STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERRVATION DIVISION FOR THE PURPOSE OF CONSIDERING:) CASE NO. 10935

APPLICATION OF STRATA PRODUCTION COMPANY

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: Jim Morrow, Hearing Examiner

March 17, 1994

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on March 17, 1994, at Morgan Hall, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Diana S. Abeyta, RPR, Certified Court Reporter No. 168, for the State of New Mexico.

ORIGINAL

APR 4 1994

I N D E X

March 17, 1994
Examiner Hearing
CASE NO. 10935

E X H I B I T S

A P P E A R A N C E S

FOR THE DIVISION:	ROBERT G. STOVALL, ESQ. General Counsel Oil Conservation Commission State Land Office Building 310 Old Santa Fe Trail Santa Fe, New Mexico 87501
FOR THE APPLICANT:	STRATTON & CAVIN, P.A. Post Office Box 1216 Albuquerque, New Mexico 87103 BY: SEALY H. CAVIN, JR.

EXAMINER MORROW: At this time, we'll call case 10935.

MR. STOVALL: It's the application of Strata Production Company for special pools, Eddy County, New Mexico.

EXAMINER MORROW: Call for appearances.

MR. CAVIN: Mr. Examiner, my name is Sealy Cavin, and I'm with the law firm of Stratton & Cavin, in Albuquerque. I represent the applicant, Strata Production Company. I have three witnesses to call today.

EXAMINER MORROW: The witnesses please stand to be sworn.

(Witnesses sworn.)

KIM ALLISON

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

EXAMINATION

BY MR. CAVIN:

Q. The first witness for the applicant is Kim Allison. Ms. Allison, would you please state your name and your employer for the examiner.

A. My name is Kim Allison. My employer is Strata Production Company, and I'm the land manager.

Q. Have your credentials been made a matter of record for the division prior to this date?

A. No, sir, they haven't.

Q. Could you give us a brief description of your background as a landman, both educational and workwise.

A. I began employment with Yates Petroleum Corporation in 1979, in the land department and in a lease records supervisor capacity. Was there for eight years, to 1987, at which time I was employed by Hondo Oil & Gas Company in Roswell, New Mexico, as a lease and title analyst. Was there for five years, to June of '92. At that time, I began employment with Parker & Parsley Development Company in Midland, Texas, as an administrative landman. Worked there to December of '92, and which I, at that time, began employment with Strata Production Company as a land manager.

Q. Ms. Allison, are you familiar with the matters involved in this case?

A. Yes, sir.

MR. CAVIN: Mr. Examiner, are Ms. Allison's qualifications as a landman acceptable?

EXAMINER MORROW: Yes.

Q. (BY MR. CAVIN) Ms. Allison, would you briefly describe what applicant seeks by this application.

A. Applicant seeks special pool rules for the Nash Draw-Brushy Canyon Pool including a provision for a gas-oil ratio limitation of 10,000 cubic feet of gas per barrel of

oil.

Q. Have you prepared or directed the preparation of any exhibits in connection with this application?

A. Yes, sir.

Q. Is Exhibit 1 an exhibit you prepared?

A. Yes, it is.

Q. I would ask you to identify and review Exhibit 1 for the examiner.

A. Exhibit 1 is a plat of the -- the green boundary is the Nash Unit covering eight sections. The yellow highlighted acreage is the Nash Draw-Brushy Canyon Pool. And the yellow or the red boundary is the current Nash Draw Cherry Canyon Pool. The blue outlined area is a one-mile radius around the Brushy Canyon Pool in which we use to identify the offset operators around that Brushy Canyon Pool.

Q. Just so we get our bearing, could you tell us where we are -- and this is Eddy County; is that correct?

A. Yes, sir, it is.

Q. Could you tell us, give us a legal description of Nash Unit, please.

A. The Nash Unit covers approximately 5,120 acres in Eddy County, New Mexico; all of Sections 1, 11, 12, 13 and 14 of Township 23 South, Range 29 East, and all of Sections 6, 7 and 18 of Township 23 South, 30 East.

Q. Could you explain for the the examiner what kind of unit the Nash Unit is.

A. The Nash Unit is a federal exploratory unit in which the ownership is undivided ownership throughout the unit.

Q. Let me ask you, back on the notice issue, you've outlined in blue a one-mile perimeter around the existing pool?

A. Yes, sir.

Q. Can you tell me, is that how you determine who to give notice to?

A. Yes, sir.

Q. Basically, you just gave notice to people outside?

A. Outside of the --

Q. Operators outside of the unit?

A. Outside of the unit; correct.

Q. Because Strata is the operator within the unit?

A. Right.

Q. Let me ask you, it looks like the west half of Section 8 in 23 South, 30 East, would also be within that one-mile barrier, but that's not highlighted in blue?

A. You're right. That operator was, however, notified.

Q. Who is that operator?

A. Texaco. It's Getty on the map, but it's Texaco.
Q. Okay, thank you.
EXAMINER MORROW: Where was that? I missed that.
MR. CAVIN: I'm sorry, Mr. Examiner, it's on the east side in Section 8.
EXAMINER MORROW: I got it.
MR. CAVIN: And, actually, that blue line should encompass the west half of that Section 8, and notice was, in fact, provided to that operator, which is Texaco.
Q. Ms. Allison, back to the Nash Unit. Can you tell me how cost and production are allocated in Nash Unit?
A. Cost and production are allocated -- working interest is -- share an alike cost throughout the unit. Royalty and overriding royalty ownership is based upon a tract basis until a well is drilled and proved in a commercial well in which at that point a participating area is established. And within that participating area, ownership would be shared across the board through royalty and overriding royalty interest.
MR. STOVALL: Mr. Cavin, can I interrupt you just to clarify something. Did you say this is an undivided federal unit?
THE WITNESS: Right.
MR. STOVALL: But it's got participating areas?
MR. CAVIN: Yes.

MR. STOVALL: Based upon -- one of us -- we don't have the same understanding of what an undivided federal unit is.

MR. CAVIN: If I might interject, an undivided federal unit means that the working interest is on an undivided basis. So in other words, across the entire Nash Unit --

MR. STOVALL: Oh, okay.

MR. CAVIN: -- the cost sharing is exactly the same for purposes of allocating royalty and override that were created prior to the unit or at the time of the unit you establish participating areas.

EXAMINER MORROW: When you say federal -- well, go ahead and just clarify a little more. Is all acreage federal acreage?

MR. CAVIN: No, sir. The vast majority of the acreage is federal acreage. I don't think there's any fee acreage, and about, I think, approximately 5 percent, maybe a little higher, is state acreage.

EXAMINER MORROW: So the participating area would just affect whether it was state or federal and any overrides?

MR. CAVIN: Yes, sir; that's correct.

EXAMINER MORROW: On the royalty or overriding royalty?

MR. CAVIN: Yes, sir. All of the acreage within the Nash Unit is under lease, with the exception of possibly a 40-acre tract up in Section 6 of 23-30.

MR. STOVALL: I'm clear now as to -- it's undivided as to the working interest is how you've got your --

MR. CAVIN: Yes.

MR. STOVALL: I'm with you.

Q. (BY MR. CAVIN) Ms. Allison, would you again describe the existing area that's been designated the Nash Draw-Brushy Canyon Delaware Pool?

A. Yes, sir. Those lands cover the south half of Section 12, the east half the Section 13 of 23-29, and also, the northwest quarter of Section 18 of 23 South, 30 East.

