NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

Hearing Date NOVEMBER 16, 1995 Time: 8:15 A.M.

NAME	REPRESENTING	LOCATION
William F. Carr	Campbell, Carr & Berge	Santa Fe
S. J. Patchet	Westinghouse Elec Corp Waste Isolation Division Carlsbad NM 88220	Carlsbad Eddy Co, NM
[illegible]	Pogo	Santa Fe
Jim Gillespie	Pogo	Roswell
Paul R. Owen	Campbell, Carr & Berge	SF
[illegible]	Arlen Dickens	SF
Thomas R. Smith	Arlen Dicken	SF
Bruce Stubbs	Strata Prod. Co	Roswell
Michael [illegible]	West Oil	SF
Sealy Cavin	Stratton & Cavin	Alb
Terry Gant	Pogo	Midland
George Dillman	Pogo	Midland
Vance Usher	Pogo	Houston
Randy Cate	Enron Oil & Gas	Midland
Patrick Tower	"	"
Bruce Inselaco	"	"

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NAME	REPRESENTING	LOCATION
PATRICK TOWER	ENRON	MIDLAND
David Bledsoe	Bass Enterprises	MIDLAND
Markus Thomerson	Meridian Oil	Midland
Leslyn Swierc	"	
Billy Juroska	"	
Mark Wheeler	Marathon Oil Co.	Midland
Shane Gough	Marathon Inc.	Midland
Jim Dore	Texaco Inc	Denver
DAN MOREHOUSE	IMC GLOBAL	CARLSBAD

STATE OF NEW MEXICO

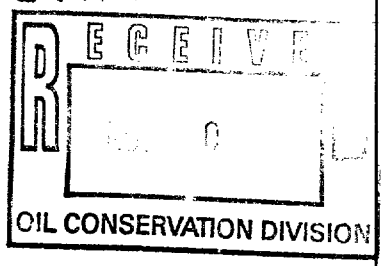
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING: CASE NO. 10,935

IN THE MATTER OF CASE NO. 10,935 BEING REOPENED PURSUANT TO THE PROVISIONS OF DIVISION ORDER NO. R-10096, WHICH ORDER ESTABLISHED SPECIAL RULES FOR THE NASH DRAW-BRUSHY CANYON POOL IN EDDY COUNTY, NEW MEXICO

ORIGINAL



REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

November 16th, 1995

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, November 16th, 1995, 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.

* * *

I N D E X

November 16th, 1995
Examiner Hearing
CASE NO. 10,935

* * *

E X H I B I T S

Applicant's	Identified	Admitted
Exhibit I-A	7	20
Exhibit I-B	7	20
Exhibit I-C	8	20
Exhibit II	8	20
Exhibit III	9	20
Exhibit IV-A	9	20
Exhibit IV-B	10	20
Exhibit V-A	10	20
Exhibit V-B	10	20
Exhibit VI	11	20
Exhibit VII	9, 11	20
Exhibit VIII	12	20
Exhibit IX-A	13	20
Exhibit IX-B	14	20
Exhibit X	14	20

(Continued...)

E X H I B I T S (Continued)

Applicant's	Identified	Admitted
Exhibit XI	15	20
Exhibit XII-A	16	20
Exhibit XII-B	16	20
Exhibit XIII	16	20
Exhibit XIV	17	20
Exhibit XV	17	20

* * *

A P P E A R A N C E S

FOR THE DIVISION:

RAND L. CARROLL
Attorney at Law
Legal Counsel to the Division
2040 South Pacheco
Santa Fe, New Mexico 87505

FOR STRATA PRODUCTION COMPANY:

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Albuquerque, New Mexico 87102
P.O. Box 1216
Albuquerque, New Mexico 87103
By: SEALY H. CAVIN, JR.

* * *

WHEREUPON, the following proceedings were had at 8:15 a.m.:

EXAMINER CATANACH: Call the hearing to order this morning for Docket Number 34-95.

I'm going to go ahead and call the continuances and dismissals at this time.

