waste?

A. Yes, I believe it is.

MR. BRUCE: Mr. Examiner, at this time we move the admission of Exhibits 1 through 4.

EXAMINER STOGNER: Exhibits 1 through 4 will be admitted into evidence.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Mayes, are you expecting to see any potential increase of production whenever you increase the pressure on injection wells, or do you just -- are you expecting just to see the regular normal decline curve?

A. We're at a point, we still need one million barrels of water injected to get to fill up and a peak rate, and we can accelerate getting that volume into the ground, we can accelerate the arrival of that peak rate, move it forward in time.

So yes, we do expect to see faster response.

Q. In your engineering modeling of this project, what do you feel will be the maximum pressure that this reservoir is going to take?

A. The reservoir was at original pressure of 3400 pounds. It depleted down to 750 pounds before we started the flood.

Our objective is to get it back up to 3400 pounds and then to balance voidage at that time.

Q. What's your expected date that that would occur, roughly?

A. Over what time --

Q. What year? I mean, how long -- how much more -- longer life do you expect this project to have?

A. Right now, with our current injection rates, we're looking at a year and a half to get to our peak rate, and then the life, remaining life of the whole flood from this point is 18 years.

Q. And you said that there was 14 present injectors in this reservoir, correct?

A. That's correct.

Q. And they are shown on Exhibit Number 1?

A. That's correct.

Q. Okay. Let's see, you have some color codes, blue showing that there's a thief zone in the injector?

A. That's correct.

Q. And have you isolated that zone?

A. Yes, in and around those three injectors colored in blue is the area of the thief zone.

Q. And then of course the red ones are the completed step rates?

A. Yes, that's correct.

Q. And then the white ones are just your regular injectors?

A. That's correct.

Q. And now this green one, that's a dual injector. Bone Springs and then the Queen?

A. Yes, sir.

Q. What project is the Queen in?

A. Querecho Plains-Queen Associated waterflood.

Q. Does it cover the same area?

A. Essentially, yes, sir.

Q. Essentially. And that is a dual, not a commingled injector? Two strings of tubing?

A. It's actually one string of tubing with three packers stacked in the hole and a side-pocket mandrel with a flow regulator for the Queen.

Q. So what's the increased pressure going to do in that particular well?

A. Well, the flow regulator is truly a flow regulator. You can set it -- We set it for 200 barrels a

day, and that -- whatever the delta P across that regulator is, it's still going to only deliver 200 barrels per day to the Queen formation. The increased pressure will just increase the rate to the Bone Spring zone.

Q. How about the Queen interval?

A. The Queen interval will be fixed by the flow regulator that we put in the side-pocket mandrel.

Q. Now, will that flow regulator into the Queen -- Will that regulate the pressure?

A. No.

Q. So essentially when we're increasing the pressure in this one, we're increasing the pressure into the Queen injector?

A. No.

Q. No?

A. No, the -- It's 200 barrels a day that's going to go to the Queen, and then the pressure at the sand face of the Queen will be dictated by the injectivity of the Queen formation.

Q. Would you provide me a schematic of that particular well --

A. Yes.

Q. -- subsequent to today's --

A. I sure can.

Q. -- hearing?

Now, the increased injection pressure, will that also increase the volumes that are presently going in?

A. That's correct.

Q. By how much?

A. It was doing 40,000 barrels per month. We estimate that we can get it up to 70,000 barrels per month.

Q. And the source of the water?

A. I have an exhibit for that, if you'd like to see that.

EXAMINER STOGNER: Might as well.

THE WITNESS: Yeah. Do you have that handy, Jim?

MR. BRUCE: Just a minute, Mr. Examiner.

THE WITNESS: I submit it as an exhibit because we have several sources that we're drawing from.

MR. BRUCE: Marked Exhibit 5, Mr. Examiner.

THE WITNESS: The sources are listed down at the bottom of that exhibit.

Q. (By Examiner Stogner) And it looks like this is all reinjection water?

A. No, sir, it's not. The Double Eagle, which is the biggest portion of the water, is the City of Carlsbad Double Eagle freshwater system.

And then really the next -- one, two, three -- four sources listed are outside-operated wells, providing us with Delaware-produced water.

And then the bottom five are recycled Bone Spring and Queen waters.

Q. When this Application was originally heard, was this the source --

A. That's correct.

Q. -- presented at that time?

A. Yes, it was.

Q. So at this point, only the volume has increased, not the location or where the water's coming from?

A. That's correct.

EXAMINER STOGNER: Okay. Exhibit Number 5 will be admitted into evidence at this time.

And I have no other questions of Mr. Mayes.

MR. BRUCE: I have no further questions.

EXAMINER STOGNER: Okay, I'll leave the record open subsequent to the delivery of that diagram on that well in Section 26.

Q. (By Examiner Stogner) Just for the record, would you identify that well, Mr. Mayes?

A. Yeah, that is the QPBSSU 11-2.

Q. 11-2. In Section 26?

A. That's correct.

EXAMINER STOGNER: Okay, thank you, sir. You may be excused.

With that, I'll keep the record open, Mr. Bruce.

MR. BRUCE: Thank you, Mr. Examiner.

EXAMINER STOGNER: Could you also provide me a rough draft --

MR. BRUCE: Sure.

EXAMINER STOGNER: -- order in this matter?

(Thereupon, these proceedings were concluded at 8:40 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11520, heard by me on 2 May 1996.

, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL May 3rd, 1996.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998