Q. So that's the area that's marked in the yellow?

A. Right.

Q. Including the area that's outlined in red?

A. Right.

Q. Now, the area that's outlined in red, what's the significance of that?

A. It's the Nash Draw Cherry Canyon Pool.

Q. Okay. Ms. Allison, based on your understanding of the ownership out here, is it your opinion that the granting of this application, as you understand it, will not adversely affect correlative rights?

A. No, sir.

Q. Ms. Allison, was Exhibit 1 prepared by you or under your supervision or direction?

A. Yes, sir, it was prepared by me.

Q. Can you testify as to the accuracy of such exhibit?

A. Yes, sir.

MR. CAVIN: Mr. Examiner, I move for the admission of Exhibit 1.

EXAMINER MORROW: We take Exhibit 1.

MR. CAVIN: Mr. Examiner, that concludes my direct examination of Ms. Allison.

EXAMINER MORROW: All right. Let's see, the Cherry Canyon, Brushy Canyon Pools, do you know about the completion there in those different zones or different pools? Which wells are completed? Or would you rather the next witness do that?

THE WITNESS: Probably the next witness.

MR. CAVIN: Yes, sir, we have quite a bit of testimony showing -- both from, I think, geologic and, certainly, engineering -- showing the different intervals that have been completed in these pools.

EXAMINER MORROW: All right. Well, that's -- Bob, have you got any questions?

MR. STOVALL: Yeah, I do, and, again, it may go

to the geologist or engineer, but I will ask you.

EXAMINATION

BY MR. STOVALL:

Q. You've drawn the one-mile line because, I assume this pool is under the statewide rules which incorporate the operational rules into the pool within a mile. Parts of the unit are beyond that one mile. Do you know if there are any wells in those areas that are technically outside that one-mile area?

A. There's not any current wells drilled, to my knowledge.

MR. CAVIN: I'm sorry. Mr. Stovall, what was your question? Is it outside of the unit?

MR. STOVALL: Well, are there any wells between the blue line and the green line, outside the one-mile radius, but within the unit area?

THE WITNESS: No; no,sir.

MR. CAVIN: No, sir, not that we're aware of.

MR. STOVALL: So then we don't need to worry about what rules those are operating under.

Q. Let me ask you this from a land standpoint, and, again, I recognize that it may be as much engineering, would Strata, as the operator of the unit, propose to operate those areas, assuming there were some exploration, under the same set of rules as are proposed for the Nash Draw Pools?

In other words, would you operate them consistently within the unit, I guess, is the question?

And again, if you're not comfortable with that, just say so and we'll ask the engineer.

MR. CAVIN: Let me just state --

THE WITNESS: I -- go ahead.

MR. CAVIN: Well, I'm sorry.

MR. STOVALL: Are you comfortable answering the question?

THE WITNESS: No, I would prefer that go to an engineer.

MR. CAVIN: I would just state it's my understanding, and we sort of -- this is obviously a collaborative effort, that we would operate all the wells whether it's in the Nash Unit or outside of the unit consistent with the rules, special pool rules, hopefully, that this body will promulgate.

EXAMINER MORROW: You would assume that any well drilled out there would be added to the pool, and, therefore the pool limits would be extended and the rules extend with the limits?

MR. CAVIN: Yes, sir, that is correct.

MR. STOVALL: Well, I guess we need to look at that, and I will do so with the engineer. Obviously, there's some concern about that since you're asking for a

higher GOR; that's basically a rule change. There would be some concern about whether you could operate the wells outside the one-mile boundary. So we may need to have some discussion to make sure we're aware of nomenclature and get pool extensions done in a timely manner if necessary.

MR. CAVIN: The other thing is we, as we'll get into later, are asking just for temporary rules. We anticipate coming back as we gain more information on this field.

EXAMINER MORROW: Okay. Temporary for how long?

MR. CAVIN: Our thinking is 18 months, Mr. Examiner. We think that would be a sufficient time to give us plenty of data regarding this pool.

EXAMINER MORROW: But you did give notice to everyone outside the green area, I believe I heard you testify, in addition to everyone outside the blue area?

MR. CAVIN: Well, everyone --

THE WITNESS: Everyone within the blue area.

MR. STOVALL: There was no one to give notice to in the green area is what I understand, Strata is the operater.

MR. CAVIN: In the green area we did not give notice to anybody --

THE WITNESS: Other than Murchison Oil & Gas.

MR. CAVIN: -- other than Murchison Oil & Gas.

Just as a point of clarification, and hopefully, not to confuse the issue, in federal units, Murchison is actually designated the operator. Strata has been designated the suboperator of the Delaware formation. But Murchison is certainly aware of everything. They have received -- they are aware of this, and they are 50 percent owner in the unit.

MR. STOVALL: I guess the answer to your question, and confirm this, talk in lawyer terms for a minute, in the context of notice, this division would have jurisdiction over everybody within the outermost boundries on this map, whether it be green or blue, because they're either the operator or they've been given notice; is that correct?

MR. CAVIN: Yes, sir.

MR. STOVALL: In other words, if you go to the outside, everybody in any of the lines you've drawn on this map has received notice, plus a few others, because the lines weren't draw correctly.

MR. CAVIN: Yes, sir. We have an affidavit to that effect. And the affidavit, what it will really show is the blue line that's outside of the green line, we've given notice -- in every case where you see a blue line outside the green line, we've given notice to the lease owner.

EXAMINER MORROW: And vice-versa?

MR. CAVIN: Excuse me?

EXAMINER MORROW: Well, green lines outside the blue line, and you've also given notice, as I understood the testimony.

MR. CAVIN: Well, in essence, we're the operator, so that we wouldn't have to give notice.

EXAMINER MORROW: Well, in Section 36, take Section 36, up near the top of the map, was notice given to those operators?

MR. CAVIN: No, sir, because the way we looked at it is the pool -- that's more than a mile outside of the pool.

EXAMINER MORROW: Okay. Well, I misunderstood an earlier answer.

MR. CAVIN: Okay. Sorry for that.

EXAMINER MORROW: Anything more, Bob?

MR. STOVALL: I don't have any more questions.

EXAMINER MORROW: Thank you, ma'am. Appreciate it.

MR. STOVALL: I do want to ask one. You don't have to come back up, but I'm gathering, inferring that I should ask to make sure that this map is not your source of title information; is that correct?

THE WITNESS: No, sir, it isn't.

MR. STOVALL: You did some actual checking of

public records?

THE WITNESS: Right.

MR. STOVALL: Okay.

MR. CAVIN: Mr. Examiner, our next witness is Steve Mitchell.

STEPHEN MITCHELL,

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

EXAMINATION

BY MR. CAVIN:

Q. Mr. Mitchell, would you please state your name and present occupation and employer for the examiner.

A. My name is Steve Mitchell. I'm a geologist, petroleum geologist. I work with Scott Exploration, Inc., in Roswell, New Mexico.

EXAMINER MORROW: You work for Scott, is that --

THE WITNESS: Scott Exploration, yes, sir.

Q. (BY MR. CAVIN) Mr. Mitchell, have your credentials been made a matter of record for the division?

A. Yes, they were, about eight years ago.

Q. Since it's been such a long time, I would ask if you would describe for the examiner your educational and work background --

A. Yes.

Q. -- as a petroleum geologist.

A. I received a B.S. in geology from New Mexico Institute of Mining and Technology in 1981, and I've worked in southeast New Mexico, as a petroleum geologist, since 1982 in Roswell, New Mexico, with Scott Exploration, working primarily southern New Mexico, Delaware Basin.