(Off the record)

EXAMINER CATANACH: At this time we'll call Case 10,935.

MR. CARROLL: In the matter of Case Number 10,935 being reopened pursuant to the provisions of Division Order Number R-10,096, which order established special pool rules for the Nash Draw-Brushy Canyon Pool in Eddy County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

MR. CAVIN: Yes, Mr. Examiner, I'm Sealy Cavin with the law firm of Stratton and Cavin in Albuquerque. I have one witness to call today.

EXAMINER CATANACH: Any additional appearances in the case?

Will you swear in the witness?

(Thereupon, the witness was sworn.)

MR. CAVIN: Mr. Examiner, our first witness is Mr. Bruce Stubbs.

BRUCE A. STUBBS,

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

DIRECT EXAMINATION

BY MR. CAVIN:

Q. Mr. Stubbs, would you please state your name, address, occupation and employer?

A. I'm Bruce A. Stubbs, I live in Roswell, New Mexico. I'm presently employed by Strata Production Company as a consulting engineer.

Q. And have you previously testified before the Division in your capacity as a petroleum engineer?

A. Yes, I have.

Q. Have your qualifications as a petroleum engineer been made a matter of record before the Division?

A. Yes, they were.

Q. Are you familiar with the Permian Basin, Mr. Stubbs?

A. Yes, I've got about 20 years in the Permian Basin, experience.

Q. Okay. Are you familiar with the Nash Draw-Brushy Canyon Pool in the Permian Basin?

A. Yes, I am.

Q. And are you familiar with Case 10,935, which was originally heard in March of 1994?

A. Yes, I helped put on that case.

MR. CAVIN: Okay. Mr. Examiner, we would tender Mr. Stubbs as an expert witness in petroleum engineering.

EXAMINER CATANACH: Mr. Stubbs is so qualified.

Q. (By Mr. Cavin) Mr. Stubbs, have you prepared any exhibits in connection with Case 10,935, Reopened?

A. Yes, I have. It's this little booklet with Exhibits I through XV.

Q. Okay. And could you state, what is Strata requesting today?

A. In March of 1994 when we had the first hearing, we requested special pool rules to increase the GOR limit to 8000 to 1. We would now like to make those permanent pool rules.

Q. Okay. Do you recall your testimony and the exhibits you presented at the original hearing?

A. Yes.

Q. And can you tell us some of the conclusions you reached at that hearing?

A. The two or three conclusions we reached were that this was an analogous field to the East Loving, which is also a Brushy Canyon field of about six miles west, that this is a typical solution gas drive reservoir. There's no gas cap and no water drive.

Q. Okay. And did you say that -- Was it one of your

conclusions that the gas-oil ratio was not affected by the rate of production?

A. That was one of the conclusions, and it still is followed to be true.

Q. Okay. So based on your knowledge of the Nash Draw-Brushy Canyon field today, the testimony and conclusions in that hearing are still pertinent?

A. That's correct.

Q. Mr. Stubbs, I refer you to what's marked Exhibit I-A and ask that you describe that for the Examiner.

A. This is a land plat of the Nash Draw-Brushy Canyon Pool area. The area highlighted in yellow is the pool -- the acreage covered in the pool as of August 1, 1995. All but one 160-acre tract is located inside the Nash unit, operated by Strata Production Company.

BK Petroleum has just recently completed the well in the northeast-northeast of Section 24, and also it appears from the public records that they've also attempted a completion in the well in the northwest of the southeast of 24, but it hasn't been included in the pool as of August, 1995.

Q. Okay. I'd refer you now to Exhibit I-B and ask that you describe that for the Examiner.

A. I-B is the area map, and just to show the relation of the Nash Draw Pool to the East Loving Pool and

the town of Loving, New Mexico, Nash Draw is about 7 miles due east of Loving and about six miles or so east of the East Loving field.

East Loving is the closest analogy pool. It produces out of the same geological interval as the Nash Draw Pool.

