STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

CONTINUED AND DISMISSED CASES

REPORTER'S TRANSCRIPT OF PROCEEDINGS

BEFORE: DAVID R. CATANACH, Hearing Examiner

September 16th, 2003

Santa Fe, New Mexico

ORIGINAL

These matters came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Tuesday, September 16th, 2003, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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WHEREUPON, the following proceedings were had at 8:45 a.m.:

EXAMINER CATANACH: At this time I'll call the hearing to order for Docket Number 30-03, and I will call Case 13,085. This is the amended Application of EGL Resources, Inc., and Robert Landreth for pool extension or, alternatively, pool creation and extension of gas spacing and proration units, Lea County, New Mexico.

I would like to announce at this point that by mutual agreement of the parties involved in this case, Case Number 13,085 will be continued to a special Examiner Hearing to be held on October 2nd of 2003 at the Oil Conservation Division office here in Santa Fe.

And with that, I will continue that case to that hearing, and this special hearing is adjourned.

(Thereupon, these proceedings were concluded at 8:46 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. _____ heard by me on September 16 2003.

David H. 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 September 16th, 2003.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 16th, 2006

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:

AMENDED APPLICATION OF EGL RESOURCES, INC., AND ROBERT LANDRETH FOR POOL EXTENSION OR, ALTERNATIVELY, POOL CREATION AND EXPANSION OF GAS SPACING AND PRORATION UNIT, LEA COUNTY, NEW MEXICO

CASE NO. 13,085

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Examiner

October 2nd, 2003

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, October 2nd, 2003, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

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October 2nd, 2003
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A P P E A R A N C E S

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* * *

WHEREUPON, the following proceedings were had at 8:20 a.m.:

EXAMINER CATANACH: Okay, we'll call the hearing to order this morning for this special docket, Number 32-03, and I'll call Case Number 13,085, which is the Amended Application of EGL Resources, Inc., and Robert Landreth for pool extension, or alternatively pool creation and expansion of gas spacing and proration unit, Lea County, New Mexico.

Call for appearances.

MR. HALL: Mr. Examiner, Scott Hall, Miller-Stratvert, PA, Santa Fe, on behalf of the Applicants, EGL Resources, Incorporated, and Robert Landreth. I have two witnesses this morning.

EXAMINER CATANACH: Additional appearances?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing today in opposition to the Applicant. My client is Devon Energy Production Company, and I have three witnesses to be sworn.

MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe, representing Southwestern Energy Production Company. I have no witnesses. Southwestern is appearing today in support of Devon Energy.

EXAMINER CATANACH: Okay, can I get all of the

witnesses to stand and be sworn in at this time?

(Thereupon, the witnesses were sworn.)

MR. HALL: Mr. Examiner, you'll recall last April we had a hearing on the original Application of EGL Resources for compulsory pooling. At the instruction of the Division and EGL's, my predecessor, counsel, the unit that was to be formed by that compulsory pooling proceeding consisted of the entirety of Section 4, Township 23 South, Range 34 East.

During the course of that proceeding, it was determined, in fact, that the location for the proposed re-entry and deepening of EGL's Rio Blanco 4 Number 1 well would, in fact, be a wildcat well and subject to 320-acre spacing under statewide rules.

Also during the course of that hearing the Examiner commenced to take evidence with respect to drainage and the areal extent of the pools in the area in the Devonian formation, and the ruling in Order R-11,962 found that that type of evidence was not relevant to what was, in fact, a very limited compulsory pooling proceeding. The Applicant in that order was invited to come back before the Division and make application for such relief by way of separate application, and that is what brings us here today.

We are asking the Division to do one of two

things: either extend the horizontal extent of the North Bell Lake-Devonian Gas Pool or create a new pool consisting of Section 4, based on the recent successful completion of the EGL Landreth Blanco 4 Number 1 well.

With that, Mr. Examiner, we're ready to proceed with the witness.

EXAMINER CATANACH: Mr. Kellahin, do you want to make any statement?

MR. KELLAHIN: Yes, Mr. Examiner.

I'll be presenting three witnesses on behalf of Devon. We have a petroleum geologist, we have a geophysicist and we have a reservoir engineer to present Devon's evidence in this case.

It is our belief that at the conclusion of all the evidence, that that evidence will demonstrate to you that Mr. Landreth in EGL's Application has very little to do with science. We believe that the evidence will demonstrate to you that it's nothing more than an attempt by Mr. Landreth to manipulate the science to save Landreth's term assignment in the southeast quarter of Section 4. That was a term assignment that he's had for almost five years, and it's due to expire in October of this year on the 25th.

You may remember from the hearing back on April 10th of this year when you were one of the Hearing

Examiners in the competing force pooling case. Based upon today's case this can only be accomplished if you are convinced that you may rule that Section 4 should be spaced upon 640 acres.

You may remember that the North Bell Lake-Devonian is located in Section 6. You move across Section 5 and you come into Section 4. Section 4, in the north half of 4, is the Rio Blanco 4 well that has been re-entered by EGL, and they are now testing the Devonian.

As part of his efforts to save his term assignment, the evidence will demonstrate to you, Mr. Catanach, that Mr. Landreth has tried three approaches. The first was within the context of the pooling cases. It was his contention that Section 4 was an extension of the North Bell Lake-Devonian Pool.

At the hearings on April 10th of that year, he argued that, in fact, Section 4 was part of that pool. Unfortunately for his position, Examiner Brooks' order held that Landreth had misunderstood Rule 104 and that Rule 104 is unambiguous because it clearly states that because Section 4 is one mile or more from the pool, being the North Bell Lake-Devonian Pool, then Section 4 is spaced upon 320-acre spacing and not 640-acre spacing.

Having failed with that approach, the second approach was that on April 22nd of this year he files his

first application that's docketed under this docket number. In that Application he is seeking to expand the North Bell Lake-Devonian Pool from Section 6 across 5 somehow to pick up Section 4, and hopefully have you order that Section 4 is spaced upon 640 acres.

There's substantial difficulty with that position. As you may remember from the pooling hearings, there's substantial evidence to demonstrate that there's a disconnect between Section 4 and Section 6. There is a substantial fault that controls the Devonian reservoir in the west, which is the North Bell Lake, from the Devonian reservoir to the east, which is the Rio Blanco 4 Devonian reservoir.

You may remember that -- and the evidence again will demonstrate to you that there's substantial disagreement between Devon and Landreth about the geologic interpretation. We anticipate that Mr. Landreth's interpretation will be the same as he made back in April, and that was one of a large, sprawling structure with multiple crests and a critical east-west-fault-trending arrangement with an extensive common gas-water contact within the reservoir.

So one of the issues that you were exposed to then and you will be exposed to today is to determine the evidence with regards to the gas-water contact in the

Devonian.

Devon's picture of the reservoir is substantially different. They believe that based upon 3-D seismic data which they have had for some time -- and which Mr. Landreth could have acquired if he wanted to purchase it -- instead, he realized that -- he utilized 2-D seismic data. But if you look at the 3-D seismic data, Devon's testimony was then, and is now, that this is a relatively simple, compact structural closure and associated with north-south-trending faults.

When we look at the structure east of the big fault in Section 4 where the Rio Blanco 4 well is, you're going to see that that's a reasonably compact structural feature. Within that feature you also need to recognize that the Devonian has substantial vertical and lateral discontinuity.

It will be our opinion and our conclusion, based upon the evidence, that we can effectively demonstrate to you that it is inappropriate to have a single wellbore in Section 6 to attempt to drain the entire Section 6 reservoir and whatever production is associated with that reservoir. You need multiple wells, the evidence will demonstrate, in order to encounter these multiple lenses, because one location may hit a couple and miss the others, and you step over a 320-acre spacing unit location and

drill a well that's going to be very successful.

So you're going to see a strong difference of opinion among my experts with Mr. Landreth's experts about the character of the reservoir.

It appears to me that Mr. Landreth recognized that there was a flaw in extending North Bell Lake to Section 4, and so on June 25th he amended his Application. And for the first time now, he asserts that Section 4 is going to constitute a new Devonian reservoir and that it should be spaced upon 640-acre spacing.

There are substantial problems with that approach, as you will realize, that you're going to be asked to space Section 4 prior to having sufficient data to determine the ability of this recent recompletion to produce any volume of gas that would approach a drainage pattern appropriate for 640-acre spacing.

So we believe and have argued before that the Application is premature at this point, because in order to create a new pool not only do you need a discovery but you need enough production and data following discovery to provide you with clear and convincing evidence that you can grant an exception to Rule 104. We believe at the end of the evidence you will see, as we see, that there's insufficient evidence to support doing anything other than allowing this well to proceed on the existing spacing which

is 320 acres.

We'll talk in detail about what information is not available, an analysis of the drill stem tests so that you can see the status of analysis of the current information on the re-entry.

Finally, it is our belief that the evidence will demonstrate that, unable to convince you that the rules are as Mr. Landreth wants them, and unable to demonstrate technically with sufficient science that they're connected to an existing pool, and finally that because there's an absence of sufficient data in Section 4 to create a new pool on 640-acre spacing, we anticipate that Mr. Landreth will try to convince you that there are two existing Devonian pools in the vicinity spaced upon 640 acres. He will refer to the Antelope Ridge-Devonian to the south, which is spaced upon 640-acre spacing.

If you choose to incorporate the record of that case and to examine the science in that, you'll find that it is substantially devoid of science.

In addition, if you look at the transcript and exhibits and decide to incorporate those past records from the North Bell Lake-Devonian Pool, you're going to see that that pool was spaced on 640-acre spacing, devoid of science.

You'll see that the strategy, almost always, for

640-acre spacing in the deep gas is to create the greatest possible size spacing unit. And it's not done for scientific reasons. The only reason it's done is to control acreage, avoid the number of wells that you might be committed to pay for or participate in and move offsetting competition away from you. That is almost always the situation.

And that, in fact, is the situation here. There will be insufficient evidence to demonstrate to you that you ought to do what Mr. Landreth seeks.

Finally, you need to know that Devon is proceeding with drilling its well in the south half of 33, which has been properly permit-authorized and allowed by both the Division and the Bureau of Land Management. That well is a drilling well at this point, and when the engineer talks about it he can tell you what its current depth is as of today.

We think that that wellbore is going to be definitive in helping us understand the reservoir and deciding whether or not these wells are somehow going to be connected. It's our expectation that they're not going to be connected in any sufficient way. And to arbitrarily and capriciously grant 640-acre spacing for Section 4 before there's sufficient science is establishing a precedent that this Division has yet to adopt. So we are opposed.

EXAMINER CATANACH: Is that it, Mr. Kellahin?

MR. KELLAHIN: For now.

EXAMINER CATANACH: Mr. Hall, do you want another opportunity to say anything?

MR. HALL: No, we're ready to go.

EXAMINER CATANACH: Okay, let's go.

MR. HALL: Mr. Examiner, call to the stand Mr. Robert Landreth.

ROBERT E. LANDRETH,

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

DIRECT EXAMINATION

BY MR. HALL:

Q. For the record, sir, please state your name.

A. Robert Landreth.

Q. And Mr. Landreth, by whom are you employed and in what capacity?

A. I'm an independent oil and gas producer, have been for 25 years.

Q. And you've previously testified before the Division and, in fact, this Examiner and had your credentials accepted as a matter of record; is that right?

A. Yes, sir.

Q. You're familiar with the Application and the lands that are the subject of the Application?

A. Yes, sir.

Q. In fact, how familiar are you with these lands in the area of the Application? Have you been working that area for a while?

A. Well, this is an area -- the Delaware Basin portion of southeast New Mexico is an area that I personally have worked and my company has worked for 22 years now. We have put together a number of drilling prospects, we have participated in probably 25 or 30 wells in this area, including with Devon, so I would say we have a tremendous amount of experience in this area.

Q. Before you became an independent, you worked for Texaco; is that right?

A. Correct.

Q. Did you work in the Delaware Basin?

A. I did for a while. I was a -- I had a drilling-engineer assignment, lived in Pecos, Texas for 15, 18 months, with responsibility over drilling operations for Delaware Basin gas wells.

Q. So during the course of your experience in the Delaware Basin and Permian Basin, is it safe to say that you're quite familiar with the geology of that region?

A. I would say so, yes.

MR. HALL: Mr. Examiner, are the witness's credentials acceptable?

EXAMINER CATANACH: Any objection?

MR. KELLAHIN: No.

EXAMINER CATANACH: Mr. Landreth is so qualified.

Q. (By Mr. Hall) Mr. Landreth, briefly review for the Examiner what it is that you and EGL seek by your Application?

A. Okay, we are seeking pool extension of the Bell Lake North-Devonian Gas Pool over into Sections 4 and 5, east of its existing -- the existing boundaries for that pool. Alternatively, we would seek the creation of a new pool to honor the discovery that we have recently completed there in Section 4. We are also asking that the 320-acre spacing unit which was established in that last hearing be expanded to 640 acres.

Q. Now, in connection with the request to expand the horizontal boundaries of the North Bell Lake-Devonian Gas Pool, you're also requesting that the special pool rules be applied to Sections 5 and Sections 4 to the east; is that right?

A. That is correct, with some modifications which we'll get into later.

Q. All right. And with respect to the request to create a new pool for Section 4, are you proposing the adoption of special pool rules and regulations establishing 640-acre spacing with commensurate well-spacing

requirements?

A. Yes.

Q. If you would, why don't you provide us with a brief overview of the events that led us to where we are today?

A. Okay. I think as we testified in the prior hearing, we for several years have been interested in getting a Devonian well drilled or the re-entry accomplished in Section 4. That finally culminated in substantial negotiations with Devon over a number of months. Those negotiations failed, broke down, and so in April of this year that led to the hearing, the force-pooling hearing, and in that hearing the 320-acre spacing unit was established. Obviously, that was not a result that we wanted.

In that order, the Division did invite us to come back and apply for pool extension, and that's why we're here today.

Q. Okay, let's look at Exhibit 1 briefly, if you would explain that to us.

A. Okay, if you all want to pull that out of your folder, this is a fairly critical exhibit. It outlines, as you will see, the Delaware Basin portion of southeastern Lea County, New Mexico, differentiating it, separating it from the immediately adjoining Central Basin Platform and

what we also call the Northwest Shelf. Those are different geologic features.

But the important thing is here that we're dealing with an area that is within the Delaware Basin. The Delaware Basin is an area that has peculiar characteristics, as I'm sure the Examiner knows. You know, it is deep gas, it has characteristics significantly different than fields that are even quite close by, and we've pointed out two of them, the Lea Devonian field and the Osudo North field. Those are both oil reservoirs.

They both produce, you know, very little gas, actually. And even though they're in fairly close proximity distancewise, they're in totally different geologic realms. Those fields, as you can see, are on 160-acre spacing. But you will also note that the two closest fields to us in immediate proximity were both spaced on 640-acre spacing after going through the hearing process and the presentation of evidence.

And then Red Hills Devonian, similarly, is also a 640-acre spaced field. And we have also made reference to the two closest fields in Texas, and you can see those are also Devonian fields that are on 640-acre spacing.

Silurian, by the way, is essentially very close geologically to Devonian, so for all intents and purposes, that might as well be Devonian.

Q. All right, let's look at Exhibit 2.

A. Okay.

Q. Why don't you explain that to us?

A. Exhibit 2 is simply a land plat setting out the ownership within Section 4 where our Rio Blanco well is. You can see the completion that we're showing there, the completion date for that well. Simply sets out the ownership on the basis of a 640-acre spacing unit versus a 320-spacing unit.

Q. And by the way, are you authorized to speak for EGL Resources here today?

A. Yes.

Q. In fact, you are the largest interest owner in either a 320-acre or 640-acre unit basis?

A. That is correct.

Q. Now I understand you originally intended to dedicate a 640-acre unit to the Rio Blanco 4-1 well for the Devonian entry; isn't that right?

A. That has always been our position, consistent position, to have a 640-acre spacing unit, yes.

Q. And was the plan to dedicate 640 acres consistent with existing precedent for the Devonian fields in the area?

A. Absolutely. We've already referred to the nearby fields on this Exhibit 1, so certainly it is in keeping,

yes.

Q. Let's look at Exhibit 3. What does that show us, what is Exhibit 3?

A. Exhibit 3 is just copies of the orders that were issued by the Division on Bell Lake North-Devonian Gas Pool and on Antelope Ridge Gas Pool, the two nearest Devonian fields to us.

Q. And there's an additional order in there, R-9493, Pacific Enterprises. What is that?

A. Whoops, I missed that one, didn't I? Yes, in this particular section in 1991 there was a hearing. We referred to this in our prior hearing. Pacific Enterprises applied for a force-pooling order for a Devonian well on a 640-acre spacing unit, and that was granted.

Q. Did that well ever get drilled?

A. That well never got drilled.

Q. Okay. You've highlighted some of the text in the orders for the North Bell Lake-Devonian Pool and Antelope Ridge. What are you trying to convey there, with the highlighted text?

A. I don't see highlighted text in my copy, Mr. Hall.

Q. I may be the only one who has that.

A. Okay, well -- Okay, what we've got highlighted there is the two critical determinations that were made in

the course of that hearing.

Q. Just a minute, which hearing are we speaking of now?

A. This is the pool rules for the Bell Lake North-Devonian.

Q. This is the BTA case?

A. Right.

Q. So on page 2 of that, is that what you're looking at?

A. That is correct.

Q. Which paragraph?

A. And I guess contrary to what Mr. Kellahin said in his opening remarks, there obviously were scientific considerations that were presented in evidence. The Division concluded "That the evidence presently available indicates that..." the Conoco well and -- the old Conoco well in Section 6 and the new BTA well a mile and a half away in Section 18 were, in fact, "producing from a single common source of supply."

Further, the evidence indicated that one well was capable of draining 640 acres and that 640-acre spacing should be adopted for that pool. And it was.

Q. All right, so you're referring to Findings (5) and (6) in Order Number R-6424?

A. Correct.

Q. Why don't you bring us up to date on the status of the re-entry and deepening of the Rio Blanco well? Would you tell the Examiner what's happened with that?

A. Okay, we spudded the well on July 9th, we completed the well on September 19th, we drilled to a total depth of 14,590 feet which -- by doing so, we penetrated approximately 92 feet of Devonian reservoir. We drill stem tested and logged and then on September 19th ran a four-point test.

Q. Is it a successful well?

A. It is a successful well.

Q. Let's look at Exhibit 4.

A. Okay. Exhibit 4 is a mud log -- is the mud log of a portion of this well, actually up in the Mississippian section, showing the dates at which we penetrated certain critical structural markers on this well. You know, this, of course, is based on -- you have a mudlogging unit on location, it plots your drilling penetration rate, they log what the sample analysis looks like so you can make picks on tops of the formations.

Q. All right. And you've indicated on Exhibit 4 that the top of the Mississippian limestone was encountered on August 17th. Is that of any particular significance here?

A. Well, the Mississippian lime is a critical marker

in the Delaware Basin. I mean, we felt all along that this well would run high. But the proof of the pudding is, when you hit the top of the Mississippian lime and again the top of the lower Miss lime, those are critical markers at which there is virtually no doubt as to how you're going to run structurally on the Devonian.

And it is our feeling that Devon was watching this carefully, and about the time we penetrated those markers was when we noticed a lot of activity in the section to the north.

Q. You were providing Devon with daily drilling reports and well data --

A. Absolutely.

Q. -- during the course of drilling?

A. Sure.

Q. What sort of activity did you see to the north?

A. Well, they started building a location probably 10 days after that.

Q. It had been fairly quiet before then?

A. Seemed to be.

Q. Let's look at Exhibit 5. What's that, sir?

A. Exhibit 5 is our Form 3160-4, which is the BLM's completion report for our well.

Q. Why don't we run through some of the components of that report for the Hearing Examiner to give him the

basics of the well completion?

A. Okay. Well, I don't know that the casing program is particularly important. We did set casing as far down into the Woodford shale as we possibly could so that we could get all that shale behind us before we drilled into the Devonian.

We then drilled out, drilled into the Devonian. You can see the open-hole interval there that we penetrated. The completion at this point is natural, we have not done any stimulation. The producing rates that you see there is one of the rates off of our four-point test.

Q. And the date of first production, what date is that?

A. September 19th.

Q. And how much gas did you make on that test date?

A. Well, you can see it made the rate that we chose to use on this four-point test, 1.87 million a day, two barrels of water, 3.7 barrels of condensate, which made it very comparable, by the way, to the yield that the Conoco well in Section 6 had over its life. It produced two barrels of oil, two barrels of condensate per million cubic feet of gas, and it indicates here that we were looking at a very similar gas, very dry gas.

Q. All right. And current status of the well?

A. Shut in, waiting on pipeline. We have already initiated our part of the pipeline construction, we're waiting for the market on the other end.

Q. All right. Let's turn to Exhibit 6, please, your well log from the well.

A. Okay. There isn't a whole lot to say about this. Unfortunately, we were not able to obtain a good log. We certainly tried, but we were dealing with a slimhole condition. The logging tool did not respond properly. Schlumberger only has two sets of slimhole logs in -- slimhole logging tools, out in west Texas, and after running this tool -- after seeing that we could not get a decent log, Schlumberger told us it would be 48 hours before we could get a logging tool. I think it was coming out of Louisiana.

And we -- At that point, you know, we already had a good mud log, we thought that the log information was not that critical, and we just decided to live with the log that we got.

Q. Now, this is a -- I'm sorry, go ahead.

A. So this log simply shows what you can get off this. You can see the top of the Devonian, you can see basically how far we penetrated into it. You have a gamma ray that's probably fine. The porosity logs, unfortunately, are not very good.

Q. Now, I understand that this is a bottom water drive reservoir; is that right?

A. That is correct.

Q. And you penetrated into the Devonian by what, 90 or 100 feet?

A. We went 100 feet in, which left us short of the -- what we think is the gas-water contact, by about 80 feet, but we felt that we could not take a chance and go any deeper than that. It would not have been prudent.

Q. Mr. Landreth, based on your background and experience in the area, both from the perspective of a petroleum engineer and then based on what I think is pretty extensive geologic experience in this immediate area, would you give the Hearing Examiner a basic geological overview of the Devonian reservoir and Devonian development in this area?

A. Okay, do you want to use Exhibit 7 --

Q. Yes, sir.

A. -- as a basis for that discussion? If you all could pull that out.

Okay, this is a map -- this is a structure map on the top of the Devonian for the immediate area around the Rio Blanco well. You can see it shows --

Q. Let me ask you first of all, when you constructed this map, Exhibit 7, what data did you utilize to put this

together?

A. We used a lot of subsurface data from the well control, and then in the northerly portion, right across -- the key area here, across the Rio Blanco and across the Bell Lake feature, what we would define as the Bell Lake North-Devonian Pool, that -- what you're looking at here is based on 3-D seismic that we purchased. We purchased 5.5 square miles of 3-D seismic in order to be able to further define that area. And we will have -- Mr. Stanton will speak to that in detail later, and we'll have a more detailed presentation.

But everything that -- off of that 3-D interpretation is honored in this map that you're looking at, but this is a presentation that allows you to have a bigger regional picture.

Q. Now, when you constructed this map, Exhibit 7, did you in fact consult with a geologist and geophysicist?

A. Yes.

Q. Okay. Would you explain to us how Exhibit 7 shows how the reservoir boundaries are defined?

A. Reservoir boundaries? Okay. Well, there are two things that establish reservoir boundaries in this area. One, there are a couple of critical faults. The one that you see over on the west -- in Sections 6, 7 and 18, that's an obvious fault that does form the westerly limit of the

Bell Lake North-Devonian Pool.

Down in Antelope Ridge, there's a fault on the northwest side of that field, which is an obvious fault and is a critical boundary for that particular reservoir. Other than that, the faulting that we see in this area is insignificant.

The other thing that is critical on defining reservoir limits is the gas-water contact, of course, and we have tried to show that. You can see in that purple-lavender, whatever that is, that is the original gas-water contact as we see it, basically the same as we had it before.

Q. That's the contour at 11,340?

A. Yes, the 11,340 contour up on Bell Lake North-Devonian, and it's the 11,310 contour down on the Antelope Ridge field.

And then you can also see that we have put on what we believe -- we have put on this exhibit what we believe to be the current gas-water contact for the easterly portion of Bell Lake North-Devonian Pool around our Rio Blanco well. And that is -- That's based on the seismic data and the saddle that we see that does not reach a low below minus 11,250 feet. It never gets lower than that. And so that became the new gas-water contact, you might say, for the easterly portion of our anomaly.

The point being that originally you had a gas-water contact at 11,340 for the Bell Lake North structure. I hope we're clear on what we're considering Bell Lake North. I mean, it's everything inside that purple contour basically.

Q. The actual pool boundaries for that pool are Sections 6, 7 and 18 today?

A. That's the existing -- That's the way it is today. But because of the large volume of production from the Conoco in Section 6, the one that made the 31 BCF, that gas contact -- that gas-water contact, has risen over time.

Q. Let's do that using Exhibit 7. Why don't we go through the history of development in this area, starting with North Bell Lake-Devonian and the Conoco well?

A. Very good. The Conoco well, which you can see is in the south portion of Section 6, was drilled in 1960. It was drilled all the way through the gas-water contact. They took several drill stem tests which defined that contact. I don't think that's in dispute. Our contact and Devon's are very close there.

That well was completed; it started producing gas, I believe, in 1963. It had the benefit of being able to produce that side of the reservoir by itself for basically its entire life or virtually its entire life, and by doing so, producing in an orderly fashion, made a heck

of a lot of gas in a water drive reservoir.

Q. By the way, what was the original spacing for the reservoir at that time?

A. The original -- When they first set it up, it was 160 acres around that well.

Q. Okay. What happened after that Conoco well? What was the next development in that pool?

A. The next development was the BTA well down in Section 18, a mile and a half away. That was in 1980. We've already talked about that a little. That well came in flowing 4.5 million cubic feet of gas a day, with not much water, very little water. Within a year it was making significant water, and it turned out to be not a very good well. You can see the cumulative production was less than a BCF, so it was not a commercial venture.

But it was that well that -- You know, BTA after completing that well immediately came, within weeks of completing that well and before they had hardly any production history at all, maybe less than 30 days, came to the Division and asked that the pool boundaries of North Bell Lake Pool be extended down to their well, and justified that on the basis of bottomhole pressure information.

They had a lengthy shut-in pressure on that well, which -- the bottomhole pressure was, I think, 6072 pounds.

We can get to that in table form later, but the bottom line is, it was about 400 p.s.i. less than what had been observed in the Conoco well when it was initially drilled and discovered.

And so BTA on the strength of that said it's obvious we are in the same reservoir with Conoco, we believe, based on our geology, that we have a common gas-water contact, and the Division accepted those arguments in moving that pool boundary down to encompass that well.

Q. So the pressure differentiation between the two wells established that there was communication over quite a large area?