Q. Mr. Mitchell, are you familiar with the portion of Permian Basin which is located in southeastern New Mexico?

A. Yes, I am.

Q. Are you familiar with the geology of the Nash Draw-Brushy Canyon Pool?

A. Yes, I am.

Q. And also the Cherry Canyon Pool?

A. Yes.

Q. Mr. Mitchell, are you familiar with the application filed in this case on behalf of Strata?

A. Yes.

MR. CAVIN: Mr. Examiner, we tender Mr. Mitchell as an expert witness in petroleum geology.

EXAMINER MORROW: We accept his qualifications.

Q. (BY MR. CAVIN) Mr. Mitchell, have you prepared any exhibits in connection with this case?

A. Yes, I've prepared four exhibits.

MR. CAVIN: Okay, I would refer you -- Mr. Examiner, those are all included in the black binder,

and to avoid any confusion, some of them are marked at the bottom with an exhibit mark, but we have stamped them and marked them with case number and exhibit number which will override that exhibit number.

Q. Mr. Mitchell, I would refer you to what we have marked as Strata Exhibit 2. It's -- I think yours is marked Exhibit 1?

A. Yes; that's correct.

Q. And ask if you would identify that and explain that for the examiner.

A. Yes. Exhibit 2 is a structural cross section that goes from the Nash Delaware Field over to the East Loving Brushy Canyon Field. At the bottom of the cross section is a map that shows the line of section. You can see that the fields are approximately six miles apart.

And what the cross section shows up above is that they both produce from the stratigraphically equivalent pay zone, and this is probably the most analogous field to the Nash Draw Delaware Field. And the reason I'm showing this is because the special pool rules have already been established in the East Loving Field for this same zone.

And on the cross section, you can see that the porosities, bulk volume waters and water saturations are similar.

Q. So based on your study, it's your opinion that an

analysis can be drawn between the Nash Draw Brushy Canyon Pool and the East Loving Field?

A. Yes. I think this is the best analogy, and this is also the closest producing Delaware Field, analogous producing Delawre.

Q. Mr. Mitchell, next, I'd refer you to what is marked as Strata Exhibit 3, your Exhibit 2, and ask that you identify and explain this for the examiner.

A. Exhibit 2 is a structural map. It's on top of the Brushy can -- Basal Brushy Canyon "K" Sandstone.

MR. STOVALL: Can I get you to hold up here, Mr. Mitchell, and let everybody get their maps unfolded.

THE WITNESS: Sure, you bet. Exhibit 3 is a structure map. It's on top of the Basal Brushy Canyon "K" Sandstone. This horizon is located just above the pay interval that we're focusing on. However, this is pretty much layer-cake geology, and this structure is a better structural pick, and that's why I use this horizon, but it's basically equivalent to the "L" pay zone.

What I'm trying to -- the point I want to get across with this structure map is basically for the engineer's benefit, so that he can show that the GOR's variations -- excuse me -- just basically, that the GOR's don't vary based on structure. As you get structurally high on the reservoir, that the GOR's don't also get higher.

Q. (BY MR. CAVIN) Mr. Mitchell, I refer you next to your exhibit, what's marked Strata Exhibit No. 4, and I believe it's your Exhibit No. 3, and ask that you identify and describe that for the examiner.

A. Exhibit No. 4 --

MR. STOVALL: Once again, Mr. Mitchell, let's get things unfolded.

THE WITNESS: Sure, I'll slow down. Exhibit No. 4 is a porosity isopach map. This is on the Brushy Canyon "L" Sandstone. And this is the main pay horizon in the Nash Brushy Canyon Delaware Field. The purpose of this map is just to show the pay thickness throughout the field and that GOR's do not vary based on pay thickness.

Q. (BY MR. CAVIN) Mr. Mitchell, I would next refer you to what's marked as Strata Exhibit 5 and ask you to identify and explain that for the examiner. Take a little more time to unfold.

A. You probably don't want to unfold the whole thing, but as you start at the bottom, this is a cross section, structural cross section from northwest to southeast in the Nash Delaware Field. It covers primarily the entire Brushy Canyon interval and a segment of Basal Cherry Canyon formation. The purpose of this cross section was basically to show the different pay zones that have

already been perforated in the Nash Delaware Field. The main pay horizon is the "L" Sandstone at the very bottom of the cross section, and the completion procedures are shown on each zone.

There are some additional pay zones that had been perforated in both the 9 and 10, Nash No. 9 and Nash No. 10 well, and I wanted to just make that clear that the Basal section is not the only zone perforated in this field, that there are some other potential pay zones in the Brushy Canyon formation.

Also, to the far right of the cross section is Nash No. 1 well, and you'd asked earlier about the Cherry Canyon Reservoir, and that is shown up at the very top on the right-hand side, shows the interval that was perforated at approximately 4,940 feet. That interval produced out of the Nash No. 4 well produced approximately 55,000 barrels of oil, was surrounded by dry holes, so it's basically a limited reservoir. So this is also shown in the cross section that this zone was perforated and did not produce in the Nash 1 well.

EXAMINER MORROW: The one that did produce is not shown?

THE WITNESS: Yes, sir, that's correct.

EXAMINER MORROW: Is it still producing, No. 4?

THE WITNESS: No, sir. That well has been

converted to a salt water disposal well.

EXAMINER MORROW: So it's not in production now in the Cherry Canyon?

THE WITNESS: No, sir.

Q. (BY MR. CAVIN) Mr. Mitchell, based on your study of the Nash Brushy Canyon Pool and your knowledge of the Delaware in this area, is it your opinion that the granting of this application would be in the interest of conservaton, the prevention of waste, and the protection of correlative rights?

A. Yes, I do.

Q. Mr. Mitchell, were Strata Exhibits 2 through 5 prepared by you or under your supervision or direction?

A. Yes, they were.

MR. CAVIN: Mr. Examiner, I move that Exhibits 2 through 5 be admitted.

EXAMINER MORROW: We admit 2 through 5.

MR. CAVIN: Thank you, sir. I have no further questions of Mr. Mitchell, at this time, sir.

EXAMINATION

BY EXAMINER MORROW:

Q. Wait, just a minute. I've asked you a few questions; let me ask you a couple more before you leave on these two maps Exhibits 3 and 4.

A. Yes, sir.

Q. You indicated those showed that neither structure nor sand thickness had any effect on gas-oil ratio, and I really didn't get the point here.

A. Yes, sir.

Q. I didn't see how these maps showed that?

A. Yes, sir. Let me explain. Actually, those maps were submitted basically for the engineer's use, especially, so you can refer back to those when he explains, when he makes his explanation of GOR's

Q. Okay.

A. Okay?

Q. All right. Thank you.

A. Thank you.

MR. CAVIN: Mr. Examiner, at this time, we call Mr. Bruce Stubbs.

BRUCE STUBBS

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

EXAMINATION

BY MR. CAVIN:

Q. Mr. Stubbs, we would ask that you state your name and current occupation and employer for the examiner.

A. I'm Bruce A. Stubbs. I'm a consulting petroleum engineer, and I'm employed now for Strata Production Company.

Q. Mr. Stubbs, have you previously testified before the division in your capacity as petroleum engineer?

A. Yes, I have.

Q. Mr. Stubbs, are you familiar with the portion of the Permian Basin which is located in southeastern New Mexico?

A. Yes, sir.

Q. Mr. Stubbs, are you familiar with the Nash Draw Brushy Canyon Pool?

A. Yes.

Q. Are you familiar with other Delaware pools in vicinity of the Nash pool?

A. Yes, I have. We studied about ten pools surrounding this pool.

Q. Are you familiar with the application filed in this case on behalf of Strata?

A. Yes, sir, I am.

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

EXAMINER MORROW: All right, we accept Mr. Stubbs.