Q. Okay. Now, I'd refer you to Exhibit I-C and ask you to describe that.

A. Exhibit I-C is a cumulative production plot of the production from the East Loving-Brushy Canyon Pool, and the significant curve to look at is the stairstep curve, which is the GOR curve.

Presently, the GOR is approximately 11,000 to 1 in that pool, and it's shown a steady increase, almost since the pool was drilled.

Q. Okay. But yet the pool rules provide for 8000 to 1?

A. That's correct. It's 8000 to 1 times the depth bracket allowable of 142 barrels a day, so they're able to produce about 1100 MCF a day per well.

Q. Okay. I refer you to your Exhibit II and ask you to describe that, Mr. Stubbs.

A. This is a listing of all the wells that have been drilled and produced from the Delaware in the Nash Draw area. There's been four Nash Draw wells and the two BK --

or one BK well and a recompletion of a BK well since the last hearing.

Just about -- well, all but two wells have produced out of the Brushy Canyon. The Nash 1 and the Nash 4 produced out of the Cherry Canyon zone, but those zones have since been abandoned.

Q. Okay. Exhibit III is a log of the Nash 23 well. What's the significance of that, Mr. Stubbs?

A. I just wanted to show where the top of the Brushy Canyon was, and also where the two main pays in the basal Brushy Canyon are, just right above the Bone Springs zone.

Q. Okay. And Exhibit IV-A is a structure map of the "K" sand. Can you explain that and the significance of that to the gas-oil ratio?

A. The structure map is, for the most part, regional dip. It's about 130 feet per mile, dipping back to the east. There's a very slight nosing over the Nash Draw.

If you'll refer, as far as GORs, you'll refer back to Exhibit Number VII, this plot shows the initial GORs and the present GORs. The highest GORs are concentrated in the east half of Section 13.

If you'll look back at the structure map, you'll see that that's the downdip edge of the field. The reason that the GORs are higher is, those are slightly older wells, they've been producing longer, and they're on closer

spacing, and the bottomhole pressure is lower in that area. So it's a function of the pressure being drawn down and the gas being liberated.

Q. Okay. Exhibit IV-B is a structure map of the "L" sand, and that tells us basically the same thing?

A. Yes, it basically shows the same structure. It's east-dipping, still about 130 feet per mile, just a very slight nosing over the Nash Draw-Brushy Canyon zone.

Q. Okay. And in most of these wells, the "K" and the "L" sand are being produced together?

A. That's correct.

Q. Is that correct? Okay.

Mr. Stubbs, I'd refer you to your Exhibit V-A and ask that you explain that to the Examiner.

A. Exhibit V-A and V-B are an oil -- what I call an oil-feet map. It's just a porosity-foot map taken one step farther to get oil saturations involved. It just shows the trends of the sands and where they're productive.

The "K" sand are two parallel sandbodies that run northeast-southwest. There's a definite oil-water contact on the southeast side of that particular sand, and that was pretty well determined by drilling the Number 20 well. That zone was right at a transition, very high water saturations.

The "L" sand shows a similar situation with

northeast-southwest trending sands. As to date, we haven't determined an oil-water contact in the "L" sand.

Q. Now, Mr. Stubbs, Exhibit VI, could you explain that for the Commissioner -- or Examiner, excuse me?

A. Exhibit VI is a summary of the Nash Draw production. It's very -- The curves are fairly similar to the East Loving. You'll notice that the GOR has been steadily increasing. Presently our GOR is 6300 to 1 on the field average. Some wells are much higher than that, as high as 16,000 to 1.

Q. So the Nash Draw is comparable to the East Loving at that stage of development?

A. Right, that's correct. It just hasn't been producing quite as long as the East Loving.

Q. Okay.

A. The East Loving has got about two or three years longer production history.

Q. Okay. Your Exhibit VII, I'd ask that you describe that.

A. Okay, we've already touched on that briefly. It just gives the initial and present GORs. The higher GORs are related to the amount of production and the well spacing. And it's not related to the structure, so there's no gas cap in that particular pool.

Q. Okay. So the higher GORs on the east side are

related to the well density there?

