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 NOS. 11,016
) 11,017
APPLICATIONS OF TEXACO ) 11,018
EXPLORATION AND PRODUCTION, INC. ) (Consolidated)

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

July 7, 1994

Santa Fe, New Mexico 27 1994

This matter came on for hearing before the Oil Conservation Division on Thursday, July 7, 1994, at Morgan Hall, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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# I N D E X

July 7, 1994
Examiner Hearing
CASE NO. 11,016



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# E X H I B I T S



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A P P E A R A N C E S

FOR THE DIVISION:

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By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 11:05 a.m.:

EXAMINER CATANACH: At this time we'll call Case 11,016, the Application of Texaco Exploration and Production, Inc., for creation of a new pool in the Tubb formation, classification of this pool as an associated oil and gas pool, and for the promulgation of special pool rules, Lea County, New Mexico.

Are there appearances in this case?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing in association with Mr. Carr with the Campbell law firm.

We're representing today Texaco Exploration and Production, Inc.

We would request permission to consolidate this case with Case 11,017 and 11,018.

EXAMINER CATANACH: At this time I'll call Case 11,017, which is the Application of Texaco Exploration and Production, Inc., for pool reclassification, pool expansion, the promulgation of special pool rules, and the further amendment of Division Order No. R-5353, Lea County, New Mexico.

Case 11,018 is the Application of Texaco Exploration and Production, Inc., for pool creation and the promulgation of special pool rules, Lea County, New Mexico.

Are there additional appearances in any of these cases?

There being none --

MR. KELLAHIN: I have two witnesses to be sworn, Mr. Examiner.

EXAMINER CATANACH: Okay, can I get the two witnesses to stand and be sworn in.

(Thereupon, the witnesses were sworn.)

BILL HAY,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. All right, sir, would you please state your name and occupation?

A. Bill Hay, geologist.

Q. Mr. Hay, where do you reside, sir?

A. Midland, Texas.

Q. You're going to have to speak up just a little bit. It's --

A. Okay.

Q. -- background noise in here.

On prior occasions, Mr. Hay, have you testified before the Division as a petroleum geologist?

A. No, sir, I have not.

Q. Summarize for us your educational background.

A. I have a BS and an MS in geology from Utah State University. I received the bachelor of science degree in 1979 and the master of science degree in 1981.

Q. Subsequent to obtaining your master's degree, would you summarize your employment as a petroleum geologist?

A. I've worked for Texaco for 13 years, the first eight in Denver as an exploration geologist and the last five in the Midland Producing Division as an exploitation geologist.

Q. As a geologist, are you familiar with what your company has identified as the North Teague field area?

A. Yes, sir, I am.

Q. How are you so involved in that?

A. I'm the exploitation geologist responsible for that area.

Q. So when we look at the exploration geology displays, that is your work product?

A. Yes, sir, it is.

Q. Based upon that study, have you reached certain geologic conclusions about this field?

A. Yes, sir, we have.

Q. Do you now have sufficient information, in your opinion, to determine whether or not the wells involved in these Applications can be classified in reservoirs that have not yet been established by the Division as pools?

A. Yes, sir, I believe we do have that information.

Q. All right. In addition to that conclusion, you have other geologic conclusions?

A. Yes, sir.

MR. KELLAHIN: We tender Mr. Hay as an expert petroleum geologist.

EXAMINER CATANACH: Mr. Hay is so qualified.

Q. (By Mr. Kellahin) We're going to try to deal with all of these together, Mr. Hay, as a common presentation.

And I'm going to suggest to you that we'll take Exhibit 1 simply as a locator map, and then we'll go to your two cross-sections so that you and I can discuss with the Examiner the vertical boundaries you propose for the three pools --

A. Okay.

Q. -- and then we'll come back and look at the horizontal separations that you've concluded, all right?

A. Okay.

Q. Let's start with Exhibit 1.

A. Just a brief description of Exhibit 1. It's centered on Township 23 South, 37 East.

What we call our Teague North field or project area is Section 9, the northeast corner of Section 8, and the south half of the south half of Section 4.

Q. All right, let's do that again. As we look at the various combinations of acreage to be dedicated to these three proposed pools, we're principally dealing with portions of Sections 8 and 9?

A. Yes, sir.

Q. Okay. When we look at what's happened to the Lower Paddock-Blinebry, those two formations, taken as a pool, do you have something on this display that will show us how that production is currently designated to a particular pool?

A. Yes, sir, I do. As you can note by the pink boxes that show the current pool boundaries, the north half of Section 9 is currently in the North Teague-Lower Paddock-Blinebry Gas Pool, established in March of 1993, and to the south there's the Teague-Blinebry Oil Pool.

We currently have two wells producing from the North Teague-Lower Paddock-Blinebry Gas Pool, and two offsetting wells have been put into the Teague-Blinebry Oil Pool.

And at this time we would like to resolve this difference.

Q. What is the proposed resolution that you and the engineer are going to recommend?

A. What we are recommending is that Texaco -- that the Commission re-classify the North Teague-Lower Paddock-Blinebry Gas Pool and to expand the boundaries and call it an associated oil and gas pool.

Q. We're going to combine the Lower Paddock and the Blinebry --

A. What we'd like to do is to reclassify the North Teague-Lower Paddock-Blinebry Gas Pool and --

Q. All right, stop right there. We're not changing the vertical limits in that pool?

A. No, sir, we're not.

Q. So when we look at Case 11,017 and deal with this Paddock-Blinebry interval, that pool -- the vertical pool boundary for that pool is not being asked to be changed?

A. No, sir, it's not.

Q. All right. What we are asking for is to change that from a gas pool to an associated pool?

A. Yes, sir.

Q. What is the initial acreage to be put into the pool?

A. In addition to the north half of 9, which is currently in the pool, we wish to include the northeast quarter of Section 8 and the southwest quarter of Section 9.

Q. And by doing that, then, we're going to take those two oil wells and put them in the new associated pool and take them out of what is called the Teague-Blinebry Oil Pool?

A. Yes, sir.

Q. They're temporarily classified in the oil pool to the south?

A. Yes, they are.

Q. All right, we'll come back to this.

But let's take that Exhibit 1, set it aside as a locator, and let's look at the cross-section, starting with A to A', which is shown on Exhibit 1 and is marked as our Exhibit Number 2.

In fact, we might as well unfold Exhibit Number 3 Let's just do that right now. That's the other section, B-B'?

A. Yes, sir.

Q. I'm going to focus your attention on giving us a geologic description, starting from the Lower Paddock. Take this all the way down to the base of the Abo, and then we're going to come back and we're going to talk about the Lower Paddock and the Blinebry by themselves.

A. Okay.

Q. Give us a general overview, geologically, of what you see from the top of the Lower Paddock marker down to the base of the Abo.

A. Would you like me to go interval by interval, or just --

Q. Any way that's comfortable for you.

A. Okay. Basically, starting with the Lower Paddock-Blinebry as a unit, they are dolomitic reservoirs comprised of numerous shallowing, upward sequences. And these sequences create very laterally discontinuous subreservoirs, per se, within this larger pool. And within these subreservoirs you have dramatic differences in porosity and permeability.

The Tubb formation is more of a silty dolomitic reservoir. Again, it has rather dramatic differences in porosity and permeability across the field area.

The Abo and the Drinkard, if you look at the cross-section, you may note that there is a significant increase in porosity at the top of the Drinkard, and it continues on down through the Abo.

And also you may note that at the Drinkard-Abo interface there is really no definite barriers to fluid flow. The Abo-Drinkard reservoirs themselves are basically a carbonate reservoir with fluctuating dolomite to limestone, and that changes several times throughout the entire process.

Q. When we look at the cross-sections -- Okay, you have studied the entire geology of the area; have you reached a conclusion about how to manage all these formations in terms of dedicating them to different pools?

A. Yes, sir, we have.

Q. Describe for us what you're proposing.

A. What we're proposing, we would like to keep the Lower Paddock-Blinebry as an existing pool and just expand it so that it includes our other producing wells in the area.

The Tubb --

Q. All right. Now, the Lower Tubb-Blinebry, you're talking about the horizontal expansion?

A. Yes, sir, I'm sorry.

Q. So the vertical dimensions don't change --

A. Don't change.

Q. -- as marked on these logs?

A. Yes.

Q. What separates the Lower Blinebry geologically from the top of the Tubb?

A. The Lower Paddock -- the Lower Blinebry and also the Tubb itself have numerous very, very tight streaks. The last 150 feet or so of the Blinebry is essentially tight and permits a very good seal for the underlying Tubb formation.