A. Correct, and that was BTA's testimony.

Q. And how did the Division determine the horizontal boundaries of the pool pursuant to that Application?

A. The horizontal boundaries? You mean what did they decide it should be?

Q. Yes.

A. All of Sections 6, 7 and 18.

Q. And that was based upon what? Gas-water contact?

A. Yes. I mean, BTA testified to a common gas-water contact, and that was certainly part of the rationale.

Q. Okay. Now has there since been additional drilling in the North Bell Lake-Devonian Gas Pool?

A. Yes, and this is very significant as well.

Amerada Hess in 1995 -- that's 35 years after Conoco drilled their well -- came in and drilled two wells. And by the way, Amerada has their own 3-D seismic in this area, and on the basis of that they came in and drilled two wells that, as you can see, came in virtually flat to the Conoco well. Amerada completed those wells in the Ellenburger but obviously on the way down went through the Devonian. They stopped and drill stem tested the Devonian in each of those wells.

The well in Section 5 tested 8000 feet of formation water and I believe the top 60 feet of the Devonian with no gas whatsoever, and had a reservoir pressure -- had a pressure of about 6000 pounds. So again, it had several hundred pounds less pressure than the Conoco well. It had just about the same pressure that the BTA well had.

The Amerada well, the Number 3 Bell Lake, tested -- it flowed 4.5 million cubic feet of gas a day, also flowed 1300 barrels of water a day on their drill stem test. Again, it showed depletion, it showed about 5900 or 6000 pounds' pressure.

So again, it showed -- what all of that clearly showed was that whatever gas -- all the gas that had been originally under those two wells had been drained by the Conoco well.

Q. Now, what does all this tell us about whether the North Bell Lake-Devonian Gas Pool reservoir extends into Section 5?

A. Well, I don't know how anything could be any clearer. It would be impossible to conclude that those Amerada wells did not have gas underneath them at some point in geologic time. And so if that gas isn't there and they're on the top of the structure, the only place that gas could have gone was to the Conoco well.

Q. So Section 5 and Section 6 are a common reservoir, in your opinion?

A. Absolutely.

Q. Let's talk about Antelope Ridge. Is there anything further with respect to North Bell Lake-Devonian Gas Pool?

A. I don't think so.

Q. Let's talk about Antelope Ridge briefly.

A. Okay.

Q. Would you run us through the development history of that reservoir?

A. Yeah. This was discovered two years after Bell Lake North. The Shell Number 1 Harris Federal in Section 27 -- that's the northerly of the wells in that pool -- that was the discovery well.

About the same time, the Shell BE in Section 4,

on the far side of the pool, was drilled, and those two wells were completed -- I'm sorry, only the Harris Number 1 was completed initially in the Devonian. The well in Section 4, even though it was drilled to the Devonian, was initially completed in the Morrow, and I believe it was for competitive reasons. It was later completed in the Devonian.

And then you can see there were two other wells drilled a little bit later in Sections 33 and 34.

Q. What era was this, about what year was this?

A. 1962 for the first two wells, approximately, and then a couple years later for the following -- I'm sorry, a couple years later for one of the others, and then much later for the fourth well.

Q. Right, so this was a substantially different gas market than we know now?

A. That's true. And because of that, I mean, these wells were shut in on initial completion. There was no market.

But Shell came before the Division and asked that pool rules be instituted based on evidence that they presented. And again, there was technical evidence. They testified as to a permeability figure that they had calculated from the drill stem test in the Harris Number 1 Federal, but -- and the Division accepted that and ruled

that 640-acre spacing and drainage was obviously appropriate for that field. And so even though there had been no production whatsoever at that time, pool rules were established.

Q. And so the calculated perm was the basis for implementing 640-acre spacing?

A. That was the key factor that was testified to by Shell's engineers.

Q. There was no production history at the time?

A. You had one Devonian penetration, one Devonian completion?

A. Yeah, two Devonian penetrations, one Devonian completion.

Q. And no production from either one at the time of the Application?

A. Correct.

Q. What was the calculated perm, do you recall?

A. 4.6 millidarcies, I believe. 4.5 or 4.6. If I'm off by a tenth, I can flip over and look at that, but --

Q. That's all right.

A. 4.5 millidarcies is what they testified to, and they testified that they felt that was adequate to drain 640 acres -- to drain more than 640 acres.

Q. Let's look at how the Applicant and the Division got there. If we'll turn to Exhibit 8, is that an excerpt

from the hearing testimony on the Antelope Ridge application?

A. I'm sorry, which exhibit?

A. Exhibit 8? Yeah, Exhibit 8 is portions of the testimony from that Antelope Ridge Pool hearing, pool-rules hearing.

Q. And you've highlighted some text in there. What are the points that you're trying to make that are highlighted in this?

A. Well, I think we've already covered the critical one, but you can see that Shell asked for 640-acre spacing with certain distances off of lease lines and noted that they had completed two wells that neither one of them had produced as of this point in time.

They noted that on, you know, log analysis they had calculated an average porosity which turned out to be extremely close to what Conoco had in its well in Section 6 in Bell Lake North.

Testified as to bottomhole pressures, and again you can see 6375 pounds, very close to the original 6400 p.s.i. that Conoco had in its discovery.

And then they testified as to the permeability based on pressure buildup analysis.

Q. So the Division felt that that scientific data was sufficient to establish a pool covering four sections?

A. That is correct.

Q. Let's talk about your well. Let's turn to Exhibit 9. Why don't you tell us more specifically about your completion information?

A. The critical -- You know, of course when you're talking about drainage and we're talking about how large an area can be drained by one well, pressure data is everything. And so the pressure -- what we did, we had Schlumberger -- you know, they did our drill stem test, and we asked them to do a reservoir analysis based on that test. And you can see in Exhibit 9 that they calculated the permeability for our well to be 17.6 millidarcies, roughly 3.5 times what Shell had in Antelope Ridge.

Q. Now, have you compared the reservoir characteristics of the Rio Blanco 4-1 reservoir area to North Bell Lake and Antelope Ridge?

A. Yes.

Q. Can you tell us about that?

A. Well --

Q. Perhaps Exhibit 10 --

A. Yeah, let's take them, I guess, one reservoir at a time here. No, let's look at both of them. If we look at Exhibit 10 -- I want to digress here for just a minute.

You know, I made the statement, and I really believe it's true, if the issue is how big an area one well

can drain, then pressure data is everything. Pressure data, you know -- I mean, a pressure bomb is the one thing that you have that you can run that gives you an absolute number. You actually measure something, it's not -- You know, nobody can fabricate it, nobody can say, well, gee, I thought it was this or I thought it was that. I mean, it is what it is.

And so I think this pressure data -- And if you look at the history of the way the data has been collected, not just by us but by everybody in this area, it is remarkably consistent.

You look at North Bell Lake field -- we've already talked about this, the initial reservoir pressure in the Conoco well, and that was based on two different drill stem tests of 6400 p.s.i.

You go down to Antelope Ridge, and the initial wells in that field were 6360 and 6415, again in very close agreement.

And that's what you would expect, because basically the Devonian reservoir has a pressure in the Delaware Basin that is equal to what a column of fresh water would exert at depth, basically .433 p.s.i. per foot. And so those are consistent figures.

Then you look and you see what happened with subsequent development after withdrawals had taken place

from these reservoirs, and you see that there is interference between wells and obvious communication between wells, as was the case with the Amerada wells that we've already referenced. You can see on that table, Exhibit 10, that they both had pressures about 400 pounds lower than what Conoco had initially. Same thing down in the Antelope Ridge, less dramatic.

But anyhow the point is, subsequent wells, it's obvious -- you have a very efficient water drive reservoir here, but it's not perfect. So you have replacement of, you know, 90 percent or more of reservoir pressure but not 100 percent. But it allows you to see clearly that you have communication between these wells over significant distances.

You'll notice that the EGL Resources well, we observed on our Schlumberger DST a pressure of 6137 pounds fully built up -- that's a three-hour shut-in following about an hour to an hour-and-a-half flow period -- and that curve came up, broke over and just sat there. So you can see that again we have 250 p.s.i. less pressure than Conoco had in its well.

And to me, you know, it's clear, then, that even our well has been impacted by the Conoco well. And it supports what we've been saying all along, that this whole anomaly is a common reservoir originally having a common

gas-water contact, which obviously has moved some now.

But you know, later in this hearing -- You know, we've talked a lot about geology and is there a fault that separates -- you know, is there some fault that could separate us from the Conoco well, is there a low in there that could separate us? You know, in the final analysis that's all just -- you know, I mean it's subject to a heck of a lot of interpretation.

Bottomhole pressure data is really not subject to any interpretation. It is what it is and it doesn't lie, and I think in the final analysis that's what you need to rely on if you're trying to determine -- you know.

And of course bottomhole pressure buildup data -- when you calculate permeability, that's also based on pressure data, obviously.

And so pressure data is what really needs to be emphasized in this case.

Q. Now, given that you've concluded from this pressure data that these wells are in communication across a very large area, what does this tell us about whether there are any discontinuities between Section 4, where the Rio Blanco 4-1 well is, and the North Bell Lake-Devonian Gas Pool? What can you conclude from this?

A. Well, I guess based on the things I've already said, I mean, it's obvious that there is no barrier between

Section 4 and Section 6. The pressure data clearly tells you that you've got communication across that.

Q. So the communication extends across from 6 to 5 --

A. -- to 4.

Q. -- to Section 4 --

A. Right.

Q. -- in your view?

A. And it doesn't matter whether you've got a low or how low it is. The pressure data says it's all the same.

Q. Let's turn to Exhibit 11.

A. By the way, could I --

Q. Yes, sir, go ahead.

A. Yeah, that's where I was headed, that's where I was headed. Go ahead.

Q. Tell us about Exhibit 11. What does it demonstrate?

A. Well, it's a comparison of reservoir parameters for the two fields and then for our discovery well where we have data.

And you know, something that might be good to do here because, you know, we have missing blanks, and I'm going to anticipate that Devon will ask a question about this permeability later on. So I'm wondering if I could impose upon the Examiner here, or all of us. I mean, we

could actually fill in these columns for the Rio Blanco where we have blanks, the gross Devonian thickness and all those things, because I don't want there to be any question that we're leaving something out here that's a matter of interpretation.

MR. HALL: We might make inquiry of the Examiner whether he thinks that might be helpful.

THE WITNESS: Okay.

EXAMINER CATANACH: You do have that data?

THE WITNESS: The -- well --

EXAMINER CATANACH: I mean, you can fill in these columns; is that what you're saying?

THE WITNESS: Well, the reason we didn't do it is because, I mean, first of all, in the first column, Mr. Examiner, the gross Devonian thickness above the -- Well, we didn't go all the way to the gas-water contact, so we don't have a comparable number. All I can tell you is that we did penetrate 92 feet of Devonian, okay? So you can put 92 feet in there. We don't have a porosity log, so we can't answer the question about net pay above 3-percent porosity.

For the purpose of the drill stem test analysis -- not that it really matters, because porosity is a very minor factor in the permeability calculation, but we used the same 5 percent as they had in the two adjoining fields.

Okay, I'm sorry, that should be down in the average porosity from the open hole log. We just used 5 percent. That's really not critical.

But what we did use here -- On a drill stem test, what they calculate is KH, right? The permeability capacity, KH. All right, so Schlumberger actually calculated a KH of 704 millidarcy-feet. Now, we did have to give Schlumberger a figure for how many feet of pay we thought we had. How much net pay did we have, okay, out of our 92 feet of Devonian? And we told them 40 feet. And we based that on our mudlog -- and I've got a copy of it right here, where we had drilling breaks, and -- where we had drilling breaks, and where we logged porosity we added up that footage and we estimated it to be about 40 feet.

Now, if you put that 40-foot figure in there, then the ratio of net pay to gross pay that we're using is actually going to be higher -- I don't want to get -- This is pretty simple but I don't want to get too technical here. But the bottom line is, I mean, we're being conservative by all standards, because our ratio of net pay, then, is 40 over 92, which is going to be like a .45, roughly, okay? So we're being -- we're leaning to the conservative side on this.

So with 40 feet of pay -- Your KH is 704, so you divide 704 by the 40 feet of pay to come up with the 17.6

millidarcies of perm.

The point I would like to make is this: If we had counted every foot, if we had said, hey, if the whole 92 feet is pay -- we don't think it is; it probably has some porosity and we know we have some degree of vertical communication, vertical movement of fluids that's certainly capable in this reservoir. But if the entire 92 feet was all pay, then we still would have a permeability -- if I could get my calculator -- I mean, it would still be -- it would be 704 divided by 92 -- Okay, thank you -- is still 7.6 millidarcies.

So if you counted every foot of pay, I mean, the most conservative analysis you could make says we've got -- pushing double the permeability that Shell had in Antelope Ridge field, which they used to justify 640-acre spacing. I think they said it could drain more than 640 acres per well with that permeability.

So I'm sorry to belabor that, but I just didn't want there to be any question that we're doing something here that could be misinterpreted.

Thank you. Sorry, Scott, I know that wasn't on the agenda but...

Q. (By Mr. Hall) We enjoyed that.

Mr. Landreth, from all of that do you conclude that 640-acre spacing is appropriate for Sections 5 and 4?

A. Absolutely.

Q. Let's look at Exhibit 12 briefly. Why don't you explain what that shows?

A. Okay. Well, you know, we got to thinking, how many Devonian wells in the Delaware Basin of either New Mexico or Texas might be spaced on 640-acre spacing? So we went and did a detailed check of every Devonian field that we could find, and amazingly enough, every one of them is on 640-acre spacing.

Q. These are all gas reservoirs; is that correct?

A. Yes.

Q. Based on your background and experience, do you have an opinion whether the fault that appears in the portion of Section 5 resulted in the creation of separate reservoirs?

A. Yes, I do have an opinion.

Q. What's your opinion?

A. It does not.

Q. Now, you've drawn a low there in Section 5. In your opinion does that result in reservoir separation?

A. No.

Q. Why not?

A. Because it's not low enough to penetrate the gas-water contact, the original gas-water contact, for this whole complex.

Q. Now again, you've said this is a water drive reservoir?

A. Yes.

Q. Why don't you discuss the location of the gas-water contact, where I think just about everybody agrees it is, and the water encroachment that resulted from the production for the Conoco well?

A. Okay. Well, I think we've already addressed that, but we were making the point that obviously as the Conoco well had produced this large amount of gas over a 40-year life, roughly, that gas-water contact has to move up, in a water drive reservoir the water has to move up to replace the withdrawals and maintain the reservoir pressure, because it's basically an infinite aquifer.

And so on the Conoco portion of the anomaly, as we pointed out, I mean, today the water is basically at the top of the Devonian. And over on our portion, however, it could not rise above that intervening low point. So it was able to work its way up until it hit minus 11,250, and then on the easterly portion of the anomaly it stops because gas can't be pulled, then, from the top of that structure down through the low, through the water and over into the Conoco structure.

So at that point you no longer have the ability, you know, to move gas from one side to the other.

Q. All right. Let me ask you, Mr. Landreth, in your opinion is the Rio Blanco 4 Number 1 well at its location situated to efficiently and economically drain all of reserves in the Devonian formation in Section 4?

A. Absolutely.

Q. And in your opinion, is the reservoir underlying Section 33 in 22 South, 34 East, to the north and Sections 4 and 9 in 23 South -- are they best developed on a 640-acre basis with one well per section?

A. Absolutely.

Q. Let's turn to Exhibit 13.

A. Okay.

Q. What's that show us?

A. This shows us what the development pattern would look like if wells are drilled on 640-acre spacing versus 320-acre spacing. You can see that with 640-acre spacing you would have three wells, you can see we have the two Devon locations that have already been permitted, and one of those, of course, is already drilling. So those would be the three locations that would be likely on 640s.

If you develop on 320s you're going to add an additional three locations, none of which will recover any additional gas that will not otherwise be recovered by the other wells.

Q. And is this a concern when, as you have pointed

out, the wells to the west have encountered water-encroachment problems?

A. It certainly is, and we testified in the last hearing and, you know, certainly my experience and the experience of many engineers, I'm sure Mr. Greenlees and others, is that if you drill multiple wells in a water drive reservoir and you have different operators for those wells, obviously there is going to be a severe competition for those gas reserves.

And in a water drive reservoir we all know of countless examples where fields have been overdeveloped and pulled too hard and ruined and a lot of hydrocarbons left behind, both oil reservoirs and gas reservoirs, and I certainly think that could be the possibility here.

And again, I would point to the Conoco well, you know, having produced at reasonable rates for most of its life and being able to enjoy having that reservoir to itself. That's not a situation you get very often, but that's the model, that's what we ought to be shooting for here. The fewer wells, the better.

You know, there are theoretical calculations where you can show, yeah, you can do -- you can justify, supposedly, pulling wells hard in water drive reservoirs, but the practical fact of the matter is -- and I could sit here and quote fields if we wanted to, but if you pull

water drive reservoirs too hard -- it's kind of a qualitative thing, but we all -- I mean, in many, many cases you're going to ruin reservoirs and you're going to leave a lot of oil and gas behind.

Q. So in your opinion is there a risk present here that 320-acre development may result in actual physical waste of reserves?

A. I would say given the circumstances. If we had one operator in here for all of this, it might somehow work. But with different operators and different working interests, I mean, this is going to be a dogfight for reserves, and that's not a good thing for the reservoir.

Q. What effect does well density have on development economics?

A. Well, if you have to drill a second well on 320-acre spacing, we've already said -- and I firmly believe it's true -- that if you drill a second well -- for example, if we had to drill a second well in Section 4, we would not recover one single MCF of gas additional we couldn't otherwise get from the re-entry that we've already completed, not one MCF additional is going to be recovered. All you're going to do is accelerate the recovery.

And that does have a benefit from a net present value, as I'm sure you can appreciate. You're going to shorten the life to recover those reserves, but the problem

is, you're going to spend $3.5 million doing it. We're going to spend $1.8 million, in the final analysis, getting our well to pipeline, drilled, completed and into the pipeline. Now we have to -- somebody's going to force us to spend another $3.5 million to recover no additional gas, and if you look at -- We have an exhibit here.

Q. Is that Exhibit 14?

A. Yes.

Q. Let me make sure I understand, make sure the record is clear on this. The going rate for the cost of a new drill to the Devonian formation in this area is $3.5 million today?

A. That is our estimate.

Q. Okay, go ahead and explain Exhibit 14.

A. Okay, well, I'll just be real quick on this. It just simply shows you have two cases here. First is the re-entry that we have already drilled, standing on its own, to recover a gas figure which, you know, is -- we think is a reasonable figure. I by no means am saying that we think that is what the reserve figure is, it's just a figure that is reasonable, okay? And based on that figure, we showed that with the re-entry by itself you'll have a net present value of $17,753,000, discounted at 10 percent.

If you drill a second well, now you're up to a $5.3-million investment.

Q. And that's shown on page 2 of Exhibit 14?

A. On page 2, and as you can -- Well, you get no additional gas, you accelerate -- you shorten the life significantly, you cut it about in half, so you gain $823 -- I'm sorry, $837,000, you can see down at the bottom of the second sheet. You would gain $837,000 of present value, net present value, at 10-percent discount.

So if you look at that on an economic basis and does that make economic sense, you can see that return over a 5.3-year period is 24 percent, and if you do that on the calculator you'll find that it's equivalent to about a 4-percent compounded rate of interest, and nobody in their right mind would do that. You can put your money in corporate bonds, high-yield bonds, for 6 percent, so...

Q. Now, I understand you get accelerated recovery of reserves with increased development density; is that right?

A. Yes.

Q. But you get no incremental recovery?

A. No incremental recovery and you aggravate the reservoir situation, and you're looking at a significant physical waste issue.

Q. So there's a chance you may recover, in fact, fewer reserves?

A. It's actually possible, yes, you could certainly do that. I mean, you could certainly justify that

statement.

Q. You've discussed the Amerada Hess wells in the area.

A. Uh-huh.

Q. Have you been in communication with them?

A. Yes, I have, I have a good rapport with those guys.

Q. Do you know what their position might be with respect to 640-acre spacing in this area?

A. Well, I was -- We asked them if they would support us in our Application. I have discussed this area at length with their engineers. Obviously they -- They are studying this area right now and have gotten active again in this area. They have recompleted their Number 2 well from the Ellenburger up into the Morrow formation, made a fairly decent well.

Their Amerada -- The Number 3 well, which tested the 4 million, 4.5 million a day on the drill stem test with a lot of water, I asked them about their plans. I was in their office in Houston three weeks ago and asked them, you know, Well, do you plan to actually test that zone?

And he said, Well, as a practical matter, you know, it would probably be prudent for us to shoot holes in it as -- you know, as we come up the hole.

But they're aware of what happened on the BTA

well, the fact that BTA completed their well -- BTA's well flowed basically the same thing, 4.5 million a day on initial completion --

MR. KELLAHIN: Mr. Examiner --

THE WITNESS: -- with very little water --

MR. KELLAHIN: -- with all due respect to Mr. Landreth's testimony, we would object to hearsay testimony he's received from Amerada Hess about their involvement in the case. They are certainly welcome to come to the hearing. They've chosen not to. They've not even sent any kind of position to any of us.

So while an expert can rely upon hearsay technical evidence from another witness, as he's done with the Schlumberger witness to enforce his own testimony, to reach a conclusion through his mouth about what another company would do in support of this case is inappropriate.

EXAMINER CATANACH: I would tend to agree with Mr. Kellahin, if you could limit your testimony.

THE WITNESS: Okay, well, let me just say then --

Q. (By Mr. Hall) Let me ask you about Exhibit 15. Is Exhibit 15 a letter written by you to Mr. Don Adams at Amerada Hess?

A. Yes.

Q. And who is Don Adams?

A. He's their senior landman, land manager.

Q. And what does your letter discuss? What did you discuss in Exhibit 15 with Amerada Hess?

A. We just kind of set out the details of the development in this area and took note of Amerada's experience and what they learned from their pressure data on their wells, and we asked them -- I mean, basically we were asking them, you know, do you conclude that one well is capable of draining 640 acres? And if you do, we would appreciate a statement of support to that effect. And that is what they did with this letter.

Q. And if you look on page 2 of this exhibit, does that indicate concurrence by Mr. Adams to the proposal to go to 640?

A. Yes, after his review with their technical people you can see, I mean, what he's saying is, based on its review of wells in the Bell Lake North-Devonian Gas Pool, Amerada Hess believes that one well is capable of draining 640 acres or more and supports our application.

Q. And that is based on their own technical analysis; is that correct?

A. Yes.

Q. Now, Mr. Landreth, with respect to the request in the Application to expand the existing 320-acre spacing unit for the north half of Section 4 to include the entirety of Section 4, how will the interest owners in

Section 4 be affected by that?

A. Well, you'll have the same mix of owners, but there will be a different -- different percentages. On a 320-acre spacing unit Landreth and EGL have 75 percent, Devon and Southwestern have 25 percent. On a 640 unit, Landreth/EGL have 87.5 percent, Devon and Southwestern have 12.5 percent.

Q. Let me ask you just briefly, with respect to correlative rights, in your opinion will development of this reservoir in the area of Section 4 on 640-acre spacing units with commensurate well locations enable all the owners in that reservoir to recover their fair share of their reserves?

A. Certainly.

Q. In your opinion, will granting your Application be in the best interests of conservation, the prevention of waste, including the avoiding of drilling of unnecessary wells, and the protection of correlative rights?

A. Yes.

Q. If 640-acre spacing is not implemented for this reservoir, will the drilling of unnecessary wells likely result?

A. Absolutely.

Q. With respect to your request to create a new pool in Section 4, in your opinion is it appropriate to create a

new pool without first obtaining additional production data?

A. Well, there's certainly clear precedent for that in the two adjoining fields, though I certainly think that's a reasonable request.

Q. Let's turn to Exhibit 16, if you would briefly. What is that, please?

A. It is proposed pool rules for the Rio Blanco-Devonian Gas Pool.

Q. And are these proposed rules what you request the Division adopt in the event a new pool is created for Section 4?

A. Yes.

Q. Now with respect to the request to extend the North Bell Lake-Devonian Gas Pool pool rules into Section 5 and on into Section 4, will it be necessary for the Division to address the provisions that you usually see in special pool rules which grandfather in unorthodox locations that might result from the adoption of the pool rules?

A. Yes, I think that would be necessary.

Q. In this particular circumstance, in view of the fact that Devon is drilling now in the south half of Section 33 to the Devonian, what's a fair procedure for the Division to adopt to address that situation?

A. Well, I guess my personal feeling is, since that well was spudded, you know, after we feel the Division had made clear that there shouldn't be anything done in this situation to further aggravate what is already a contested matter, and since Devon has chosen to do so, that no allowable should be assigned to that well until they go through a procedure of hearing to determine whether a penalty should be assessed against that well for one or more reasons, including lease line infringement, possibly productive acreage. And so we believe that that's only fair, that that well should go through that kind of rigor.

Q. If you look at page 2 of the proposed pool rules, at numbered paragraph (3) --

A. Okay.

Q. -- is that the language that suggests that procedure, that that well should be made the subject of an unorthodox well-location application --

A. Yes --

Q. -- a separate proceeding?

A. -- right

Q. Based on what we know now about the reservoir in the area of Section 4, will the Devon well in Section 33 at its likely resulting unorthodox location be able to produce reserves at an advantage because of that location?

A. Certainly.

Q. Now, in this particular case we've made two requests of the Division. Are you recommending the extension of the North Bell Lake-Devonian Gas Pool rules over the creation of a new pool in Section 4?

A. Well, we're doing that because we believe that's the reasonable thing to do. I mean, to us it's clear that there is communication, it is a common reservoir, and so it appears that that would be the logical thing to do.

On the other hand, if the Division chooses to form a new pool, you know, regardless, 640-acre spacing is the clear precedent. But you know, I suppose we do not have a strong feeling, other than it is our feeling that it is a common reservoir all the way across.

Q. Now, provided that the Division can address the grandfathering provisions of the North Bell Lake-Devonian Gas Pool pool rules, does extension of existing pool rules offer some administrative convenience to the Division?

A. I don't know that I really can answer that. I understand that it does, but I don't know for sure.

Q. Now, timing is difficult and under these circumstances, but are you requesting the entry of an expedited order in this matter?

A. Yes, we are.

Q. And why?

A. Well, it's already been mentioned by Mr. Kellahin

and it's certainly true: We have an expiring lease in the southeast quarter of Section 4 that we have to protect by October 25th, and in the absence of an order by that date we will be forced to do whatever is required to protect that term assignment, to initiate whatever form of operations is required to protect that lease. And that's going to involve the spending of money and the damaging of -- you know, we'll have to do a certain amount of location work and so on, and we would certainly rather avoid that if at all possible.

Q. From whom did you obtain your interest in the south half of Section 4?

A. Well, in the southeast quarter it was from OXY --

Q. Yeah.

A. -- OXY USA.

Q. And so what you're telling the Division, you will drill to preserve that term assignment?

A. We have tried diligently to get an extension of that term assignment and have not been able to do so, so we have no choice but to protect it.

Q. All right. Were Exhibits 1 through 16 prepared by you or at your direction?

A. Yes.

MR. HALL: At this point, Mr. Examiner, we'd move the admission of Exhibits 1 through 16. That concludes our

direct of Mr. Landreth.