A. That's correct. Those are -- were initially re-entries of Morrow wells. That's why the spacing is kind of funny there.

But the closer -- the denser spacing has drawn the pressure down in that area quicker, so there's been more gas liberated.

And if you'll notice, on the wells we drilled on the western side, the most recent wells, we've gone to a little wider spacing, and we're in the process of trying to determine what the optimum spacing is. We've started a project to do a reservoir simulation to help us decide that.

Q. Okay. Your Exhibit VIII shows the percentage water cut in the Nash Draw-Brushy Canyon Pool. Can you tell us the significance of that at this hearing?

A. We were trying to determine if there's any significant influx of water into the reservoir, and at this time it doesn't appear there is.

Most of the water-oil ratios remain fairly constant throughout the life of the wells. The ones that do increase usually have a little higher water saturation, a little more mobile water, and the water doesn't decrease as quickly as the oil decreases. So you get a little higher percentage, but it's really the water still

decreasing. We can show that here on the production curves.

Q. Okay, and Exhibit IX are those production curves on a well-by-well basis; is that correct?

A. That's correct.

Q. Could you describe Exhibit IX, and particularly any anomalies you see, or explain to the Examiner any anomalies in the consistencies that you see with your typical Delaware model?

A. Well, in our previous testimony at the previous hearing in 1994 we used what we call our Delaware model to evaluate our Delaware wells. And that model basically says that during the first year the production will decline about 50 percent, and over a two-year period it will decline about 25 percent a year. Then it will level off to about a 12-percent decline.

And for instance, one of the anomalies -- and we've already touched on it a little bit -- on the Nash 1, you'll notice that it doesn't follow the model very well. But that's primarily due to the close spacing. It's surrounded by four other wells, and it's on about a 30-acre spacing. So it's been affected by interference pretty severely.

You'll also notice that that well, the GOR, which is the little stairstep line, is up to about 16,000 to 1.

If you'll turn to the next exhibit, -B, is the Nash Draw 5, which is also in that tight spacing area, but it's about -- about half of its drainage area is to the back of it, and it's not affected by other wells. So it's a lot closer to the model, and its GOR is up to about 10,000 to 1.

The rest of the wells, if the Examiner wants to, we can go through them one by one, or if you want to just pick one to analyze -- They're all pretty well staying on the model, no great surprises at all, behaving like we expect them to behave.

Q. There's a bit of an anomaly in the Number 11 well. Is there any reason for that?

A. About the first part of this year, we went back in and perforated some additional pay zones, and we've got about a 20-barrel-a-day increase in production from that workover. That's why that has a --

Q. Okay.

A. -- jump in production.

Q. Mr. Stubbs, I'd refer you to your Exhibit X and ask that you explain that and where the Nash Draw-Brushy Canyon Pool is on that curve.

A. This is an example from Slider's Practical Petroleum Engineering Handbook, depicting a typical solution gas reservoir and its behavior.

The Nash Draw is presently about halfway up that curve, whereas the East Loving field is just about to the top of that curve. It's starting to flatten out, GORs are starting to flatten out, and at some point in time they'll even start declining.

So we're somewhere probably halfway up that curve in this particular pool.

Q. Okay. Now, I'd refer you to your Exhibit XI, which is a summary of the PVT data, and ask you to describe the significance of that for this hearing.

A. We ran a PVT analysis on the Number 19 well. From that analysis, we determined that the -- well, the pressure buildup and the analysis, we determined that the bottomhole pressure is 2963 pounds, and the bubble-point pressure is 2677 pounds.

So it takes just a very small amount of withdrawal from the reservoir to reach bubble point, and that's why we see an increase in the GORs almost immediately within the first two or three months of production. The original solution gas-oil ratio is 1109 to 1.

Q. And what is it that happens at bubble point when the gas-oil ratio goes up?

A. Well, when you reach bubble point, the gas comes out of solution and you have free gas in the reservoir.

Q. At this time I'd refer you to your Exhibit XII and ask you to describe the significance of that equation and how it affects this hearing.

