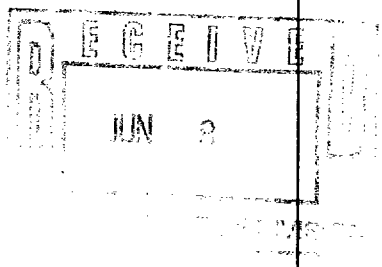
STATE OF NEW MEXICO

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 DEVON ENERGY CORPORATION (NEVADA)

CASE NO. 11,305

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

June 15th, 1995

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on Thursday, June 15th, 1995, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, before Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

June 15th, 1995
Examiner Hearing
CASE NO. 11,305

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E X H I B I T S

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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 8:29 a.m.:

EXAMINER CATANACH: At this time we'll call Case 11,305.

MR. CARROLL: Application of Devon Energy Corporation (Nevada) for special pool rules, Eddy County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

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

I have two witnesses to be sworn.

EXAMINER CATANACH: Any additional appearances?

Will the witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

KEN GRAY,

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

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. My name is Ken Gray.

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

A. I work for Devon Energy Corporation as district landman.

Q. Have you previously testified before the Division?

A. No, I have not.

Q. Would you please outline your educational and work background?

A. Well, for the past three years I've worked for Devon as the district landman for the southeast New Mexico district, obviously Lea and Eddy County. Prior to that, I worked for ten years for Sun Oil Company/Oryx Energy. Worked previously to that as an independent landman. Most of that time was in the mid-continent area.

I have an undergraduate degree from the University of Oklahoma in language arts, a master's degree in secondary education. I graduated in 1973.

Q. And your area of responsibility does include southeast New Mexico?

A. Yes, it does.

Q. And are you familiar with the land matters involved in this case?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Gray as an expert petroleum landman.

EXAMINER CATANACH: Mr. Gray is so qualified.

Q. (By Mr. Bruce) Briefly, Mr. Gray, what does Devon seek in this case?

A. We're asking the Commission to establish or assign a temporary allowable of 150 barrels of oil per day, a special depth-bracket allowable of 150 barrels of oil per day for the East Catclaw Draw-Delaware Pool.

Q. What is the current pool allowable?

A. Current allowable is 80 barrels per day.

Q. Would you refer to Exhibit 1 and identify it for the Examiner?

A. Exhibit 1 is a land plat of the pool, the current pool, which consists of all of Section 9, the west half and the southeast quarter of Section 16. It also includes the location of the wells surrounding the pool within one mile and the operators of all wells surrounding the pool.

Q. Who are the only operators within the pool boundaries?

A. The only other operator of Delaware wells is in Section 9, and that's Chi Operating.

Q. And was notice of this Application given to all operators in the pool and all operators of wells within a mile of the pool?

A. Yes, it was.

Q. And is Exhibit 2 my affidavit of notice containing the letter to the offsets?

A. Yes, it is.

Q. Have you had any contact with the other operators

in the area?

A. We've had only contact with the only other operator in the pool, which is Chi Operating, and I think one of our exhibits reflects their support of the Application.

Q. Is that Exhibit 3?

A. Exhibit 3, yes.

Q. Okay. And you haven't had any contact with or no one has called you, any of the offset operators?

A. No, they have not.

Q. Were Exhibits 1 through 3 prepared by you or compiled from company 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, it is.

MR. BRUCE: Mr. Examiner, at his time I would move the admission of Devon's Exhibits 1, 2 and 3.

EXAMINER CATANACH: Exhibits 1, 2 and 3 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Gray, Devon and Chi are the only two operators in the pool?

A. Yes.

Q. Is there any acreage in the pool that does not contain wells on it, that's leased by somebody else, that you know of?

A. Well, there are other -- there are nonoperators that own leases within the pool, yeah. Is that what --

Q. There are leasehold owners that -- within the pool --

A. Yes.

Q. -- that don't have wells on their leases?

A. Well -- Yeah. But contractually in both sections, due to joint operating agreements and things of that nature, we've got -- everybody owns a contractual interest in all the leases.

Does that answer your question?

Q. Well, is it just Chi and Devon that have the right to drill in the pool?

A. Yes. Well, to drill as operator, to operate the wells, operate -- Chi operates the wells in Section 9, and we operate the wells in Section 16.

Q. All that area is covered under a JOA?

A. Section 9 is a separate JOA, Section 17 is a separate JOA, yes.

Q. Section 16?

A. What did I say?

Q. 17.

A. 16, yeah.

EXAMINER CATANACH: Okay. Okay, that's all I have of the witness.

MR. BRUCE: Call Mr. Morrow to the stand.

DICK MORROW,

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Please state your name for the record.