Q. Is it appropriate then, geologically, to divide the Blinebry from the Tubb and treat them as separate pools in terms of managing those resources?

A. At this time we believe it is.

Q. Okay. So initially we would start with that subdivision, we get down to the base of the Tubb and the top of the Drinkard?

A. Yes.

Q. What do you see there, geologically?

A. The last 150 to 250 feet of the Tubb is extremely tight and unproductive and permits -- and is a very acceptable barrier to hydrocarbon flow vertically. And therefore those two formations are not in communication with each other.

Q. Satisfied geologically as we look vertically through these formations that we're dealing with a separate source of supply?

A. Yes.

Q. If we make the Tubb a pool, then that would be separate and unique from the Blinebry and the Drinkard?

A. Yes.

Q. All right, take us down to the Drinkard and the Abo.

A. The Drinkard and the Abo, as you can see from the cross-section, have considerably better porosity. They're not relying so much on porosity stringers; it's a uniform reservoir. And there is no apparent seal or barrier between the Abo and the Drinkard that we have observed.

Q. Do you have any reservations as a geologist in combining the Drinkard and the Abo?

A. No, sir, we do not.

Q. Makes good geologic sense, doesn't it?

A. Yes, sir.

Q. It would simply be an arbitrary subdivision to try to treat them as separate pools?

A. It would be very difficult to treat them as separate pools.

Q. All right. Okay, let's go back to Exhibit 1.

If we're taking the North Teague-Lower Paddock-Blinebry Pool, adding the northeast of 8 and the southwest of 9 as the initial boundary of that pool, do you have a geologic opinion as to whether that constitutes a separate source of common supply from any other Blinebry production?

A. Yes, sir, from our mapping, both well control, aided by our 3-D seismic surveys in the area, definitely placed the North Teague field area as a separate structure.

Q. Do you have any geologic reservations about separating the North Teague from what is now known as the Teague-Blinebry Oil Pool to the south?

A. No, sir, I do not.

Q. Describe for us, on Exhibit 1, what you mean by that structural separation.

A. Well, you can see that we have a structural closer centered around Sections 8 and 9, and there's a syncline separating the North Teague structure from the Teague structure to the south, and we feel that that is a definite barrier to hydrocarbon flow.

Q. Give us a quick summary of the 3-D seismic information data.

A. The 3-D survey was a 5.2-mile survey centered around Section 9. It had a 110-foot bin or grid spacing, which was very adequate to adequately identify the structure at this level.

Q. Based upon the data, are you satisfied there is sufficient data to separate this structural feature from the Teague-Blinebry Oil Pool to the south?

A. Yes, sir, I am.

Q. Okay. So that we can come back to this in a minute, can you identify for us now the producing wells that will be in the North Teague-Lower Paddock-Blinebry Associated Pool if the Division grants your request?

A. We'll be putting the two wells that are currently already in the pool, the well in the southwest and the northwest of Section 9 and the northwest of the northeast of Section 9. In addition, we want to add the well that is currently -- that's in the southeast of the northeast of Section 8 and the northwest of the southwest of Section 9.

Q. Geologically, are all those wells in the same common source of supply in the Lower Paddock and Blinebry?

A. Yes, sir, they are.

Q. Okay. Let's go down a level and look at the next proposed pool, and that's the Tubb, right?

A. Yes, sir.

Q. And that's shown on Exhibit Number 4?

A. Exhibit Number 4 is a structure map contoured on top of the Tubb formation. The well controls shown are only penetrations below 6000 feet, and the orange dots highlight the current Tubb producers.

And that term is used a little bit loosely. The one well that you see in the northeast of the northwest of Section 9 is currently completing and testing, although it's indicated as a producer at this time.

Q. All right. Before we talk about the geology, let's look at the nomenclature.

In this area, what is currently defined as the pool to which any kind of Tubb production is dedicated?

A. I'm sorry?

Q. Yes, sir. Ignore the geology. When we look at the nomenclature, describe for us how you have shown any existing Tubb pool, whether it's oil or gas.

A. I see. The only existing Tubb pool in the area right now is the North -- is the Teague-Tubb Pool. It was established in 1982. It's a one-well field, and that production has been abandoned since 1984.

Q. All right. We're dealing now with your Application in Case 11,016, in the Tubb. What acreage are you proposing that initially go into the Tubb Pool?

A. We are indicating that we would like to have the northwest quarter of Section 9 put into that pool.

Q. All right. And what well or wells, then, would initially be dedicated to that pool?

A. Right now it would be the B.F. Harrison "B" Number 25, the one highlighted with the orange dot.

Q. Okay. And that would be the initial well and currently the only well in the Tubb?

A. Yes, sir.

Q. Describe for us the geologic conclusion you've reached about this constituting a new source of supply that's separated from any other Tubb production.

A. From the well control and our 3-D seismic survey, the Tubb is located on a separate structure from any of the other existing production in the area.

Q. Is this consistent with your conclusions about the structural separation that we discussed in the Paddock and the Blinebry?

A. Yes, sir, it is.

Q. And in a general sense, this is the same feature we're looking at, right?

A. For the most part, the structure changes very, very little from the Lower Paddock down through the Tubb, Drinkard and Abo.

Q. So it's no surprise to you as a geologist that if you found the Lower Paddock and the Blinebry to be separated, that you're also going to expect the Tubb to be separated from the features to the south?

A. Yes, sir.

Q. All right. Let's go down and look at the Drinkard, which is the next level down, and if you'll look at Exhibit 5, before we talk about the geology let's identify for the Examiner's benefit what the nomenclature shows to be the current boundaries of any of the Drinkard Pools.

A. Okay, you can see that all of Section 3 is in the Drinkard South Oil Pool. This pool has since been abandoned. And the northeast quarter of Section 17 is the Teague-Drinkard Oil Pool. It was established in 1982, and its production was abandoned in the same year.

Q. You concluded earlier that you proposed to combine the Drinkard and the Abo?

A. Yes, sir, that's right.

Q. So let's look at the Drinkard, and then we'll look at the Abo.

A. Okay.

Q. What causes you to conclude -- Well, first of all, have you concluded that the Drinkard is separate from any other Drinkard pool?

A. It is separate from any other Drinkard pool in the area. Structurally, again, using well control and a 3-D seismic survey has indicated that we are on a separate structure.

Q. Are you satisfied that that's sufficient data to reach that conclusion?

A. Yes, sir, I am.

Q. All right. Now, let's go to the Abo and see how that looks in comparison to the Drinkard. If you'll turn to Exhibit 6, identify for us any current Abo pools that are in the area.

A. You'll notice in the southwest quarter of Section 16 is the North Teague-Abo Pool, established in 1989, and its production was abandoned in 1990.

Q. What do you conclude about the Abo production in Sections 8 and 9 in relation to the old Teague-Abo Pool down in Section 16?

A. I've concluded that the production is not related to the old Teague-Abo Pool, that we're on a separate structure.

Q. All right. If we create a new pool now with the

Drinkard and the Abo combined, what are you proposing to the Examiner as the initial horizontal boundaries of the new pool?

A. The horizontal boundaries that we are proposing are the northeast quarter of the northeast quarter of Section 8, the north half of the northwest quarter of Section 9, and the northwest quarter of the northeast quarter of Section 9.

Q. All right. Got the northeast northeast of 8. Is there a producing well in either the Drinkard or the Abo in that 40-acre tract?

A. Yes, sir, there's a -- The F.B. Davis Number 1 is currently producing from both the Drinkard and the Abo.

Q. Okay, so we've got a producing well, the northeast, northeast of 8.

If we go over, and you said the northwest, northeast of 9, that's another 40-acre tract?

A. Yes, sir.

Q. Do we have any production currently from either of those zones in a well on that tract?

A. We have a temporarily abandoned completion in the Abo and a current producing well in the Drinkard.

Q. Okay. You're -- The last acreage you propose for the new pool would be the north half of the northwest of 9?

A. Yes, sir.

Q. Do you currently have any Abo or Drinkard production in that 80-acre tract?
A. No, sir, we don't.
Q. So you want to bridge that acreage, tie in your two Abo-Drinkard wells, and then have that acreage available for future Drinkard-Abo production?
A. That is correct, we have plans to drill those wells this year.
Q. Does that make sense to you geologically?
A. Yes, it does.
Q. Are the two wells on each end in the same reservoir when we look at the Drinkard and the Abo?
A. Our cross-sections show that the reservoirs are continuous through there. Our mud logs and log analysis indicate that we've had both shows and good log calculations through there, indicating that that pool does extend across that acreage.
Q. Okay. Are you sufficiently familiar with the ownership to tell us whether or not within any of these combinations we're dealing with any other operator, other than Texaco?
A. I am familiar with it, and we are not dealing with any other operator, besides Texaco.
Q. When we look vertically, do you know whether the ownership has been subdivided vertically so that we have

different ownerships or combinations of percentages of ownerships when we move across pool boundaries?