A. Exhibit XII and XII-B are the general material balance equation.

And if you'll turn to XII-B, the only item in that particular equation that's not affected by the properties of the oil in the reservoir is the produced gas-oil ratio. And there's really no good way to control that. It's going to produce that ratio sooner or later. So it basically says that the wells are not rate-sensitive.

Q. Okay, your Exhibit XIII concerns 1987 Delaware completions. Can you tell me the significance of that?

A. In our original testimony, we showed curves similar to this for, I believe it was about a five-year period for each year [*sic*], and we also showed curves for numerous Delaware pools. And this is how we arrived at our Delaware model, was taking these pools and then applying the curve fit till we got a match. This was 1987 Delaware completions in southeast New Mexico.

And you'll notice it jumps above the line after it starts to flatten out, and that's primarily due workovers, and I believe there's a waterflood project or something in there which caused that little anomaly. But for all practical purposes, this model works on about 75 or

80 percent of the Delaware wells in the Basin.

Q. And the Nash Pool fits this model?

A. Yes, it does.

Q. Your Exhibit XIV is Brushy Canyon completions in Eddy County in 1990, and again, what's the significance of that?

A. Well, this basically shows the same thing. It's primarily East Loving wells coming on line in 1990. The anomaly in 1994, I think, is mostly ONGARD system; part of the production is not in there yet. But you can still see it was jumped up to where the line was and still had about the same decline. We're just missing some wells that haven't been accounted for yet.

Q. Okay. I understand that Exhibit XV gets us into showing the economics of limiting the gas-oil ratio based on the general statewide rules. Can you explain what would happen if we limited production in that fashion?

A. Well, presently there are six wells that would be producing over the 2000-to-1 GOR limit in the Nash Draw Pool. If we stayed with the 2000-to-1 GOR limit, it would mean pinching these wells back to maintain a daily gas production rate of 284 MCF a day. And so I took the Number 19 well and did a model of what would happen if we could only produce at a 2000-to-1 GOR.

So the first short period of time, you could

produce at a fairly high rate, until the GOR got high enough that you had to pinch the well back. And what that in effect does is, it extends the life of the well and increases the operating cost.

And if you'll turn to the next page, you'll see that the -- Let's see, let's turn to the economics page. Under that scenario, it takes 1.45 years to pay out, discounted before tax net return on investments, 2.77 to 1.

The next --

Q. The rate of return is what?

A. 2.77 to 1.

Q. Okay, what's your percentage rate of return?

A. Percentage is 70.76.

Q. Okay. So that's if you hold it to 2000 to 1?

A. Right.

Q. Okay. What happens if we go with the special pool rules, 8000 to 1?

A. Okay, the next section is the Nash Draw 19 as it is today, and as it has been produced. If you turn to the economics page, you'll see that the payout is .94 years, return on investment discounted is 3.62 to 1, and there ends up being slightly over half a million dollars discounted future net revenue increase, just because you shorten the production time and increase your present worth to that project.

Q. Okay. So, Mr. Stubbs, based on your knowledge of the Nash Pool, you believe the special pool rules with a gas-oil ratio of 8000 to 1 should be made permanent?

A. Yes, I do. In the future, as we drill more wells, we're probably going to see -- I'm almost certain we're going to see a higher GOR, and this will be a much bigger problem in the future.

Q. Okay. And Mr. Stubbs, is it your opinion that the failure to provide such a higher gas-oil ratio would result in economic waste?

A. Yes, it would. I think at some point in time, it would get to the point that you couldn't afford to drill wells, you wouldn't be able to produce them.

Q. So you believe it would also result in physical waste?

A. I believe so. You're not going to be able to fully develop the field.

Q. Okay. Do you think the extension of these rules would adversely affect -- Is it your opinion that the extension of these rules would adversely affect correlative rights?

A. I don't believe it would, because any other operator in the area in that pool would have the same ability to produce their wells to higher GOR.

Q. Okay. Mr. Stubbs, were Strata Exhibits I through

XV prepared by you or under your supervision or direction?