A. My name is Dick Morrow.

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

A. I work for Devon Energy Corporation as a reservoir engineer.

Q. At Devon does your area of responsibility include southeast New Mexico?

A. Yes, it does.

Q. And are you familiar with the engineering matters related to this pool?

A. Yes, I am.

Q. And have your credentials -- You have previously testified before the Division, haven't you?

A. Yes, I have.

Q. And were your credentials as an engineer accepted

as a matter of record?

A. Yes.

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

EXAMINER CATANACH: Mr. Morrow is so qualified.

Q. (By Mr. Bruce) Mr. Morrow, what type of reservoir are we dealing with in this pool?

A. From the data we've gathered so far, it appears that the reservoir is producing by solution gas drive.

Q. At this time do any special rules apply to the East Catclaw Draw-Delaware Pool?

A. Yes, there's a 6000-to-1 GOR under Order Number R-9952-C.

Q. When was the increased GOR instituted?

A. The GOR was increased by an order dated November 10th of 1993 and made permanent on June 5th, 1995.

Q. And did you testify at those hearings?

A. Yes, I did. We presented substantial testimony at those hearings on the drive mechanism of the pool.

Q. And what are you requesting today specifically?

A. We are requesting a 150-barrel-of-oil-per-day testing allowable, and we request that it be granted for a three-month period so that we can collect data on the long-term effect, if any, of the higher production rates.

Q. Let's move on to your first exhibit, Exhibit 4.

Would you identify that for the Examiner and briefly discuss the geology of this pool?

A. Exhibit Number 4 is a structure map on the Cherry Canyon marker within the pay section. These are Cherry Canyon sands at a depth of about 3000 feet.

You can see that there's a structural high centered on Sections 9 and 16 with about 160 feet of relief from the highest well to the lowest known producer. We have up to about 100 feet of net-pay sand in this pool. And as I stated earlier, it produces by a solution gas drive.

Q. Let's move on to your Exhibit 5. What does that represent?

A. Exhibit 5 is a three-page exhibit on the three currently flowing wells on our lease, Wells Number 1, 2 and 7, and I've entitled this exhibit the Cactus State Well Productivity.

In most cases it's excessive drawdown which causes harm to the reservoir, and I intend to show from this exhibit that it would take very little drawdown to increase the production of these wells to 150 barrels a day.

There's a lot of data on these three pages, and I'll try to go through it as logically as I can.

On each page I have a table and also an

accompanying chart for a specific well. The table shows the daily production, as well as flowing tubing pressure, flowing casing pressure and choke size. The shaded areas in the table indicate representative tests at the different choke settings.

In the case of Well Number 1, which is the first page here, we took tests on a 12/64 choke, 10/64 and 8/64. And as you reduce the choke size, naturally, you reduce the oil production and you increase the flowing pressures.

So on the right-hand side of each page, I have made a plot of the daily oil rate versus flowing casing pressure. Now, I've used flowing casing pressure because it is more indicative of downhole conditions than the tubing pressure, because you have friction losses up the tubing. As you flow up the tubing you get friction losses and you can't really tell what the downhole pressure is. The casing pressure is a very good indicator of downhole pressures.

So what I did was extrapolate the data to determine what the flowing casing pressure would be at our requested allowable of 150 barrels a day.

As shown by the dashed red lines in the case of Well Number 1, you could extrapolate this two different ways, but they indicate that we could produce 150 barrels a day with a flowing casing pressure of between about 880 and

940 pounds. Even if you take the lesser of those, 880 pounds, we would only be decreasing the flowing pressure by about 80 pounds, out of over 900, which is less than ten percent. Thus, we could achieve our 150-barrel-a-day rate with very little drawdown on this well.

Page Number 2 is also Well Number 2, and this well we only tested at two different choke settings. But if you extrapolate those two data points, it gives a flowing casing pressure of about 690 pounds at 150 barrels a day, and this is still over 80 percent of the flowing casing pressure at the current allowable, at the lower rates.

The third page, Well Number 7, this is our newest well. It's only been on production about a month. And we've used numerous chokes in an attempt to reduce this production to the current allowable of 80 barrels a day. It's a very strong well. We initially tested the well at over 300 barrels a day, and we've been continually reducing the choke size, as I said, to get it down to the current allowable. So we know what the flowing casing pressure will be at 150 barrels a day because we've already flow-tested the well, and it shows it to be about 920 pounds.

So if you consider all three of those plots, we would induce very little drawdown on this reservoir to produce at the requested rate of 150 barrels of oil a day.

This would impose very little danger of damaging the reservoir, and thus we would not be causing waste of any reserves.

Q. Do you have any other indications of productivity of the wells? And I refer you to your Exhibit Number 6.

A. Yes, Exhibit Number 6 is the data collected from a bottomhole pressure buildup test we conducted just last week on this Cactus State Number 7, and this is another example of the productivity of the Delaware sands in this field.