A. No, there's no subdivisions within leases themselves.

Q. All right. And if the Division establishes pool spacing on 40s, 80s or 160s, then we would still be the operator of those configurations and spacing units?

A. Yes, sir, we would.

Q. In terms of a way geologically to manage these reservoirs, what is your conclusion about this initial proposed plan as described before the Division Examiner on this docket?

A. I feel it's the best way to manage this reservoir, is to produce them together.

Q. Okay. So that the Drinkard and Abo are produced together?

A. As one pool, yes.

Q. Geologically, do you see what kind of reservoir we're going to have? Is this going to be oil, gas or some combination?

A. Well, it may be some combination. We're assuming right now that it's an oil pool, but it's very early in the game and we're not positive.

Q. All right. When we look at the Drinkard-Abo initially as an oil pool, does any of the current or past production classify it as anything other than oil production?

A. Not that I'm aware of.

Q. Okay. So our instincts tell us that at least it starts off as an oil pool?

A. (Nods)

Q. When we look at the Tubb interval, do you have any -- We have one Tubb well, right? We're just now getting around to completing that well?

A. Yes, sir.

Q. Do you know generally what kind of test information is available on that Tubb well?

A. I do have the test information.

Q. Does it show geologically that this is going to be an oil well, gas well or something else?

A. I think it's too soon to say what we're actually going to produce right now. The initial well is quite gassy, but that may have to do with its structural position.

Q. Okay. Is there enough structural difference in the Tubb that we should concern ourselves about the formation of a secondary gas cap?

A. I think maybe Mr. Moehlenbrock had better answer that question.

Q. All right. But do you see enough structural difference where that is a potential issue?

A. I don't think there's all that much of a structural difference. We're looking at probably about 120 to 150 feet of structural closure.

Q. Okay. Geologically, when we look at the Drinkard and the Abo, is there enough structural relief within that structural feature that we need to worry with the engineers about an initial gas cap or the formation of secondary gas caps?

A. Again, maybe Todd could answer those questions better. Structurally, we have about 120 feet of closure.

Q. Okay. Now, let's go back up to the Paddock and the Blinebry. Let's go back and look at Exhibit 1.

The well in the northeast of 8 and the well in the southwest of 9, that are currently in the Blinebry Oil Pool to the south, are those oil wells or gas wells?

A. Those are oil wells.

Q. All right. Within the current boundary of the North Teague-Lower Paddock-Blinebry Gas Pool, do we have any gas wells in that pool?

A. The two wells that are producing are -- No.

Q. All right. Gas well being a well that will produce more than 100,000?

A. Yes, but we don't.

Q. Okay. The blue arrow shows the two wells within the current boundary of that pool, and those are the wells you're identifying for me?

A. Yes, sir.

Q. Are either of those wells high-GOR wells?

A. They're both high-GOR wells.

Q. When you look at that structural feature and look at those four wells, do you see any structural explanation to why the two existing wells in the pool are higher-GOR wells than the two oil wells that are not in that pool?

A. No, sir, we don't. In fact, the one well in the northwest of the northeast of Section 9 is structurally low to the well in the southeast of the northeast of Section 8, so the high-GOR well is structurally lower than the oil well in Section 8.

Q. Geologically, are you seeing a reservoir that has an initial gas cap -- the classic associated pool, if you will, where you have a gas cap and then downstructure you have oil production?

A. No, sir, we're not.

What we're seeing is numerous reservoirs or subreservoirs within the pool that are laterally discontinuous. They have variations in porosity and permeability, and those reservoirs may contain varying amounts of gas versus oil.

Q. Okay. What's the geologic explanation to why at certain points in the field we are finding higher-GOR wells, independent of structure, than other wells that have lower GORs?

A. I think it's partially its depositional nature. It's several sequences of shoaling upward. You're dealing with the inner-tidal, near-tidal and super-tidal environments as a highly variable environment of deposition. You may have pinchouts of the porosity due to those depositional differences.

Q. In terms of reservoir management, as a geologist do you have a recommendation to the Examiner as to what the initial rule should be for managing all three of these pools?

A. Yes, we do. First of all, we would like to reclassify the North Teague-Lower Paddock-Blinebry Gas Pool to an associated oil and gas pool and expand the horizontal limits, as we've mentioned before, to include the northeast quarter of Section 8 and the southwest quarter of Section 9.

And then we would like to create a Tubb pool with an associated oil and gas pool rules.

And finally, we would like to create a Drinkard-Abo pool, oil pool.

Q. We're going to let the engineer talk about some of the issues, but part of that request is going to include some special gas-oil ratio limits for each of those pools?

A. Yes, sir.

Q. Okay. In addition, we'll have some recommendations about spacing for gas and oil wells?

A. (Nods)

Q. All right. Mr. Hay, were you going to identify for us Exhibit Number 7?

A. No, I wasn't.

Q. All right, then we have finished with your displays, have we not?

A. Yes, we have.

MR. KELLAHIN: That concludes my examination of Mr. Hay.

We move the introduction of his Exhibits 1 through 6.

EXAMINER CATANACH: Exhibits 1 through 6 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Hay, what you want to create in terms of the new pools in Sections 8 and 9, they're all basically the same kind of structure?

A. Yes, sir.

Q. And they're all segregated from -- and separated from existing structures and pools?

A. Yes, sir.

Q. Basically, what are they separated by?

A. From the existing pools, mainly just structure. The North Teague area is a separate structural feature.

Q. And it's a closed structure, or it's not in communication at all with any of the other structures or pools?

A. We don't believe it is, no.

The maps show some question as to what's going on to the northwest, but our 3-D seismic survey shows that we have dip in all four directions, but with lack of well control I decided to not show the complete closure there.

Q. You have dip, meaning --

A. The -- We do have a separate isolated structure, centered around Sections 8 and 9.

Q. Is it basically -- Is it separated by impermeable barriers of some kind, geologic barriers?

A. That I can't say for sure. All we have is a separate structure with the wells that we have pointed out downdip in the synclines. Although they have been put in the pools and produced short times, they have quickly watered out, so we feel that we have a separate structure with water downdip.

I cannot at this time say where that oil-water contact is, though.

Q. So it's your opinion, but you don't really have anything to substantiate it, that it is separate from the existing pools?

A. We do have other data. We do have pressure data suggesting that the wells that we've drilled here are at virgin reservoir pressure, whereas the ones to the south at the Teague field area have had substantial depletion.

Q. Are the existing wells in the North Teague-Lower Paddock-Blinebry, are those just completed in the Blinebry?

A. Yes, they are.

Q. There's no Paddock?

A. We have no wells perforated in the Lower Paddock.

Q. Do you know why that pool was vertically extended to include the Lower Paddock?

A. In talking with Paul Kautz in Hobbs, he extended them mainly because it was what's done in the area. Even though the Teague-Blinebry Pool to the south doesn't denote it, it also produces from the Lower Paddock.

In addition, to the east of us in the Klein field, that pool has recently been extended to the Lower Paddock also.

Q. Do you have any potential Paddock pay in this area, in these wells?

A. We have not perforated or tested it. We do have mud log shows and some good log calculations in connection with the Lower Paddock itself, but we have no plans at the moment to perforate it.

Q. Okay. That is pretty much standard Division procedure, I understand, okay, to combine the Lower Paddock and the Blinebrys. You're not doing anything new there?

A. No, sir, we're not.

Q. That's already existing.

Have the two -- The two oil wells that you described, the two Blinebry oil wells, those are currently not in any pool?

A. They are in the Teague-Blinebry Oil Pool, kind of unofficially, I guess. I don't think the pool boundaries have been extended.

Q. They have not been extended?

A. No, sir.

Q. Okay. Now, you talked a lot about subreservoirs within the -- is it basically within the Blinebry? --

A. Yes, it is.

Q. -- that are not laterally in communication with each other?

A. There are numerous laterally discontinuous porosity stringers that we perforate, and they cannot be correlated very far across the field.