EXAMINER CATANACH: Any objection, Mr. Kellahin?

MR. KELLAHIN: No objection.

EXAMINER CATANACH: Exhibits 1 through 16 will be admitted.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Landreth, let's start where you finished. The term assignment in the southeast quarter of 4 that you obtained from OXY almost five years ago is subject to --

A. Four, four years ago.

Q. -- is subject to expire on October 25th?

A. Yes, sir.

Q. And you've not been able to obtain an extension form OXY as to that farmout -- that term assignment?

A. Correct.

Q. You say if you're not able to do so, that you'll be forced to drill a well in the south half of 4, if the Division does not change spacing to 640 acres, right?

A. Well, we will be forced to at least initiate operations, good faith operations, until we get a ruling.

Q. Have you explored the options of building that safety net for yourself by permitting any locations in the south half of 4?

A. We have an approved APD in hand for a Devonian-

Ellenburger well, yes.

Q. Would this be the re-entry of the well in the southwest quarter of 4?

A. No, sir, it would be a new well.

Q. It would be a new well? Show me where you would put the well.

A. 1650 from the south and east lines of Section 4.

Q. Let's look at the North Bell Lake-Devonian Pool to try and keep us straight on a map that helps us orient ourselves. Let's look at Exhibit 7, which has got the structural interpretation.

If we look at the west side of the display, I want to go back and look at the Conoco 6 well in Section 6. That's what we often have characterized as the big well?

A. Yes, sir.

Q. It eventually cum'd over its life, starting, I think, in 1960. I don't know when it stopped producing.

A. Stopped producing?

Q. Yeah.

A. In the mid-1990s, and then I think it had a short period where it went back on production, but for all intents and purposes it was depleted in the mid- to late 1990s.

Q. And by that time it had accumulated about 31 BCF of gas?

A. Yes, sir.

Q. You made reference to a case that BTA had brought before the Division back in 1980 with regards to the well in Section 18, correct?

A. Yes, sir.

MR. KELLAHIN: Mr. Examiner, we'd ask you to take administrative notice of that case. It's Case Number 6962, Order Number R-6424, and the order was issued on August 4th of 1980.

MR. HALL: It's in our exhibit book, Mr. Examiner.

EXAMINER CATANACH: Okay, administrative notice will be taken of that case file.

Q. (By Mr. Kellahin) As part of your review of that case, Mr. Landreth, did you look at the geologic evidence presented in that case?

A. Yes, I did.

Q. Did you look at what I've marked for this hearing as Devon's Exhibit A? It was introduced by BTA as their structure map in the original hearing; it was marked by them as Exhibit Number 2. I've given you a copy of that.

A. Yes. Well, Devon's Exhibit A.

Q. Right, that's how it's currently identified right now.

A. Uh-huh.

Q. It was also identified as Exhibit B to Devon's motion to stay, so I think we're all looking at the same display.

A. Uh-huh.

Q. Am I correct in understanding that BTA's argument was at this time the only well in Section 6 was the Conoco 6 well?

A. The only well in Section 6? Well, I think that's true. It certainly was the only Devonian producer in Section 6.

Q. And later on there was the Amerada Hess Number 3 well drilled in the northeast quarter of 6?

A. That's correct.

Q. So as we move down through 7 there was not then, nor is there now, a Devonian well at any time?

A. Correct.

Q. And when BTA went down into Section 18, they have the BTA well Number 1 that's shown on your Exhibit Number 7?

A. Yes.

Q. And their argument was that based upon early information they asked that the Commission expand the pool and develop 640-acre spacing to include Sections 6, 9 -- 6, 7 and 18?

A. Yes, sir.

Q. Do you see on this display the throw of a fault that apparently has been hached through the far western boundary of Section 7?

A. Which display, Mr. Kellahin?

Q. On BTA's Exhibit Number 2.

A. Do I see a fault that is through the westerly portion of Section 7?

Q. Yes --

A. No.

Q. -- Section 5.

A. I beg your pardon?

Q. Look at Section 5.

A. Section --

Q. On the far western side of Section 5 --

A. Yes.

Q. -- has BTA presented evidence concerning a fault running north and south?

A. They've presented evidence, yes, based on a single line of 2-D data.

Q. There was apparently no attempt by BTA to ask the Division to extend the 640-spaced pool any portion of acreage east of the east boundary of Section 6 and 7?

A. Well, this is a moot point, Mr. Kellahin, at this point. Now you have 3-D seismic, your client has 3-D seismic, we have 3-D seismic, and that fault isn't where

BTA had it.

Q. Well, let's see what's happened. Mr. Landreth, I've handed you a copy of your Exhibit 7 that you sponsored and introduced at the pooling hearing heard before Examiner Catanach and Mr. Brooks back on April 10th, and it is your structural interpretation of this area, is it not?

A. Yes, it is.

Q. When we find the BTA well and analyze that information, what is your opinion as to the top of the water in that wellbore in the Devonian?

A. In which -- in the BTA well?

Q. No, in the Conoco 6 well?

A. I'm sorry, where is the top of the water in the Conoco well?

Q. In the Conoco 6 well, right.

A. When? Originally?

Q. Yes.

A. The original gas-water contact --

Q. Uh-huh.

A. -- in the Conoco well was, we testified to, minus 11,340, and that's the contour that's shown on this map.

Q. Okay. What was the total column of gas that you utilized in that well? You said there was a gas column associated with the Conoco 6 well.

A. It was the difference -- Initially, it was the

difference between minus 11,075 and minus 11,340.

Q. And that gave you the 265 number, I think?

A. I believe that's correct.

Q. And as we moved to the east, into Section 4, there's the Amerada Hess Bell Lake Number 3 well in the southeast quarter of 5, drilled in 1995. Do you see that one?

A. I'm sorry, Mr. Kellahin, in Section 5 you have the Amerada Number 2 in the southwest quarter.

Q. That's what I was trying to say.

A. Okay.

Q. That well in 1995, where did it encounter the gas-water contact?

A. At the top of the structure, the very top of the Devonian.

Q. So the initial gas-water contact by 1995 has moved upstructure to the point that if you're at the Amerada Hess Number 2 well, the entire Devonian is contained with water?

A. That's correct.

Q. Is that also true, in your opinion, of the gas-water contact in the Conoco 6 well?

A. For all intents and purposes, the Conoco well at that point in time, I believe, was making -- and I've got a curve here -- was making about 600 barrels of water a day,

along with -- well, it was making about 600 barrels of water a day.

Q. Do you believe that there was --

A. Sorry?

Q. When we look at the southwest quarter of 5 for the Amerada Hess Federal 2 well, do you believe that there was originally recoverable gas in the Devonian, in that well?

A. Absolutely.

Q. Where did the gas go?

A. To the Conoco well.

Q. The well in the northwest quarter of 6, in 1996, was drilled with what results?

A. In the northeast quarter of 6? That's the well that we talked about that flowed gas and a large volume of water from the Devonian on drill stem test.

Q. It was a year after the Amerada Hess Number 2 well?

A. Roughly.

Q. And was still able to flow gas?

A. Well, it flowed some gas. Amerada hasn't lifted a finger to try to recover that gas. They have a marginal Ellenburger well. Gas prices are four dollars per million BTU. If I were Amerada and I thought that was commercial gas there, I think I would have moved to get it just like

they have on the Morrow and that other well.

Q. Do you believe that there was gas underlying that well location in the Devonian?

A. Yes.

Q. Where did the gas go?

A. To the Conoco well.

Q. Down in Section 19 -- I'm sorry 18, 18 with the BTA well --

A. Yes, sir.

Q. -- that's the well in 1980, and it came on with an initial potential of 4.1 million, I believe?

A. I believe 4.5.

Q. 4.5 million. Was there gas in place underneath that spacing unit in Section 18 at the time that well was completed?

A. Obviously so.

Q. Is it your concept that the gas underlying Section 18 migrated towards the north and was produced by the Conoco Number 6 well?

A. Yes. And obviously -- I mean, with this distance it's probably not a highly efficient recovery, but certainly there was some recovery of gas. Gas was certainly displaced from the vicinity of the BTA well in the direction of the Conoco well.

Q. Do you have pressure information on the BTA well

so you can tell us what the pressure was in 1980?

A. 1980, when it was first drilled?

Q. Yes, sir.

A. Yes, that was in our table. They had a very lengthy shut-in tubing pressure which they took to depth and came up with the pressure that they testified to at the hearing of 6072 pounds, I believe.

Q. What would be original pressure in the Devonian?

A. 6400.

Q. Apparently after some 20 years of production by the Conoco 6 well, if you are assuming that the BTA well had an original reservoir pressure that was virgin --

A. If which well had a virgin pressure?

Q. The BTA well.

A. You mean that location --

Q. Right.

A. -- before anything was ever drilled would have had a pressure, before the Conoco well was drilled, before any well was drilled, would have had a pressure of 6400?

Q. Right.

A. Yes.

Q. Both locations, before there's withdrawal of gas, would have had pressures based upon calculations that would have anticipated you getting 6400 pounds, and so by -- after 20 years, the reduction in pressure at the BTA well

is what, three hundred and --

A. About 400 pounds. Three hundred and --

Q. Three hundred and thirty pounds?

A. -- thirty pounds, yes, sir.

Q. Do you attribute that pressure reduction to withdrawals taken by the Conoco Well 6?

A. Yes, I do.

Q. When we look at this portion of the reservoir on your display, I'm taking Section 5 and splitting it east-west, and so take the western portion and move that over into this portion of the pod with the west half of 5, 6, 7 and 18. When we look in that area, now is the gas-water contact at the top of the Devonian?

A. For all intents and purposes it is.

Q. So under your analysis you don't believe there's any gas left in this part of the pod?

A. Is there gas left? Yes, there is some gas left. Can it be commercially recovered? No.

Q. Have you done any drainage calculations for the Number 6 well to determine what you believe would be the acreage drained by that well?

A. We did go through that exercise and submitted that at the last hearing.

Q. Why haven't you done so again today?

A. Because at this point the case is drainage and

the case is interference or communication between wells, and speculation about net feet of pay, what the average porosity was and all those things, Mr. Kellahin, just become variables that are subject to conjecture. And when you have hard pressure data that you can now rely on, there's really no reason to get into that exercise. It just becomes a he-said, she-said situation.

Q. Well, when we look at the Rio Blanco 4 well over in Section 4, we still have a substantial basis of uncertainty about how to calculate drainage area, look at performance of the well as it will provide data to decide drainage areas, right?

A. I disagree with that. The ability of that well, of our new well, to drain 640 acres is simply a function of permeability and pressure. It really doesn't have anything to do with net pay.

Q. Have you taken pressure information to the point where you have any pressure drawdown tests?

A. Have we taken -- Yes, that's what the drill stem test was.

Q. All right, do you have any pressure buildup test?

A. Yes, the drill stem test itself is a pressure buildup test.

Q. Did Schlumberger run the drill stem test analysis for you?

A. Yes.

Q. And this was for the top 92 feet of the Devonian in this well?

A. That's correct.

Q. You did not drill it down deep enough to encounter the gas-water contact at that location, did you?

A. That's correct.

Q. Where do you estimate the gas-water contact in that well to be now?

A. To be now?

Q. Yes, sir.

A. Minus 11,250.

Q. And that's the number you continue to --

A. -- insist is accurate, yes.

Q. Yeah, that you show on your Exhibit 7 for today. And for the Exhibit 7 from the pooling hearing you had it at 11,720?

A. I'm sorry, what was that, Mr. Kellahin?

Q. 11,260 -- -270. 11,270.

A. -- -270, yes.

Q. So we're within 20 feet?

A. Yes, sir.

Q. When you asked Schlumberger to analyze the drill stem tests, what were the things you asked them to do, or what assumptions did you ask them to make?

A. We just asked them to do a reservoir analysis. And to do that we did have to give them certain parameters.

Q. Tell me the parameters that you had to give Schlumberger so they could run the analysis.

A. Porosity, average porosity, feet of pay, water saturation. I believe that's it. If you'll give me a minute, I'll look and make sure that that's the correct answer.

Porosity -- Well, we gave them porosity, reservoir temperature, gas gravity, water saturation. Okay? Now, of those factors, the only one -- you know, porosity really is a very small factor in determining the permeability calculation. Reservoir temperature is a non-issue, water saturation is a very small factor, gas gravity is a small factor.

And I failed to mention -- and I did mention as we dealt with this earlier -- at depth we did tell them the -- at length, I mean, we did give them -- we told them to run the analysis at 40 feet of pay.

We also had them run an analysis at 90 -- at 100 feet of pay, just for comparison's sake.

Q. You had it run at 40 feet of pay, and another one at 100 feet?

A. Yes.

Q. Did you have any other reports or analysis done

with other parameters?

A. Yes, we varied the porosity because we wanted to look at a spectrum here to make sure that we weren't going to misrepresent anything. So we had them run a case, and I've got them over here, I'd be happy to pull them out if you would like.

We ran another case with a porosity up to 11 percent, because after all we don't have an actual porosity on this well. So what we were using with the 5 percent I think was reasonable, because that is what the porosity was in the two adjoining fields that had been testified to in prior hearings.

Q. Of these various reports, which one did you put in the exhibit book?

A. The one that showed the 40 feet of pay.

Q. Out of the 92 feet of interval in the Devonian that you drilled down to, that was the drill-stem test interval, over that interval?

A. Yes. I would like -- you asked -- We chose to use the 40 foot of pay, as I previously testified, because I think it's a reasonable ratio of net pay to gross pay for this area. In fact, it's more than reasonable. And that's why we gave Schlumberger that figure, because we thought it was more than reasonable. And that's why we think 17 millidarcies is really a very accurate figure.

Q. The log you showed us for this well failed to give you an adequate log, right?

A. Failed to give us adequate porosity.

Q. And if you're trying to give a porosity cutoff or some porosity value to give you net feet for your KH calculations you have to make some judgments, and that's what you've done?

A. Yes, but the porosity factor by itself, we have -- if you want to get the runs out, we can do that. The difference between 5-percent and 11-percent porosity was the difference between 7.6 and 7.1, I believe, millidarcies.

Q. The well is not currently being produced, it's shut in?

A. Correct.

Q. Have you run any other types of tests on the well?

A. We flowed the well on the drill stem test, we moved the rig off the hole, we ran the four-point test, and that's the only testing we have done.

Q. How long did you flow the well?

A. Five hours.

Q. How long was the four-point test?

A. Five hours.

Q. Did you get an absolute open flow potential for

the well?

A. No, sir, not yet.

Q. And how would you go about doing that?

A. We would have the engineering company that ran the test do the customary procedure of plotting the data and coming up with a calculation.

Q. But you don't have the calculated absolute open flow for this well yet?

A. Correct.

Q. Even if you did, that's not going to tell you anything about reserve potentials for the well, is it?

A. No.

Q. At this point, is there any engineering way that you can calculate a drainage area for the Rio Blanco 4 well?

A. No.

Q. When we look at your --

A. But I would like to add, the drilling of additional wells isn't going to change that one iota either, of course.

Q. When we look at your Exhibit 7, we've got the original purple line that outlines the original gas-water contact.

A. Yes, sir.

MR. HALL: I'm sorry, Tom, which 7 are we looking

at?

MR. KELLAHIN: The 7 for today.

Q. (By Mr. Kellahin) And also when we look at Exhibit 7 from the force-pooling hearing, if you have those side by side, back in April you estimated the current gas-water contact was following the green contour line, and for today's hearing we have a different configuration for a gas-water contact that's shown in an orange line.

A. Yes, sir.

Q. Explain to me what you did to cause yourself to change the area identified in the green so it now looks like the area shown in the orange.

A. Simply based on our 3-D seismic that we acquired.

Q. That 3-D seismic data, then, caused you to delete on your prior Exhibit 7 the east-west fault in the southern portion of Section 33, just north of Section 4? Are you with me?

A. Our coverage -- Let's see, hold on just a second. That is a true statement.

Q. Did your acquisition of the 3-D seismic data -- Did you get the same data set that Devon acquired some time ago for this area?

A. I think I need to defer to our geophysicist for that question.

Q. To see if we're dealing with the same data set or

not?

A. Yes.

Q. He may know that, okay. So based upon his geophysical analysis, then, you have deleted what was previously shown to be this east-west-oriented fault in the southern portion of 33?

A. Yes, that fault was never a critical fault, it's just -- you know, we thought we could see, and I think you can see if you look at our interpretation today, there is dip, there is pretty sharp dip heading off on the north side -- on the northwest side of -- I'm sorry, the west side of Section 33. And when we looked at our one 2-D seismic line that we had at that time we said, You know, it looks to us like that could be faulted. So we actually put a fault there. We could have contoured it as dip.

Q. Okay, let's look at some that are more important. If you go to the Section 5 on your prior exhibit at the pooling hearing --

A. Uh-huh.

Q. -- you have a north-south fault line running just east of the Amerada Hess Bell Lake Federal 2 well. Do you see that?

A. Yes, sir.

Q. Now when we look at the interpretation you've provided today for Section 5, that fault appears not to

extend past the northern edge of a point where this well is located.

A. That's correct, that's what the 3-D did for us.

Q. The reason for shortening the extension of that fault is reasons explained by the geophysicist?

A. Yes, sir, I believe that is -- yes.

Q. Okay. On your Exhibit Number 7 --

A. Our Exhibit 7?

Q. Yeah, for today's hearing.

A. Okay.

Q. -- you have interpreted a fault in Section 4, just to the southwest of the Rio Blanco 4 location that did not appear on the Exhibit 7 from the pooling hearing. What's the basis for that fault?

A. Same thing, Mr. Kellahin, when we look at the 3-D data we see evidence of an extremely minor fault there.

Q. Now let's go to the current interpretation of your opinion for the gas-water contact, the orange line. Tell us what data caused you to put the line where you put it.

A. Well, I think we already covered that. I mean, the 3-D data shows us that that's where the minus 11,250-foot datum is.

Q. Well, the 3-D seismic data won't tell you where the gas-water contact is, so what data did you use to get

the contact?

A. Our -- We already testified to the fact that the geology shows that the water rose in time to the lowest point on that easterly portion of the Bell Lake North Pool, for lack of a better way to say it, and so that's where it has to be.

Q. Show me the control point for that opinion.

A. The control point for the minus 11,250?

Q. Yes.

A. Well, you're going to see this more clearly on a seismic display which Mr. Stanton will present later.

But if you look at -- Let's see, do you see where the saddle is at the -- close to the south section line of Section 5, you're going -- Well, let's look at it this way: You're coming off -- You're dipping east off of the Conoco portion of the anomaly down to a point, and then almost right along the section line, the common section line of Section 5 and Section 8, there is a low point there. There is a saddle that passes through there. And in that saddle there is a high point of the saddle which determines where -- the highest point that gas can migrate from one side to the other, or that it was -- okay, just let it go at that.

So that's where -- That low point we have estimated at minus 11,250, and that's why we have that contour pulled essentially to that point.

Q. Can you utilize data from the Amerada Hess Bell Lake Number 2 well in the southwest quarter of 5 to give you an indication of where the gas-water contact is?

A. No, not -- You cannot do that, no.

Q. Okay.

A. Because the gas has already -- has been pulled up, as we testified.

Q. At this --

A. In the westerly anomaly you have gas that's already been pulled way up into the structure. That's not true of the easterly anomaly, and that's what that saddle -- that's why that saddle is somewhat critical.

Q. Well, let's look and see how critical it is. When we look at that saddle, at this point in time, because of the depletion of the gas from the Conoco 6 well, the gas-water contact is moved to the far eastern portion of Section 5, right?

A. The far eastern portion?

Q. Of Section 5.

A. It is moved to where we have represented on that orange line.

Q. Yeah. So there now, because of production, is a disconnect between Section 4 and 6? You've got the reservoir full of water?

A. I'll agree with that, there is a disconnect. I

don't know how it matters. I mean, you define a reservoir by what it was originally, you don't define it by what it is after production takes place over 20 or 30 years.

Q. Okay, let's look at the shape of the orange. Are you telling me that the current shape of the orange has been attributed to production entirely from the Conoco Bell Lake 6 well in Section 6?

A. The movement -- Yes, the movement of the gas-water contact would be attributable to the production from the Conoco 6.

Q. Within the purple area, have you determined what the volume of gas is that's associated with the reduction from the purple to the orange area?

A. Well, no, I have not.

Q. Is it going to be more than 31 BCF of gas?

A. In that area?

Q. Yes, sir.

A. Well, you're talking about a less than efficient withdrawal of that gas, okay? Obviously, the further you are away from the Conoco well, the less efficient the Conoco well is able to impact locations that are significantly removed. Did it impact it some? Absolutely.

Q. Well, I'm not --

A. Did it withdraw all the gas? We still have gas over here, obviously.

Q. Well, and that's what I'm looking at, is, your display has shown me in Section 3 over there to the east that the original gas-water contact has moved upstructure to a point on the eastern boundary of Section 3, and the only source for that change is the Conoco 6 well in Section 6, three sections away.

A. Uh-huh.

Q. So have you calculated the volumetrics to show how much gas area would be contained by a well that produced 31 BCF of gas?

A. Well, we did that. But at this point I'm going to again say, the focus of this hearing is on how big an area can one well drain? And it really doesn't matter whether the Conoco well efficiently drained an area three miles away. We're not asking for three-mile spacing. What's important here is that it did drain a well three-quarters of a mile away, and that's the real issue.

Q. Is it your opinion that the well in Section 4, the Rio Blanco 4, the well at this point, in the top of the Devonian, is going to be able to capture all the gas within the orange area?

A. That well would certainly be capable of doing that, yes.

Q. Let's look down into Antelope Ridge to the south on your map. This is a pool that you've told us is spaced

upon 640-acre spacing, Antelope Ridge?

A. Yes, sir.

Q. Okay. When we look at that area -- you and I talked about this at the last hearing -- it appears that there are about 800 productive acres contained within that feature, and there's four wells, which is a density of one well every 200 acres.

A. I'm glad you brought this up, Mr. Kellahin, because you have completely misrepresented in subsequent motions what I said in the hearing that day.

Q. Well, why don't you tell me what you want to say?

A. Okay. There are four wells in that field. That they are in close spacing has nothing to do with how much area a well can drain. Obviously people were trying to crowd in on top of that high, right? They had seismic data just like we do.

Q. You said it was a correlative-rights issue?

A. Well, it is a correlative-rights issue also.

Q. How?

A. How? Well, they're trying -- I mean, everybody's trying to get as much of the gas as they can, right?

Q. So what's your definition of correlative rights?

A. The ability -- the right to protect yourself from drainage.

Q. Was there --

A. My point is -- I mean, you know, I did not make any statement, as you have tried to indicate in some of your filings, that it was necessary for four wells to be drilled to drain this. That's what you intended to imply, and that is simply --

Q. Well, you and I will differ --

A. -- not true from what I said.

Q. We'll leave it up to the Examiner about that difference, but you and I disagree.

A. Well, would you like to pull out the --

Q. No, just answer my questions.

A. I'm trying.

Q. Let me give you another question. Do you analyze any of those wells to see if there's interference between any of the wells? You've got four-well densities down in Antelope Ridge. Any of those wells talking to each other?

A. We did not have any pressure information on those wells similar to what we had in Bell Lake to draw those kinds of conclusions.

Q. So if the well in 33 is -- Well, find the best well in Antelope Ridge for me. Just look at your cum numbers. It looks like the well in 33?

A. I think it's the well in 34.

Q. I'm sorry, the well in 34. In the southeast of 34 --

A. Uh-huh.

Q. -- it's go the highest cum, right?

A. Uh-huh.

Q. Are you saying that the Shell 9 over in 33 is an unnecessary well?

A. No, I'm not saying it's an unnecessary well, no.

Q. Well, how about the well in the northwest of 4?

A. Well, again -- Of course the well in the northwest of 4 was already drilled, okay, at the time of the pool-rules hearing?

Q. Uh-huh.

A. And so it was grandfathered, I believe, as part of the pool rule determination there. So I'm not sure what's the issue here.

Q. The issue is whether this pod down here spaced on 640-acre spacing was overdrilled.

A. Well, if it had been drilled in reverse order, Mr. Kellahin, the well in Section 33 could have drained the entire thing. It didn't happen to be drilled that way. Three wells were drilled, and then late in the game they said, gee, I guess we could drill a well and get high there in Section 33 and maybe we could recover enough gas to justify it.

So they have an attic location there, and they recovered some gas.

Q. The Antelope Ridge 9 well that had what, 85 -- Well, I've lost track of my numbers.

Do you know -- I didn't add these up very well, but do you know what the total recovery is for these four wells out of Antelope Ridge?

A. It's about 38 BCF.

Q. I asked you a while ago to define correlative rights for me. Would you do so?

A. Well, I'm not a lawyer. My opinion of correlative rights is, it's the right of someone to protect their reserves.

Q. Well let's take that as your statement. If we look in Section 33 -- and let's assume that's the first well, just for argument's sake, the Antelope Ridge 9 in 33 is the first well, and it's spaced --

A. Suppose it had been the first well drilled?

Q. Yeah.

A. Okay.

Q. -- and 640-acre spacing is the spacing.

A. Uh-huh.

Q. And if that well is going to drain the entire pod of its recoverable Devonian gas, how do the owners in Section 34 protect themselves?

A. They drill wells, hopefully at legal locations.

Q. If the well in 34 now is necessary to protect

themselves, those wells are 160 acres apart, are they not?

A. The well in Section 9 and the well in Section 34?

Q. No, the well in 33 and the well in 34.

A. I'm sorry, the well in 33 and 34.

Q. Yeah, they're 160 acres apart, right?

A. 160 acres apart? They are what, a half a mile apart? I would say a half a mile would be much more like 320, but I fail to see where you're going with this.

Q. Well, these wells are not 1650 apart, are they?

A. Well, let's see, I've got a scale over there, let's just look at it.

(Off the record)

THE WITNESS: Well, the wells in Section 33 and 34, those wells are 2400 feet, so they're close to a half a mile apart. And the well in 34 looks like it's a legal location of 1650 out of the south and west.

Q. (By Mr. Kellahin) When we look at Antelope Ridge, we've got four wells in a feature that has produced more gas and less water than the feature you see over for the Conoco 6 where we have one well that's produced the feature.

A. Yeah, I don't see any -- Okay, what's the point?

Q. What was the pressure on the test for the Rio Blanco 4 well in Section 4? I think it was 4047 pounds?

A. I'm sorry, are you talking about the pressure

that we observed --

Q. Right, your re-entry well.

A. -- on the drill stem test?

Q. Uh-huh.

A. The reservoir pressure?

Q. Uh-huh.

A. 6137.

Q. Are there any other pressures you have associated with the re-entry in Section 4?

A. You mean like shut-in bottomhole pressures?

Q. Whatever you have.

A. We would have a surface pressure -- No, I guess we actually would not have a surface pressure associated with that drill stem test pressure.