Q. (BY MR. CAVIN) Mr. Stubbs, have you prepared or directed the preparation of any exhibits in connection with this hearing?

A. Yes. I believe it's Exhibit 6, and it's a bound

volume.

MR. CAVIN: Mr. Examiner, this Exhibit 6 contains many exhibits, and so what I will do is refer to the exhibit number within the Exhibit 6, if that's okay.

EXAMINER MORROW: Fine.

Q. (BY MR. CAVIN) Mr. Stubbs, could you give us an overview of what Exhibit 6 represents?

A. Well, this is our study of the Nash Draw area, and also the surrounding fields that we've used to use as a model to predict what the Nash Draw-Brushy Canyon Pool is going to produce like.

Q. And just so we have a perspective, you will be giving us testimony today that will indicate that the Nash Draw-Brushy Canyon is a solution gas drive reservoir?

A. That's our conclusion, yes.

Q. That it's not sensitive to the rate of production?

A. That's correct. It's a typical solution gas drive reservoir, correlates to quite a few of the surrounding Delaware pools. And, typically, those are not rate sensitive, and we'll present evidence to show that.

Q. Mr. Stubbs, I would ask that you identify and review for the examiner what you have marked as Exhibit 1.

A. Exhibit 1 is just an area map. The Nash Draw-Brushy Canyon Pool is located there in the center.

There's only five other Delaware completions in the two townships that the Nash Draw Pool is in. The only significant Delaware production is in the Forty Niner Ridge Field just to the east, about two miles, but that produces out of a shallower part of Brushy Canyon, at about 6,000 feet, whereas we're at 6,700 feet, so it's a different interval.

The closest pool that we can correlate to, as the geologist stated, is the Loving Brushy Canyon Pool, which is located about seven miles to the west. And it's not on this map, but you can see in Section 19, the Loving East Field is in the next township. So that's the one that we've used as our analogy.

Q. Mr. Stubbs, I would ask that you identify and describe Exhibit 1-A for the examiner.

A. In our study we've pulled data on every well in those two townships. This is a listing of the wells in the two townships. The Delaware wells are highlighted by a black arrow. Then the next exhibit behind that, 1-B, is just the production from the different fields in those two townships.

Q. Okay. I would next refer you to what's marked Exhibit 2 in your report and ask that you describe that for the examiner.

A. This is a blowup of the Nash Draw-Brushy Canyon

Pool so we can see the location of the wells. The Brushy Canyon completions are marked in red and the Cherry Canyon completions are marked in blue.

EXAMINER MORROW: I'm having a little trouble following here. Where are you now?

THE WITNESS: Exhibit 2 should be this colored blowup of the land plat.

EXAMINER MORROW: If you will find it for me, I would appreciate it.

THE WITNESS: It's right behind all this tabular historical data.

And if you would, the next page is a summary of which zones have perforated and any comments concerning those wells. As the geologist stated, the two wells in the Cherry Canyon Pool, the No. 1 and the No. 4, have since been abandoned. The No. 4 was abandoned and converted to a salt water disposal well. The No. 1 was originally a deep Morrow well that came back, tested the Cherry Canyon, those perforations were then squeezed, and the well is being completed in the Brushy Canyon.

MR. CAVIN: Before you leave that, just a note, that page that indicates the perforated intervals should be marked Exhibit 2-A. Just for future reference. That's the way it's referenced in the report, Mr. Examiner.

EXAMINER MORROW: Okay.

Q. (BY MR. CAVIN) Mr. Stubbs, I would next refer you to what is marked Exhibit 3-A and ask that you identify and describe that for the examiner.

A. Exhibit 3 is going to be a summation of the production in the Nash Draw-Brushy Canyon Pool. Exhibit 3-A is just the oil and gas and water production. Presently, we're producing about 15,000 barrels of oil a month, about 58 million cubic feet of gas, and about 7,000 barrels of water.

Exhibit 3-B is the same gas and oil production curves with the addition of a GOR curve. And the GOR curve is a thin dot-dash line. And you can see the average GOR now is up to about 4,000 cubic feet per barrel.

The next page is Exhibit 3-C. Again, it's the same oil and gas production curves with the addition of a water cut curve, which is the top curve. The water cut initially was as high as about 58 percent. Now it's decreased to about 40 percent. So it's on a pretty good decline.

Q. You have production information attached directly behind Exhibit 3-C?

A. This is just the tabular numbers that those graphs were created from.

Q. Would this indicate the magnitude in which this field has been overproduced, as far as the gas-oil ratio?

A. Yeah, the statutory limit is 2,000 to 1, which means you can produce 284 mcf a day per well. So the number of wells times 284, times however many days in the month would give you a gas volume you could produce, and anything over that volume in this produce column, Gas mcf column, would be an overproduction number.

Q. So the field is not significantly overproduced and only recently had --

A. Yeah, in the last, probably three months or so it's really started being over -- the gas production has been over allowed.

EXAMINER MORROW: What does the limit calculate?

THE WITNESS: 284 -- the statewide rules --

EXAMINER MORROW: The total -- I know the total limit, though? Something we can compare to the 41,711 in February of '94.

THE WITNESS: Okay, it would be a total of eight wells, 284 mcf a day for 28 days. I don't have my calculator with me, but that would be --

EXAMINER MORROW: Okay.

MR. CAVIN: We can certainly give you more specific information on overproduction, Mr. Examiner, if you --

EXAMINER MORROW: Okay. Good, I would like to have that.

THE WITNESS: We'll tabulate that after the

hearing and give that to you.

Q. (BY MR. CAVIN) Mr. Stubbs, I next refer you to Exhibit 4-A. Before you identify and describe that, is this the same structure map, just a reduction, as the one that Mr. Mitchell presented earlier?

A. Yes, this is just a copy of his structure map just over the Nash Draw Unit. And then what I have done is taken the initial GOR'S, which is the top number, and then a cum'd GOR, which is the bottom number, and put it next to each well. And the significance of this exhibit is that it appears that structure has no real bearing on the GOR. The lower structure wells, like the 5, 6, 1, 10 and 14, have the highest GOR'S, the cum'd GOR'S, and that's primarily a function of the length of time they have been producing and somewhat the spacing probably interferes -- there's a little, probably, interference with all those wells in the that area.

The newer wells, 9, 11, 13, have not exhibited the high GOR'S yet. And they're the higher wells, higher structure wells.

Q. So the conclusion from this map is that there's no correlation to structure in the gas-oil ratio?

A. Yeah, there's no correlation to structure, and there's no gas gap present.

Q. I would next refer to you Exhibit 4-B, and before

you describe that, this is also the same exhibit, except reduced, that Mr. Mitchell presented earlier?

A. That's correct.

Q. I believe that was Strata Exhibit No. 4, Porosity Isopach Map?

A. That's correct.

Q. Would you describe that and the significance of this map for the examiner.

A. It's using the same GOR numbers. You can determine that there's no real relation between thickness of the zone and the GOR'S. There's zones that have relatively thin zone that has about the same GOR's as wells that have the thick part of the zone; so there doesn't appear to be any correlation between thickness of pay and GOR'S.

Q. Mr. Stubbs, I would next refer you to Exhibit 5, which are individual well production GOR curves and ask that you describe those for the examiner.

A. We pulled the individual well production, and on most of them, all except for the first one, there will be another page behind it that has tabular production in a GOR plot on the right-hand side. The first one we just included -- it's the Nash Draw No. 4 Cherry Canyon -- just to see how that well produced, and we'll use that well for a history match here in just a minute.