Q. The intervals that you're producing in these four wells, can any of them be correlated to each other?

A. Oh, yes, sir. It isn't difficult to correlate. Some of them are very laterally continuous, others are very discontinuous.

You may look at cross-section B-B' there. It just shows the two wells to the south, the Number 5, which is the gas well, and the Number 1, which is the oil well, and there are some porosity streaks that you can correlate between wells, others you cannot.

Q. How would you explain the difference in the GOR of those wells?

A. What they were thinking is that we may be perforated in a gas leg or an oil leg, and because we have such a wide range of perforations in each wellbore, that we may be producing from several different porosity streaks with different relative GORs.

In addition to that, we do see porosity and permeability differences that may permit gas flow easier than oil flow in some wells.

Q. Have you looked at the Teague-Blinebry Oil Pool and does it show similar types of subreservoirs within that pool?

A. It does. The Teague-Blinebry is a little bit different. The Blinebry isn't quite as well developed down there. We appear to have more porosity streaks.

The Teague field was developed, I think, on 40 acres, and it also has a GOR of 6000 at the current time, and they are seeking a similar-type high GOR in some wells.

If you plot just the production from various wells, you'll have a very high-GOR well next to a lower-GOR well, and that's scattered throughout the field area. They are seeing a similar situation to what we are picking up.

Q. Okay, the Tubb interval you've got producing in the Number 25 Well?

A. It's currently testing.

Q. Section 9, okay. And it shows to be, you said, very gassy?

A. Yes. We did a four-point on it, and the CAOF is 7.6 million, and roughly eight barrels of condensate at this time.

Q. Eight barrels?

A. (Nods)

Q. Why would Texaco propose that to be an associated pool rather than a Tubb gas pool?

A. Perhaps Todd can explain that a little bit better, but I think mainly we don't know what we're dealing with at the moment, and it may be in the best interests of the reservoir to try and protect it using associated gas rules at this time.

Q. You're satisfied that the Tubb is vertically -- that there are barriers to separate the Tubb from the

Blinebry and the Drinkard in this area?

A. Yes, sir, there's tight zones in the base of the Blinebry and also the base of the Tubb that separate the producing porosity interval in the Tubb from the overlying and underlying formations.

Q. You said you had some Drinkard production established in this area?

A. Yes, we do. The F.B. Davis Number 1, in the northeast, northwest of Section 8, has been producing for probably four or five months now, I think.

And in addition to that, the G.W. Sims Number 1 in the northwest of the northeast of Section 9 has been producing for roughly the same amount of time.

Q. From the Drinkard as well?

A. Yes, sir.

Q. Okay. Abo? What have you got --

A. The Abo, in the G.W. Sims Number 1 in the northwest of the northeast of Section 9, we completed it, tested it, and then set a bridge plug on top of it until we got field rules established.

In the F.B. Davis Number 1, in the northeast, northeast of Section 8, we are currently flowing the Abo up-tubing and the Drinkard up the back side.

Q. I'm sorry, the well name was -- ?

A. The F.B. Davis Number 1.

Q. And do you believe that the Drinkard and Abo are in communication in this area?
A. Looking at our log analysis and examining the logs in detail, we see no barrier between the two formations. It's porous and permeable, it looks like, through the entire section.
Q. You don't see a barrier between the two intervals that are being produced?
A. Geologically, no.
Q. Mr. Hay, have you talked to Paul Kautz about your proposal?
A. We did go to Hobbs and talked with Paul, and we also talked with Mr. Sexton about our proposal, and they were supportive of what we propose to do.
One of the things that they wanted us to do was to clear up some of our problems out there, with respect to the Blinebry in particular. Just having two pools associated with offsetting wells, in addition to that, they were very supportive of our plans for the Tubb and the Drinkard-Abo.
Q. Did they have any other concerns?
A. Their only concerns that I know of were reservoir concerns. Basically, if we had to shut in one of the wells, would there be cross-flow and would there be damage?
And I think Todd Moehlenbrock is going to be able

to answer that question for you.

EXAMINER CATANACH: Okay, I have nothing further of the witness.

MR. KELLAHIN: Nothing further.

I'd like to call at this time Mr. Todd Moehlenbrock.

TODD MOEHLENBROCK,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Moehlenbrock, for the record would you please state your name and occupation?

A. Yes, my name is Todd Moehlenbrock, and I'm a drilling engineer for Texaco.

Q. Mr. Moehlenbrock, on prior occasions have you testified as a petroleum engineer before the Division?

A. No, sir.

Q. Summarize for us your education.

A. I received a bachelor of science degree in petroleum engineering from the University of Tulsa in 1987.

Q. And you currently reside in Midland, Texas, do you?

A. Yes.

Q. Prior to moving to Midland, were you in the Hobbs office of your company?

A. Yes, sir, we have an area office in Hobbs, and I was a production engineer, and during my time there I worked on the Teague field area.

Q. All right. When you moved to Midland, to another Texaco office that handled this field, what were you asked to do?

A. I was asked to help create some new pools out here and develop -- or -- and utilize rules and regulations to maximize the production here.

Q. As part of your analysis of the engineering, did you also utilize Mr. Hay and his geologic expertise to assess these issues of concern?

A. Yes, I did.

Q. As a result of your study and his efforts, do you now have a recommendation for the Examiner as to a comprehensive plan for the development and production of all these various formations?

A. Yes, sir.

Q. In addition to being involved in production, do you also do reservoir engineering work for your company?

A. Yes.

Q. As part of your work, have you made a study of the questions concerning the appropriate initial gas-oil ratio to establish for these various pools?

A. Yes.

Q. And do you have engineering conclusions and recommendations concerning the classification of these pools as gas, oil or associated pools?

A. Yes, I do.

MR. KELLAHIN: Mr. Examiner, we tender Mr. Moehlenbrock as an expert petroleum engineer.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) To help us understand your plan of development, let's turn to Exhibit 7. I want to let you have a moment and help us see the color code of what you're doing, and then let me come back, and I'm going to ask you your overall plan.

First of all, tell us about the color code.

A. Okay. As you can see, we have various colors for the different proposed pools. The orange color would be a Blinebry location, the green would be a Tubb, and the blue would be a Drinkard-Abo location.

Q. All right. Those are open circles by color code, and if we've got a producer in those zones, then the color code remains the same, but it is a colored dot?

A. That's correct.

Q. Without worrying about the specific details of which goes where, tell us what your overall conclusion is about the optimum plan of development for all of these pools.

A. Yes, our objective here is to maximize our net present value in the most prudent manner possible, and we feel that -- our current view is that this proposed plan accomplishes this goal.

Q. In developing a plan, did you take into consideration that Texaco in fact was the operator of this entire structural feature?

A. Yes.

Q. That you're not concerned with offsetting operatorship and different owners?

A. No.

Q. All right. So it's within your control, then, to determine how best to produce these wells?

A. That's correct.

Q. Within a spacing unit, is there different ownership of royalties and overrides?

A. No, sir.

Q. Okay. So we have a unique opportunity in that we have common ownership throughout the area?

A. That's correct.

Q. What do you propose to do about well spacing?

A. Okay, what we propose to do is to create an associated oil and gas pool for the Blinebry and the Tubb formations, and depending on its GOR it will be classified either an oil well, which will receive a 40-acre proration unit, or a gas well, which will receive a 160-acre standard proration unit.

Q. All right. So when we're asking for rules for the Paddock-Blinebry, you're initially asking for 40-acre oil spacing and 160-acre gas spacing?

A. That's correct.

Q. Okay. What is going to be your recommendation for the GOR for that pool?

A. To be 6000 to 1.

Q. Okay, let's step down and look at the Tubb. What are you recommending for the Tubb, in terms of well spacing?

A. Like the Blinebry, we recommend to create an associated oil and gas pool for the Tubb. Depending on its GOR, it will be classified either as a gas well or an oil well. An oil well will receive a 40-acre standard proration unit and a gas well will receive a 160-acre proration unit.

Q. And initial recommended GOR is what, sir?

A. Same as the Blinebry, it's 6000 to 1.

Q. All right. You're going to have identical rules for the Blinebry and Paddock as you will for the Tubb?

A. Yes, sir.

Q. When we get down to the Drinkard-Abo, what spacing?

A. We propose to create a Drinkard-Abo oil pool on 40-acre standard proration units.

Q. All right, if those are the rules -- Wait, I missed one. Drinkard-Abo, what GOR?

A. We're requesting a 10,000 to 1.

Q. Okay. 10,000-to-1 GOR in the Drinkard-Abo.

Under that system of rules and procedures, tell us how you're actually going to produce the wells. How will you set up production for the Drinkard-Abo?