There's a lot of data on these three pages, and I would just like to point out the two numbers that I have highlighted.

At times equals zero, which is just prior to shut-in, we were flowing the well at about 125 barrels a day, with a bottomhole flowing pressure of 1054 pounds.

We then shut the well in, recorded the pressure buildup, and on page 3, at the end of 72 hours, we recorded a reservoir pressure of 1131 pounds.

So taking those two pieces of data, we were only drawing the well down about 80 pounds to produce 125 barrels a day. And that 80-pound drawdown is less than seven percent of the reservoir pressure.

Q. And --

A. We are --

Q. Go ahead.

A. Excuse me. We're continuing to collect data like this to ensure that we are properly managing this reservoir.

Q. Thank you. Finally, what does your Exhibit -- Excuse me, we have two more. What does your Exhibit 7 show?

A. Exhibit Number 7 shows the current status of each well on our Cactus State lease and the latest test data.

We have six wells that are currently producing, two wells that have been drilled and cased, that have not yet been completed. In fact, we started completion on Number 5 just this week.

We only have one well, which is the Number 4, that is not capable of making the current allowable of 80 barrels a day.

Wells Number 1, 2 and 7 are flowing and need to be choked back to 80 barrels a day. In fact, Well Number 1 has been flowing its allowable for over two years.

Well Number 3 is pumping, but we're not running the pumping unit at full capacity, so that production could be increased.

And Number 6 is pumping, but you can tell by the casing pressure of 200 pounds that it's also flowing up the casing. So we have to restrict production on this well

also.

This exhibit is intended to point out that we're requesting this allowable not based solely on one or two extraordinary wells in the pool, but basically all the wells. Five out of our six wells, we feel, are capable of making substantially more than the 80-barrel-a-day current allowable.

Q. Now, with respect to your GOR cases, you did some -- or Devon had some computer modeling done on the reservoir, did it not?

A. Yes, we did --

Q. Okay, and --

A. -- and we presented that in the previous hearing.

Q. Did you have some additional modeling done for this hearing?

A. Yes, we did. Exhibit Number 8, there are four graphs that I'd like to discuss.

This last exhibit are the results of some computer modeling work performed by a consulting firm in Dallas named the Scotia Group. That's S-c-o-t-i-a.

We used data from logs, cores, PVT analysis and special core analysis to model a single 40-acre well in this pool.

The first plot there is the daily rates, oil and gas and GOR, for a well constrained by the current 80-

barrel-a-day allowable, and it shows that the 80-barrel-a-day rate is sustained for several years prior to going on decline.

The second page is a plot of the same well under a constraint of 150 barrels a day. You can see it maintains 150 barrels a day for a period of about a year prior to going on decline.

The third page is a plot of cumulative oil versus time, comparing these two different rate cases. And although it shows that the rate of recovery depends on how you produce the well, the ultimate recovery is essentially the same for both cases. In other words, we would still recover over 70,000 barrels, whether we produce the well at 80 barrels a day or 150 barrels a day.

And finally, the last plot is cumulative gas production versus time, comparing the two cases, again showing that we would not lose any ultimate recovery by producing the well at a higher rate.

Thus, this computer modeling indicates that producing the well at a higher oil rate would not cause harm to the reservoir or any waste.

And we feel that granting a 90-day test period at an oil allowable of 150 barrels a day would allow us to gather additional data to verify these mathematical computations.

Q. In your opinion, will the granting of this Application be in the interest of conservation and the prevention of waste?

A. Yes, I do.

Q. And were Exhibits 4 through 8 prepared by you or under your direction?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, I move the introduction of Devon's Exhibits 4 through 8.

EXAMINER CATANACH: Exhibits 4 through 8 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Morrow, the figure you've arrived at, 150 barrels a day, is that significant in any way?

A. Well, it's not a directly computed number, let me put it that way.

We really considered three factors in arriving at that number.

One, we looked at the productivity plots that I showed you and tried to determine a rate which would not cause excessive drawdown in the reservoir. We felt that a 10- to 20-percent drawdown was reasonable, it would not cause harm. So the 150-barrel-a-day rate kind of fit that criteria.

Number two, we wanted a rate that was sustainable for a period of time. We didn't feel there was any reason for us asking for such a high allowable that we couldn't make it after a month or two. We wanted a rate that we could sustain for a period of time.

Number three, we looked at some of the other Delaware pools that are being developed in Eddy County, and although most are deeper Brushy Canyon wells, which have a depth-bracket allowable of between 140 to 190 barrels a day, we felt these wells had similar productivity, so that we thought 150 barrels a day was a reasonable request for a Delaware pool.