A. Yes, they were.

MR. CAVIN: Mr. Examiner, I move that Strata Exhibits I through XV be admitted.

EXAMINER CATANACH: Exhibits I through XV will be admitted.

MR. CAVIN: And I have no further questions for Mr. Stubbs at this time.

EXAMINATION

BY EXAMINER CATANACH:

Q. Okay. Mr. Stubbs, the East Loving-Brushy Canyon Pool, is that currently being developed on a higher GOR than 2000 to 1?

A. That pool presently has 8000-to-1 GOR limits. I believe those were approved back in 1993.

Q. Okay. Do you know if that's on a permanent basis for that pool?

A. Yes, it is, I believe so.

Q. It is. And the -- You're producing the same interval in the Nash Draw as is being produced in the East Loving Delaware?

A. That's correct, it's the basal Brushy Canyon, what we're calling the "K" and "L" zones, "K", "K2" and "L".

In our previous testimony, the geologist

correlated those and had a cross-section. There's probably one in your file.

Q. Those sands -- Is it the same sands that are found in both pools?

A. They correlate, yes. We don't know what happens in between there, but they correlate very well on the logs.

Q. Are the "K" and "L" sands separated and not in communication with each other?

A. I believe that's correct. We just got through doing a 200-foot full core of the "K" and "L" interval, and there's many shale barriers. It's a laminated -- highly laminated sands, and there's many shale barriers even in the -- like the "K" and "L" interval themselves. There's many separate reservoirs in those intervals.

Q. So do these separate reservoirs exhibit the same reservoir characteristics?

A. Yes, they do, very similar. In the early stages of the development of this reservoir, we did the zones separately . We would complete the "K" zone or the "L" zone and produce it for a few months and come back and do the "K" zone, and the production is very similar.

Presently, we just perforate it all and frac it all at one time.

Q. You've seen no evidence in any of the separate reservoirs of the presence of any type of gas cap?

A. No.

Q. The PVT data was at -- What was that run on? Was that run on full -- in a well that had both the "K" and "L" sands --

A. That's correct.

Q. -- completed?

A. Yeah, that was the Number 19. I believe the "K" and "L" zone were completed together. Right, from 6721 to 6830.

Q. Okay, you mentioned 11,000 to 1 as being the current GOR for the pool?

A. The 11,000 to 1 is what's presently being produced in the East Loving Pool. Our --

Q. That's the average?

A. Yes. If you'll turn to Exhibit I-C, the little stairstep curve is just above 10,000 to 1.

Q. Okay, that's the East Loving Pool?

A. That's the East Loving. Our present GOR on a field average is about 6300 to 1.

Q. Is the East Loving a much older pool?

A. Yes, it was -- its development really started -- If you'll notice on that curve, production really started to peak or climb up in 1989, so it's got about three more years' production than the Nash Draw. Nash Draw started in 1992.

Q. Do you feel like it's the age of those wells that are dictating the high GORs in that east half of Section 13?

A. I believe that's correct. Those wells have been producing the longest, and they're also on the closest spacing. So the reservoir pressure is lower in that area, and more gas has been liberated from the oil.

Q. Now, you mentioned -- Let's see. The 2963, was that the initial bottomhole pressure?

A. That's correct.

Q. Okay.

A. That was measured in the Number 19 well, up in Section 12.

Q. What is the reservoir pressure at this time?

A. We haven't run a pressure buildup recently, so I don't know. We're scheduled to do that probably on the next well.

Q. Well, have you seen evidence that shows that the wells in the east half of Section 13 do have a lower bottomhole pressure?

A. Just by the production and the GOR. If you go back to the completion schedule on the PVT data, you can see how much gas would be released, you know, a certain pressure. So you can kind of draw a conclusion as what the pressure is in that area.

Q. How many operators are in the pool? Do you know?

A. Just two. Strata has the wells on the Nash Draw Unit, and then BK Exploration has just recompleted -- or drilled one well in 24 and then recompleted another well in 24.