A. Okay, I guess I can explain how we were planning to develop this.

Q. Yes, sir.

A. Our plan, our current plan, is to drill each 40-acre -- potential 40-acre location and set 7-inch casing through the Abo. Each well, then, will be completed in the Drinkard-Abo, and then it will be dualed with either a Blinebry or a Tubb completion, and we will alternate the Blinebry and Tubb completion and since have a checkerboard pattern for the Blinebry and Tubb, and produce it in that fashion.

Q. All right. So throughout the field, then, on 40-acre spacing, you're going to have the Drinkard and the Abo produced in each well up through its own tubing string?

A. Yes.

Q. Okay. And as you move within the 160 acres and we look at the choice between the Tubb and the Blinebry, within the 160, what would you do?

A. It will be developed on an 80-acre pattern.

Q. All right. So look at a 160, hypothetically. In that 160 you've got four Drinkard-Abo wells?

A. Correct.

Q. And then how would you produce the Tubb on the 160?

A. We will have two Tubb wells caddy-corner.

Q. All right. You're going to take those Abo wells and you're going to take a tubing string that will produce the Tubb as a dual in two of those?

A. Correct.

Q. The other two, you're going to add another tubing string and make it a dual with the Paddock-Blinebry?

A. Correct.

Q. All right, that's your plan?

A. Yes.

Q. Is that good engineering?

A. Yes.

Q. Okay. Let's go back and deal with the pieces that got you to that conclusion. Let's start with the Blinebry and look at what is marked as Exhibit 8.

And it may be of help to us to look at one of Mr.

Hay's locator maps and pick out Exhibit Number 1 so that we can keep track of what's going on.

Exhibit 8 represents what?

A. These are production curves for the four existing Blinebry wells in the North Teague field area.

Q. All right. Let's go through each of the production plots, identify the well, tell us where it is, and then tell us what the plot shows you.

A. Okay, the first is the production plot of the F.B. Davis Well Number 3; it is located in Section 8, in the southeast quarter of the northeast quarter.

And, as with all these plots, the green curve is the oil rate in barrels per day, blue is the water rate in barrels per day, the red is the gas rate in MCF per day, and the purple is the GOR.

Q. The conclusion from looking at the production is what classification for this well?

A. This would be classified as an oil well due to its GOR ranging from 6000 to 8000 standard cubic feet per barrel of oil.

Q. Okay, we've got an oil well that's in the 6000-to-8000 range. That's consistent with your initial GOR of 6000 to 1 for this pool?

A. Yes, it is, sir.

Q. All right. Let's turn to the next well, which is the Harrison, B.F. - B - 5. That one, if I remember, is in Section 9. It's in the southwest, northwest?

A. Yes.

Q. What does the production plot on that well tell you in terms of the classification of the well?

A. Well, as you can see, the history of this shows that the GOR has been running at around 30,000, maybe a little bit more, and its classification is a gas well.

And it has produced historically about a million cubic feet -- maybe a little bit more -- cubic feet per day, and about 30 or so barrels of oil.

Q. Okay. If this is reclassified as an associated pool, then we have 30,000 to 1 as the classification point between gas and oil. This is probably going to be a gas well?

A. Yes.

Q. Okay. Next one, the Harrison B.F. -- and I think this is the C Number 1?

A. That's correct.

Q. Okay. There's a typo there on this display, isn't it?

A. Maybe on yours.

Q. Okay, yours says C Number 1?

A. Yes.

Q. All right. Where is this one located?

A. It's in the northwest quarter of the southwest quarter in Section 9.

Q. Okay, and what does the production plot tell you in terms of classification for this well?

A. Looking at the GOR curve, this appears to be an oil well. It -- Historical GOR has been hovering around 10,000. Lately it's been a little bit less.

Q. Okay. And then finally we look at the Sims G.W. 3. Where do we find this well?

A. This is located in Section 9, the northwest quarter of the northeast quarter.

Q. Describe for us the characteristics of this well, when you look at the production curves.

A. The short time this has been on production, initially it was classified as an oil well and it was initially placed in the Teague-Blinebry Pool.

However, its GOR got above 30,000, and it was then reclassified as a gas well and placed in the Lower Blinebry Gas Pool.

Q. When we read this display and we're looking at the horizontal plot, what are those numbers?

A. That's years, and that's the decimal years.

Q. All right, sir, you're taking a year and dividing it into ten parts?

A. Yes.

Q. So this well first established production in -- What's that? About February of --

A. Yes, sir.

Q. -- 1994?

A. Yes.

Q. Something's happening here just after 1994.3?

A. Yes.

Q. There's an acceleration in oil recovery and a substantial drop in the GOR. What's happening?

A. Well, it was reclassified in the Teague-Blinebry Gas Pool, and we were able to produce it at a little bit higher rate, and we were able to see a little more oil production. Therefore, the GOR came down.

Q. Well, if you produce this well at a higher rate, do you have a conclusion as to whether that's more efficient?

A. Yes, I believe it is more efficient doing that.

Q. A higher rate is recovering you more oil out of this well?

A. Yes.

Q. Correspondingly, if you're limited to a 2000-to-1 GOR, what's happened to the oil production?

A. It drops in relation to the gas.

Q. Okay. In terms of gas allowable, if we use for the Blinebry Paddock 6000 to 1, is that going to be the initial starting point by which you have sufficient gas that you can maximize your oil production from these wells by producing them fast enough?

A. Our current view is that this is a sufficient limit to produce at, these wells.

Q. Why have you sought to apply the associated rules to the Paddock and the Blinebry Pool?

A. Well, the difficulty lies in the fact that we have both oil and gas wells out here, and utilizing the current rules, it kind of hinders our acreage dedication.

If we are able to adopt the rules and regulations governing the associated pools, it will give us a lot more flexibility in acreage dedication and production allocation.

Q. Let's turn now to the next series of displays that are marked as -- starting with Exhibit Number 9, is it?

A. Yes, sir.

Q. Describe for us what you're doing here.

A. Okay, this is a material balance equation for a solution gas drive reservoir below the bubble point.

We feel that the stringers that are oil-productive are essentially a solution-gas-type drive mechanism --

Q. Okay.

A. -- and we do make some assumptions here. We're assuming there is no initial gas cap, there is no water influx and there is no change in pore volume due to formation compressibility, and there is no change in water volume due to water compressibility. And these are valid assumptions.

We can write the material balance equation as such, as shown on the exhibit, which essentially is saying that underground withdrawal is equal to the expansion of the oil plus its originally dissolved gas. And we can rearrange it to solve for a recovery factor, $N_p$ over N.

Q. So what's the purpose of having the material balance equation available to you?

A. What we're trying to show here is that oil recovery in a solution gas drive reservoir is primarily dependent on its cumulative produced gas-oil ratio.

Q. Is this a method that you as an engineer go through to see if we can produce these wells at a higher GOR -- I mean at a higher gas allowable, if you will, and what effect that will have on the oil recovery?

A. Yes, it's a procedure to show that, just to see if we will do -- or waste any reserves by producing at a higher rate.

Q. Okay. Let's look and see what happens when you do that. Let's look at Exhibit 10. Let's find the B.F.

Harrison "B" Number 5 well. You've already described that well. Now, where is it?

A. It's in Section 9, in the southwest quarter of the northwest quarter.

Q. You've varied the choke setting on this well?

A. Yeah. This is showing a -- when we vary the rate, what the effect is on the produced GOR.

On the left side of the spread sheet, these are the pumper's gauges for the month of May, and at the bottom we sum the volumes, and then the next line is an average during the month of May, and the average was about 28 barrels of oil, one barrel of water, and 882 MCF per day.

Q. All right. Let's stop for a minute and show the Examiner how we got to this choke setting.

When we're looking at 160 acres for the maximum gas allowable in the Blinebry, you're going to take the depth bracket, whatever that was -- What is the depth bracket?

A. It will be 107 barrels of oil.

Q. Yeah, 107 times 4 --

A. Correct.

Q. -- times the GOR of 6000 to 1, is going to give you your gas allowable for the 160.

A. For the 160, that's correct.

Q. Something over 2 million a day, wasn't it?

A. Yeah, 2.5 million.

Q. All right, 2.5 million for the 160.

But your plan is to have two wells in the 160 in the Blinebry?

A. That's correct.

Q. So you take the allowable and cut it in half?

A. That's correct.

Q. And so when we look at the Harrison well, the idea is to set the choke so that we're trying to hit but not exceed by much a million a day for the gas allowable?