Q. Okay. When we look over at the Conoco 6 well in Section 6 --

A. Uh-huh.

Q. -- by 1995 do you know what the pressure was in that well?

A. No, I do not.

Q. If I told you it was 4047 pounds, for the sake of argument --

A. Where, bottomhole pressure?

Q. Yeah, bottomhole pressure?

A. I would not believe it.

Q. Okay.

A. It couldn't be.

Q. Would you expect, then, the bottomhole pressure that you have in the re-entry well to be the same as the bottomhole pressures of any of the wells over in the Bell Lake pod?

A. I would expect that based on the distance that we have removed, that what we observed is logical, and that's what's really good about this table, our Exhibit 10, is that you show that wells drilled much later than the Conoco well but in closer proximity to it have 400 pounds, 350 pounds, less pressure. We have something like 250 pounds less pressure, and that's probably due to the fact that we are a full two miles removed from the old Conoco well. So it really fits together quite well.

Q. Okay. What is your sense of the number of feet in the re-entry well? You've penetrated or tested 92 feet?

A. Yes, sir, we penetrated 92 feet and tested that entire 92 feet.

Q. Is it your sense that that entire 92 feet is contributing gas into the wellbore?

A. How can I say this? I would say 95 percent of the gas that we tested or that's being contributed to the wellbore is coming out of something like 40 feet of pay. It is certainly possible that some of the rest of the rock

is extremely modestly contributing gas.

Q. Do you see any fracturing affecting production in this area?

A. The fracturing that we have observed is fairly minimal. Having said that, I do think that there is.

And I have said it before, there is a certain amount of vertical permeability here, and that's witnessed by the fact that -- I mean, you have water that does rise from bottom to top in this reservoir. And if water can rise from bottom to top then certainly gas can rise from bottom to top, obviously not in as efficient a way as if the zones were perforated and flowing to the wellbore. But over time some gas could certainly migrate. I mean, if water can migrate up the structure, then certainly gas can migrate vertically to some degree too.

Q. The Rio Blanco 4 well has not provided us sufficient data by which you can actually calculate based upon that well the net feet of porosity for that well, can you? You have to do it by analogy with the other wells in the area?

A. Correct.

Q. Is it appropriate to assume that we could take the top of the Devonian in the re-entry well, calculate down to where you say the top of the gas is in that wellbore, and use that as the gas column?

A. To where the top of the gas is?

Q. Well, you've estimated a gas-oil contact in that wellbore.

A. No, not in that wellbore. We did not penetrate the gas-water contact in that wellbore. We are well short of it, so we can't make any estimate of an actual gas-water contact in that wellbore.

Q. Can you get it another way, by taking the structure map on Exhibit 7 for this hearing, finding the structural position for this and by subtraction figure out what the gas column would be above the gas-water contact?

A. Sure.

Q. What is that distance?

A. Well, if you're talking about -- if you're talking about the total from the top of the Devonian -- which is 11,072, right? -- down to 11,250, is 178 feet of potentially available gas contact at that location -- gas column at that location, of which we only penetrated a hundred feet, 92 feet.

Q. In Section 4, in the southwest quarter of Section 4, Mr. Landreth, there is an old well that was not deep enough, apparently, to drill into the Devonian, if I remember correctly.

A. Yes, sir.

Q. That would represent an opportunity to re-enter

an existing wellbore and deepen it into the Devonian, test it, and if you're successful you could hold your term assignment for the expiring term assignment in the southeast quarter of 4, could you not?

A. If I drilled a well to the Devonian?

Q. If you just took that and re-entered it like you did with the Number 4.

A. For a Devonian?

Q. Right.

A. Yes. I mean, it's not geologically appropriate, but somebody could do it, I guess.

MR. KELLAHIN: That concludes our examination of Mr. Landreth.

EXAMINER CATANACH: Thank you, Mr. Kellahin.

MR. KELLAHIN: For purposes of the record, we would move the introduction of what we have marked as -- by a letter number. It was a Devon exhibit that really was Mr. Landreth's original exhibit from the pooling hearing. I've lost track of my numbers. I think it was -- It should have been B. A was the BTA map. B should be --

EXAMINER CATANACH: So you've got A and B, Mr. Kellahin?

MR. KELLAHIN: Yes, sir.

EXAMINER CATANACH: Devon's Exhibits A and B -- Any objection to that?

MR. HALL: No objection.

EXAMINER CATANACH: Devon's Exhibits A and B will be admitted.

Mr. Bruce, did you have some questions?

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

EXAMINATION

BY MR. BRUCE:

Q. Mr. Landreth, your Exhibit Number 9, just one quick question on that one.

A. Okay.

Q. Up at the top it says Case 4. How many cases were run?

A. About 4. I think 4 was the number.

Q. Why did you use this one rather than 1, 2 or 3?

A. Well, I think I already testified to that, Mr. Bruce, and I also said --

Q. Well, I may have stepped out of the room.

A. -- that I'd be willing to bring out the others, bring out the others for review here, if you would like them. We do have them.

We used this case because we thought the porosity value was reasonable, even though it has very little bearing on permeability. Obviously, permeability was the key thing we were trying to determine here. But the net pay, we used 40 feet because we felt that that was a good

indication of the net pay based on drilling time analysis through the Devonian.

Q. Okay. Next, I'd like to look at your Exhibits 7 and 10 together, and just looking down at the Antelope Ridge, when was the Section 34 well drilled?

A. Let's see, we don't list that one on the table, do we?

Q. No, sir.

A. Section 34. Well, I've got a -- I probably have a scout ticket on it if you'd like me to -- Would you like me to get that and --

Q. Sure.

A. -- confirm that date? I have a little problem here because they changed well names on these wells somewhere along the way, so I don't know whether the scout ticket is going to show Antelope Ridge 34 or it's going to show some older name.

It was completed in September of 1964.

Q. And what was the pressure on that well?

A. Well, I don't know without going through the scout ticket. Would you like me to do so? And are we talking about a Devonian pressure?

Q. Well, that's what we're here for.

A. So which pressure do you want? I don't believe I have information on a bottomhole pressure in that well.

Q. Okay, that's fine.

Next question, the first well drilled was in Section 27, correct?

A. I'm sorry, I was still looking for that pressure -- Would you say that again?

Q. The first well drilled was the Section 27 well?

A. That's correct.

Q. Okay. And then the second well was the well in Section 4, and that actually had a higher pressure than the Section 27 well?

A. Yes, within the accuracy of the instruments.

Q. And then --

A. Let me address that. You can see that the pressure on the Harris well, the discovery well, was only a 60-minute pressure, so it's not quite as -- it's not -- You can see most of the other pressures here are longer than that, so it's arguable that it might not have been completely built up. But gosh, we're within spitting distance in any event.

Q. Then the next well drilled was up in Section 22, and isn't -- even though it's considered an Antelope Ridge-Devonian well, isn't that outside the reservoir?

A. Yes.

Q. And that only had a pressure of 6200, right?

A. That's correct.

Q. So that should be a virgin pressure, shouldn't it?

A. Well, you know, without addressing the flow rates from these wells during these tests -- The fact that that well was out of the reservoir, I don't know what it recovered. It could have had a low recovery. And again, with a 120-minute shut-in, if it had a low recovery, it might have still been building.

Q. Well, the well in Section 4 only had 127 minutes, didn't it?

A. Yes, but I believe its test was several million cubic feet of gas a day, and I'm sorry I don't know what the test was in Section 22, but --

Q. And then finally the well in Section 33 was drilled, what, 24 years after the discovery well?

A. Yes, sir.

Q. And 20 years -- more than 20 years after the adjoining wells were drilled, and it still has almost a 6200-p.s.i. pressure, doesn't it?

A. Yes, it does.

Q. Almost virgin pressure?

A. Well, I wouldn't call it virgin. Again, it's indicating --

Q. Well, it's equivalent to the one in Section 22, which is outside the reservoir.

A. Well, I don't have a comment on that.

Q. Okay, let's move on to your Exhibit 12. Now, first, you mentioned the State of Texas wells. Do any of these pools provide for optional spacing?

A. Truth is, I don't know the answer to that.

Q. Are you aware, for instance, that the Waha Pool provides for 40-acre optional spacing?

A. In the Devonian gas?

Q. Yes, sir.

A. 40-acre optional spacing.

Q. I'm asking you if you know.

A. I do not know.

Q. Now, down below in Section 2, you've got the State of New Mexico. Are these the only Devonian gas pools in southeast New Mexico?

A. I don't know if they are all of them. They are the ones that are in closest proximity to us.

Q. Well, your Exhibit 7 lists a couple of other Devonian pools, does it not? The Middle Bell Lake and the Bell Lake?

A. Well, the statement at the top, Mr. Bruce, says these are "Delaware Basin Devonian Gas Pools for which pool/field rules have been implemented".

Q. So you don't have any idea how many other Devonian gas pools there are in southeast New Mexico?

A. There might be one or two others, Devonian gas pools, in the Delaware Basin. I would say -- My guess would be, there might be one or two others in Eddy County.

Q. Now, finally, Mr. Landreth, you've asked that the well in Section 33 to the north not be allowed to produce if it's completed; is that correct?

A. We have -- Until such time as it can be -- as it can go through the customary hearing for an unorthodox location.

Q. I'm looking at the advertisement that's on the desk back there for this case. Does this proposed advertisement address that request?

A. I don't know, it's --

Q. Does your Application address that request?

A. Does our Application address --

Q. -- the request to essentially shut in the Section 33 well?

A. No, and I think we recognize that these matters need to be addressed at a future hearing. We're just suggesting proposed pool rules in case the Division wants to consider creating a new pool.

Q. Well, you're suggesting -- for one thing, you're requesting that the -- If you turn to your Exhibit 3 --

A. Uh-huh.

Q. -- you're requesting that the North Bell Lake

Pool be expanded to include the Section 4 acreage, and by implication the Section 33 acreage.

A. Okay, I'm sorry, which exhibit are you --

Q. Exhibit 3.

A. Of ours?

Q. Of yours. I'm just directing you to Exhibit 3, which is the current North Bell Lake Pool rules, which you include in your Exhibit --

A. Okay, I'm sorry.

Q. If you turn to the last page of that exhibit --

A. Of the North Bell Lake --

Q. Yes, sir.

A. -- Pool rules?

Q. And if you'd read paragraphs (1) and (2), what do they essentially provide for?

A. Well, they provide "That the locations of all wells presently drilling to or completed in the North Bell Lake-Devonian Gas Pool or in the Devonian formation within one mile thereof are hereby approved".

Q. So in essence, you're asking to amend these pool rules today?

A. Well, Mr. Hall, would you like to help me out with that question?

MR. HALL: I will, I will.

Q. (By Mr. Bruce) I'd like to have you answer.

You're the Applicant, Mr. Landreth, I'd like you to answer. Does your Application request that this provision of the North Bell Lake Pool rules be amended?

A. No.

Q. What about paragraph (2)? Doesn't that essentially provide even if the pool rules are expanded that an existing well can have a nonstandard spacing unit approved?

A. Existing wells in the North Bell Lake-Devonian Gas Pool. So how do we define a well there? Drilling or completed?

Q. Well, is the Devon well in existence today in Section 33?

A. Well, I guess I would argue that that might be a liberal interpretation.

Q. Well, but aren't you seeking to amend this provision of the North Bell Lake Pool rules also?

A. Well, I'd like to defer to legal counsel.

MR. HALL: Mr. Examiner, I think we're engaged in colloquy between counsel and the witness now. The Application speaks for itself. The proposed pool rules we're recommending speak for themselves. I think it's clear what's being requested.

I would also point out to the Examiner that at the time this case was filed, the Application given, there

was no well in the north half -- or rather the south half of Section 33.

I would also point out -- the parties all know this -- that on August 21st, this year, the Examiner admonished Devon, admonished all of the parties, to do nothing that would compound the problem presented by the pooling case in this case, and I think Mr. Bruce's question completely disregards that.

MR. BRUCE: Well, I'll cease the questioning, Mr. Examiner. I'll merely point out that Mr. Landreth is the one here asking for the changes in the pool rules, and he can't answer me whether or not his Application addresses this issue.

Q. (By Mr. Bruce) But getting to Mr. Hall's final statement, Mr. Landreth, when was this Application filed?

A. Which application?

Q. The one we're here for today.

A. Sometime in May, would that be correct?

Q. Okay, so it was originally scheduled in June?

A. To be heard?

MR. HALL: If you know.

THE WITNESS: I don't remember the exact date, I'm sorry.

Q. (By Mr. Bruce) Okay, I don't remember -- but originally scheduled for June sometime?

A. I assume so.

Q. And then it was continued a number of times?

A. By both sides.

Q. Why couldn't it be heard earlier? If you're asking for an emergency order now, why couldn't it be heard earlier?

MR. HALL: Well, Mr. Examiner, I'm going to have to object to this line of questioning. I think had Mr. Bruce participated in the case initially, all of the motions and pleadings filed in this case address that.

EXAMINER CATANACH: I'll let the witness answer the question.

THE WITNESS: So the question again? I'm sorry, Mr. Bruce?

Q. (By Mr. Bruce) Why couldn't this matter be heard, why couldn't you be here in June or July or August? I mean, you're chastising Devon and, by implication, my client about commencing a well in August. You had two months to conduct this hearing before then. Why couldn't you be here?

A. I will say again, the postponements have been mutual on both sides. But at the point in time when -- You know, what we finally decided, Mr. Bruce, was, you know, is there really any point to have a hearing? If we drill this well and we don't have a well, then all this effort is just

wasted. So why don't we just wait and find out if we have a well, and at the point in time when we have a well then let's have a hearing? And that's why we're here.

MR. BRUCE: Thank you, Mr. Landreth.

EXAMINER CATANACH: Anything further?

MR. HALL: I suggest we take a break.

EXAMINER CATANACH: Just -- in a minute.

Mr. Hall, we may have to -- I'm not sure your Application does address the issue over the Devon well, and I don't know if you've got the time to amend that Application. But yes, I will deal with that when I write the order, your request on that issue.

I just have a few questions of the witness and then we'll take a break.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Landreth, there are other Devonian pools in this area, as Mr. Bruce referred to, the Middle Bell Lake, and the one to the south, the Bell Lake --

A. Yes.

Q. -- and my research has indicated that those wells are spaced on 320 acres.

A. Statewide spacing.

Q. Did you -- When you looked for analogies to your well, did you look at these other two pools to see how the

reservoir compares to these fields here?

A. No, sir. My feeling is that they were marginal fields, and that's why the operators in those fields never bothered to come before the Division and try to get the pool rules established, because -- like in the case of the Bell Lake Middle field, I believe it's a one-well pool that turned out to be a marginal recovery. And so I guess I would not consider it to be fruitful to look at those particular cases as good analogues. I mean, we're up in an area where obviously you've got extremely good reservoir rock properties and such. I think we had the analogues that we were needing to use.

Q. Okay, you didn't list the cums on those wells, at least on your Exhibit Number 7. Are you testifying now that those are marginal recoveries?

A. Well, I don't want to say anything that isn't true, and I'm trying to think of somewhere I've got -- with me, where I could answer your question. And I'm sorry, I do not believe that I can tell you what those cums were.

Q. Okay. Can you provide that to me after the hearing?

A. Yes, sir, sure. Did you want that on Mid Bell Lake as well as -- is that the only field, Middle Bell Lake?

Q. How about Bell Lake also?

A. Bell Lake-Devonian.

Q. Yeah.

A. Okay.

Q. Looks like you had two producing wells down in Bell Lake that may have produced.

The current status of the Conoco well up in Section 6, that's not producing?

A. That's correct.

Q. Is it plugged, do you know?

A. It is not plugged, it's my understanding the well is not plugged.

Q. Okay. In Section 6 Conoco is no longer the operator? Is that your understanding?

A. Amerada is -- Boy, that's not a simple question. The operatorship has gone back and forth in there. When Amerada came in, Amerada drilled the wells. That's a federal unit, so Amerada drilled the wells. And sometime after completion they turned over operations to whoever it was at that time, Conoco. And then I understand that only in the last several months that operations have now gone back to Amerada.

And I don't know if that's to all depths or not, Mr. Examiner. I do know that Amerada, by virtue of the farmout trades that they made in here, did earn rights from some parties to all depths, but not all parties to all

depths.

So I may be making this unnecessarily complicated, but...

Q. So you don't know at this point whether or not Amerada has the right to complete the Devonian in their well?

A. I know that they own at least some Devonian rights in those wellbores, yes. But they may not have --

Q. But not all the rights?

A. They may not have all the rights, that's correct.

Q. Your testimony is basically that the Blanco well is in the reservoir, the same reservoir as the wells in Sections 6, 7 and 18?

A. Yes, sir.

Q. And that's basically based upon your pressure data; is that correct?

A. Yes, sir.

Q. Now, there are no other wells in the eastern half of this structure that could have been -- that could have drained that reservoir to reduce the pressure; is that correct?

A. In the eastern half of this -- You mean over where we are, basically --

Q. Yeah, over where you're at.

A. Where we are, on that portion of the reservoir?

No.

Q. That is the only penetration thus far, the Rio Blanco?

A. Yes, the only Devonian penetration.

Q. Okay, so that reduction of reservoir pressure over there could have only come, in your opinion, from the west side of that structure?

A. I believe that's true.

Q. Okay, so you're saying we have a common reservoir.

Now, given that we don't have any -- that you can't calculate any drainage data at this point, you're basing your request for 640-acre spacing on the reservoir properties that you've determined in the Rio Blanco well?

A. Pressure data as to the historical evidence of communication between wells, based on bottomhole pressure observations and the permeability that we have observed, the excellent permeability in our well.

Q. Okay. And according to your -- I think it's on Exhibit Number 11, you -- You don't have the permeability on this exhibit. What do you have the -- Oh, yeah, you do.

A. Yeah, I do.

Q. Down there in the Antelope Ridge you've got 4.5 millidarcies.

A. Yes, sir.

Q. And you don't have a figure for the Conoco well.

A. Well, simply because Shell happened to testify specifically to their permeability, Conoco did not. Obviously the permeability on the Conoco well, I mean, you had a well that had a calculated absolute open flow, I believe, of 30 million a day. So obviously it had extremely good permeability.

Q. But you don't have a number for that; is that right?

A. The AOF or the permeability?

Q. The permeability.

A. No, sir.

Q. So in your opinion it would be a lot higher than the Antelope Ridge?

A. That would be a tough guess. I don't know that I would say it would be a lot higher. I mean, Antelope -- I would say they're both quite permeable.

If you judge the permeability by AOF, and that is kind of a good parameter, I would say the absolute open flow on the Conoco well -- and I can get it here, I believe it was 30- -- something in the range of 30 million a day -- would compare pretty favorably with the -- you had -- I know one of these wells in Antelope Ridge after stimulation had an AOF of 40 million a day, another had about a -- 10 or 15, as I recall. So you're talking about comparable

among good wells to good wells.

Q. And then -- You don't have an AOF for your well, though?

A. No, sir.

Q. But are you pretty confident with your permeability number for your well?

A. You know, I frankly have been reluctant in preparing for this hearing to talk about specific flow rates and other specific reservoir parameters, but we have what looks like a pretty darn good well. That's probably not answering your question. I mean, we have every indication that that well has very good permeability. We have not stimulated it, and yet we had very little drawdown between points on our four-point test. I mean, I don't think there's any way -- I think your question is, do we believe the Schlumberger figure? Yes.

Q. Did you have any water production in that well during your test?

A. During the test, very minimal. And it was so minimal, I mean, to be honest, it was very hard to measure. I mean, we only flowed the well for five hours, some of that on very small choke rates that we're taking, you know, very small recoveries and trying to extrapolate them to 24-hour rates.

Things like gas gravity were -- I mean, we

analyzed everything we could, that we could get our hands on. Oil gravity, which compared favorably to the Conoco well. Gas gravity, basically the same as the Conoco well.

EXAMINER CATANACH: I think that's all I have of this witness. Are there any other questions at this point?

MR. HALL: (Shakes head)

EXAMINER CATANACH: Okay, this witness may excused, and let's take a 10-minute break.

(Thereupon, a recess was taken at 10:58 a.m.)

(The following proceedings had at 11:16 a.m.)

EXAMINER CATANACH: Okay, call the hearing back to order, and turn it over to counsel.

MR. HALL: At this time, Mr. Examiner, we would call Jim Stanton to the stand.

JAMES C. STANTON,

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

DIRECT EXAMINATION

BY MR. HALL:

Q. Mr. Stanton, if you would for the record, please state your name, your place of residence.

A. My name is James Clifford Stanton, and I live in Midland, Texas.

Q. How are you employed, Mr. Stanton?

A. I'm a geophysicist. I'm a consultant, I have my

own consulting practice.

Q. Right, and you've not testified before the Division; is that correct?

A. True.

Q. Would you give the Hearing Examiner a brief overview of your education background and work experience?

A. I have a bachelor's degree in mathematics from Texas Tech in 1970, a master's degree in geophysics from Texas Tech in 1972.

After I got that done, I went to work for Texaco in Houston as a data processor. I was there roughly a year and a half and was transferred to Midland where I was a data interpreter for a couple of years.

I left them in 1976 and went to work for the Hunt Energy Corporation in Dallas, which is a company I worked for for five years from 1976 to 1981. I was a staff geophysicist in Dallas for the first three years, 1976 through 1979, and I was transferred to Midland in 1979, and I was district geophysicist there for two years, 1979 to 1981.

In 1981 I left Hunt Energy to become a consultant and start a consulting business, and I've been doing that ever since. This is my 23rd year as a consultant.

Q. Do you have any experience in the Delaware Basin area?

A. Yes, I do. When I was with Texaco, the data I processed was behind Texaco's Delaware Basin crews. My assignments as an interpreter for Texaco were in the Delaware Basin. One of my duties when I was a staff geologist -- or geophysicist, rather, with Hunt in Dallas was to do and oversee seismic work in the Delaware Basin that was done by the company's Midland office, and I had occasion to work on various Delaware Basin projects as a consultant as well.

Q. All right, do you have any financial or ownership interest in the lands that are the subject of the Application today?

A. No, I don't.

MR. HALL: At this point, Mr. Examiner, we offer Mr. Stanton as a qualified expert geophysicist.

EXAMINER CATANACH: Any objection?

MR. KELLAHIN: No, sir.

EXAMINER CATANACH: Mr. Stanton is so qualified.

THE WITNESS: Thank you.

Q. (By Mr. Hall) Mr. Stanton, have you prepared a geophysical evaluation of the lands in Section 4 as well as the lands in the vicinity of the North Bell Lake-Devonian Gas Pool?

A. Yes, sir.

Q. And in doing that, did EGL Resources and Mr.

Landreth obtain new 3-D seismic data that you relied on in conducting your evaluation?

A. Yes.

Q. And have you prepared an exhibit in conjunction with your evaluation?

A. Yes, I have.

Q. All right, let's refer to Exhibit 17, please, sir. Would you identify that?

A. This is my final Devonian depth map of the 5.5 square miles of 3-D seismic data that Landreth and EGL licensed, I believe in July.

Q. And what methodology did you utilize to construct this map?

A. I used an isochron mapping method whereby I timed -- identified -- of course, first identified all the reflectors which -- or pertinent reflectors, which in my case are the Bone Springs and the Devonian for the purpose of this map. That was accomplished through two synthetic seismograms that I had within the project area, one in the Continental Number 6 Bell Lake and one in the Amerada Number 3 Bell Lake. And the reflection identifications I considered to be reliable.

So at that point I made a time map of the Bone Springs, made the measurements and made a time map, made a time map of the Devonian, and then constructed an isochron

map from the Bone Springs to the Devonian.

At that point I needed to have a velocity gradient, obviously, to reduce the interval times to depths, and I came to that by determining a velocity at each of the four shot points the well ties within the project area, which is the Conoco well, the two Amerada wells and now the Rio Blanco well over here in Section 4. Away from the control -- and that provided me with four control points, obviously.

Away from the control, I varied the velocity gradient slightly faster to the north and slightly slower to the south. In my experience, as you go towards the edges of the Delaware Basin, which is north and east from here, your velocity should be increasing slightly as you go shelfward, and that's the reason for how I completed the gradient away from the control.

At that point, I -- from the time -- I'm sorry, from the isochron map and the interval-velocity map, I then could construct an isopach map from the Bone Springs to the base of the Woodford or Devonian. At that point I hang that isopach value from a subsurface map of the Bone Springs, which was provided to me by Bob Landreth's geologist.

And the purpose of this mapping technique -- and it's the historical mapping technique, I think, in the

Delaware, whether you hang off the Bone Springs as I did, or hang off the Delaware lime as you can in some areas -- is to minimize as much as you can the effects of any near-surface problems you may have in your data area. This is not a particularly good data area, I don't think, although this survey, I think, is excellent. I think we have excellent data here, I have no criticism of the data. It's great, considering the issues that you have in this area.

So that's how the map was constructed.

Q. When you conducted your study, tell us what questions you were trying to answer, what were your conclusions?

A. I haven't lived this case, and I just have been involved with this since the data was acquired, and basically --

MR. KELLAHIN: Excuse me, I didn't hear you. I did not hear your answer.

THE WITNESS: I have not been involved in the case until the data was acquired or licensed by Bob Landreth and EGL.

And I was basically asked, obviously, to put together the map, what I thought the structural interpretation was, but I was asked also to pay particular attention to two things.

One was the low area between the Bell Lake North

field and the structure in Section 6, the high area in Section 6 where the Rio Blanco well is.

And secondly, I was asked to give an interpretation of the faulting at the Devonian level, where faults were present and maybe how large they would be and those kind of things.

Now, the structural position and -- Do you want me to just go on?

Q. (By Mr. Hall) Yes, go on.

A. Okay, the structural position or the low issue I'll want to talk about in a minute, but let me comment about the faults first.

I have a Geoquest workstation. I never really liked how you portray faults on that system, so the way I like to do it for my clients is make an overlay to the map that I create, showing where I think the faults are. And my interpretation -- That's how I did this.

And my interpretation that I provided to Landreth is the fault patterns that you see on Exhibit 7.

Q. So that was your contribution to the creation of Exhibit 7, you located those fault patterns?

A. Yes, such as they are on this 5.5 square miles of data, yes.

Q. Let me ask you this: What are your conclusions with respect to Section 4 as a separate reservoir from the

North Bell Lake-Devonian Gas Pool reservoir?

A. I'm not an engineer, but let me tell you how it was told to me and the way I thought it through.

I was told that that established gas-water contact of minus 11,340 was associated with the Bell Lake North field. And to me, intuitively, for this feature in Section 4 to be totally separated from the feature in Section 4, I should find values in this low between the two high areas that were always below minus 11,340 at some point. In other words, I would have to close off the Bell Lake North feature at an elevation of at least minus 11,340 from this other feature, for me to say with certainty that I thought the features were separated.

As a result of the measurements and calculations I made, I didn't come up with that. The way it calculated was that there was an area, kind of a saddle or a bridge, I guess, within that general low area, that connected these two highs at roughly minus 11,260.

And so based strictly on the seismic interpretation, if you've got a productive structure down to minus 11,340, I don't think you can separate this feature from this feature strictly with the low that's between -- the low trend that is present between the two high areas.