But both of those wells, if you'll turn to Exhibits IX-N and IX-O, that's the production on the BK wells. They started at about 30 barrels a day and have promptly dropped off. So they're right on -- as our map indicates, they're right on the edge of the sand.

Q. Have you guys been in contact with those operators, or with that operator?

A. I haven't personally. The geologists have talked to them, but I haven't.

Q. You're not aware that they're opposed in any form or fashion to this?

A. I don't think so. In fact, they're not real happy with what they have, so I don't think they're going to do much more, the way it sounds.

Q. Do you anticipate having to come back in and getting an increased GOR for this pool?

A. I don't anticipate that. As the oil production continues to decline and the GOR goes up, we're still going to be at 8000 to 1 GOR. That would allow us to produce about 1.1 million per well, so that should pretty well

cover us.

Also, we're in the process, as I mentioned, of doing a reservoir simulation, and hopefully that will lead us to some kind of secondary or enhanced recovery project on this field.

Q. The reservoir simulation is to -- for what purpose?

A. We want to determine -- Well, two or three main things. Number one, what's the optimum spacing? We're not sure of that yet. It's definitely not 30 acres, and it's probably -- We're drilling them on approximately 80-acre spacing now, and that may be a little bit too big a spacing. So we want to determine the optimum spacing.

We also want to determine if some kind of secondary or enhanced recovery project is economical or feasible, and then of course what kind of recoveries we might get from that.

Q. Tell me again about your -- the model that you constructed for the Delaware.

A. Which exhibit are you --

Q. Well, generally, I'm just looking at IX-A, but that does have the Delaware model on it, right, the upper portion of that curve.

A. Yes, the solid black line is the model, superimposed over the production.

Q. And the solid black line, that is the GOR?

A. No, the solid black line is the oil production.

Q. Okay.

A. The GOR is the little stairstep curve there in the middle, and it's right now about 16,000 to 1 on that Number 1 well.

Q. Okay, the top area of that curve, that's the Delaware model you put together?

A. Yeah, the heavy straight line is the Delaware model.

Q. And on that you've got plotted the oil -- decline in oil production?

A. That's correct, the solid black line, the jagged line, is the oil production.

Q. Okay. What data did you use to construct that?

A. Well, that goes back to -- If you go back to Exhibit 13, when we originally developed this model, we looked at every year of Delaware production from 1985 to present and did a curve-fit, just like we did in this -- this is 1987 completions -- and came up with this model.

Then we took it farther and applied it to each Delaware field and found that that model pretty well fit the fields. There's about 20 or 25 percent of Delaware wells that this doesn't work on, and probably half of those are kind of the poor Delaware wells, and they just drop off

and they don't ever flatten out.

And there's another group that actually has some water influx, and the pressures are kept up, and it has fairly stable production.

Q. Mr. Stubbs, from the data that you've looked at and analyzed, you do have an opinion that this production at this GOR is not going to decrease the ultimate recovery of oil from the pool?

A. I believe that's correct. I don't think it's rate-sensitive.

Q. Are there going to be more wells drilled?

A. Yes, we drill about two to four wells a year out there, and next year we're planning on drilling four wells.

Q. So you've really -- you've not found the edge of the reservoir?

A. No, the only edge that we've found is in the "K" interval on the southeast side where we hit a transition zone in the Number 20 well, and we're seeing a higher water saturation. So the "K" zone probably doesn't extend down to that southeast side. We have not found any oil-water contact or boundaries in the "L" zone as of yet.

There's many other problems out there. We're in the potash area, and there's some areas we're either going to have to directionally drill or not be able to drill, and we have to contend with surface problems like playa lakes.

So it's getting to be pretty difficult to get wells drilled in there.

EXAMINER CATANACH: Okay. I believe that's all I have, Mr. Cavin. The witness may be excused.

Is there anything further that you have in this case?

MR. CAVIN: No, Mr. Examiner.

EXAMINER CATANACH: Okay. There being nothing further, Case 10,935 will be taken under advisement.

(Thereupon, these proceedings were concluded at 9:00 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10935, heard on November 16, 1995.

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 November 19th, 1995.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998