A. That's correct.

Q. All right. When we do that through the month of May, what does this spread sheet show you to be the result?

A. Well, for the month of May, the average GOR was 31,292 standard cubic feet per barrel of oil.

Q. All right. And what happened to your daily oil production on average? What did you get?

A. It's approximately 28 barrels a day.

Q. Okay. Now, let's go over and see what happens if you have to curtail your gas production and live with 2000 to 1, divided among the two wells, and that's on the right side of the spread sheet, right?

A. Yeah, under the 8/64 choke setting.

Q. Yeah, that's an attempt to meet the 2000-to-1 GOR?

A. That's correct.
Q. What happens?
A. Well, the ratio of oil to gas goes up -- or the gas to oil goes up to 63,263 on average for the five days that we tested this well.
Q. Okay. Instead of getting 28 barrels a day, you're getting just short of four barrels of oil a day?
A. That's correct.
Q. What conclusion?
A. Well, it appears that if we slow down the gas rate, pull back pressure on it, that we will be increasing the gas-oil ratio, and that is a less efficient way to produce this well.
Q. Okay, and as to the Harrison "B", then, we have a field test at different rates to confirm that for you?
A. Yes.
Q. In addition, you've looked at the production plots on the Sims G.W. 3, and you also see a positive benefit: By increasing the gas withdrawals of the well, you get more liquids back?
A. That's correct.
Q. All right. Do you see any problem with producing at a higher GOR? Are we going to do anything to the reservoir that we're going to regret?
A. I don't believe so, no.

Q. All right, the convenience of the associated rules, lets us manage the resources so that we can produce both gas and oil wells?

A. That's correct.

Q. This is not, though, the classic associated pool where you have structure, high on the structure you've got gas production, low on the structure you've got oil production, and you're trying to limit gas withdrawals to maximize oil recovery. That's not the creature we see here is it?

A. No, it's not the classical associated gas pool, as defined in the rules and regulations of associated oil and gas pools.

Q. All right. Let's go down to the Tubb now and look at Exhibit 11. This is the data to which Mr. Hay referred to a while ago on the Tubb completion. Give us a quick summary.

Q. This is just a brief synopsis of the completion that we're performing on this well at this time, and it shows to be a very good well.

The CAOF was just recorded at 7.6 million, and during those four-point tests the GOR averaged around 20,000. That 7.6 million was a rate during one hour, and in that one hour it produced eight barrels of crude.

Q. How does this information relate to the knowledge you've developed from the Blinebry?

A. Well, our current view is that the Tubb is going to be analogous to the Blinebry, and we have a good chance of having oil and gas wells in the Tubb.

Q. Is there any of the flow test data that gives you a basis to start the initial GOR in the Tubb at 6000 to 1?

A. Yes.

Q. What is that?

A. Well, it appears that as the oil rate or the gas rate is increased, we're starting to see more oil production.

Q. All right. Let's go down to the Drinkard now and see what happens when we move into that pool.

You've got -- Under Exhibit 12 you've got three production plots. This represents all the current production you now have out of either the Abo or the Drinkard?

A. That's correct.

Q. All right. Identify each of the wells and tell us where it is.

A. Okay, the first is the F.B. Davis Well Number 1. It's located in Section 8, in the northeast quarter of the northeast quarter, and it is currently -- We have a temporary exception to a multiple completion out here. We are producing the Drinkard up the tubing casing annulus, and the Abo is producing up the tubing.

Q. Well, that's not how you want to leave this well, is it?

A. No, sir.

Q. You're bringing the Drinkard up the annular space, is it?

A. Yes.

Q. Well, that's not very efficient, is it?

A. We don't believe so.

Q. Okay. So what's your plan, then?

A. Well, we hope to combine the Drinkard and Abo into one pool and reset the packer above the Drinkard pay, and then dual this with either a Blinebry or a Tubb completion.

Q. Would the fact that you're currently producing the Drinkard up the back side in this well be an explanation as to why the gas-oil ratio is so high?

A. It could be.

Q. All right. And once we get this produced through tubing, then you expect to see a more characteristic production of oil in relation to gas?

A. We hope so.

Q. All right, sir. Let's go to the next well and have you identify that well. This is the same well, and we're looking at the Abo portion, right?

A. That's correct.

Q. All right. What do you see?

A. Well, it has a GOR -- We have limited data here, but its GOR, maximum it's been is about 20,000, and it's slowly declining. It's hovering around 16,000, 17,000 now.

Q. Okay. And then finally let's get back to the Sims G.W. Number 1. In the Drinkard, what do you have here?

A. Well, it has a GOR of less than 10,000, between 8000 and 10,000, in its short production life.

I may also add that, as Bill Hay indicated, we did attempt a completion in the Abo, or we did complete the Abo, but had to -- we set a bridge plug above it and went to the Drinkard, and at last test prior to abandoning the Abo was 44 barrels of oil per day, 74 barrels of water per day, and 433 MCF per day, giving us a GOR of 9840.

Q. In the Drinkard-Abo combination you're asking to start at 10,000 to 1?

A. Yes, sir.

Q. What causes you to reach that conclusion?

A. Well, I feel that this will be a more efficient rate to produce these wells.

Q. Do you have documentation that causes you to reach that conclusion?

A. Yeah, we did another variable rate test in the

G.W. Sims Number 1.

Q. Okay, and we're showing that on Exhibit 13?

A. Yes, sir.

Q. Show us how the display is organized.

A. Okay, this is the Drinkard zone, and we have four choke settings here, an 8/64, a 9/64, 10/64 and a 13/64 choke setting.

And we're showing the number of days it produced, and below each one of these is the sum of the volumes and the average production at these choke settings.

Q. Where are we most efficient in terms of oil production in relation to the gas-oil ratio limit?

A. Well, it appears at the 13/64 choke setting when we're producing at a higher rate, the GOR actually is dropping slightly.

Q. Can you give us a choke setting that is the equivalent allowable if we were limited to 2000-to-1 GOR in the Drinkard?

A. Well, it would even be something less than 8/64.

Q. All right, let's deal with the 8/64 case. On average, if that's as good as we can do, we're getting about 32 barrels a day?

A. Yes.

Q. What is the corresponding choke setting that is the equivalent to 10,000-to-1 GOR?

A. It's approximately 13/64.

Q. Your oil production goes up to 75 barrels a day on average?

A. Yes, sir.

Q. What does it tell you?

A. We feel that it's -- it will produce more efficiently at this higher choke setting.

Q. All right. 2000 to 1 is not very efficient. We can more than double -- in fact, one-and-a-half times, if you will -- the efficiency of producing the oil out of the reservoir at 10,000 to 1?

A. That's correct.

Q. Let's go back and talk about whether or not there is any reservoir concern of combining the Drinkard and the Abo. Have you examined the characteristics of those two reservoirs to see if in fact they can be treated as a common source of supply?

A. Yes, sir.

Q. Let's look at Exhibit 14. What does that show you, and what do you conclude?

A. What I've done here is do some reservoir characteristics, comparison between the Drinkard and Abo formations.

First is the reservoir pressure. We ran some bottomhole pressure buildup tests in the G.W. Sims Well

Number 1, which is the Drinkard zone. The extrapolated P* showed to be about 2871 p.s.i. at 6299.

And in the F.B. Davis Well Number 1, we built up the Abo, and that's P* extrapolated to 2489 p.s.i. at 6618 foot.

Q. For all practical purposes, we're dealing with the same type of reservoir and similar hydrocarbons, right?

A. Correct.

Q. Okay. Let's look and see if there's any kind of -- Let me ask you this: Is there any water production in either the Abo or the Drinkard?

A. There's some, yes.

Q. Well, have you gone so far as to examine whether or not the introduction of water from one into the other is somehow going to be a bad idea?

A. Yes, we have.

Q. How have you done that?

A. Well, we cut a core in the B.F. Harrison "B" Number 25, the well we're currently completing in the Tubb, and from that core data, which we have on Exhibit 15 --

Q. All right, sir, let's turn to that.

A. -- we conducted a water compatibility analysis between the formation brines and the Drinkard and the Abo, and also did a water sensitivity test, which is essentially testing a core with -- and introducing the different brines to it.

Q. Okay. Let's go to the plot, and I think it's the fourth page back in the report. It says "Permeability versus Throughput".

A. Yeah, what they're doing here -- This is a plot for the Drinkard core, and what they're doing on the X axis is the cumulative fluid injected, and the units in that is the pore volume. And on the Y is the permeability to the liquid in millidarcies.