The next one is the Nash Draw No. 1. Significance --

you might turn to Exhibit 5-B-2, which is the little graph for the GOR. The significance being wells started at about 1,000 to 1 GOR bobbled back and forth between 3,000 and 1,000 for about six or seven months and then the GOR started to increase. And we'll refer back to this -- these little curves in a second when we talk about a typical solution gas drive well.

The next well is a Nash Draw No. 5, and Exhibit 5-C-2. The GOR has roughly the same characteristics. Started at about 1,000, three or four months into the life of the well the GOR started increasing and GOR now is over 7,000 to 1.

Q. Before you go any further, Mr. Stubbs, can you explain, it looks like that GOR is sort of jumping around at first, and then it's fairly steady after November?

A. On which well are you referring to?

Q. I'm looking at Exhibit 5-C-2, and I think you see a similar pattern in the other exhibits, as far as a GOR rate.

A. Well, initially, on a lot of these wells, they are trying different choke sizes and different techniques to get them pumping properly, and the production is a little erratic in the first few months, but the trends, you can see the trend is over the first three months the well averaged about 1,000 to 1 GOR. Then in October of '93, there was a

drastic increase to November, to about 3,000, and then it's increased monthly from that point on, to over 7,000.

Q. Rather than go through all of these exhibits for each well, you might proceed with Exhibit 6, unless you prefer to go through each well, Mr. Examiner?

A. Each well has behaved similarly and there's no great deviation in how they have been produced or are producing.

Q. So you don't see any anomalies in these various wells, as far as the gas-oil ratio?

A. No. They've all started out at about 1,000 to 1 for two or three months, and then the GOR starts to increase.

Q. Again, that's what you'd expect for a typical solution gas drive reservoir?

A. Yes. If you refer to Exhibit 6, which is just a copy of a curve out of Slider's "Practical Petroleum Reservoir Engineering Handbook" or book, it just depicts a typical gas-oil ratio history for a solution gas drive reservoir, and, if you'll remember, back in Exhibit 5-B-2, the GOR is similar to what Mr. Slider indicates is a typical well where you have a fairly constant GOR for the first part of life of the well. Once the bubble point is reached and you have having free gas breaking out, you may have a slight reduction, and, in fact, the Nash No. 1 had a reduction in

GOR'S from June of '93 to about August. That's where your solution gas -- in the formation you reach a critical saturation. Once that saturation is reached, then the GOR starts increasing. And that's what we're seeing in the Nash Draw, so we draw the conclusion that the Nash Draw is a solution gas reservoir. It's behaving as predicted, and water rates are not increasing, indicating there's no active water drive.

Q. Can you tell us where we are, when you look at Exhibit 6, where we are on that curve in your opinion?

A. In my opinion, we're about half way up that steep slope part of the curve before it flattens out at the top.

Q. And so even though -- what is the average GOR right now?

A. The average is about 4,000. Some of the wells are over 7,000; some of them are still a couple thousand.

Q. So you anticipate we're still climbing, and hence you are asking for a higher GOR than current?

A. That's right. We'll talk about it in just a minute, but the Loving Field is now about 10,000 to 1, and that's what we're basing our --

Q. Did the Loving Field go through this same curve that's referenced in Exhibit 6?

A. That's correct.

Q. I would next refer you to what's marked

Exhibit 7-A and ask you to identify that and describe that for the examiner.

A. We're in the process of doing PVT analysis and getting some good reservoir data. And in conjunction with that, we have run a pressure build-up test. Exhibit 7-A is just a Cartesian Plot of the build up, reservoir built up to about 2,760 and slightly over 90 hours.

The next one, Exhibit 7-B, is an extrapolation of that build up to a p* of 2,963. And that correlates pretty well. That's a gradient of about .43 psi, which is fairly standard for the Delaware.

Q. Now, Exhibit 8 looks interesting.

A. Let's talk about --

Q. Oh, I'm sorry.

A. There is one more exhibit, Exhibit 7-C.

Q. Okay.

A. Like I said, we're in the process of getting our PVT data together, and Core Lab has given us an approximate bubble point saturation pressure, if you will, of 2,463 pounds, which is about 500 pounds below reservoir pressure. And I think this correlates pretty well with what we're seeing productionwise. It doesn't take much of a withdraw from the reservoir to reach bubble point pressure, and that's why we're seeing an increase in GOR in the first five or six months of the life the wells.

Q. What happens at bubble point, again?

A. As long as you're above bubble point, the gas is held in solution in the oil. Once bubble point pressure is reached, the gas can no longer stay in solution. It's just like opening a bottle of Coke, the bubbles start coming out of the gas and now you have free gas in the reservoir. And once the gas builds up enough in the reservoir that you have reached the saturation point, then the permeability of gas is high enough that the well starts producing more, higher and higher GOR'S.

Q. It's your opinion this doesn't -- the rate of production doesn't affect the pace of this?

A. No. And we'll show some evidence in just a second to that end.

Q. Okay.

A. Also, one number that we've been using is the gas-oil ratio, initial gas-oil ratio of about 1,000. Core Lab has determined that the gas-oil ratio is about 995 standard cubic feet per stock tank barrel.

Q. Okay. I would next refer you to Exhibit 8 and ask you to describe that in as little detail as possible.

A. Before I go to Exhibit 8, I would like to make a statement. In part of our study, we've looked at some simulation data out of the SPE "Petroleum Engineer's Handbook" that Mr. Ridings did, and he has drawn four

conclusions that are pertinent to this case.

The first one being that ultimate recovery is essentially independent of rate and spacing. Two, that GOR's depend somewhat on rate and spacing, but over the long haul it all kind of averages out. No. 3, the computed depletion time agrees closely with conventional analysis. No. 4, intermittent operation greatly affects instantaneous GOR behavior, but the cumulative GOR is not affected significantly. Also, oil recovery is not affected.

And carrying that a step farther, we wanted to verify his findings, and one way to do is that is using the material balance equation, which using the material balance equation you just account for the fluids taken from the reservoir added back to the reservoir.

And on the first page of Exhibit 8 is just the general material balance equation. Since there is no injection, doesn't appear to be any water drive, no active gas cap, and since we're so close -- the bubble point is so close to the bottomhole pressure, compressibility is almost negligible. That long equation reduces down to the simpler part of the equation on the second page of Exhibit 8.

Now, we can rewrite that part of the material balance equation to come up with fractional recovery of the oil in place, and that's the bottom equation, which is just oil produced over the oil in place to give us a recovery

factor.

Examining the right-hand side of that equation, it indicates that the terms, all the terms except for the produced gas-oil ratio are a function of pressure and are the properties of reservoir fluids. As the nature of the fluid is fixed, it follows that the recovery is fixed by the PVT properties of the reservoir fluid and the produced gas-oil ratio. And through the simulation studies, that produced gas-oil ratio, no matter how you produce the well, over the life of the well, is going to remain the same.

Q. Okay. Next, I would refer you to what's marked Exhibit 9 and ask you to identify and describe that. Before you do that, can you tell the examiner a little bit about your experience with the Delaware and how many -- I know it's quite extensive, as far as developing these decline curves.

A. Well, in our dealing with the Delaware, I think we probably looked at probably every Delaware completion that's been made now. Right now, there's 1,538 completions in the Delaware in southeast New Mexico. And the next set of curves is yearly summaries of those completions. And that's what they call Delaware, which includes almost everything, and then in some cases, they break it out Cherry Canyon and Brushy Canyon.