So we looked at those three pieces of data to arrive at the 150-barrels-a-day rate.

Q. Okay. You have tested the wells at rates of over 150 barrels a day?

A. Yes, sir, we have.

Q. And you --

A. Not -- Excuse me, not all of the wells.

Q. And you -- The results of those tests got you out of the 10- to 20-percent drawdown?

A. I'm not sure I understood the question.

Q. The drawdown after -- at rates higher than 150 barrels a day got you out of the range of 10- to 20-percent pressure drawdown?

A. Well, in the case of Well Number 7, no, we could still go higher on Well Number 7. As I said, we produced that well at almost 300 barrels a day, within that 10 to 20 percent.

The other wells we never really tested much beyond that, so I can't answer for those wells.

Q. During the three-month test period, what kind of tests do you plan on conducting and results -- What kind of results do you think you'd get to?

A. We -- Some of the main tests we want to take are some pressure tests. We have taken probably half a dozen bottomhole pressures in this pool as we've been developing it, and we will continue to do that.

We will also increase these wells stepwise. In other words, we won't jump from 80 to 150 barrels a day; we're going to step them up gradually and watch the GOR and water-cut performance of the wells, to make sure we're not -- I hate to use the word "coning", but bringing additional gas or water into the wells.

So we hope to get additional data on these productivity plots as we step the wells up in rate.

Q. On your -- On the modeling that you did, that was based on a single 40-acre tract within the pool?

A. Yes, it was. It wasn't intended to be a history match of a specific well or the modeling of a specific

well. We kind of took all the data and put it together to come up with a composite or an average, to see what a typical well would do in that pool. And it was a single 40-acre well, yes.

Q. Now, did it include -- Well, let me ask you this: These wells that we've been discussing here, these are the wells that you operate in Section 16?

A. Yes, it did, yes.

Q. Was any data from the wells in Section 9 incorporated into your study?

A. Basically, the only data we have on those wells, since we don't operate them, were well logs, which we've incorporated into our net-pay maps, and production data. We did not have any pressure data on those wells to speak of.

Q. Do you know if any of those wells are capable of producing in excess of the allowable?

A. I don't believe they are.

Q. Do you intend to do any more reservoir modeling?

A. Right now we have no specific plans, but I can see us as we develop this pool, we will need to do some more reservoir modeling in terms of history matching and future predictions, yes.

Q. Is that something that can be done in the near future, in the short term, to help you -- If we grant the

three-month test period, is that something that can be done in the next three months to support your Application?

A. I really don't think a study could be completed in that period of time. We hope to use the data gathered in that three months to input into our model and go from there.

So I don't think it can be done concurrently, getting the data and running the models. I think we'll have to do the modeling after we gather the data from the three-month test period.

Q. You say you used an average for the model. Do the producing characteristics of all these wells -- are they pretty similar to where you feel comfortable with using an average?

A. Yes, I do. We have taken cores on a number of wells and run some pressure buildup tests on several wells, and all of the data seems to fit, as far as permeability and productivity. Naturally, the -- I mean, some wells are going to be better, some wells are going to be worse.

And it also depends on the completion procedure. We've been learning as we've been developing this field, and that's why I think some of the -- Specifically, Well Number 7 is one of the better wells. We've kind of tailored our stimulation procedure as we've learned.

But I think overall, the productivity of the

wells is very similar.

Q. Are any of your wells overproduced at this time?

A. I don't believe so.

Q. On your pressure-buildup test, do you feel like 72 hours was sufficient to get a good representation?

A. We have run tests longer, and in fact we've run up to seven-day buildup tests, and the amount of buildup you get past that 72 hours is fairly insignificant. 72 hours is a pretty good buildup time for wells of this productivity, yes.

Q. Is it Devon's intention to come back in three months and present the results of their tests? Is that the purpose, to gather the data, to come back in three months and ask -- seek permanent rules?

A. Whether it's three months or slightly longer, depending on how much additional time we need to analyze the data, yes, it is our intention to come back and ask that that be made permanent rules, if that is appropriate for the reservoir.

Q. But you're -- Right now you're just seeking the allowable for the three-month period, you're not -- Do you intend to come back at the end of three months and present the data, or --

A. Well, yes, we do.

EXAMINER CATANACH: Okay. I have nothing

further, Mr. Bruce. The witness may be excused.

Is there anything further in this case?

MR. BRUCE: No, sir.

EXAMINER CATANACH: There being nothing further, Case 11,305 will be taken under advisement.

THE WITNESS: Thank you.

EXAMINER CATANACH: Thank you.

(Thereupon, these proceedings were concluded at 8:56 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11305, heard by me on June 15 1998.

David R. Catanach, 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 June 17th, 1995.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998