And they will inject -- Initially they injected the Drinkard formation brine into the core and established a so-called baseline of permeability. And then following the Drinkard brine, they introduced the Abo brine.

Q. All right, the Drinkard brine is the little squares?

A. Yes, sir.

Q. And once we put the Abo in -- Those are the little circles?

A. Yes, sir.

Q. Does that change the shape of the curve?

A. Not at all.

Q. So what does that tell you?

A. That the Drinkard is compatible with Abo formation brine.

Q. All right, did they try this the other way around?

A. Yes, sir.

Q. All right, where do we find that?

A. A couple pages back you'll see another graph, set up in the same manner, however, this is an Abo core. And initially the introduced Abo brine into the core, and followed by Drinkard brine.

Q. What results?

A. Well, it appears that there's a slight decrease in permeability. However, we saw that decrease even before we introduced the Drinkard brine. And at the end of the test they reversed the flow to check for solids plugging, and that was a positive test, which indicated that the permeability reduction was not due to incompatibility of the brines; it was due to more of some kind of a plugging agent. It could be like drilling solids in the core.

Q. Okay. From the perspective of a reservoir engineer, do you see any reason not to combine the Drinkard and the Abo as one common source of supply for purposes of this area?

A. No, sir.

Q. Okay. Fill in the blanks for us, if you will, on Mr. Hay's separation of these pools from any other like pool. He's given us the structural conclusion, and he referred to the fact that you had pressure data that helped confirm or validate his geologic description.

A. Yes, sir.

Q. Fill in the blanks for us. What do you have?

A. Well, we conducted some pressure buildup tests out here, and on Exhibit 14 it kind of shows the results of -- for the Drinkard and Abo, which appears to be virgin reservoir pressure.

And as far as the Blinebry, we did the same. And we conducted a test in the F.B. Davis Number 1, which is a direct offset to the B.F. Harrison Number 5, which had been producing for a while, and it saw a somewhat less than initial reservoir pressure in that well.

But we also conducted a buildup test in the G.W. Sims Well Number 3, which is in the northeast quarter of Section 9, and its conclusion was if we were seeing virgin reservoir pressure in this well at this time.

Q. Do you have any engineering reservations about the various components for the rules for each of these three pools?

A. I don't understand.

Q. All right, sir, do you see any problems as a reservoir engineer in the adoption of any of these rules for any of the three pools that you propose?

A. No, sir, I think from what we can tell, this will allow us to produce these in an efficient manner.

Q. Okay. Let's talk about the economic consequences of doing this.
A. Okay.
Q. If you'll look at Exhibit 16, give us a quick summary of what this means.
A. Okay, this is just showing some what Texaco looks at to decide whether or not we're going to drill a well, the drilling economics.
And what I have here is a comparison between having these special pool rules and without the special pool rules, and this is just looking at the acceleration of the reserves.
Without the special pool rules, we would have to wait till the Drinkard was depleted to recomplete to the Abo, and we would also have to limit the gas rates and confluence oil rates, and this is just a comparison of the acceleration of the reserves.
Q. The end conclusion is, it's more efficient to produce the pool under the combination of rules you're suggesting, rather than not do that?
A. Yes, sir.
Q. All right. More timely, efficient recovery of the resources, without spending any more money than is required to do that?
A. That's correct.

Q. One of the clerical details the Examiner needs to deal with is the mechanics of a start date, should he grant this solution for you. He needs to figure out how to start the process.

Were you involved in the discussions with Mr. Sexton with regards to the general concept of division of the formations?

A. No, I actually wasn't.

Q. That was Mr. Hay?

A. Yes.

Q. All right. We've got some choices on when to start the rules for production. What is the first production from any well, for any well? How far back do we have to go if we choose the start date of actual production in which to trigger the allowables and all the rest of the rules?

A. Well, first well out here in all these three pools would be the B.F. Harrison "B" Well Number 5.

Q. And what's its first production?

A. I believe it's sometime in the early part of 1991.

Q. Okay, and what did that pool produce from? That well produced from what formation?

A. It's the Blinebry.

Q. All right. Is there any effect on that well, based upon the time at which the rules are triggered?

A. I don't believe so.

Q. All right. So it doesn't have the capacity to produce either oil or gas in such a situation where it would be over- or underproduced, any appreciable quantity?

A. I don't believe so.

Q. Can you identify for us any of the wells that might be caught in this no man's land, if you will, from date of first production to whatever the trigger date is for the new rules?

A. Yeah, I believe that two wells may be affected. These would be the F.B. Davis Well Number 1 --

Q. All right. Let's look at that one first. The F.B. Davis Well 1 was in what section? 8?

A. Yes, sir, the northeast of the northeast.

Q. All right. And that well -- I'm losing track of the wells. It produces from what?

A. Well, this is the one we have -- we're producing the Drinkard up the back side and the Abo up the tubing.

Q. All right. This one is not well configured just yet?

A. No, sir.

Q. Okay. As a consequence of having the Drinkard and the Abo separated, your choice of production was in this configuration, so you produced more gas under statewide rules than you would be permitted to do?

A. Yes.

Q. All right. What's the status of the well?

A. Currently it's producing under temporary allowable.

Q. All right. What's its date of first production?

A. I don't recall, but it was like -- I believe in the latter part of February.

Q. Of 1994?

A. Yes, sir.

Q. Okay. If the Division makes the application of these rules, particularly the Drinkard-Abo rule, effective as of the date of first production from the Davis Number 1 Well, would that avoid having the well shut in?

A. Yes, sir.

Q. You told me earlier there's a common ownership in this area, common operatorship, royalties and all the rest.

Do you see any opportunity for inequities if the Examiner makes the rules effective as of the date of first production from that well?

A. I'm not sure if I understand.

Q. Yes, sir. We're asking that the Davis well, the production -- the pool, the Drinkard-Abo Pool rules be effective as of the date of first production of the Davis well.

A. Yeah.

Q. If he does that, then there's no restrictions, overproductions or shutting in of that well, right?

A. Right. We -- do the retroactive, we won't hurt anyone's correlative rights, no.

Q. Well, that was my question.

A. Yes.

Q. You don't --

A. We will not hurt anyone's correlative rights.

Q. Because it's all the same people?

A. That's correct.

Q. All right. Sometimes we don't do it because you now are ahead of other offset operators with different ownership?

A. That may be one case.

Q. All right. And that doesn't work here?

A. No, sir.

Q. Okay. So we can either start the rules now and cancel overproduction, or you can make the rules retroactive to date of first production?

A. Yes.

Q. Are there any other wells that are in that no man's land of what to do for an allowable?

A. Yeah, the G.W. Sims Well Number 1, which is that Drinkard well. It's in Section 9, in the northwest quarter of the northeast quarter. It may be caught in that no man's land, as you say. It's currently shut in right now. It ran out of its temporary allowable.

Q. Again, same issues as for the Davis well?

A. Yes, sir.

Q. What's the date of first production on the Sims well? Do you have an approximation?

A. It's approximately the same time as the F.B. Davis 1, in the latter part of February.

Q. Now, you've spent what? The last four or five or six months trying to get a handle on what kind of rules ought to be applied in this field, have you not?

A. Yes, sir.

Q. And part of the reason for waiting is to figure out what to do, and you needed some data in order to decide?

A. Yes.

Q. Okay. Do you see anything wrong in terms of correlative rights to make the effective date of production such that the Sims well gets the benefit of having the rules apply as of the date of first production?

A. I don't see a problem with it.

Q. All right. Do you see anything else, from an engineering concept or perspective, that needs to be discussed concerning these rules?

A. Not at this time.

MR. KELLAHIN: All right, sir.

Mr. Carr has provided me his certificate of mailing for this case, Mr. Examiner. I will mark them and submit them to you. I need to double-check them, because I'm not quite sure how he's organized those, Mr. Examiner, but I do have them.

And subject to introducing his certificate, that concludes our presentation.

And we move the introduction of Mr. Moehlenbrock's Exhibits, and I believe they were 7 through --

THE WITNESS: -- 16.

MR. KELLAHIN: -- 16.

EXAMINER CATANACH: Exhibits 7 through 16 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Moehlenbrock, evidence concerning reservoir pressures, where is that contained? As far as supporting the assumption that this is a new common source of supply in all three horizons, all four horizons? Do you have supporting reservoir pressure to --

A. Are you saying an analogy to what it ought to be?

Q. I'm saying that, do you have some pressure data which would indicate that you are encountering virgin reservoir pressure?