Q. Let's talk specifically about the faults --

A. Okay.

Q. -- that might be at play here. Why don't you tell us how you went about locating these faults and what your view is of the extent of that faulting, as you've shown it?

A. Let me kind of define what I think -- what I interpret as a fault. And I'll acknowledge that, you know, interpreters approach things differently, and I -- I'll acknowledge that. But my definition of a fault is a visual and distinct break in the seismic data, a displacement in the seismic event.

And in this case we're working on the Devonian, so what I would call a Devonian fault as I interpreted it would be a location where I had a time displacement. And it doesn't have to be a lot of milliseconds, I'm not saying it's got to be a lot. But it's got to be a discernible displacement of the two events that departs from the dip rate at least some.

A fold is not a fault to me. If I see the data turn over and I don't see a break in the data or a discontinuity there, I wouldn't call that a fault. I'd call that a fold.

On that basis, I did not think this area was heavily faulted. When I looked at the data, you know, deal -- can I do this now?

Q. Go ahead.

A. Let me just deal with the faults on what I think is on the east side of the Bell Lake North field. We just -- We don't have any data north of Section 6, but I pick up a fault, I think, in the very southwest quarter -- I'm not much of a landman.

Q. In Section 32.

A. -- 32, that I think runs roughly northwest, maybe north northwest-southeast, for maybe a half a mile and then dies out. That's what I see. I don't see faulting bounding the southern part of this feature.

Over on the feature that Landreth completed the well -- or drilled the well, or re-entry, recently, I see a couple of small faults that maybe go a quarter of a mile, one that kind of straddles the lease line between 4 and 33 and then one that's just -- oh, maybe, a thousand feet west of the re-entry. Beyond that, I don't see faults the way I define faults between these two highs.

Q. Now, the faults you've identified in Section 5, is the areal extent of that sufficient to result in a separation between the two larger features?

A. I don't think so. I would measure -- I would interpret the displacement on the faults on the order of 50 to 100 feet on the three faults that I've talked about.

Q. In your opinion, is that displacement between 50

and 100 feet, is that sufficient to create a barrier separating the two features?

A. Well, not to me. And I don't have the fault running all the way anyway, the whole length of the side of the feature, so... To me, I think you can get from the Bell Lake field to the lobe that Landreth drilled without crossing a fault, any fault.

Q. And you've explained why the low or the saddle in Section 5 does not act as a barrier. Anything further to add to that?

A. No.

Q. How about the Woodford shale in this area? Does it act as a barrier to separate these features?

A. Well you know, I'm not a practicing geologist, but my understanding is, it acts as a seal.

Q. But is it sufficient to act as a seal to overcome the fault displacement?

A. I'm not sure I understand. If you've got a 50-foot fault, that means -- and you have -- I think in this area we have roughly 200 feet of Woodford. Correct me if I'm wrong. But we would have -- If you had a 50-foot fault, obviously on the downthrown side of that 50-foot fault you'd have 50 foot of Woodford where you used to have 50 feet of Devonian. So obviously that's not productive. But below the base of the Woodford, I don't know why that

wouldn't be productive, as long as it was above the gas-water contact. I mean, I'm just speaking intuitively.

Q. And again, what's the vertical extent of the gas column we're dealing with here?

A. Well, what I was told it was originally was minus 11,340, and the top of the structure is roughly a minus 11,080, so what does that come to? 275 or something like that?

Q. So the displacement is not sufficient to act as a seal?

A. It's not a big enough fault to place, in my view, enough impervious material on the downthrown side to end the field, based on the size of that fault. That would be my intuitive belief.

May I talk about the lines?

Q. Yes.

A. We didn't talk about that.

On the exhibit there's three seismic lines that we chose to display, and the line numbers aren't on here for a reason. We're not allowed to put them on there for license reasons.

And the three lines that we've shown here from top to bottom on the left panel are north to south on the map. And the Devonian event that I've identified is marked in orange, and I believe we've written it in red off to the

right here.

Now, let me just talk about the northernmost one first. It's an east-west line that runs roughly through the Amerada Number 2 well. And we have this line here to kind of demonstrate -- kind of go along with my sermonette earlier about what I call the fault.

Over towards the left of the line you see what I would consider a clear break in the Devonian, an event of maybe 15 milliseconds or so. That is what I believe is a fault associated with the west side of the Bell Lake North feature.

Q. And you've indicated that fault on Exhibit 7 as well?

A. Yes, it is on here.

Over towards the middle of the display there's the placement of the Amerada Number 2 Bell Lake Federal, and by the way I define things I don't interpret a fault there at the Devonian level.

The next line is a line that is just -- Well, let me see how far it is. It's roughly a thousand feet south.

And by the way, these aren't arbitrary lines, these are actual -- these are what I call cross-lines which are just lines that are out of the data set. They're not arbitrarily drawn.

Again, the Devonian event is the one that's

marked in orange here with the name on it. And again between -- This line roughly runs from the Continental Number 6 well over here on the Bell Lake structure, down into this low area, and over to -- I didn't know that this was a Devon oil, I apologize here. I guess this is the well in the southwest of 4? I don't see anything that I would call a fault between those two wells. In other words, I don't see a fault along that line -- this line at all, from the west of the Conoco -- to the east of the Conoco well over here in Bell Lake North field.

Q. If I might ask you about that middle line, as you say, you define faults as distinctive events. And in my perception the only distinctive fault is that which shows up to the west of the Bell Lake --

A. Yes.

Q. -- 6 well, and that's the fault you displayed on Exhibit 7 --

A. Yes.

Q. -- just about right in the center of the section?

A. Yes. And the southern line is just more of the same. It's another line that shows, I believe -- We don't get quite as close to wells over here. We're on the south flank of the Bell Lake North feature now, and while you go into a nice low out here I don't see anything on here that I would call a fault.

Q. In your opinion, is there any advantage to utilizing three lines over, say, one line, in conducting an analysis like that?

A. Well, sure. I mean, the more data you can -- we obviously -- It would be nice, I guess, if we could trot out every line, but this is designed to show that in this area down here where I think the high and the low -- or the saddle in the low that connects these two larger highs -- these lines are drawn to show that through that 2000 feet or so, it's hard at least for me to interpret a fault there. And we've made three displays evenly spaced, relatively, to show that.

Q. Now, utilizing your definition of a fault being a visual and distinct event, you have perceived some, and you've reflected some of those faults in Sections 4, 5 and 6, and as you've explained, they're limited in horizontal extent.

A. Yeah, they don't go very far.

Q. Right. The fact that there are faults there, though, in each of those three sections, what do you conclude with respect to whether or not the horizontal extent of those faults are sufficient to act as a barrier between the features again?

A. Intuitively, again, I don't think the faulting -- on the picture that I believe here, I don't think the

faulting is a major part of it. I think this is a pretty good-sized structure of several hundred feet, and I think within it you have some minor faults that come and go, 50 to 100 feet. I'd almost call them cracks, as opposed to faults, just because they don't seem to be major.

Q. All right.

A. And I don't see how they could do much, other than be minor faults.

Q. Anything more?

A. No.

Q. Was Exhibit 17 prepared by you?

A. Yes and no. I did the maps and I provided this, and it was put together by Bob Landreth's office.

Q. All right.

A. I didn't physically do it, but I provided the information for it.

MR. HALL: At this point we'd move the admission of Exhibit 17, and that concludes our direct of Mr. Stanton.

EXAMINER CATANACH: Any objection?

MR. KELLAHIN: No, sir.

EXAMINER CATANACH: Exhibit 17 will be admitted.

Mr. Kellahin?

MR. KELLAHIN: Thank you.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. As part of your preparation in this case, Mr. Stanton, did you review the Devon geophysical presentation that they presented back to the Division on April 10th?

A. I saw -- I was given some exhibits, if that's what you mean. I've seen the exhibits.

Q. Did you review the transcript of the hearing in that case?

A. No, I did that yesterday. I didn't do it at that time.

Q. Did you discuss any of the geologic aspects of this case with Mr. Brezina?

A. No.

Q. Do you know who he is?

A. Yes. We office in the same building, I believe.

Q. Did you review any of the work he had performed in this matter?

A. No, sir.

Q. Did you utilize any of the two-dimensional interpretations that Mr. Brezina had made?

A. No, sir.

Q. Did you review Mr. Landreth's Exhibit 7 from the April hearing?

A. Which one was that?

Q. I'll show it to you.

A. I've seen things, but I don't know what number they are.

I don't know that I've -- I don't think I've seen that. I don't recall seeing that.

Q. When I look at the data set that you examined from the previous seismic information, and I'm looking at Mr. Landreth's Exhibit 17 for today, the area on the right side of the display, is this all representative of the data set that you worked with? Did it go outside the boundary of this --

A. Oh, oh --

MR. HALL: Make sure you're looking at the right exhibit. We're talking --

MR. KELLAHIN: The colored map that you're talking about.

MR. HALL: -- about 17.

THE WITNESS: Okay. Do I have more data than this; is that what you're asking me?

Q. (By Mr. Kellahin) What I asked you was, did you examine -- did this data set that you acquired, or Mr. Landreth acquired, that you examined, is all of that represented on this exhibit?

A. Except for one little piece that we had, that we bought to tie a Morrow out here.

Q. Okay.

A. Other than that, yes, this is all...

Q. Did you examine any data, 3-D data, that would have -- Let me see if I understand.

The colored part of your map, these squares appear to me to be consistent with the size of a section?

A. Yes, it's a land grid that was purchased from Tobin.

Q. Okay. So Section 4 is in the middle --

A. Yes -- No, Section 5.

Q. 5 is in the middle, next to 5 on the left is 6?

A. Yes, sir.

Q. Below 6 is 7?

A. Yes, sir.

Q. Did you extend any of this to make a geophysical analysis of how Section 7 related to Section 18 below it?

A. No, sir.

Q. So you stopped short of that?

A. Well, I didn't have any data. I was asked to work the 3-D data. Previous data they may have had, I wasn't involved in.

Q. Now, when we talk about this data, where was it licensed from?

A. The data -- Landreth acquired a license from WesternGeco.

Q. Well, that's the same company that Devon acquired

their license from, I believe.

A. Okay.

Q. You're not aware of that?

A. I understand -- I found out the last few days, apparently Devon underwrote this. I didn't know that.

Q. When I look at the colored portion of Exhibit 17 --

A. Uh-huh.

Q. -- am I correct in understanding that you have not placed any faults on this colored area of the map?

A. True. I haven't put any faults --

Q. I can't see them. You'll have to help me, I can't see them.

A. No, I haven't.

Q. When you placed the faults pictorially, it's your work product that we see on Mr. Landreth's Exhibit 7, this bigger map?

A. Yes, sir.

Q. When I look at the colored portion of 17, the horizontal green lines --

A. Uh-huh.

Q. -- they correlate to the vertical sections I'm seeing over on the left side of the display?

A. Yes, sir.

Q. When I look at the top green line and I look at

the Amerada Bell Lake 2 well in Section 5 down in the southwest quarter --

A. Uh-huh.

Q. -- the green line is slightly above the wellbore location?

A. Yeah, it looks like maybe a hundred feet or so, yes, sir.

Q. Is there any reason that you didn't draw that line through that wellbore?

A. Through the wellbore?

Q. Take a data set that would take your geophysical profile and display for us what the 3-D shows at that point.

A. No, actually all the lines from about the north line on down all look about the same. It was just a -- I guess maybe it would have been better to have it right through the well, but I -- I'm not sure why we picked that one instead of the next one down, to be honest.

Q. So when we look at Exhibit 7, the composite map, and I'm looking at Section 5, you have terminated the southern extent of the fault just before it gets to the Amerada Hess Bell Lake 2 well?

A. A few lines, yes, sir. I think it probably stops, if you look on your -- on Exhibit 17 there's a hand-drawn number there of minus 11,200. I think that's about

where that fault terminates, a few hundred feet north of the Amerada well, which I think is what is displayed here on the map.

Q. In looking at the Devon geophysical exhibits from the last hearing, do you recall that the Devon exhibit for this same fault continued a southern boundary of that fault all the way through Section 5, down into Section 8?

MR. HALL: Mr. Examiner, I believe he testified he didn't review that.

Q. (By Mr. Kellahin) Did you look at those maps?

A. I've seen them.

Q. Yeah.

A. I haven't -- You know, my idea of a review is more than just looking at them. I haven't scrutinized them, no, but I have seen them.

Q. So you can't explain for me this morning why you've stopped your fault line substantially shorter than the one Devon has portrayed for this same fault?

A. Yes, sir, I can explain it. I just don't see it. When I look at the data I don't see a break in the data from roughly where it's shown on the map to the Exhibit 7 till we run out of data to the south. I don't interpret a fault there. And, you know, I'm respectful of my colleagues; if they do, they do. But I honestly don't see it.

Q. Well, let's see if it's on your map. If you'll look on Exhibit 17 --

A. Okay.

Q. -- let's look at the first vertical section on the top, the top left.

A. Uh-huh.

Q. It says the Amerada Hess Bell Lake 2, and there's the wellbore and the projection downward with a blue line?

A. Yes, sir.

Q. When we project downward, the green -- the brown line appears to be coded to be the Devonian.

A. Uh-huh.

Q. Is that the top of the Devonian?

A. Yes, sir, I believe so.

Q. Well, look where the brown line and the blue line intersect.

A. Uh-huh.

Q. Is there not a change of character in the brown line that would be indicative of a fault?

A. Not to me. I just think there's a dip rate change in there, and you're dipping at one rate for several traces, and you're dipping at another rate for three or four traces, and then you flatten out a little bit. I mean, if you want to say there's a 2-millisecond fault there, Mr. Kellahin, I guess I would stipulate -- I mean, I

would agree with that, it could be. But to me that's not a significant displacement, worthy of a fault tag.

Q. When we look at the next set down on the left side, it's captioned Continental Number 6 Bell Lake Unit?

A. Yes, sir.

Q. Follow the well symbol dashed blue line and go down until you get to the brown line which is the Devonian.

A. Yes, sir.

Q. If you look over to the left, and I can't tell you how far that distance, but the brown line separates --

A. Yes.

Q. -- and drops down.

A. Yes.

Q. What is occurring there?

A. We have that interpreted as a fault.

Q. And where is that then shown on the right-hand portion of Exhibit 17?

A. Just to --

MR. HALL: Exhibit 7?

THE WITNESS: You mean 7?

MR. KELLAHIN: 17. 7 to find it.

THE WITNESS: I have -- Yes.

MR. KELLAHIN: Okay.

THE WITNESS: Yes, that's what I'm saying. Maybe I should have said a little more about that.

In my system, what happens -- you can place faults on your maps, but what happens is, you have to cover up grid and you have to cover up contour lines, and it's kind of a messy process, so I really don't like to put them on these maps. I like to put overlays to my maps and then place them on a more geological interpretation.

But the fault that I'm interpreting on these two lines, and I guess maybe on all three of them -- yeah, on all three of them -- is this brown fault that's shown just to the west of the Continental 6 Bell Lake well on Exhibit 7.

Q. (By Mr. Kellahin) Okay, I'm with you. Now, let's go in the same centered vertical section, and if you'll move to the right and find the Rio Blanco 4-2 well --

A. Yes, sir.

Q. -- when we look back on Exhibit 7, now, and we're looking at the Rio Blanco 4-2, which well on Exhibit 7 is being represented by that line?

A. I think this dryhole symbol in the very southwest of Section 4.

Q. Okay.

A. I apologize, I don't know the well names perfectly out here. I have to kind of wing it.

Q. When I go to Mr. Landreth's Exhibit 7, I see that

you've interpreted a fault just to the west of the Rio Blanco re-entry 4 well --

A. Yes, sir.

Q. -- shaded in brown. Where do I find that on any of these vertical sections?

A. You won't. I don't interpret a fault that far south in that area. I don't think it's faulted.

Q. Then what's the basis for putting the fault on Exhibit 7?

A. Well, up -- I thought you were talking -- I'm sorry, maybe I misunderstood your question. I thought you were talking -- asking me why that fault doesn't extend farther. Did I miss the question?

Q. Yes, sir.

A. Okay, I'm sorry, let me answer the right question.

Q. Yeah, let's go back up to the re-entry well.

A. Okay.

Q. There's one entered -- labeled with the blue?

A. Yes, sir.

Q. I see on this Exhibit 7, just to the west is the appearance of an interpretation by you of a fault.

A. Yes, sir.

Q. I'm looking for indication of that on the vertical section.

A. You won't -- there's no -- The lines that we have here are too far south of that fault as it's interpreted. In other words, if we'd included another one or two that went up to the re-entry, you would see the fault. But we are -- the lines that we're presenting are, I'd say, several hundred feet south of that fault, that interpreted fault location.

Q. Well, if you're trying -- if part of your project or the issues you're addressing is to determine whether the re-entry well --

A. Uh-huh.

Q. -- the 4 well, is fault-separated from something over in the Conoco 6, would you not have additional vertical lines across there to let us know?

A. I guess it would have been nice to bring one that showed a fault, but what we were trying to show with these lines was that -- my interpretation of the data is, there was not a fault that would necessarily separate the two highs in its entirety. I'm not saying there aren't little faults within the features, but I don't see faults that go the distance -- go from one end of the Bell Lake feature, from north to south, and on the west side of where Landreth has drilled or re-entered from north south, that separate the two features strictly by faulting.

And these lines are intended to show -- They're

not intended to show necessarily where faults are, but they're intended to show that down here in this area where I think the features connect at minus 11,260, that I don't interpret faulting there.

I mean, I guess we could have had more lines and more exhibits, I won't deny that. But the point of these was to show that there isn't faulting in this area where I think the features connect.

Q. In making your preparation, were you not curious as to where and in what ways the Devon geophysicist might differ from your conclusion?

A. Not at all, sir, I really -- I respect Devon and I've dealt with their guys. But my job really isn't to wonder about that. I mean, I -- My job is to provide my own analysis.

And if you want to say, you know, did you wonder? Well, I won't deny that I might have wondered. But trying to figure it out, I just didn't take any time to do that.

Q. Okay. Let me ask you about your methodology. How did you satisfy yourself that in making the analysis you located the top of the Devonian?

A. I was given the tops from Landreth. Are you talking about the geological information?

Q. Yes, sir.

A. I received that from Landreth's geologist.

Q. Did you make any adjustments in your analysis based upon information derived from the re-entry well in Section 4?

A. Yes, I used that well top.

Q. All right, so --

A. Yeah.

Q. -- you utilized the latest information --

A. Yeah, in fact, this map I think is dated September 18th, and it was my final revision based on finally getting a log top on that well.

Q. Tell me again how you solved the near-surface interference kind of problems in distorting what you might see in the Devonian.

A. I just got below it.

Q. Uh-huh.

A. And typically --

Q. How far below did you go?

A. To the Bone Springs.

Q. Okay.

A. And I think that was my only choice in this area. And I don't want to get into all the problems, because I know Devon knows all about them, they were real involved in -- But I would prefer to use the Delaware lime to hang off of, or a Delaware event, but the Delaware then isn't continuous in here and it appears that there's places in

the Delaware Basin where there's solution of near surface and collapse in the evaporites up there, it fills in with real slow-velocity material and it gives seismic a lot of trouble.

And the way you get around that is to get to an event down beneath it that you have faith in and is put together well, and do isopach work off of that event, and that's what I did. And that's the Bone Springs in this area. It can be the Delaware in a lot of areas, but in this area it's the Bone Springs.

MR. KELLAHIN: Thank you, Mr. Stanton. No further questions.

EXAMINER CATANACH: Mr. Bruce?

MR. BRUCE: I have no questions.

EXAMINER CATANACH: Just a couple.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Stanton, the main purpose in this exhibit is just to demonstrate that there is no fault that would separate the two structures here; is that really the --

A. Well, to present the structural interpretation, yes, sir, because your faults are presented more on Exhibit 7, but this is a structural interpretation of the area off of the 3-D data.

Q. And it's your interpretation that there is no

fault that separates these two structures?

A. Yes, sir, it's my interpretation that there is no fault that runs from one end of the feature to the other, even low, that could separate it. I don't think there's a fault present. Whether it could separate or not, I don't think a fault is there.

Q. So again in your opinion, you believe that these two structures are in communication?

A. They sure could be. I think they connect at a level at least 70 feet high to what I was told was the old gas-water -- original gas-water contact of minus 11,340. I believe they connect at around minus 11,260. And I'm not an engineer, but all things being equal I think they could communicate, yes, sir.

EXAMINER CATANACH: Okay, I have nothing further.

MR. HALL: Just briefly, Mr. Catanach.

REDIRECT EXAMINATION

BY MR. HALL:

Q. Mr. Stanton, does the WesternGeco license limit your ability to display more data than we've shown here today?

A. I haven't read the license agreement, but I know they are restrictive. Maybe Mr. Landreth would be a better person to answer that, but I know they don't -- we couldn't put line numbers, and I think it would have been in bad

form if we'd have had 15 lines in here. I don't think they would have liked that.

Q. Okay. If you look down in the display where it covers Section 9, you show some data going into the western portion of Section 9, but then it's discontinued. Why was that data left out of the display?

A. Oh, over here?

Q. Yes, sir.

A. Right there? I was asked to cut it out. Mr. Landreth could answer that, should answer that.

Q. For proprietary reasons?

A. Yes.

MR. HALL: All right. Nothing further, Mr. Examiner.

EXAMINER CATANACH: Anything further of this witness?

This witness may be excused.

Anything further, Mr. Hall?

MR. HALL: That concludes our case on direct.

EXAMINER CATANACH: Okay. I guess at this point we'll take a lunch break and we'll reconvene about one o'clock.

(Thereupon, noon recess was taken at 11:57 a.m.)

(The following proceedings had at 1:10 a.m.)

EXAMINER CATANACH: At this time I'll call the

hearing back to order and, I believe, turn it over to Mr. Kellahin.

MR. KELLAHIN: Mr. Examiner, Devon's first witness is their petroleum geologist, Mr. Steve Hulke.

STEVEN D. HULKE,

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. Hulke, for the record, sir, would you please state your name and employment?

A. My name is Steve Hulke. I work for Devon Energy in Oklahoma City.

Q. On prior occasions have you testified before the Division?

A. Yes, I have.

Q. And in fact, you were one of Devon's witnesses back on May [*sic*] 10th in the compulsory pooling cases, were you not?

A. I was prepared to testify, I did not.

Q. But in other cases you've done so?

A. Yes, I have.

Q. Summarize for us your education.

A. I have a bachelor's degree in geology from Carleton College. I have a master's degree in geology from

the University of Texas at Austin.

Q. Summarize for us your employment experience.

A. I have approximately 29 years of experience as a petroleum geologist working in many basins in North America. Fifteen, 16 years of that is in working the Permian Basin, mostly on the New Mexico side.

Q. Are you familiar with the subject matter involved in this Application --

A. Yes, I am.

Q. -- by Mr. Landreth?

A. Yes, I am.

Q. And you have examined the geologic details involved in the Devonian?

A. Yes, sir, I have.

Q. Have you worked in association with a geophysicist to assist him in providing geologic markers so that he can evaluate his data?

A. Yes, I have.

Q. And based upon your research, are you satisfied that you had a sufficient database of geologic information upon which to base your expert opinions?

A. Yes.

Q. And as part of your study have you prepared certain displays for introduction today?

A. Yes, I have.

Q. And those displays represent your work product?

A. Yes.

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

EXAMINER CATANACH: Any objection?

MR. HALL: No objection.

EXAMINER CATANACH: Mr. Hulke is so qualified.

Q. (By Mr. Kellahin) Mr. Hulke, let's break this down into components. I've put on the easel next to you Devon's Exhibit Number 1, and we've passed out copies of that same display to the participants.

Before we talk about the details of the displays, including Exhibit 1, let's talk about some of the general themes that you're going to address. First of all, when we look at the geology, do you have an expert professional opinion about the structure of the Devonian?

A. Yes, I do.

Q. Does that opinion include Sections 6, 5 and 4?

A. Yes.

Q. In addition, have you made a regional investigation of the geology to see whether or not the features you are locating in the area in question are similar to other Devonian features?

A. Yes, I have. We purchased about five townships worth of 3-D data in Lea County, and before we purchased it

I did reconnaissance work to determine if it was worthwhile to purchase it.

One of the zones we felt was prospective was the Devonian. We have purchased that data, and those original reconnaissance maps have been updated on a regional basis. This is a piece of that regional work.

Q. When did you first start doing the work?

A. When we first started thinking about purchasing the data, about January, 2001.

Q. Summarize for us, then, the major topics of your investigation, particular with regards to how you describe the structures and whether or not you can conclude there is a geologic disconnect between Section 6 and Section 4.

A. Okay, I've looked at all of these Devonian fields, and I've found that all of them are fault-bounded on at least one side. They tend to be compact structures, they tend to be relatively small. By compact I mean the length to width is maybe one mile to two miles. By simple structures I mean that they're not chomped up by a whole bunch of faults. There's generally just one or two major faults. They might be short, secondary faults, but they tend to be simple.

Additionally, the structures are filled to spill. So if there is, say, 200 feet of structural closure, there tends to be about 200 feet of hydrocarbon column.

Additionally, I would say that it's not necessary to have -- in this example, 200 feet of column, it's not necessary to have 200 feet of throw on the fault, because faults trap in two ways.

One is that the reservoir rock on one side of a fault is juxtaposed to nonreservoir rock on the other side of the fault.

The other is a phenomenon called fault-gouge, which is very common when you have two very hard rocks that are compressed and rubbed against each other. They don't slide past one another like dominoes. There's a grinding of the rock, and it creates a rock flour, rock gouge. We've seen it in outcrops many times. It's impermeable.

So you can have a fault throw of, say, 100 feet and a few inches of fault-gouge and you have an impermeable boundary. We see it in other formations with -- a couple tens of feet of throw is still enough to create a seal. So I think that summarizes what I know on the structure.

Q. Have you satisfied yourself that Section 4 is geologically separated from Section 6 in the Devonian feature?

A. Yes. Yes, I have.

Q. When we look at the Devonian feature within the structure, how do you characterize the vertical and lateral continuity of the Devonian?

A. Stratigraphically, the Devonian is not -- It's not a homogeneous reservoir. It doesn't have, say, throughgoing 10-percent porosity. It has intervals of low porosity and intervals of higher porosity. These intervals are connected inefficiently, either because when they were deposited or as they were created diagenetically, a zone that's high is connected to a zone that's low by some additional porosity between the two that we don't see on logs, or there can be vertical fracturing that connects zones of higher permeability and porosity. So it is not homogeneous.

Q. When you look at Exhibit 1, and from a geologic perspective alone, is there a geologic explanation as to why we see what appears to be a well density pattern of about one well per 200 acres or 160 acres? What's the geologic explanation for that?

A. I don't understand the question.

Q. If you have a well in this feature, are we going to be able to access all these lateral portions of the Devonian with a single wellbore?

A. No, not all of them.

Q. Why not?

A. Some of the zones -- As I said, the higher-porosity zones are in some cases very areally extensive, in other cases they may cover an area the size of this room or

the size of this building, and they're not efficiently connected, there's not a pipeline between these different porosity zones. They are of differing areal extent and vertical extent.