The first curve is a 1986 curve, and we start in

1986, because I consider that kind of the modern age of the Delaware. That's where the technologies finally caught up and people started making decent Delaware wells. In 1986 is the first year that you really start seeing that. And It's not a real good match, but I went ahead and threw it in here just for an example.

What we've done in our study is try to develop curves to match a typical Delaware well. And if you will turn the page to the --

EXAMINER MORROW: I don't -- what are we trying to do here?

THE WITNESS: We're going to the --

EXAMINER MORROW: On the first one in the group there, what was the purpose of that?

THE WITNESS: Okay, the first one is all of the Delaware completions in southeast New Mexico in 1986. There's a total of 54 wells. We want to make a history match to develop some type curves so we can predict production from the Delaware using this production history.

EXAMINER MORROW: So what have you plotted here?

THE WITNESS: Okay, this is just oil and gas and GOR, to start with.

EXAMINER MORROW: Which curve is which?

THE WITNESS: The solid line is the oil curve, the heavy dashed line is the gas production. The little

skinny dot-dash line is the GOR.

And in this case, the GOR is about 2,000 to 1. Like I say, this is the summary of 54 wells.

EXAMINER MORROW: Okay. All of them added together?

THE WITNESS: All added together. Okay, then if you'll turn the page, we've gone and made a match. And our typical Delaware model is -- for one year we decline production at 50 percent, two years at about 25 percent, and then it flattens out to about 12 percent. And you can see the match on that, that match on that history.

Okay, the next page is --

EXAMINER MORROW: Tell me what's plotted there.

THE WITNESS: That's the same thing, except we left off GOR and we've added our -- the straight line, solid straight line is our --

EXAMINER MORROW: The top one is the gas and lower one is oil?

THE WITNESS: Yeah, the dotted line is gas. The solid line is oil. And then the straight line is our model.

EXAMINER MORROW: Okay.

THE WITNESS: Now, we have done that for, I believe, four more years. The next one is 1987. That's the summation of the history. And again, the GOR has gone from about 1,000 to 2,000. And if you will turn the page to the

match, and you can see that we have developed a pretty good match using that same model on the 1987 wells.

Turn one more page. This is the 1988 completions. Same data. If you will notice on this one, though, the GOR's are a little higher. It's approaching 3,000 to 1. Turn the page, and you can see the match. The only anomaly is about four or five years out, it's above the line. That's what we feel is due to some recompletions and maybe a water flood or two that's been thrown in there.

The next one is 1989. In that group of wells, GOR's are up to about 5,000 to 1. And if you will turn the page, look at the match, you can see that still can get a pretty good match on the model versus the history.

EXAMINER MORROW: Are you adjusting the model as you move along, or do you do that in early days and leave it alone?

THE WITNESS: No, we -- it's the same model. It's a 50 percent decline for a year, 25 percent for two years, and 12 percent for the life of the well.

EXAMINER MORROW: Okay.

THE WITNESS: Do you want Exhibit 10?

MR. CAVIN: Yeah, why don't we go to Exhibit 10 and get you to explain that.

THE WITNESS: Now we have gone one step farther and we have taken our model and we're going to apply it to

fields that are surrounding the Nash Draw Field just to make sure that everything still ties. The first one is the Lost Tank Delaware. It has 37 wells. It's located in 21 and 22 South of 31 East. And again, the history, oil gas and GOR. GOR's steadily increase from 5- or 600 cubic feet per barrel, and now it's about 2,500 to 1. And if you'll turn the page and look at the match, you can see that the model matches that field fairly well.

Now, the next one is the Livingston Ridge. This is a relatively new Delaware Field. It's got 69 wells in it now. Initially, the GOR 6- or 700 to 1. And over the last year or two has been increasing and is now a little over 1,500 to 1. And if you'll turn the page, you can see, again, the model has a pretty good match.

Moving on, the next one is the Fenton Delaware. It's 22 wells. Have quite a bit of history on this field. The initial GOR, again, was 7- or 800 to 1. Over the life of the well it's been as high as 3,000 to 1. And if you will turn the page, you can see that we, again, have a good match.

And the next one is Nash Draw Cherry Canyon, which is primarily the Nash Draw 4. And we put that one in there just because it was close, close as we could get. And what's significant about this well or this pool is the GOR initially was 7- or 800 to 1. Increased throughout the life

of the well to -- well, there is one month it was over 8,000 to 1. If you will turn the page, you can look at the match, and, again, fairly predictable decline.

EXAMINER MORROW: What's that on, what's the action out here in '92?

THE WITNESS: In '92, that's when the No. 1 well was completed. When they first completed the No. 1 well, it was in the Cherry Canyon Pool. Then they realized that it was really in Brushy Canyon, so they created a new pool and it was moved to the Brushy Canyon Pool, and that production history is just lumped in there.

EXAMINER MORROW: Is that accurate Brushy Canyon production?

THE WITNESS: Yeah, starting from the end of '92 on, it's Brushy Canyon production.

Q. (BY MR. CAVIN) Next, I would refer you to Exhibit 11, if you're through with Exhibit 10, regarding the Loving Brushy Canyon Field curves and have you describe those.

A. Okay, the Loving Brushy Canyon, as we studied earlier, is our prime model for the Nash Draw. It correlates on the logs. It appears to have the same GOR-type history. So we feel like it's the closest match, and it's also the closest field that has any significant production out of Brushy Canyon.

The first graph is just a history of that field. As you can see, the GOR now is approaching 10,000 to 1. Initially, back in 1990, the GOR was 1,500 to 1,800 to 1 and has steadily increased through the life of the pool. What we wanted to do in this part of the study is verify that producing a high GOR really doesn't have a lot of affect on the way the well produces and the ultimate recovery. So what we did is we took Brushy Canyon completions in 1990, which there's a total of 50 wells, which is the next graph, and that group of wells, the GOR now is about 10,000 to 1 or slightly over. We did our history match on the next graph, and you can see that the match, the model matches the history.

The conclusion we draw from that is the pool is producing as you would expect it to; it is producing like other Delaware Fields. A rate doesn't appear to be affecting the production. There's no drastic declines in the oil production.

EXAMINER MORROW: Which page are you on?

THE WITNESS: That's about the third page in that section. That's the first history match.

EXAMINER MORROW: What does it say right at the top of the page, Loving Brushy Canyon --

THE WITNESS: Yeah, 1990 Completions, get No. 5. I realize there is a lot of data in this book. It's kind of

hard to -- it would be the third page in Exhibit 11.

EXAMINER MORROW: And you're on the '91 or the '90?

THE WITNESS: '90.

MR. CAVIN: Is it second or third?

THE WITNESS: The third page. The first page is the whole field history, and we break it -- the second curve is the 1990 completions, which is 50 wells. And then the third page is the history match on the 1990 completions. You can see there was a good match. Those close group of wells in that pool are behaving as you would expect them to.

The next graph is the 1991 completions. That group of wells, the GOR is now at about 7,500 to 1.

EXAMINER MORROW: This is only the '91; it couldn't pick up any older completions; is that right?

THE WITNESS: Well, if you refer back to the first graph, the primary development of the pool was in 1990 and '91. That's when most of the wells were drilled.

EXAMINER MORROW: But the '91 don't include the '90?

THE WITNESS: No. Just one year at a time. That way it kind of normalizes it so you can start your decline curve.

EXAMINER MORROW: Okay.

THE WITNESS: Then, if you look at the history

match, you will see that group of wells in that pool also follow the model very well.

Then the last two curves are the 1992 completions. Those GOR's are now about 8,000 to 1. If you turn to the last page in that section is a history match. Since we don't have a lot of time on that group of wells, you can't really tell a whole lot about it, other that it is following the first part of model.