A. Oh, yes, we conducted some pressure buildup tests, and we had --

Q. In what intervals?

A. What's that?

Q. In which intervals?

A. Okay, we conducted recently pressure buildup tests in the Blinebry, the Drinkard and the Abo, and we actually used a bottomhole bomb to conduct the test.

And in the Tubb well, the B.F. Harrison "B" 25, we ran a static gradient bomb after shutting it in for 24 hours, and it also indicated -- It was like 2500 p.s.i., was its bottomhole pressure after 24 hours.

Q. And the Drinkard and Abo are -- Is that shown on Exhibit 14?

A. Yes sir.

Q. Okay. Do you know what the initial reservoir pressure was in the offset pools or reservoirs?

A. I don't know right offhand, sir, no.

Q. Did you compare those pressures?

A. I tried, but it's a little difficult to find that information. If the Teague-Blinebry was a gas pool, I could find those. But it is an oil pool, and they're not required to do a 72-hour buildup each year.

Q. With what you did compare, did you find that -- is it your opinion that this is separate from all of the other oil and gas pools in the --

A. Yes, sir, it is.

Q. In your plan of development, Exhibit Number 7 --

A. Yes, sir.

Q. -- I notice that in some cases -- in some cases you'll have possibly more than one, say, Blinebry well on a 160. You might have two Blinebry wells on a 160-acre tract; is that correct?

A. Are you -- Are you referring to any particular tract that you're --

Q. No particular tract, but I mean generally it looks like you may have more than one Blinebry well on a 160-acre --

A. It could be a potential, yes.

Q. Okay. It also could -- That also could be the case for Tubb wells; is that correct?

A. Yeah, and I may also interject that on down the road, a well that had a Blinebry completion or a Tubb completion, maybe after it has depleted to the point its not economical, it could be recompleted in the other zone.

Q. You've got the potential, at least in the Blinebry, of having an oil well and a gas well on the same proration unit?

A. That's correct.

Q. How would you propose to deal with that situation?

A. Well, that's kind of the reason to adopt the associated oil and gas rules, because it has a formula in there to allocate production to a well, based on acreage dedication, and we would have to file for the gas well a nonstandard proration unit.

Q. You're not seeking any kind of exception to allow simultaneous dedication?

A. No, sir.

Q. You are proposing at the current time for both the Tubb and the Blinebry of having a 30,000-to-1 cutoff?

A. We're proposing to adopt the rules in the associated oil and gas pool, yes, sir.

Q. Let's talk a little bit about the Blinebry GOR. You're proposing a 6000-to-1 GOR on the Blinebry?

A. That's correct.

Q. And basically what you've got -- Is Exhibit Number 10 what you've got to support your request?

A. Essentially, yes.

Q. Would you summarize the results of that again for me, Mr. Moehlenbrock?

A. Yeah, we feel that it is more efficient to produce at a higher rate, based on the observed GOR, and a

6000 limit will allow us to produce approximately a million -- I mean, the limit would be a little bit more, but it would allow us to produce at approximately a million cubic feet a day, which we had been producing this well.

Q. Now, am I reading something wrong here? I show on your producing -- when you were testing the well on the left side --

A. Yes, sir.

Q. -- when you're talking about producing a million a day, it looks like your GOR is very high. In the right-hand column there, 34,000?

A. Yeah, but the GOR limit is, in my book, kind of like a gas allowable for a proration unit. And being able to produce that amount of gas from that well, we will actually be reducing the GOR if we had to produce it at a lower rate.

Q. This particular well is probably going to be a gas well; is that correct?

A. That's correct.

Q. Number 5. Do you have any data from the oil wells as to how the rate of their production compares with the GOR?

A. No, sir, I don't.

Q. How do we know that the oil wells behave similarly to what you've got here?

A. Well, I'm making the assumption that they will. We were attempting -- We were going to do a test in the Blinebry in the G.W. Sims Number 1, but the facilities that we had did not allow us to do that. G.W. Sims Number 3, excuse me, the Blinebry well.

Q. Do you have any PVT data in the Blinebry?

A. No, sir.

Q. It's your opinion that the Blinebry production is basically solution gas in this area?

A. Yeah -- Yes, I do.

Q. In all of the different producing horizons in the Blinebry?

A. Well, we have intermingled -- It's a very complex reservoir. I think we have intermingled layers of gas stringers and oil stringers; and the oil stringers, we feel, are driven by a solution gas-type drive.

Q. Do you know if there's other Blinebry pools in this area with high GORs?

A. Well, Bill Hay kind of indicated south there, the Teague-Blinebry, which is an oil pool. But he has more information on that than I do, as far as the actual GOR production down there.

Q. Okay. In terms of the GOR requested for the Tubb, you're also asking for 6000?

A. Yes, sir, and primarily we're saying that the

Tubb will behave in a similar manner as the Blinebry, for lack of further data.

MR. KELLAHIN: Mr. Examiner, a point of information.

Mr. Hay says that the Teague-Blinebry Oil Pool to the south currently has 6000-to-1 GOR in its rules, and the two wells that we're seeking to put in the new pool are currently governed by the Teague-Blinebry Oil Pool rules and are producing at 6000-to-1 GOR. So by analogy, that's the closest one we have, and it's consistent with our request.

Q. (By Examiner Catanach) We've already established that the Teague-Blinebry Oil Pool is not part of this new pool.

The Drinkard-Abo Pool GOR request is based on the data you presented on Exhibit -- Help me out here.

A. Yeah, Exhibit 10 -- No, excuse me, that's the Blinebry.

Q. Exhibit --

A. I can't find it either. Exhibit 13.

Q. Now, I believe you said that the 13/64 choke setting was most like a 10,000-to-1 GOR?

A. Yes.

Q. What are you comparing that to, as far as -- what other GORs are you comparing that to in this whole scenario? I see an average of 14,000 -- 15,000 to 14,000.

A. Well, essentially, being an oil pool, the 10,000 GOR limit will allow us to produce enough gas, and it doesn't appear to be too rate sensitive here, the GOR. And it appears that the 10,000 limit is kind of a natural GOR for the Drinkard.

Q. Did you conduct any tests at the normal standard 2000-to-1 GOR?

A. No, sir, we didn't. The closest was the 8/64 setting, and that was -- it averaged about 400 to 600, about 500 a day.

Q. Do you have any idea how the well might react to the 2000-to-1 GOR?

A. Well, it would probably tend to increase the GOR, I mean, just from the trend that we're seeing here.

Q. Do you have an opinion on how the proposed GORs are going to affect recovery from these pools?

A. My opinion is that the proposed GOR will not affect ultimate recovery out here.

Q. And that's based on the evidence that you have presented?

A. That is correct. It doesn't appear that GOR is that rate sensitive at the rates that we're requesting.

Q. Would it be beneficial at all to conduct any additional tests out here?

A. I don't believe so. I mean, what we're seeing is, as we increase that gas rate, we seem to see more of a liquids ratio. And, you know, what I think may be occurring here is that as we open the well up, we're essentially lowering the flowing bottomhole pressure, and we have a bigger differential between reservoir pressure and the wellbore, and that may help move the oil and the water.

There is no indication, there's no reason to think that there's any type of water coning or anything of that nature either.

Q. Mr. Moehlenbrock, what is Texaco's objective in this development of this whole structure right here?

A. Well, it's kind of a unique area. I mean, we've got -- There are ten productive zones out here, and our objective is to minimize the number of wells that we have to drill out here to produce these reserves.

These four zones can be produced with just one wellbore, and we'll be able to accelerate the reserves to make it as attractive as we possibly can.

And by adopting these special rules, I feel that we will also help prevent waste, because the drilling economics, adopting these rules, will be better, and therefore we can extend the limits of this reservoir out further, we can justify doing that with these rules.

Q. In developing the plan for this reservoir, do you take into account maximizing recovery?

A. Absolutely.

EXAMINER CATANACH: I have nothing further.

Mr. Kellahin?

MR. KELLAHIN: Subject to the submittal of the certificate of notification of the hearing, that concludes our presentation, Mr. Examiner.

EXAMINER CATANACH: Okay. Mr. Kellahin, can I get rough orders in each of these cases from you?

MR. KELLAHIN: Yes, sir, I'd be happy to do that.

EXAMINER CATANACH: Okay. There being nothing further, Cases, 11,016, 11,017 and 11,018 will be taken under advisement.

(Thereupon, these proceedings were concluded at 1:00 p.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11016, 11017, 11018 heard by me on July 7 1994.

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 July 14, 1994.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1994