Q. Let's take Exhibit 1 now and have you characterize for us what we see in the Devonian as a typical characteristic feature of the geologic presentation of that formation.

A. Please repeat the question.

Q. Describe for us Exhibit 1 and how it fits with your conclusions about the Devonian.

A. What I have on Exhibit 1 is just a location map for the existing fields in the Devonian and the Rio Blanco prospect area. I also have a data box at each of the fields telling its name, when it was discovered, how much the field has produced, how many wells there are, where I interpret the original gas-water contact to be, and the amount of the original gas column.

This was important to us in a reconnaissance sense, because we were contemplating spending an awful lot of money to generate prospects, some of which would be Devonian prospects, and we wanted to have some idea of how big a Devonian prospect had to be to be worthwhile. We're talking about spending an awful lot of money to test these things, and we wanted to see if these features are so

subtle that we can't tell a big one from a small one.

What I depict here is that there are three features -- North Bell Lake, Bell Lake and Antelope Ridge -- that are worth finding.

And there's one feature that it isn't worth spending the money to get there. That's the Bell Lake Middle-Devonian field. Bell Lake Middle has about 79 feet of column, the others have well over 250 feet. And we can tell the difference between these fields when we do a structural interpretation with our 3-D.

Additionally, we can look at the trapping geometry. The trapping geometry on the existing fields includes -- in all cases it includes north-south-trending faults. They may go as far as 30 degrees off of directly being north-south.

The Bell Lake Middle feature is small, it's an anticlinal closure, and when it gets to the fault that fault doesn't seal because across the fault from the Devonian there is the Morrow. So any gas that would have migrated into that feature, once it got beyond the anticlinal closure it leaked across into the Morrow.

Additionally on that map I have -- the red outline is the OCD Devonian fields, field outlines, which I got from the OCD website. So for instance, at Antelope Ridge geologically the field is defined by the brown fault

and the blue gas-water contact, but the OCD pool outline is all of Section 4, all of Section 33 and 34, and all of Section 27.

Also at each Devonian penetration on this map, I have either a filled green circle, indicating that it was a producer, or an open green circle, indicating that it was a dry hole penetrating the Devonian.

I have the subsea elevation of the Devonian at that well, and I have the date that well was completed.

Q. Mr. Hulke, what's the specific trapping mechanism in the North Bell Lake-Devonian?

A. North Bell Lake is a structural accumulation. It has bounding faults on the east and west. North closure is achieved by dip, south closure is achieved by dip. To the west it's fault closure and to the east it's fault closure.

Q. When we look at the Section 4, Rio Blanco 4 Devonian Pool, describe the specifics of that trapping geometry.

A. Okay. The Rio Blanco structure has a large piece and a much smaller piece. The large piece is on the high side of a north-south-trending fault that goes about through the -- It's close to the west boundary of Section 4. North dip is achieved by north closure as well as east, and southeast closure is achieved by structural dip.

There's a smaller piece of it on the down side of

the fault, which we map to be about a half a section in areal extent, in which that trapping structure is against the low side of the same fault. We have a secondary fault on the crest of the structure which doesn't have much throw on it, and a secondary fault on the southeastern portion of the structure. These are not part of the trapping geometry of that prospect.

Q. In North Bell Lake-Devonian you've indicated on that display your opinion about the gas-water contact?

A. Yes, sir, I have.

Q. Do you have a gas-water-contact opinion with regards to the Section 4 pool?

A. Yes, at North Bell Lake I mapped the gas-water contact and the lowest closing contour at minus 11,362. At Rio Blanco the lowest closing contour is at minus 11,250. We believe that is also the gas-water contact.

Q. And why is the gas-water contact important in this area?

A. The gas-water contact is important because it defines the bottom of the hydrocarbon column. It also tells us where the lowest closing contour ought to be. So when our geophysicist has data over a prospect, I can tell him not just the top of the Devonian there, but I can also tell him the value where the structure ought to close.

For instance, at North Bell Lake the bottom of

the hydrocarbon column is at 11,362. That's where it ought to close. At Bell Lake Mid, the bottom of the hydrocarbon column is at minus -- it's at 11,230 feet below sea level. That's where that structure ought to close.

So these are -- The gas-water contact is a guide to our geophysicist's structural interpretation just as much as the top of the Devonian is.

Q. Let me show you Mr. Landreth's Exhibit 7 from his presentation this morning in this case. What in your opinion is wrong with Mr. Landreth's geologic presentation as shown on Exhibit 7?

A. Well, I explained that our exploration model for the Devonian is simple structures. This is not a simple structure, it's not a compact structure. It has three crests, which we don't see in any other Devonian field that I have looked at.

The faults -- I don't quite understand the fault interpretation. Apparently they are intermittent, and they're not keys to the trapping geometry on the structure which my work indicates is necessary.

I disagree with the original gas-water contact stretching all over -- around all three of these structural crests. We see that the North Bell Lake and the Middle Bell Lake structures have different gas-water contacts, and we would expect -- and by the way, all of the other

Devonian fields have different gas-water contacts, and we would expect that any prospects would have different gas-water contacts.

So this structure is unlike any other Devonian field I've seen in my work.

Q. Let's turn now to your Exhibit Number 2, Mr. Hulke. You've analyzed for us the structural interpretation. Let's see how we look at the reservoir within its lateral components and how those lateral components are arranged horizontally. If you'll take a moment and unfold this display.

A. Exhibit 2 is a structural cross-section that connects six wells. The six wells are -- The first two wells on the left are in Sections 19 and 18 on the Bell Lake Middle-Devonian structure. The next three wells are in Section 6, Section 6, Section 5 of North Bell Lake-Devonian field. The last well, the rightmost well on the cross-section, is the Rio Blanco 4-1 well.

And this structural cross-section follows the structural map on the top of the Devonian which our geophysicist will be presenting in a few minutes.

The Middle Bell Lake structure on the left is clearly separate from the North Bell Lake structure in the middle and the Rio Blanco structure on the right.

Additionally on this map, on this cross-section,

the green data is all with respect to the Devonian. I've listed all of the DSTs, the cums in the Devonian. The pressure data our petroleum engineer will discuss somewhat later this afternoon. We've tried to put as much of the Devonian data as possible on a single piece of paper.

The cross-section also shows the original gas-water contact at Middle Bell Lake and at North Bell Lake.

Q. Walk us through the analysis so that we can see the reasons you're displaying on this exhibit that support your conclusion about the separation of Section 4 from 6.

A. Okay. On our Devonian structure map we have south dip on the south end of the Bell Lake, middle structure which is depicted on the extreme left-hand part of the cross-section. The top of the structure is relatively flat. The well in Section 18 is a little bit higher than the one in 19.

We have a very substantial low in Section 7, which clearly separates the Middle Bell Lake and North Bell Lake structures.

In Section 6 and 5, all three wells on the top of North Bell Lake structure are within about nine feet of each other, so it's a pretty flat-topped structure.

Then we cross a substantial fault, we cross a fault that has -- it looks like about 200 feet of throw. We drop down in Section 5, just beyond the North Bell Lake

Number 2 well, just to the east of that. We drop down about 200 feet, it goes into a little low.

The line of the cross-section then goes up and rolls over into the downside of another high-angle reverse fault. It faults up approximately a hundred feet, 90 feet, something like that, to the top of the Devonian on the high side of the Rio Blanco fault, the high east side of the Rio Blanco fault, which is also -- and the Rio Blanco structure is somewhat flattopped, and then there is east dip off the crest of that structure.

Q. Are you satisfied, Mr. Hulke, that the re-entry well in Section 4 is geologically disconnected and separated from the Conoco Number 6 well in Section 6?

A. Yes, sir, I am.

Q. Let's set this exhibit aside and go to the next exhibit. Mr. Hulke, before you describe Exhibit Number 3, let's orient the Examiner as to where these wells are that are displayed on the cross-section.

A. Okay. As I explained before, cross-section A includes six wells. Cross-section B includes only three wells. They're the three wells at North Bell Lake, going from the well drilled in 1960, the only productive well, to the well in the northeast of Section 6, to the well in the southwest of Section 5.

Q. Having constructed the structural cross-section

among those three wells, what are the important conclusions that you've reached from doing this work?

A. It's very clear that the porosity development in the Devonian is not homogeneous, and it is inefficiently connected.

Q. Illustrate that for us.

A. Okay, if we -- Let me describe what I've got here. The cross-section is hung on structure, but the top of the Devonian is pretty flat, as I said before; the tops are only about nine feet apart, so it's almost a stratigraphic cross-section.

What I did was look at the gamma-ray curve, which is to the left of the depth bar in each log. I correlated the gamma-ray curve across, and you can see right under the top of the Devonian I've got the Devonian 2 mark, which correlates across the Devonian 3 mark in blue, which correlates across also with the Devonian 4, 5, 6, 7. These indicate gross intervals within the Devonian which are correlative.

However, within those gross intervals the porosity is inconsistently developed, and the way I chose to depict that was by calculating the porosity -- By the way, all these are sonic curves, it's the only common set of logs I have in all three wells. I was -- We're lucky that we do have a consistent set of logs throughout.

I calculated the porosity in a dolomite. Where the porosity exceeded 3 percent, I color-filled this yellow color. When it exceeds 5 percent it's color-filled in the tan or orange color. Where it exceeds 7 percent it's in the red color.

So for instance, at the first interval from the top of the Devonian -- it might help to turn this cross-section on edge -- if you look at the porosity in the top interval, from the top of the Devonian to the green, it's very clear that the porosity in the first well on the left probably correlates to a porosity interval that's at about 13,600 feet in the well in the middle, and it does not appear to be present -- or if it is present it's a very low-porosity interval -- in the well on the right.

Additionally, right at the top of the Devonian there's a high-porosity interval on the right, two high-porosity intervals in the middle, and it's almost gone when we get to the well on the left. As we go down, you'll see that's a common theme. These high-porosity intervals correlate, perhaps, between two wells. More than likely they don't correlate very well at all.

One that is especially obvious is the interval between the gray and magenta markers in the middle well. There's a very nice porosity development at -- below 14,750. There's about a foot of it left to the right, and

it's not present at all on the left.

Also, we can look at -- just look at this in the big picture. If you stand back and look at the porosity development in these logs, you'll see that in the well on the right there's not very much porosity developed at all. In the well in the middle, gosh, there's a ton of it. And when you look at the well on the left it's what, about a third, 40-percent developed in this well? So it is clearly not a homogeneous reservoir.

Q. Is this the kind of evidence you'd find in a reservoir in which you would expect a single well to drain 640 acres?

A. To drain a large area like 640 acres, I would expect relatively homogeneous reservoir, and I would expect it to be isotropic in that it is the same in every well and in all directions. I'm not seeing that at all here.

For instance, if we go from the productive well on the left, to the east, the well that's on the right in the cross-section, clearly the porosity development decreases to the east. However, if we go to the northeast, to the well in the middle, clearly the porosity development increases to the northeast. So it's not the same everywhere and in all directions.

This is not at all uncommon in the carbonate. It's why we drill lots of wells in carbonates and why we

drill horizontal wells in carbonates, trying to hook up fractured porosity and porosity zones.

Q. Let's turn to another topic now. If you'll put aside this Exhibit Number 3, let's turn to Exhibit Number 4, Mr. Hulke. Identify for me what Exhibit 4 is.

A. Exhibit Number 4 shows all of the logs we have in the Rio Blanco 4-1 on a single sheet of paper. The logs are tied to the top of the Devonian. Additionally, there's a porosity zone near the base about 18 feet above TD in the well which I think probably correlates across to the porosity log, but it's a pretty flaky porosity log. So it's a much thinner line than the top of the Devonian.

Q. Is this a log that was generated by EGL Resources when they re-entered the Rio Blanco 4 well?

A. Yes, it is.

Q. So this represents the new data out of that well?

A. Yes, the mud log is on the left, neutron density on the middle, the resistivity log is on the right.

Q. Was this well drilled deep enough to encounter the gas-water contact in this reservoir?

A. No, it was not.

Q. Is this the extent of the log information available?

A. Yes, it is.

Q. What conclusions as an expert can you reach by

this analysis?

A. I can't use these logs to learn very much about the reservoir. The porosity log is invalid because of tool failure. The resistivity log I've shaded in purple where there's an invasion profile. When there's a difference between the shallow resistivity and the deep resistivity, it's a potential indicator of permeability, so I've shaded that here. There's just not very much information available here to tell me what the reservoir parameters are, beyond picking the top of the Devonian.

Q. What kind of reservoir parameters would you need?

A. The other cross-section we had, the three-well cross-section, tells me that we ought to -- the effective porosity through the entire gas column is in the neighborhood of 4 or 5, 6 percent, something like that, and I've arrived at that number by going to the Bell Lake Unit Number 6 well and taking the digitized curves and calculating the porosity on a half-foot basis, adding it up, dividing it through, so I get a total average porosity of about 4 percent. There's additionally secondary porosity beyond what we see on the sonic log of probably a couple percent, no more than that. So the effective porosity is in the neighborhood of 5, 6 percent for the entire interval.

Q. If you're trying to aid the petroleum engineer in

making calculations of potential drainage areas for the Rio Blanco 4 well, is this log data of any use?

A. The log data from the 4-1 is not of any use, beyond the top of the Devonian.

Q. Let's turn to a different topic, Mr. Hulke. Would you take a moment and unfold Exhibit 5?

A. Exhibit 5 has a dot for -- showing the location of every single Devonian gas pool in southeast New Mexico. These pool names and locations came from the OCD website. The additional thing is, the dots are colored, indicating whether the spacing units are 160 acres, 320 acres or 640 acres. Those numbers came from the pool rules, which Jim Bruce researched for us.

Q. Are the color codes indicative of anything other than a spacing unit size?

A. No, they're not.

Q. And when we look at this tabulation of information, we're dealing with gas pools, are we not?

A. Yes, absolutely.

Q. Before we leave this display, let's have you identify the companion exhibit to this display, Exhibit Number 6. You also prepared Exhibit Number 6?

A. Yes.

Q. What's the source of your data?

A. The same source, OCD gas pools and the field

rules as researched by Jim Bruce. There are three parts of this.

The bottom is a simple list, an alphabetical list with the name of the gas pool, the spacing unit size and the date the pool was established.

The top of it simply shows by decade when these pools were established, and it indicates that from the decade of the 1940s through the decade of the 1990s there's been no clear trend of pool spacing unit size increasing, decreasing. No trend.

The pie chart in the middle is just another way of depicting the pool size for the 21 gas pools. Eleven of them are on 320s, seven on 160s, three on 640s.

Q. Your conclusion, then?

A. My conclusion is that 640-acre spacing has occurred in three out of 21 of the gas pools, and it's certainly not the norm for the Devonian.

MR. KELLAHIN: That concludes my examination of Mr. Hulke. We move the introduction of his Exhibits 1 through 6.

EXAMINER CATANACH: Any objection?

MR. HALL: No objection.

EXAMINER CATANACH: Exhibits 1 through 6 are admitted.

Mr. Hall?

CROSS-EXAMINATION

BY MR. HALL:

Q. Earlier, Mr. Hulke, you said that Devon had undertaken a fairly extensive evaluation project for Devonian prospects in the area, it had acquired a great deal of seismic data; is that correct?

A. Yes.

Q. Over what area?

A. Actually, our recon efforts started at -- it was before Devon at Santa Fe; I brought the trend with me. It started in 1998 with some aeromagnetic data that covered all of Lea County, New Mexico, and it continued -- I guess it covered all of Lea County.

Q. All right, so it's something you brought over from Santa Fe Energy?

A. Yes.

Q. When did Devon management become interested in the Devonian out here?

A. When I showed them the results of the reconnaissance effort from the aeromagnetic data. This would have been the fall of 2000.

Q. So this was after Mr. Landreth brought the prospect to Devon?

A. I don't know what that date was.

Q. You're saying fall, 2000 --

A. Well --

Q. Go ahead.

A. -- if he brought the -- if he mentioned the prospect to us before 1998, yes, that's true.

Q. Does Devon's evaluation include Section 4?

A. Section 4 of --

Q. -- 23 South, 34 East.

A. Yes, of course, that's in Lea County.

Q. And do you know if Devon has approached OXY about acquiring any of OXY's rights in the south half of Section 4?

A. No, we have not.

Q. Do you know whether it's been discussed in-house at Devon?

A. I have not been a part of one of those discussions.

Q. Have you recommended to anyone in-house at Devon that they pursue those OXY rights in the south half of 4?

A. No, I haven't because I know that it would be a sensitive topic.

Q. Why would it be sensitive?

A. Because it's in dispute, it's part of this situation.

Q. Do you know whether your land staff has contacted OXY about acquiring those rights?

A. No.

Q. You simply don't know, or they have not contacted them?

A. I don't know if they have.

Q. Okay, is there anyone else here from Devon that could answer those questions?

A. You'd have to talk with our land department.

Q. Okay. Is there anyone else that came to the hearing today that would know?

A. I can't answer that, I don't know what they know.

Q. Okay. Let's talk about your Exhibit 1 briefly, Mr. Hulke. I understand you correctly, did you incorporate your 3-D data in constructing this exhibit?

A. Yes, each of the -- we have 3-D that includes -- that goes down to about the township line, perhaps a little bit of it, but the south township line of 23-34. So those contours have come from the 3-D interpretation at the fields.

Q. Does Devon plan on presenting a geophysicist witness today?

A. Yes.

Q. Would that witness be able to tell us how these faults were located as you've shown them?

A. I think so.

Q. From your own personal involvement in

constructing this exhibit, can you explain to us how you determine that the faults you've shown on the exhibit have the horizontal reach that they do? What did you use to draw them so long?

A. I used the geophysicist's interpretation for the amount of throw and the location of the faults.

Q. Earlier you testified about a concept I've not heard of before called fault-gouge. Explain that to me a little bit more. As I understand it -- correct me if I'm wrong, but the movement of the rock, you contend, results in a decrease in the permeability; is that right?

A. That's correct.

Q. There's some sort of a shearing activity that occurs on movement?

A. When hard rocks are faulted -- well, these -- first let me explain that these are high-angle reverse faults, and they occur from compression, the rocks are being driven together. And they don't slide past each other like dominoes or like a Teflon-coated surface. These rocks grind past each other, and they grind -- each side of the fault, where the rock meets and is moving past each other, it's ground into a flour-like consistency called rock flour or fault-gouge. It's a well-known phenomenon.

Q. Why doesn't that grinding, that breakup action, actually enhance permeability and communication across

the --

A. Because the -- It's called rock flour because it has the consistency of flour, and it's a gooey, impermeable or -- I shouldn't say impermeable -- extremely low-permeability substance.

Q. Do you have any evidence that substantiates that that's what may have occurred in this area?

A. Yes, I do. That may have occurred -- it has occurred here and in other areas, because it is not uncommon to see hydrocarbon columns that exceed the amount of offset on a fault.

Q. Why doesn't that movement of the rock result in a lot of vertical fracturing up and down the plane of the movement?

A. It can result in additional planes of motion, but they would also create fault gouge.

Q. You're saying up and down the vertical fractures --

A. Yes.

Q. -- additional fault-gouge occurs?

A. Yes, if the rocks are moving past each other, they're rubbing against each other. This is not a frictionless sort of motion.

Q. What if the fractures are, in fact, expansions of the rock material --

A. It can't happen.

Q. -- creating voids?

A. The rocks are not being pulled apart, they're being pushed together. You're not creating space, you're jamming things together.

Q. But they are being fractured, do you agree?

A. Yes, a fault is a fracture.

Q. Well, if there is fracturing occurring, why doesn't that fracturing action overcome this gouging effect?

A. Once again, if a fracture is occurring it's occurring because the rocks are moving past one another. And when they're moving past one another they're not simply sliding by, they're grinding.

Q. So is it your recommendation where you see faulting, in this area anyway, you're presuming that there is fault-gouging?

A. Yes.

Q. So you're recommending -- when you're picking drilling locations, that you ought to avoid areas near the faults, because you're going to encounter fault-gouging?

A. How -- What is your concept of "near"?

Q. What's your concept of "near"? How close would you get to a fault if you were --

A. A couple hundred feet.

Q. The reason you get no closer to the fault is because of apprehensions that fault-gouging has occurred?

A. Precision on locating a fault, yes.

Q. Do you agree where your geophysicist has placed the fault across Section 9?

A. Placed the fault across Section 9. Yes.

Q. Based on where that fault has been placed, do you agree that the acreage west of that fault is nonproductive?

A. Yes.

Q. Let's turn to your Exhibit 3 briefly, Mr. Hulke.

A. 3 is the three-well cross-section?

Q. Yes, sir. Now, you've indicated that you believe that there is non-homogeneous porosity development across the cross-section. You paid particular attention to the North Bell Lake Fed Number 2 on the right side of the cross-section there, and particularly with respect to the upper porosity interval up there. Do you recall that? At the very top of the column there?

A. Yes, sir.

Q. And you are positing that the porosity development does not correlate across the cross-section; that's your basic thesis here?

A. Yes, not from side to side.

Q. If you go down at the bottom of the column and look at the DST data, can you explain to me why virgin

pressure didn't show up on that DST showing 5908? Why wasn't it closer to 6000?

A. I do not see a 5908 -- Which well are you talking about, sir?

Q. I'm sorry, it's 5872. My mistake.

A. I must be --

Q. Let me point it out to you.

A. Oh, I'm sorry. I'm sorry, what is your question again?

Q. Do you see that? The drill stem test data showed pressure encountered as 5872. Do you see that on the exhibit?

A. Yes.

Q. Can we reasonably expect that the DST took into effect pressures from the upper interval you've highlighted up here?

A. Yes.

Q. Why didn't it show something closer to virgin pressure as along the lines of 6000, or 6400 even?

A. I don't know how the test was run. I don't know if that interval is completely connected to the rest of the porosity.

Q. Well, what's the explanation for the lower pressure up there in that upper porosity development?

A. I believe I've answered that.

Q. That you don't know?

A. I don't know.

Q. Is it possible that it's in communication with another well?

A. It's also possible that the test was not run long enough to entirely build up.

Q. Let me talk to you about your graphic depiction of Devonian pools, your Exhibits 5 and 6. First let me ask you, your Exhibit 5, you're depicting Devonian Pools outside of the Delaware Basin as well as in the Delaware Basin, correct?

A. Yes, that's correct.

Q. And how many are actually in the Delaware Basin?

A. It doesn't matter.

Q. Well --

A. The Delaware --

Q. -- answer my question, please.

A. Everything south of about 21 south. That's not the defining factor of what determines reservoir conditions in the Delaware -- I'm sorry, in the Devonian.

Q. Let me ask a question, Mr. Hulke. You're showing two green dots in Bell Lake North, Bell Lake Mid -- Bell Lake Pools. I'm sorry, just the Bell Lake Middle and Bell Lake Pools. And green means 320-acre units, correct?

A. Yes.

Q. And also for the Paduca Northwest and Paduca?

A. Yes.

Q. Are those pools spaced pursuant to statewide rules, or are there specific pool rules implementing 320-acre spacing for those pools?

A. Those -- The color for those dots came from the pool rules provided to me by Mr. Bruce.

Q. Are they special pool rules?

A. I cannot answer that.

Q. When you go to your Exhibit 6 you also have Paduca Northwest listed on here as 320 acres, and it shows date established, July 24th, 1998. Do you see there?

A. Yes.

Q. For example, as I understand it, you don't know what the exact pool rules are for that particular pool?

A. No, I do not.

Q. Okay.

A. I know that the spacing unit size is 320 acres.

Q. Mr. Hulke, do you know if there are any other Devonian prospects that have been permitted on 640 acres in the immediate vicinity, fairly close in proximity to the Rio Blanco prospect?

A. Please ask that question again.

Q. Do you know if there are any other wells in the proximity of the Rio Blanco prospect that may have been

permitted on 640 acres for Devonian?

A. I know of two fields that are proximal to the Rio Blanco prospect in which the spacing unit size is 640, Bell Lake North and Antelope Ridge.

Q. Do you know of anything other than those two?

A. No.

Q. Dry holes or not?

A. (Shakes head)

Q. Mr. Hulke, let me hand you what we've marked as Exhibit H-1. Exhibit H-1 is a transmittal letter for an APD from Santa Fe Energy, from April of 1995, to BLM for the Shamrock 29 Fed Com Number 1. Were you familiar with that well in Santa Fe Energy days?

A. 22-34, Section 29, okay, that was apparently -- that well was apparently renamed the Gaucho Unit 1.

Q. Would you turn to page 2 of that exhibit, which is the face page of the APD, and look at line item 10 there. For what pool did Santa Fe Energy apply for that well?

A. This says North Bell Lake.

Q. Devonian?

A. North Bell Lake-Devonian.

Q. And if you look down at line item 17, how many acres were dedicated to that well?

A. It says 640.

Q. Isn't Section 29 for that well exactly one mile, exactly one mile, from the boundary of the North Bell Lake-Devonian Gas Pool?

A. No, I'd say it's considerably more than one mile.

Q. If you run from the corner -- the southwest corner of Section 29 to the northeast corner of Section 6, isn't that exactly one mile?

A. Yes, sir, it is.

MR. HALL: Okay. Nothing further, Mr. Examiner.

EXAMINER CATANACH: Mr. Bruce, do you have anything?

EXAMINATION

BY MR. BRUCE:

Q. Just to follow up on that question, isn't that well in 22 South, 34 East, that Exhibit H, Mr. Hulke?

A. Please ask the question again.

Q. Isn't this Exhibit H concerning a well in 22 South, 34 East?

A. Yes, Section 29. Yes, that's correct.

MR. BRUCE: Okay.

EXAMINER CATANACH: Mr. Kellahin, go ahead.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Hulke, how come you didn't confine your analysis of the pool spacing to the area that Mr. Landreth

confined his to?

A. Listening to his testimony this morning, I believe that he was incorrect by restricting his gas pool analysis to the Delaware Basin. The Delaware Basin is a feature that started being formed in Wolfcamp age about 150 million years ago. The Devonian was deposited during the Devonian, about 320, 350 million years ago.

When the Delaware Basin formed, a much larger basin in which the Devonian was deposited, called the Tobosa Basin -- the Tobosa Basin was broken up into the Delaware Basin, the Central Basin Platform, the Midland Basin, the North Basin Platform, all these other features, during Wolfcamp age. So when the Devonian was deposited, the Delaware Basin did not exist.

Reservoir quality in the Devonian, reservoir formation of the porosity, stopped when the porosity was filled with hydrocarbons, which was during the Wolfcamp age. So anything that has to do with reservoir quality in the Devonian had to occur before gas migrated into it 120, 150 million years ago. And it has to be after it was deposited 320, 350 million years ago.

So the Delaware Basin as a geologic feature did not exist when the reservoir quality -- when diagenetic action was happening which determined the reservoir quality in the Devonian. So it's a meaningless term with respect

to putting sideboards on Devonian reservoir quality, it doesn't matter.