So from that study, the conclusion we draw is the higher GOR and the higher rates that they're producing in the East Loving Field really haven't affected the declines as follow in the model, and the ultimate recovery should not be affected.

Q. (BY MR. CAVIN) That takes us into Exhibit 12, which I'm not sure how that compares with Exhibit 11, but maybe you'll identify and describe Exhibit 12 and the relationship to --

A. Okay, Exhibit 12, the first graph is just a production history of the Nash Draw Brushy Canyon Pool. And then the second one is just applying the model to that production history. And again, the field is relatively new, so we don't have enough history to make a good match, but that's the way that we would expect that pool to produce.

Q. Okay, when you say "the model," you mean the model looking at all Delaware fields?

A. Right. The first year, a 50 percent decline; two years, at 25 percent; and then leveling off at a 12 percent.

Q. Maybe I just missed this, how does the Nash -- the analogue is Loving Brushy Canyon Field, and how does the Nash Draw compare to that? Is there something that shows that, or is that --

A. Well, other than -- we're just applying the model, and we use that later in the economics, but that's the way we would expect the Nash Draw Brushy Canyon Pool to produce. All indications are that using the analogy with the Loving Pool, that it's going to produce like a typical Delaware Pool.

Q. Certainly what you see so far indicates it's very similar to the East Loving Field?

A. That's correct.

Q. Next, I'd refer you to Exhibit 13, regarding the economic model comparing 2,000 to 1 GOR versus the 10,000 to 1 GOR and ask that you describe that.

A. These are projections based on two models. The first one is if we have to leave the pool producing at a GOR of 2,000 to 1, if you will notice on the production history curve, the dotted line, which is the gas production line, is held constant for a couple of years. That represents holding the production at 284 mcf per day, which is the statutory limit. As the GOR increases, it's going to cause

you to hold the well back and the oil production drops drastically during that first year or so of production.

Once the well is not able to produce that allowable, you start your decline and then the oil flatten out so you can produce, essentially, at that rate plus a decline to the life of the well. And the negative effect that has on the operator is it extends the life of the well four or five or six years, which increases the cost of operations. It also reduces the time for payout. So in this particular model, it reduces the cash flow by $288,000. And the present value reduces it by $343,000.

EXAMINER MORROW: Do you show that somewhere?

THE WITNESS: That's on the next page, the next, really, two pages. That's the economics on that particular model. Then the model at the end would be if we could allow it to produce at the 10,000 to 1 GOR and have a normal production history.

If you will refer to the last page, which is Reserves and Economics, you'll notice that was PV 10 value, which is in the last column, is $1,181,000, as opposed to the PV 10 value in the first model of $838,000. There's about $300,000 difference in the PV 10 value.

Q. (BY MR. CAVIN) What does it do to the payout period, Mr. Stubbs, based on your calculations?

A. It lengthens the payout period two or three

months. It doesn't affect the payout that much, because you're still able to produce the well at a fairly high rate right at the beginning, but it does drastically affect the ultimate economic benefit.

Q. I wonder if I'm reading this right, then, the payout would occur at about 600,000, something like that maybe, or more?

A. Well, the drilling cost is about $500,000. If you'll look on the last page, over on the left-hand side it has a payout number of .98 years. On the first model, the payout is 1.1 years. So it's just a month or two longer on payout. But that's because you can produce the well at a fairly high rate for a number of months before the GOR starts to increase. So the payout is not affected drastically, but the total economic benefit is affected drastically.

Q. Mr. Stubbs, based on your study of the Delaware in your study of the Nash Draw Brushy Canyon Field, in particular, is it your opinion that the granting of this application will be the interest of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes, I do. Our study indicates that the Delaware is going to produce like the simulator models say. It's not going to be rate sensitive, therefore we should recover the

same amount of reserves. There shouldn't be any waste. We feel like that the higher GOR will allow the operator to produce the wells in a more economical manner and reduce a lot of production problems.

Q. Mr. Stubbs, let me make sure you get this straight. The applicant is requesting temporary pool rules?

A. Yes. We would like to see temporary pool rules of 10,000 to 1 GOR for 18 months. That would allow the drilling of a few more wells, it will allow the time for us to get our PVT data together, and give us enough history to make a match as to how this field is producing.

Q. What sort of effective date would you propose?

A. March 1, probably.

Q. And it's your opinion that this Nash Field is analogous to the East Loving Field?

A. That's correct.

Q. Mr. Stubbs, was Exhibit 6 and all of the exhibits contained therein prepared by you or under your supervision or direction?

A. That's right.

MR. CAVIN: Mr. Examiner, I move that Strata Exhibit 6 be admitted.

EXAMINER MORROW: Exhibit 6 is admitted.

MR. CAVIN: And Mr. Examiner, I have no further questions of Mr. Stubbs at this time. That concludes my

direct examination.

EXAMINER MORROW: Thank you, sir.

EXAMINATION

BY EXAMINER MORROW:

Q. Mr. Stubbs, do you propose any field pool rules other than the gas-oil ratio limit change?

A. No. The gas-oil ratio limits, the one that is affecting the pool right now, that's the only one we need.

Q. You indicated you didn't believe there was any water drive present. Go ahead and explain where the water comes from.

A. There's irreducible water saturation. The Delaware, because of the clay structure, can hold about 40 percent water saturation as bound water. These wells have an average water saturation of about 45 percent, some of them are 48, 41, somewhere in that range. The average is about 45. So you have the difference between the irreducible water saturation, and that 45 percent is going to be movable produced water. And that's why we see, initially, we see some produced water, and that's why it's declining as you're depleting that mobile amount of water, the water that's mobile in the formation.

Q. Are there any Delaware reservoirs in southeast New Mexico that have water drive?

A. Yes, sir. There's two of them that I've done an

extensive study on, the Northeast Lee, up in 20-34, and the Quail Ridge, which has now been combined into the Northeast Lee, which is also in 20-34. Very strong water drives, constant pressure, constant GOR's.

Q. Are they Brushy Canyon?

A. They are Cherry Canyon.

Q. And they have increasing water production; is that correct?

A. It's not increasing yet, but it will. The wells are still producing in the oil column. There's one or two that are just right on the oil-water contact that have increasing water, but they were drilled into the water to start with.

Q. Are they water free now?

A. No.

Q. The ones that are complete in the oil column?

A. No. They produce a small amount of water, less than 10 percent.

Q. So you base your water drive on -- or you determined that they did have water drive by pressures and performance rather than by --

A. Yeah, pressure performance. And there's been some downdip wells drilled that were wet. So we know a precise of a water contact in those two pools.

Q. Are they included in your data?

A. No, sir. Those wells are probably 20 or 25 miles north of this pool.

Q. I thought you included everything in southeast New Mexico in your overall data?

A. Yeah, they are in the raw data, yes.

Q. They are in these curves that include all 1500?

A. Yeah, the model curves, right.

Q. How do they affect your analysis or do they have --

A. They're such a small percentage of the total wells, that it doesn't really affect it. Probably, my guess is probably 90-something percent of the Delaware wells are solution -- pools are solution gas drive. That's the primary mechanism. The exception is the water drives. There's just not very many of them that are true water drives.

Q. On your pressure buildup curves that you presented, when were those done and what pressure does that -- I believe it was around between 2,500 and 3,000 psi. Is that current or initial or --

A. Yeah, this well, the Nash 19, is the newest well in the field. In fact, they're just in the process of completing it. This pressure buildup was run last week and they pulled the bottoms Monday. And they just faxed it to me, so I just got it Tuesday.

Q. So that's current reservoir pressure?

A. Yes, sir. And we feel like that's initial pressure because of the gradients, about .3 psi per foot, which is pretty standard Delaware. So this well doesn't look like it's being affected by any of the wells. You would expect that because it's way on the north end of the field.

Q. So it's far enough away that it hasn't been affected?

A. If you want to refer back to Exhibit 2, the 19 is way up on the north end. And the 13 and 19 are relatively new wells. Or the 13 is a relatively new well, and the 19 is a brand new well. So they really haven't had time --

Q. Where is 19 from 13? I've got it spotted on this exhibit --

A. Okay, 13 is in the northeast of the southwest. 19 is in the northwest of the southeast. So it's just due east of the 13. It's a little clearer on Exhibit 2, which is a blown-up plan map.

MR. STOVALL: Exhibit 2 in your Exhibit 6 is what you mean?

THE WITNESS: Yes, sir.

Q. (BY EXAMINER MORROW) Who do you sell the gas to out there?

A. I believe that's going to Phillips.

Q. Is there a market for this increased volume?

A. Yes, G.P.M., which is Phillips. Yes, there is a market for the gas.

Q. You're not venting any gas or flaring any gas?

A. No, sir. They have varied that gas rate by choking the wells back, and over the last two or three months, doing different things to try different things, but no, I think all the gas is presently going into the pipeline.

Q. And you're asking for 10,000 to 1, and that's what Loving is now; is that correct?

A. Yes, sir, that's what the production on the Loving Field has gone to over the last couple of years.

Q. Some of the models we've seen in other requests similar to yours have shown a slightly decreased oil recovery at the higher GOR's; would you anticipate that?

A. I guess it's possible. Maybe we're not far enough along to tell that. You know, based on what we're seeing at the Loving Field, it's right on the model. So if there's any drastic reduction, we're not seeing it at this time.

Q. And you're going to tabulate some --

A. Yes, sir.

Q. -- gas allowables compared to gas production and give us a summary of your current overproduction?

A. Right. I'll figure that out right now and give

it to you.

Q. Okay, good. Maybe you can leave that with us today.

A. Okay.

EXAMINATION

BY MR. STOVALL:

MR. STOVALL: I guess I'll, since the landman deferred to you, ask you the question about development within the unit that is outside the one-mile area surrounding the pool. Is there any or are there any plans pending?

A. Well, I guess the long-range plans, there's probably -- they're going to drill wells to extend the pool till they find the limits of the pool, whatever that is. Right now, there's no plans to drill any wells, you know, in those areas that you're talking about. The development is going to occur between the 13 and over -- well, where the 13 well is there is a couple of locations. You'll notice a little circle there where 12 is. There's another little circle in the northwest of the northwest of 18 and 23-30 with the proposed location of No. 17. And then No. 20 is there in the middle of northwest of the northwest of 18. So the development, right now, is going to be within the bounds of that pool as it's stated right now.

Now, if wells are drilled outside of that pool,

the pool will be just be extended and the rules will apply -- I assume they will apply to any extension in that Brushy Canyon Pool.

MR. STOVALL: Well, I guess, make Strata that, yes, it would extend, but before it extended to an area that was more than a mile from the existing pool, the nomenclature would have to be done to take the pool out to where the development had occurred.

A. Right.

Q. Which would bring it, probably bring it within a mile.

A. Right.

Q. In other words, just because it's within the unit, does not now mean -- say, for example, if you went up to Section 6, northeast of Section 6 --

A. Yes, I agree with that. If they made a stepout and it was over a mile, then it would be a whole new game --

Q. Exactly.

A. -- a whole new ballgame, right. And I don't think that's the plan. I think the plan is to make it orderly development and extend the pool, you know, kind of one step at a time.

Q. I guess I just suggest that if you get to that point and it makes a difference, advise Artesia to include it in the nomenclature and get the official pool extension

done.

A. Okay.

MR. CAVIN: If we extend it beyond a mile?

MR. STOVALL: Well, I'd say when you get your development, if it starts to go -- you know, if it's getting to that point, make sure that the bureaucratic process has been done, as well as the -- you may have drilled your well, but if they haven't brought your nomenclature in, you're still not in the --

MR. CAVIN: Okay.

EXAMINER MORROW: Yeah, that would apply to any extension.

THE WITNESS: I don't think that's going to be the case, because it should be just an orderly development in pool extension.

EXAMINER MORROW: Well, I hope you do get up there --

THE WITNESS: Well, I hope it's that big.

EXAMINER MORROW: -- in the northeast corner of Section 6. Thank you, sir. We appreciate the testimony.

MR. CAVIN: Mr. Examiner, before we conclude, I would like to add I provided an affidavit as Exhibit 7, which indicates we have given notice by mailing, as required by the division's Rule 1207.

And one other sort of housekeeping matter, you

might want to consider, as far as the new special pool rules, is combining the two pools. I understand that's been happening anyway, at least that's my understanding that these pools are being considered as one Delaware pool?

EXAMINER MORROW: So you're proposing a different vertical limit; is that right?

MR. CAVIN: Yes, the whole Delaware interval. It seems to me that might make things a little --

EXAMINER MORROW: But you don't have any completions in anything but the Brushy Canyon, do you?

MR. CAVIN: Well, previously, we had Cherry Canyon in the Nos. 1 and 4 wells. And, of course, those have been abandoned at this point. So maybe just, I guess we could just keep a special -- just have it apply only to the Brushy Canyon. I'm not sure there's any need for the Cherry Canyon --

MR. MITCHELL: There are some mud log shows in the courthouse that indicate that there is some additional pay in the Cherry Canyon. We don't anticipate completing that for several years.

EXAMINER MORROW: If you do decide you want to do that, would you submit us a log showing the limits, top and bottom of the limits that you'd propose to include and have those marked on a log that we could refer to as being the tops and bottoms of the pay interval.

MR. MITCHELL: Yes, sir.

MR. STOVALL: I would actually suggest that what has happened in some of these is that's gone in the other direction, is to separate it out.

MR. CAVIN: Splitting them out?

MR. CAVIN: Split the Brushy Canyon out. The Delaware is kind of interesting, as you know, because of the interval and different characteristics, and I think, I wouldn't talk to all of them, but I think there have been several cases where it's gone --

MR. CAVIN: They split them out.

MR. STOVALL: Leaning the other direction, to isolate the interval that we're really producing from.

EXAMINER MORROW: I guess that kind of went that way on this one to begin with, that had two pools there and --

MR. STOVALL: Certainly in this case, there is no notice and no way that we could consolidate the pools.

MR. CAVIN: That's fine. We'll just -- I guess my understanding was that the division was doing that on its own in any case. So I just --

MR. STOVALL: Well, that would become a part of a nomenclature case if it were --

EXAMINER MORROW: So you're saying that really we don't have the notice in place to do consolidation?

MR. CAVIN: That's fine.

MR. STOVALL: Correct.

MR. CAVIN: We will just back off of that.

EXAMINER MORROW: We'll go with the Brushy Canyon then?

MR. CAVIN: Yes, sir.

EXAMINER MORROW: Anything more, sir?

MR. CAVIN: No, sir.

EXAMINER MORROW: Case 10935 will be taken under advisement.

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF Santa Fe)

I, Diana S. Abeyta, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that I caused my notes to be transcribed under my personal supervision, and that the foregoing transcript is a true and accurate record of the proceedings of said hearing.

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, March 28, 1994.

DIANA S. ABEYTA
CCR No. 168

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10935, heard by me on March 17 1994.

Examiner
Oil Conservation Division