MR. KELLAHIN: No further questions.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Hulke, the geophysical data that you're going to present later on, that's going to tell us -- or that's going to show us the location of these faults; is that correct?

A. I'm not going to present it.

Q. Right.

A. Mr. Hager will present it. Yes, that's --

Q. That's the data you're using to map the faults?

A. Yes.

Q. Okay.

A. This fault interpretation comes from his interpretation.

Q. Okay. On your Exhibit Number 3, now, I believe what you were saying is, the porosity --

A. One moment, please.

Q. -- was not consistent.

A. Yes, sir, go ahead.

Q. I believe the point you were trying to make is, the porosity is not consistent between these zones, between wellbores; is that right?

A. Yes.

Q. Well, are some of the pay zones -- are they consistent over these wellbores? Are they pretty much continuous?

A. The gross --

Q. Is it just the porosity that varies, or is the pay zone -- Does it actually come and go in these wellbores?

A. Not in -- It doesn't come and go in a single wellbore, it comes and goes between wellbores.

Q. Right, that's what I'm asking.

A. So for instance, if we look at the Devonian 4 to 5 interval between the gray and magenta, we see that there's an extremely well-developed zone in the middle, which is nearly gone on the right and clearly not present on the left.

If we look between the Devonian 5 and 6, between the magenta and the gold, again we can see a higher-porosity interval in the middle, which is nearly gone on the right and has -- it's not present, or it's broken into three thin zones of low porosity on the left.

As we go down between the 6 and the 7 marker you can see that there's zero porosity on the right, a little bit in the middle, and it's a little bit better developed on the left.

Some of the zones, we can actually see them going away. That's why I was saying that some of the zones have great lateral extent -- areal extent, others have very little areal extent. And they're inefficiently connected.

Q. Now, I guess can you use this data -- Moving over into Section 4, do you believe that it's the same way in that Devonian area over there?

A. I have to assume that it's the same. I don't have the porosity log to tell me what it looks like over there.

Q. So it may be the same kind of discontinuous nature over there?

A. We see it in other Devonian fields, so yes, I think it's a very good assumption that it is discontinuous laterally and vertically over there.

Q. Is that same kind of discontinuousness present in some of these fields in the south here, like the Antelope Ridge?

A. Yes.

Q. It's the same kind of --

A. Same idea.

Q. -- discontinuous nature.

A. Same idea.

Q. Okay. How would that -- That would affect communication between the wellbores; is that correct?

A. Absolutely.

Q. Now, the data on the Rio Blanco 4 Federal Number 1, the log data, you say that that's not very useful in an analysis here?

A. Yes.

Q. What can't you get off that? You can't get the porosity?

A. That's the big thing that I'm looking for, yes. That would be the most valuable thing for me. I understand that Schlumberger didn't even charge us for the density curve, and as you can see there, their note -- On the neutron density log there's a note about the neutron data, just above where it says CSG, casing, it says "Neutron data not valid below casing due to tool failure."

Well, if the neutron failed and they're not charging us for the density, I think that tells us all we know about the data quality. It's zero.

So unfortunately that would -- We can't get any data there, and it would be valuable to have it.

Q. So some of the assumptions that Landreth made, do you disagree with some of the geologic assumptions that they came up with for this well, as far as porosity and --

A. As I recall, they assumed porosity of 5 percent?

Q. I believe so.

A. I think that's in the ball park. I'm sorry?

Q. I believe that's correct.
A. I think that's in the --
Q. So that's a reasonable --
A. I think 5, 6 -- 4, 5, 6, 7 percent is all reasonable, yes.
Q. And how about permeability? Can you make a judgment on that?
A. No, sir. The separation -- The invasion profile on the lateral log suggests that there's some permeability, but I sure wouldn't put a number on it. Enough permeability to get invasion that would cause the shallow resistivity to be different than the deep resistivity, that could be very little.
Q. And the faults that you've got mapped, you believe that those are isolating these structures, there's separation between sections --
A. Did you say that the faults isolate the structures?
Q. Effectively isolate --
A. Yes.
Q. Communication.
A. They separate the structures, yes, they are impermeable boundaries between the different structures.
Q. So according to your geologic map, you've got actually two faults that separate these structures?

A. Yes, there's the west-bounding fault on the Rio Blanco structure and there's the east-bounding fault on the North Bell Lake, that's correct.

Q. So both of those would effectively isolate?

A. Yes.

EXAMINER CATANACH: I believe that's all I have. Anything else of this witness?

MR. HALL: Briefly, Mr. Catanach.

RECROSS-EXAMINATION

BY MR. HALL:

Q. Let me ask you, Mr. Hulke, what would better log data from the Rio Blanco well tell us?

A. It could tell us porosity, it could tell us where the Devonian is tight and where it's porous. If we had an image log we could actually see where the vugs are, if there is vertical fracturing, so it could help us out with our reservoir characterization.

Q. Okay, and with this data, the data that we have now, you can't preclude the likelihood that there is good porosity development; is that right?

A. That's right, I don't know what the porosity -- the value of the porosity is.

Q. Okay. And again, you mentioned fracturing in the vicinity of the wellbore itself, so I'm having a hard time with this concept, but is it the type of the fracturing

that you say would result in gouging again and sealing?

A. Oh, okay. Fractures are not the same as faults. Fractures have no vertical offset along them. Fractures are aligned -- they're breaks in the rock that are aligned with the stresses when the fractures are formed. There's no vertical offset. Faults have some vertical and lateral offset.

Q. Make sure I understand, though. There is fracturing in the vicinity of faults out here. In fact, they're all over the areal extent of the reservoir. That type of fracturing is not going to result in sealing?

A. No --

Q. Did I understand you correctly?

A. No, there's no vertical offset, the rocks are not rubbing against each other.

Q. Okay. So it's possible, then, that you could have vertical communication up and down the column --

A. Yes.

Q. -- to that fracturing?

MR. HALL: Okay, nothing further.

MR. KELLAHIN: One last question.

EXAMINER CATANACH: Okay.

FURTHER EXAMINATION

BY MR. KELLAHIN:

Q. Based upon this log data, do we know where the

top of the water is in the Rio Blanco 4?

A. We know that it's below the TD of the well.

Q. That's all you know?

A. That's all we know.

MR. HALL: Mr. Examiner, I would move the admission of Exhibit H-1.

EXAMINER CATANACH: Any objection?

MR. KELLAHIN: I don't think it's relevant, but it comes in anyway.

EXAMINER CATANACH: H-1 will be admitted.

This witness may be excused.

JIM HAGER,

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. Hager, for the record, sir, would you please state your name and occupation?

A. My name is Jim Hager, I'm a senior geophysical advisor for Devon.

Q. And where do you reside, sir?

A. In Edmond, Oklahoma.

Q. How long have you been employed by Devon as a geophysicist?

A. About two and a half years.

Q. Did you testify as an expert geophysicist before the Division in the compulsory pooling cases heard by the Division back on April 10th?

A. Yes, I did.

Q. Have you continued to be involved in this process?

A. Yes, I have.

Q. And you've continued to review your seismic conclusions, evaluations and data?

A. Yes, I have.

Q. Have you had access to information from Mr. Landreth's recompletion of the Rio Blanco 4 well that is important to you as a geophysicist?

A. Yes, and we've incorporated the data.

Q. Why is that important to you?

A. Number one, it gave us a top on the Devonian a mile -- more than a mile from where we had our nearest control. Number two, it verified our top. Our velocity model was correct, so we feel very confident in our structural picture now.

Q. So when we compare your analysis back in April to the analysis that we're about to see, they are substantially the same in every important detail?

A. Yes.

Q. So this wellbore that Mr. Landreth re-rented,

confirmed your interpretation of the structure?

A. Yes, it did.

Q. Based upon your analysis, do you believe you have sufficient geophysical data on which to form expert opinions?

A. Yes, I do.

Q. And have you presented certain displays here today for us to consider in support of your opinions?

A. Yes, I have.

MR. KELLAHIN: We tender Mr. Hager as an expert geophysicist.

EXAMINER CATANACH: Any objection?

MR. HALL: No objection.

EXAMINER CATANACH: Mr. Hager is so qualified.

Q. (By Mr. Kellahin) Mr. Hager, let's take Exhibit Number 7 for a moment, unfold it. But before we talk about it, give us a short history on the 3-D seismic data that was acquired and used.

A. We began the process near the end of 2000, speaking -- in-house and in negotiations with Western Geophysical. I may not have all the dates exactly right, but we got in-house go-ahead to fund underwriting this 3-D survey. It's approximately a 125-mile 3-D survey.

Q. What's this kind of stuff cost?

A. It's pretty expensive, it just depends. I mean,

underwriting up front, early on, your costs are much less. But you're probably talking -- to acquire data like this, it would cost you at least $25,000 to $30,000 a square mile.

But acquisition began -- I believe it was summer of 2001. I think it was July of 2001. And then the processing began.

And as alluded to before by Mr. Landreth's geophysicist, there is a -- it is a tough area. There's near-surface issues and so on. And we set the shoot up accordingly, to try to shoot in the best way possible that we could get the best data. And we spent from November of 2001 until July of 2002 iterating with Western processing the data. And the biggest issue here is doing the early processing steps. Refraction statics, for instance, is very crucial. So we went through that, took our time, and I think we got a pretty good product out at the end.

Q. Are you satisfied with the quality of the product?

A. Yeah, I think it's good data.

Q. Was it your understanding that Devon was not interested in pursuing the re-entry of the Rio Blanco 4 well, based upon Mr. Landreth's 2-D seismic presentation?

A. That is correct. I think it's pretty general knowledge that 2-D data for deep structures -- we're

looking at 14,500 feet below the earth's surface -- using 2-D data can be very misleading. I think an example of that, unfortunately, was Santa Fe's well up in Section 29, where they probably had sideswiped 2-D lines, probably made it look like a large structure, and that's why it was drilled to the Devonian.

So 2-D data definitely would not be enough for our management to go ahead and drill the well.

Q. When we look at the three-dimensional analysis, you're utilizing it in the Devonian for the purpose of trying to map the structure?

A. That's correct.

Q. It's not going to tell you anything about the composition of the reservoir contained within the structure?

A. That is correct.

Q. You're not going to be able to use this data and create an isopach map?

A. That -- Well, you might be able to. For instance, if you're making a depth map from the Bone Springs to the top of the Devonian, you could in that case. However, for reservoir thickness in the Devonian, no.

Q. For validating the analysis that Mr. Hulke did in the vertical and horizontal discontinuity of the Devonian within the Devonian itself --

A. Right.

Q. -- you cannot use 3-D seismic to confirm or deny that?

A. No, that is correct.

Q. So when we look at the structural components -- and let's start with Exhibit 7

A. Okay.

Q. We'll talk a minute about how the details were put together. What are the major you want Mr. Catanach to understand, based upon your analysis of Exhibit 7?

A. Okay, what I really -- what I'm displaying here and what I think the 3-D clearly shows is, we have three separate structures. We have fault picks through here. There can be -- Different people can look at it in different ways. The way we approach it is, we use a very integrated approach. We use geology, reservoir-pressure information, we integrate all this data. I use that when I'm making my interpretations, the geologist uses the geophysics when he makes his, the reservoir engineer and so on. So we all collaborate with one another.

We know from the pressure information that this North Bell Lake is separate from the 4. We know that now, after the well was drilled, especially.

A very key point here that really needs to be brought up. You see the gas-water contact coming to the

end of the fault in Section 8, closing off the North Bell Lake field. If you spilled around that edge, that gas would travel up, and there's no way to close off this structure over in 4. If you go up into Section 23, just north of -- Well, if you go up to the northeast where it goes green again, it goes green, then blue, then green. It's starting to climb again that way, up to the very northeast edge of my map.

Right off the edge of my map in Section 23, there's a well up there drilled in 1974. It topped the Devonian at 11,159, 200 feet above the gas-water contact, and was wet. That well -- and then it opens up even further, the structures keep climbing. If you spill around that edge and you try to put a gas-water around 4, you've got -- the entire area has to fill with gas. It's totally impossible. It has to close at that fault closure.

Q. Let me ask you to take us through that analysis using a different exhibit. You've looked at your Exhibit 7. Let's look at Mr. Hulke's exhibit, it's Number 1 --

A. Right.

Q. -- and walk us through that.

A. Okay.

Q. Give us a moment to get organized here. You can do it on the board if you like.

A. Okay, if we come around the edge of this -- This

is the closing fault. We think it closes this field off right here.

Q. Now, you're going to have to tell the court reporter where you're pointing your finger --

A. Sure.

Q. -- so he understands verbally what you're seeing.

A. Right, we're in 23 South, 34 East, Section 8. Gas-water contact in the Bell Lake North field, we have it at 11,362 feet subsea.

If you spill around the edge of that and you try to fill this whole structure with a common gas-water --

Q. You mean the structure in 4?

A. The structure in 4, yes.

Q. Yeah.

A. What happens also is that gas will travel to the north, travel updip. And you can see on the structure map, the seismic structure map, it will travel to the northeast. Section 23 is actually sitting right here north of 26. There's a well up there drilled to the Devonian in 1974 at 11,159. It's 200 feet above the gas-water contact, it's wet.

There is no way you can have these two structures connected. It's not possible. You'd fill up -- The entire area would be full of gas if that happens.

Q. Let me show you another one. When we look at Mr.

Landreth's Exhibit 7, he shows a contraction of the original gas-water contact, and then he has it shrunk all the way down to an area confined within the reservoir over in Section 4.

A. Right.

Q. Is that possible?

A. No, it's not. The 3-D map -- The two 3-D maps are fairly similar, the one that we made and the one the geophysicist made for Mr. Landreth. However, his data ends halfway up through Section 33, and as you head up to the north that's all conjecture with maybe two points of control. We have 3-D that continues on up to the north.

That structure keeps climbing, and that well is evidence of that because it's at 11,157, up in Section 23 where their structure map shows it 200 feet low.

Q. So is there any doubt in your expert opinion or in your mind about the disconnect between Section 4 and Section 6 in the Devonian?

A. None at all.

Q. Totally separated and isolated?

A. Yeah.

Q. Let's talk about the details of how you're located -- interpreted the data to show us the faults.

A. Okay.

Q. Let's start with Exhibit 8 first. What are we

seeing here?

A. Okay, on Exhibit 8 -- let's see if I have it here. Is that Exhibit 9? Oh, Exhibit 8 is the -- yeah.

Q. Have you got one?

A. Yeah, it's just a -- it's a synthetic tie between the Bell Lake North field -- here it is -- and the seismic. And again, just to reiterate how well of a tie we have here, we come on a Mississippi lime which is fast. This is a sonic log, the DT is a sonic log on the left side. And the red box actually is a synthetic that was created from that sonic log.

So you can see a large peak is created at the top of the Mississippi lime. Come down to the Woodford shale, a large trough is created, and then at the top of the Devonian a large peak is created. That is then laid on this seismic, the 3-D seismic, and it just shows the correlation.

The correlations are very good here. We know we are on the top of the Devonian right there, there's no doubt. So our mapping around the area, we feel very confident we're staying on the Devonian.

Q. Sometimes that's an issue, is it not?

A. It can be, yeah. You can have sand/shale-type sequences, for instance, that can become very nebulous, and you're not really sure if you're staying on the same event

or not. Here, it's pretty clear going from Woodford shale to the Devonian. It's a clearcut change.

Q. We're about to see a series of vertical sections, and there's three of them. I want to start with Exhibit Number 9 first. Before we talk about the details, unfold yours and keep your Exhibit 7 as a companion exhibit, and from the 3-D seismic data tell us how you construct Exhibit 9, Exhibit line 1.

A. Okay, this is a seismic line, seismic cut out of the 3-D survey. On the map it's going from west to east, through the Bell Lake North field, then it goes south to north, and then it goes west to east again across the Rio Blanco 4 well. So it ties these wells exactly.

Q. You have a control point along the top where each one of these little squiggles is a certain distance apart, is it not?

A. Yes, these are 110 feet apart, each one of the little traces, each one of the bins out here. So we have control through the whole area at a spacing of 110 feet.

Q. When we look over on your Exhibit 7, where is the tracing for line 1?

A. Okay, line 1 again, it goes from west to east through the North Bell Lake field, and then south to north through the trough that separates the two structures, and then it goes west to east across the Rio Blanco 4

structure.

Q. Is -- Although you don't have it here, is the data set such that you have analyzed the vertical lines that you can create out of the data set in such a way that you can locate on fault A the beginning point at the top and the ending point on the south of this exhibit?

A. Yes. I mean, you can see -- right, I've labeled fault A, and then on line 1 you can see where it crosses fault A. So there's my pick.

And then at fault B there's clearcut separation there, evidenced by the peak to the trough across fault B. You can see that, how big of a break there is right there. It's a pretty large offset. And this actually travels south of the North Bell Lake Fed 2 well, and that's the pick for the B fault. It's a clearcut fault.

Q. Well, let's stay on fault line A.

A. Sure.

Q. So out of your data set on your computer, I assume, to analyze all this stuff --

A. Uh-huh.

Q. -- you can select data and generate multiple profiles so that you know where a fault line starts in the north and where it disappears in the south?

A. That's correct.

Q. So it's not just a single point --

A. No, and --

Q. -- in which you have displayed the line?

A. And you can pick -- There are lines you can pick here where you see where the data has variations in it, where it does get a little noisier, where the pick gets a little tougher. But you've got to work the whole data set to be able to pick the faults where they're located, and also incorporate what you already know about the reservoir issues and geologic issues in the area.

Q. Okay, let's start on Exhibit 9 then.

A. Okay.

Q. Let's read down to the captions where it says fault A. We read on down the blue line, and what do we see?

A. Okay -- One more time, I'm sorry? I missed --

Q. I'm on Exhibit 9.

A. Okay, right.

Q. And I'm trying to follow your analysis of fault line A.

A. Okay.

Q. I'm starting at the caption, and you'll have to integrate for me the color codes as we move down and get to the markers that are of significance to you.

A. Okay, sure. Well, the Devonian is in yellow. That's the yellow pick that's across the seismic line, and

that's the tie that we make at the Bell Lake North field with the synthetic tie, so that is the top of the Devonian there.

After the fault, to the west of the fault, the structure drops off pretty dramatically. To the east of the fault we come into the structure which forms the Bell Lake North field.

One thing I want to point out also is, the display parameters I'm using here, this is a really very squashed, very expanded section. What that does is, it helps you to pick faults, it helps to pick smaller features that are sometimes really difficult to see when you stretch the section out. Okay?

Q. So before we leave fault A --

A. Sure.

Q. -- have you satisfied yourself that there is a sufficient displacement between the west side of fault A and the east side of fault A to make a boundary for the Devonian pool that was produced by the Conoco 6 well?

A. To the west? It looks very weak on this seismic line.

Q. Right.

A. However, if you look at other lines up and down there, that fault is stronger and weaker. It looks like it changes throw. I kind of doubt that it does, I think maybe

it's a quality issue with the data, a resolution issue with the data, but that is a pretty strong pick, I think, all the way through there.

Also, the structure falls off dramatically on that side. It's not really a fault-closure issue on that side of the structure.

Q. So that as we move from fault line A on this display on Exhibit 9, moving to the right, the yellow line intersects the wellbore line for the Amerada Hess Bell Lake Number 3?

A. That's correct. Yeah, it intersects it right there. The peak -- we've traveled -- we take that across the structural top, and then we hit fault B --

Q. Okay.

A. -- and that's our bounding fault on the east side of the North Bell Lake field.

Q. Discuss this fault B now.

A. Okay, fault B is a northwest-southeast-trending fault. It also displays in places less apparent throw and more apparent throw. On this particular cut it has quite a bit of apparent throw. It probably has 140 feet of apparent throw. We're looking at velocities here.

The sidebars, the side ticks, are 100 milliseconds. If you look at that, that's probably something on the order of 10 or 15 milliseconds. So we're

probably looking at velocities of about 8 foot per millisecond. That gives us about 100 feet of throw right there, at least 100 feet of throw at that fault.

And then as we cross over on the Devonian -- Okay, well, did you want to talk more about fault B?

Q. I did.

A. Okay, sure.

Q. And fault B is analyzed in the same way you have analyzed fault A?

A. That's correct, all the lines --

Q. You go through your data set and conform --

A. Sure.

Q. -- all your opinions with regards to the length of that line and its location?

A. Right, that is correct.

Q. And as we follow fault line B down vertically --

A. Uh-huh.

Q. -- at the two points where it crosses through the yellow line --

A. Uh-huh.

Q. -- that is the point of separation that you've just described --

A. That's correct.

Q. -- where to the east of the fault you have the commencement of a syncline?

A. That's correct.

Q. Well, take us through the syncline and move us up into fault C.

A. Okay, we're now -- as we travel down into the syncline, we're traveling kind of north on that jog of the seismic line on Exhibit 7. So we travel through the syncline, and then we head over to the next -- to the Rio Blanco 4 structure to the east, and then we hit fault C.

Q. Okay, let's talk about fault C.

A. Okay, fault C at this particular location exhibits quite a bit of throw, probably well over 100 feet of throw at this point.

Q. Incidentally, it appears to be greater than the throw you had on fault A -- on fault B?

A. It does. I think it varies as you move along that fault, but I think the fault is continuous through that area.

Q. In your opinion, is that going to constitute a western boundary for the Rio Blanco 4 Devonian pod?

A. I think it will, but I think what's more important is the fault B, as far as closing -- as far as separating the two structures. You can see on fault C, it ends at the north part of the structure, before you hit the green. So there would be a little bit of potential connection there, but I think the fault at -- fault B is

the one that closes off the structure.

Q. Okay. Anything else about Exhibit 9?

A. No.

Q. Let's look at the next -- line Number 2. If you'll unfold that, it's Exhibit 10. With vertical line 2, which is Exhibit 10 --

A. Uh-huh.

Q. -- what are you trying to analyze?

A. Well, with line 2 I was -- actually was speaking to the previous map that Mr. Landreth had, to show that the fault actually didn't trend west-east in Section 33, it actually is trending north-south.

This particular line 2 on the map, you can see, goes south to north along the lease lines bordering Section 9 and Section 4, and then it goes from west to east across the very northern portion of Section 4. So it does a little bit of an upside-down L shape there.

The dark line that you see on the seismic line is where the line bends, where it goes from south to north and then west to east. And what that illustrates -- what it was to show was that, yes, indeed, the fault you see here, which is fault C, is trending north-to-south through this area.

And again, it just illustrates another cut across this fault where you see separation on the Devonian. It

again illustrates what you see has a fault cut through it.

These are very common in these kind of structures, in this kind of a compressional regime where you have the pressure of the Central Basin Platform pushing on these structures, these are pop-up features. It's very common to have bordering faults. This is a very common thing. It would be very unusual not to see continuous faults going along these.

Another point is Steve's point about fault-gouge, I just wanted to talk about that for a second, talk about well, wouldn't that be a leak point? Well, when you're under compression you're closing the pore spaces, you aren't allowing things to flow through that. Fault-gouge is a very good permeability barrier in a compressional regime. In a tensional regime it's questionable, but in a compressional it's a very good permeability barrier.

Q. When we turn to Exhibit 11, line 3, have you investigated the relationship between the Conoco 6 well in Section 6 and the BTA well down in Section 18?

A. Yes. We again, using the geologic information and the reservoir information, looking at these two and knowing that they were separate, we looked at our 3-D data and tried to figure out why, what's going on here? Why didn't this Middle Bell Lake field work, for instance? It looks like a pretty good-sized structure. It should have

been a pretty good producer.

Well, when you see, when you look at the line, what it shows, number one, is that you have a synclinal separation in Section 7. And that's where I have a little arrow and it says "Note synclinal separation". That separates the gas-water in Section 18 and 19 from the North Bell Lake field, number one. So you have a clear synclinal separation. There is no doubt those two fields are separate with 3-D data.

Again, the 3-D that Mr. Landreth has goes to the center point of Section 7. He did not have enough data to the south to see the southern edge of the North Bell Lake field or the synclinal separation between these two fields.

So everything is consistent. Our reservoir picture, our geologic picture, our geophysical picture is all consistent and can explain this. It's the easiest explanation for what we observe here, is that these are two separate fields, they aren't in connection.

Q. Does the geophysical evidence that you're presenting here support Mr. Landreth's opinion that the BTA well in 18 was watered out by production taken from the Conoco 6 well?

A. That could not happen.

MR. KELLAHIN: No further questions.

We would move the introduction of Devon's

Exhibits 9 through 11.

EXAMINER CATANACH: Exhibits 9 through 11 will be admitted.

MR. HALL: No objection.

CROSS-EXAMINATION

BY MR. HALL:

Q. Mr. Hager, just before you concluded your testimony you were discussing the separation between Sections 18 and 6 there. Explain to me how you derive different gas-water contacts for those two features.

A. The gas-water contacts come from the wells. Why the -- And let me just go on further on that, because it could be a little confusing.

The Bell Lake fault that's off to the west is a large fault, 2000 feet, 3000 feet of throw. You can just see it on the very edge of my map there. Gas-water contact, you see, intersects that fault. What we think was that that structure -- first off, we think there's probably a shear going across here that has warped that structure. That's why that structure has that west turn to it on the north.

We think that structure contacts that fault. Across that fault is probably siliciclastics in the Morrow which are porous, and we probably had a leak point, it probably blew the seal on this structure right there. The

fault was probably too large to hold the gas column back in that field. That's what we think. It seems the most logical conclusion there, looking at that gas-water contact.

Q. The well in Section 8, though, did it penetrate to the water?

A. In 18?

Q. 18, I'm sorry.

A. I don't know, I'd have to -- I don't know off the top of my head, I'd have to look at the cross-section again.

Q. Earlier you mentioned these features have spill points. Explain that to me. Why didn't -- That explains a feature filling with gas, correct?

A. Right.

Q. Covering an areal extent.

A. That's correct.

Q. Why didn't the spill point on the reservoir in Section 18 reach out to the 11,350 contour?

A. What we think is that the seal was blown at the fault, and where that structure was warped against it, if you look at the 3-D data through there, you can see that the structure actually turns up into the fault at that point, it doesn't roll into it. And that's where the seal got blown, and that's why we think that gas-water contact

is right there.

Q. And so you think that gas went up that fault line; is that correct?

A. It probably either went up the fault line or contacted Morrow across the fault from it.

Q. Even in view of the fault-gouging?

A. Yeah, it was such a large fault, there was so much moving along that fault, that it blew the seal. It seems the most logical explanation, looking at what we have here.

Q. So that fault was not a barrier --

A. That fault probably --

Q. -- to gas migration obviously?

A. -- and I don't -- you know, if you look along it, I wouldn't drill a field -- If you saw a closure along this fault, I wouldn't drill it because I think that fault would probably be a leak. I think you need to get back away from that fault, onto structures back away from it.

Q. All right. So but you do acknowledge that there was a fairly large gas canister there. Are you precluding absolutely the possibility that that gas was captured by the wells in Section 6?

A. No, because I think we clearly show on the 3-D seismic that we have synclinal separation. We go below the gas-water contact in North Bell Lake field. They could not

have been in contact with one another, it's not possible.

Q. Let's refer back to your Exhibits 9 and 10, and you had discussed fault C there, which is the fault that runs north-south through Sections 33 and 4?

A. Right.

Q. And your point was to show in part that there was a lot of variation in the displacement of this fault along its horizontal extent. Did I understand that correctly?

A. No, actually what I was trying to show there, the number 1 line was to demonstrate a tie between the Bell Lake North big well and then our well that we drilled in Rio Blanco 4. That's what the Number 9 exhibit is 4.

The line 2, Exhibit 10, what that was to demonstrate -- I didn't know that you had a new map now, but what that was to demonstrate was to show that the east-west fault you had in 33, we didn't believe in because of our 3-D data. And that was to demonstrate that that fault actually trends north-south, not east-west.

But you do get two cuts on the C fault with these two lines.

Q. Well, if I'm reading this correctly, the displacement on Exhibit 10 for fault C --

A. Uh-huh.

Q. -- is somewhat closer than the displacement on Exhibit 9 for this?

A. That's what it appears like, yes.

Q. Okay. Is it possible as you trend southward on that fault that it comes even closer?

A. I don't think it is. I think -- Well, let's refer to the map, and I can probably talk to that. When you look at the structural contours going from east and west across C, look to the north there, you see the red against the green. There's a lot of throw on the fault at that point.

As you come down where this line goes across there's probably less throw. Maybe we're talking on the order of 50 feet, 75 feet, something like that. And as you move south it gets even closer, it looks like the throw even drops off further. But it's still there, the fault still exists. And then as you drop down to the south the fault grows again. It does show variation, but I think it's continuous through the whole area.

Q. But is the displacement larger in the gas column throughout?

A. No, I think it varies.

MR. HALL: All right. Nothing further, Mr. Examiner.

EXAMINATION

BY EXAMINER CATANACH:

Q. I just have one question. Isn't Landreth and

Devon basically looking at the same 3-D seismic data?

A. Yes, we are.

Q. And is it Landreth's -- I'm not sure where Landreth's lines are in relation to your lines, but why aren't these faults showing up on this data, Mr. Hager?

A. Okay, it's a display problem, number one. For instance, let's go to the first seismic line that he has on the top there. It would be the most northern west-to-east seismic line that he has.

Q. Uh-huh.

A. Right where the Amerada Number 2 Bell Lake Federal crosses the Devonian right there, that's clearly a break, that's clearly a fault. That's actually where I mapped my B fault, so I think there's clearly a break there.

You know, let's look down. If you look down into the section, they picked the Ellenburger there. Say, for instance, if you go down to the next line down to the south, it goes from west to east. If you look at -- Okay, on that, if you look along the Continental Number 6 Bell Lake, okay, and you hit the Devonian right there, you go off to the west a little ways, you see there's a clear break there, right?

Q. Uh-huh.

A. Then you come down about 150 mils or 200 mils,

two of those ticks, there's a real deep peak running across there. Do you see what I'm talking about? Okay, if you go off to the west there, there's no break there. Then as you go down further, you see another -- there may be some more breaks there. It's tough, this is tough data to pick faults in. You need to display the proper scale. You have to blow it up, you have to squeeze it, to be able to pick these faults accurately.

If you pick certain lines, it's -- sometimes it's almost -- you think, where did the fault go? But then you go back and you look and you go look at every line around there, and you continue your fault through it.

Sometimes you have to look down below or up above the Devonian to continue your fault through.

Q. Okay. Now they used three lines, and you used, I assume, considerably more than three lines?

A. Well, I think they probably used all the data also, and I used all the data in this area. They used all the data for their five and a half squares, for their interpretation.

Q. Okay, so you're saying you both used the same data for this whole area?

A. That's what I assume, probably looked at -- I would assume they used about every line through there, and I'm -- through their five and a half squares. I used every

line through the whole hundred squares.

And by doing that too, you can also build in these other -- you know, the Antelope Ridge field, these other fields, and get a sense of how those are set up, why they work, how they get closed off.

Q. So I guess -- Did you have more data than they had?

A. Yes, they have -- they bought five and a half squares, licensed five and a half squares of data. We had licensed a hundred squares, so we have the whole area covered. They only have a very limited area covered here.

Q. And they didn't have anything up to the north? In the upper tier of sections that you've got listed in Exhibit Number 7, they had nothing up here in --

A. North --

Q. -- Section 23?

A. -- if you put a line halfway through Section 33, they have no data north of that, nothing north of that. And if they had the data they would see that the structure continues on up that way, that you -- In my mind, if you look at the water contact, you look at the reservoir information, you've got to close off the North Bell Lake field. There's no other way around it.

Q. So that Rio Blanco well, is that in communication with the well that you said was drilled up in Section --

was it 27?

A. 23.

Q. 23.

A. No, it's actually closed off. I'm in agreement, I think the most likely place for the structure to close over Rio Blanco 4 is probably along a green, which is at around minus 11,250. I think that's -- That's the most likely gas-water contact.

So I think we're clearly separated from up there, I would think.

Q. Okay. So would you agree that the Well Number 1 was the first penetration into this particular reservoir?

A. The Rio Blanco 4 Number 1?

Q. Yes.

A. Yes, I do agree with that, yes, sir.

EXAMINER CATANACH: Okay, I believe that's all I have.

Anything?

MR. KELLAHIN: May we take a short break?

EXAMINER CATANACH: Yes, we may.

(Thereupon, a recess was taken at 3:00 p.m.)

(The following proceedings had at 3:15 p.m.)

EXAMINER CATANACH: Okay, we'll reconvene the hearing.

MR. KELLAHIN: Mr. Examiner, our final witness is

Mr. Jim Linville. Mr. Linville is a petroleum engineer with Devon.

JIM L. LINVILLE, JR.,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. For the record, sir, would you please state your name and occupation?

A. Yes, my name is Jim Linville, Jr. I'm a senior reservoir engineer -- excuse me, reservoir engineering advisor, with Devon Energy.

Q. Summarize for us your education.

A. I graduated in 1987 with a bachelor's in petroleum engineering from New Mexico Tech in Socorro, New Mexico. In 2000 I graduated Marshall University, located in Huntington, West Virginia, with a master's degree in environmental engineering. I'm a registered professional engineer in Colorado, number 28790.

Q. Summarize for us your employment experience.

A. Employment experience, I've worked in the industry approximately 17 years. I worked for a major oil company a short time as a drilling engineer -- that was Unocal -- and then I've worked for various independent oil and gas companies. I was an independent petroleum

consultant for about a year in Denver, Colorado. With the various independent companies I've worked virtually every basin in the United States. I've worked in California, the Rockies, mid-continent, Permian Basin, Gulf Coast and Appalachian Basin. I've also had the opportunity to do some international work in the country of New Zealand.

Q. Mr. Linville, describe for us what has been your involvement in this particular project involving the request by Mr. Landreth and EGL Resources to space Section 4 on 640-acre spacing.

A. Okay. I've been -- Sort of related back to the job history, I've been with Devon for three years. I joined them as an operations engineer and I did that for approximately 18 months. And then since then I've been in a reservoir-engineering group. Specifically, all of that operations and reservoir in southeast New Mexico. And I've been involved with this project since August of last year as one of the team members.

Q. Have you prepared for today's hearing an engineering evaluation of your opinions and conclusions about this case?

A. Yes, I have.

Q. And are these exhibits that you have compiled yourself?

A. Yes, they are.

Q. And based upon these exhibits you have now reached certain engineering opinions?

A. Yes.

Q. Give us a summary of what you think are the major conclusions you're about to make.

A. The major conclusions that I'm going to make are, looking at the pressure data from these various fields, my reservoir analysis is going to tie to the geological interpretation as well as the geophysical interpretation by Devon that these fields, in fact, are separated.

I'm also going to present data that shows that in water drive reservoirs multiple wells are required to efficiently drain them and produce them and maximize recovery of natural gas.

Q. Have you studied all the available pressure information from the wells in the immediate vicinity of what we're discussing now?

A. I believe that I have. I've looked at the publicly available data as it's posted on PI Dwight's.

Q. If Mr. Landreth's theory of the reservoir engineering is correct, would the current pressures of these wells all be the same, even in a water drive reservoir?

A. Yes.

Q. Are they?

A. No.

Q. What does that tell you?

A. It tells me that they're separated.

Q. Let's look at your displays. Let's start with Exhibit 11 -- I'm sorry, Exhibit 12.

MR. HALL: Is that the one marked 1? I'm sorry. It says 1 on the front.

MR. KELLAHIN: I'm sorry, did I tender Mr. Linville as an expert witness?

EXAMINER CATANACH: You did not.

MR. KELLAHIN: I do so now.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) Mr. Linville, before we talk about the specifics of this montage, you've identified it as -- This is your Exhibit 1 that you prepared?

A. Yes.

Q. For purposes of this hearing, I think the actual number is 12. Is a summary of your analysis of comparing the North Bell Lake to the Middle Bell Lake?

A. Yes, it is.

Q. So orient us. If you'll take one of the locator maps, probably the one right there on the easel --

A. Uh-huh.

Q. -- this first display is going to be an analysis of what, sir?

A. I'm comparing this Bell Lake Middle field to the Bell Lake North field, and in particular the two wells noted on here where I represent decline curves and pressure data, I'm referring to the BTA well in Section 18 and the Conoco Bell Lake North Number 6 well.

Q. One of Mr. Landreth's arguments in support of his Application was his opinion that the Conoco 6 well in Section 6 had drained the gas all the way down to and including the gas that would have otherwise been produced by the well, the BTA well, in 18.

A. Correct.

Q. Do you agree?

A. No, I disagree with that.

Q. To study that issue, to come up with your own independent expert opinion, what type of information is it necessary for you to use?

A. Primarily in this case it was pressure data.

Q. As was described earlier today, pressure for a reservoir engineer is the best possible data?

A. Yes, it is.

Q. I think there's a couple of corrections on the display before we get into the details, but -- and we'll get to those as we come to them.

We have four portions to this montage. Where would you like to start?

A. I would start in the upper -- suggest we start in the upper right, which just -- It's tabular data for the wells I noted on the map, the BTA well in Section 18 and the Conoco Bell Lake 6 well in Section 6, and it's just historical bottomhole pressure data, again from PI Dwight's the public source that everyone uses and I'm sure has been noted before this Commission before.

Q. Let's go through those and have you make your observations.

A. Okay. Well, looking at the right-hand column, as everyone has testified, the Conoco well was drilled in 1960, had an original bottomhole pressure of 6400 pounds, from a DST in this case. And then the data subsequent to that for the Bell Lake 6 is from PI Dwight's. You can see that the last data point noted is July of 1998 at 3820 p.s.i. I made a note there that type of a pressure decline is indicative of a water drive reservoir.

The data to the left of that is tabular data for the BTA well in Section 18. Again, as has been testified here today -- and previously, I believe -- that well was drilled in 1980. Its original bottomhole pressure was 6072 pounds.

And then tracking the PI Dwight's data, you can see in July of 1986, reported bottomhole pressure was 850 pounds, July of 1987 was 16 pounds. I don't know how much

weight you can put on that 16-pound data point, so I would call it bad data and just cut it off at 850 pounds in 1986. That's also around the time when that well ceased production, so it had depleted.

Those two columns of data are then plotted in the plot on the lower right, bottomhole pressure versus time. The blue data points and the blue line represent the Bell Lake 6 well. Again, you can see original pressure is 6400 pounds in the upper left of the scale. And then in 1998 the last point recorded was 3800 pounds, 3820.

The red line represents the BTA well, and that's where one of the errors exists that you mentioned.

Q. Describe where that should have been posted.

A. You'll note that the first red point on the graph starts in 1960 at 6072 pounds. That point should actually be plotted at May of 1980, so more in the center of the graph. The second point for the BTA well is plotted correctly, August, 1980, at 4999 pounds.

The reason -- or the purpose for the plot, you can see that the red data, which is the BTA data, clearly falls off. In a matter of six years that well depleted, reservoir pressure went from 6000 pounds to 850 pounds in six years' time, while over that same time frame the Conoco Bell Lake 6 well went from 6000 pounds in 1979 to 1998 of 3800 pounds.

Q. If these wells are in communication, what would the bottomhole-pressure-versus-time plots look like?

A. They would be virtually identical, the data points themselves, as well as the trends themselves.

Q. So when you look at the red line and see the dramatic falloff from 1980 down to 1986, it doesn't appear to have a corresponding effect on the Conoco 6 well?

A. That's correct. I conclude that the BTA well is separate, it produced from a somewhat limited reservoir because it depleted so quickly. That well did produce water, although not anywhere near the rates that the Conoco Bell Lake 6 well did. Again, that was an indication to me that they weren't connected, they had different water-drive aquifers below them, which everyone else at Devon has testified about, that they're separated. Each field has a unique gas-water content.

Q. When we look at the information plotted on the upper right portion of the montage in black, you have got the pressure data, bottomhole pressure data, first for the Conoco 6, and then just to the right of that is the BTA well in Section 18.

A. To the left.

Q. I'm sorry, to the left.

A. Yes.

Q. When we read out -- Find some points in time

where we can draw a comparison between what we have for a bottomhole pressure in the Conoco well versus the bottomhole pressure in the BTA well.

A. Okay, the first -- well, let me -- If I may, let me --

Q. Sure.

A. If you recall the BTA OCD case that Mr. Landreth represented earlier, that was back in 1980 when they reported the bottomhole pressure of 6072 pounds.

Q. Uh-huh.

A. If you look at -- 1979 is the closest point, 1979 for the Conoco 6 well, it shows a pressure of 6039. That's when BTA came in and said, Look, these are in the same reservoir, same bottomhole pressure.

Mr. Landreth also has an exhibit that today he represented all these wells had the same original bottomhole pressure. Maybe they did, but you've got to look at the bottomhole pressure over time, how do they fall off, how do they compare, how do they contrast?

Q. Do that for us, then.

A. Well, that's where I'm headed. If you then continue that comparison, then the next correlative date would be 1983 -- or year, excuse me, September of 1983 for BTA, that well in Section 18 had a bottomhole of 3318 pounds, while in October of 1983, one month later, reported

for the Conoco well, Bell Lake Number 6, of 6080 pounds.

If you continue further, in the year 1986 the BTA well had a reported bottomhole pressure of 850 pounds. That's when that well ceased production. Similarly for that year in 1986, the Conoco well, Bell Lake Number 6, in 1986 had a reported bottomhole pressure of 6014.

So clearly totally different pressures, totally different wells -- I mean reservoirs, excuse me.

Q. When we look at the montage, on the lower left you have two displays.

A. Uh-huh.

Q. What are you showing us here? These are production displays, are they not?

A. Yeah, production decline curves. Again, there's a curve on the far left for the Bell Lake well, the Conoco well. And then the curve to the right of that is for the BTA well. I present these just for historical information.

Q. But you can draw some conclusions from this too, can't you?

A. Yes. The reason I put this here is, you can see that the BTA well was drilled in 1980, had first production in 1980. If you look at the Conoco well in 1980, when that BTA well came on production, you don't see any change of the production rate or the decline profile for the Bell Lake Conoco well.

Q. Which would be an indication of interference?

A. That's correct.

Q. And you don't see interference?

A. I don't see any indication of interference.

You can track it over time as well. You know, for example, in 1986 when the -- it's probably more like 1987 on this plot, when the BTA well ceased production, if you look at 1986-87 for the Conoco well, again you're not seeing any drastic changes there. In fact, the production had flattened and remains flat.

Q. How do the water production rates and profiles compare?

A. The profiles are similar in that they're both flat, which led me to believe that they're both producing from a water drive reservoir, but not the same reservoir because they're producing at different rates and they also have different cumulative volumes.

Q. No doubt in your mind, then, Mr. Linville, that these two areas area separated?

A. No doubt at all.

Q. Let's move, then, to an analysis of data on another set to show the next one. If you'll unfold what is marked for purposes of the hearing as Exhibit 13, let's unfold it and show -- Your numbering system is your exhibit number 2.

A. Yes.

Q. Based upon your study and the information you're displaying here, what are you illustrating?

A. What I want to point out here is that I'm making a comparison, if I can point to the map again, of the Bell Lake North field again, up here where Conoco and the 6 well is, comparing that field to Antelope Ridge field down in Sections 27, 34, 33 and Section 4.

Q. Take us through the comparison.

A. Okay. The comparison I'm making -- we can refer to the upper left part of this display -- they both had similar bottomhole pressures. Again, I believe that was also pointed out today and in previous testimony. Bell Lake North had 6400 pounds, Antelope Ridge had 6300 pounds.

Q. You're talking about original pressures?

A. Yes. Then the next column I have is just what is that fact, and then a conclusion that can be drawn from that. One could say, these fields have the same original bottomhole pressure; they could produce in a similar fashion.

Looking at the field size, Bell Lake North is 1000 acres, approximately, Antelope Ridge is 1100 acres. The fact is, they have similar size. The conclusion that might be drawn is they're going to have the same recoveries, produce the same amounts of gas.

If you look at the cumulative gas, then, Bell Lake North has produced 31 BCF while Antelope Ridge has produced 39 BCF. The fact there is that Antelope Ridge has produced more gas than Bell Lake North. The conclusion drawn there, in my opinion, is that due to the fact that they're multiple wells in Antelope Ridge, spaced closer than 640, that it had a higher ultimate recovery.

The line represents original gas in place estimates. I personally performed those estimates based on planimeter, volumetrics, which I note there in the fact column. At Bell Lake North there's 80 BCF in place, at Antelope Ridge there's 58 BCF in place. If you then compare the original gas in place to the gas that's been produced, you have two markedly different recovery factors.

Continuing further down to the next line --

Q. Let's stop there. Do you have an opinion as to why the recovery factor in North Bell Lake is only about 38 percent?

A. Yes, I do.

Q. And what's that?

A. I believe it's a low recovery factor because, as Mr. Hulke indicated, it's a non-homogeneous reservoir and it requires multiple wells to increase that recovery factor. That's further substantiated by the fact that the Amerada Number -- I forget the number.

Q. It's the Number 2, isn't it?

MR. HALL: 3.

Q. (By Mr. Kellahin) That's the 3 up there.

A. Amerada Number 3 well in 1996 DST'd gas along with water, leading me to conclude that there's still gas in place, there's still recoverable gas that can be produced --

Q. And that was what, 36 years later?

A. That's correct, yes. -- to increase the recovery factor for Bell Lake North field.

Interesting to point out, if you go back to the last display, at that time in 1995 the Bell Lake North had -- the Conoco well, back to pressure, had a pressure of about 4000 pounds. And I don't have it, but Mr. Hulke's displays had -- the DST pressure from the Amerada well was, I think, back up around 6000 pounds. We could look at that display.

But again, the point being that even within that field the wells over time are seeing different pressures, even within that field they're not connected. And I think it deals with the nonhomogeneous nature of this rock, this carbonate rock, and that's why multiple wells are required to efficiently produce it and avoid waste.

Q. When you take this display and look at that portion of the analysis that deals with Antelope Ridge, in

approximate terms, the area that was produced in the Antelope Ridge is about 800 acres, give or take?

A. Uh-huh.

Q. And we've got four wells in there?

A. Correct.

Q. Do you find any evidence, based upon your study of pressure over time, that those wells were in communication with each other or one to another?

A. Not really, and no, I do not. We can look at the plot on Exhibit 13 in the lower left. That's a composite plot of all the four producing wells that were in Antelope field. Again, it's pressure versus time. And you can see the various colored triangles representing the Antelope well names. It's a busy plot, but if you try to find those colors you'll see that basically each well came in with an original bottomhole pressure of 6000 pounds or greater.

And then -- There's some scatter to the data, I'm not sure why. But essentially the point of this plot is, look at when -- Like the Antelope Ridge Unit Number 9, that's the greenish triangle, it was drilled in 1986. If you look at that pressure point, it's about 6250 pounds. At that same time in 1986, if you look at the other colored triangles, you don't see a marked decrease in bottomhole pressure to where those wells are competing for reserves. The other colored triangles remain the same.

Q. Any other points that you would like to discuss with regards to this exhibit?

A. Well, again, I don't think that these wells exhibited pressure interference, so that they were in effect properly spaced. You can look at the decline curves in the lower right for these four wells. Again, when the well in 1986 was drilled, you don't see any marked change in production-rate or production-decline profile for the other producing wells.

I think it's also important to note that Antelope Ridge did recover more gas from more wellbores than did Bell Lake North.

It also produced less water than Bell Lake North, and I think that's a key -- I'll talk later in my testimony, but a key to producing water drive reservoirs is multiple wells, because you can manage that gas-water contact rise and in fact reduce it and sometimes maybe even prevent it with multiple wellbores.

You know, again, we've already pointed out at Antelope Ridge, it's, you know, in effect 800 acres field size, maybe a 1000 acres if I planimeter the outer contour to the gas-water contact at Antelope Ridge. But in effect, that is wells are spaced on 200-acre-type spacing, certainly not 640s.

Q. Let's turn to your analysis of Mr. Landreth's

exhibit. You've marked it as Exhibit 14.

A. Yes, sir.

Q. Subsequent to the hearing on the compulsory pooling case, you took Mr. Landreth's structure map that he presented in that case as Exhibit 7 --

A. Uh-huh.

Q. -- and made some calculations and reached some conclusions?

A. Yes, sir.

Q. You have not yet had time to look at the exhibit he showed today in order to make similar calculations?

A. Not to make the calculations, but I did a qualitative check, just based on his contours over the same sections and it appeared similar in my opinion.

The absence of his east-west fault to the north of the Rio Blanco structure has just been closed out with contours, as opposed to that fault. So relatively speaking, within a couple of percent, my numbers would not change using his new math.

Q. Let's look at the map, then, he had for the compulsory pooling hearing.

A. Okay.

Q. His map shows the original gas-water contact --

A. Uh-huh.

Q. -- and his assumption that that contact then

moves over time and is currently at a point located along the green line, do you see that?

A. That's correct.

Q. Are there engineering calculations you can make to determine whether his thesis is valid or not?

A. Yes, there are.

Q. And what have you done and what have you concluded?

A. What I have done was, again, I did a volumetric calculation to determine, just looking at the Rio Blanco structure on Mr. Landreth's Exhibit 7 from the prior hearing, in order for the water contact to move from the blue line to the green line, as he suggests -- and that's also noted on his cross-section from that same hearing, Exhibit 8 -- but in essence he stated that the water contact moved from 11,340 vertically to 11,270.

I did a volumetric calculation for that wedge of reservoir and determined --

Q. You're talking about the eastern wedge of this --

A. Yeah, the eastern wedge --

Q. -- of this structure feature?

A. Right, from the blue line to the green line. I did a volumetric calculation to determine, okay, how much gas are we going to have to remove from that for the water to migrate as he suggests? That's what's noted as item 1

in my exhibit here. 47 BCF would have had to have been produced. That hasn't happened, only 31 BCF have been produced from the Conoco well.

Q. And if you're dealing with the entire structure and taking the area that he says has been voided --

A. Right.

Q. -- by production to change the blue line to the green location, what total volume of gas would have had to have been removed from this feature if, in fact, it was all common?

A. Are you talking about the whole feature or the west half now?

Q. The west half now is an additional sum of gas.

A. Correct.

Q. And what is that sum?

A. Yeah, the west half, as it's represented by Mr. Landreth in this Exhibit 7 -- again, keep in mind he's contouring Bell Lake Middle field and Bell Lake North field together -- he stated previously that he believed that they're all in communication and that the gas-water contact has risen to the top of the Bell Lake 6 well. Hence, that whole volume of rock has been swept with water. Hence, the gas has been displaced from there.

For that to occur, my item 2, 209 BCF would have had to have been produced from the reservoir for that

migration to have occurred.

Q. It didn't happen?

A. It didn't happen. The combination of the two being, you know, greater than 250 BCF, if Mr. Landreth's representation is accurate, would have had to have occurred. Bell Lake North has only produced 31 BCF, the BTA well has produced 1 BCF, so a total of 32 BCF have been produced.

And again, this analysis ties to what you've already heard today geologically and using our geophysical data, that these structures have to be closed.

Again, this represents also that these Devonian wells can't and do not drain large acreages. It just doesn't happen.

Q. Let's turn to another topic, Mr. Linville. If you'll direct your attention to what we've marked as your Exhibit 15 --

A. Uh-huh.

Q. What have you analyzed here?

A. Okay, my Exhibit 15 now is another volumetric calculation where I strictly focus in on the Bell Lake 6 well, trying to determine what could that well have drained? I already pointed out earlier that the Bell Lake North field has had a total field recovery factor and recovery of 38 percent of the original gas in place.

If I look at the --

Q. Let's see, how have you subdivided the display? What do we see on the left as compared to the right?

A. On the left-hand side is my volumetric analysis for the Bell Lake 6 Conoco well.

Q. All right.

A. On the right-hand side is my volumetric analysis, however I've used Mr. Landreth's recovery factor from the previous hearing.

Q. You don't have to go through the details of it, but give us the bottom-line number.

A. Well, the bottom-line number, focusing to the left, again we know that we've recovered 31 BCF of gas, I have chosen to use a recovery factor of 75 percent, which I can document and we'll discuss later that that is a commonly accepted petroleum engineering, Society of Petroleum Engineers, recovery factor for gas water drive reservoirs.

Using a porosity of 4 percent and water saturation of 18 percent, that calculates to be a drainage area of 330 acres for the big 31-BCF well.

If I keep all the parameters the same and use Mr. Landreth's 90-percent recovery factor, as he felt was appropriate in the last hearing, the acreage of drainage even gets smaller, 275 acres.

The point of the whole display is that these wells don't drain big acreages, and multiple wells are required. Again, it's further substantiated by the Amerada Number 3 well. That --

Q. Let's look at that. Those two wells, the Amerada 3 and the Conoco 6, are on equivalent 160-acre locations, are they not?

A. Yes.

Q. They're in adjoining 160s?

A. That's correct.

Q. What do you find?

A. Well, I found that 36 years later, or 35 years, the Amerada Number 3 well was drilled as that offsetting 160, it had a higher bottomhole pressure on DST than existed at that time in the Conoco well. The Amerada well also flowed gas, unfortunately, with water on DST. But the point is that there's gas remaining in the reservoir, there's gas in place. So the Conoco well didn't drain it all.

Q. And the Conoco well had a different bottomhole pressure than the Amerada Hess well?

A. That's correct.

Q. And if they were in communication they would have been the same?

A. That's correct. And again, all of this plays

back into what you heard from Mr. Hulke, that these reservoirs are discontinuous, and the only way to properly develop discontinuous reservoirs and protect all the owners is to have multiple wellbores. I think it's -- No.

Q. Let's go on to a different topic. If you'll turn to Exhibit 16, Mr. Landreth this morning talked about him asking Schlumberger's expert to run some drill stem test calculations for him on the initial data received from the re-entry of the Rio Blanco 4 well in Section 4.

A. Yes.

Q. Have you also been in contact with the experts at Schlumberger concerning similar-type tests for you?

A. Yes, we have.

Q. When I look at Exhibit 16, am I looking at the results of that effort?

A. Yes, it's a summary of the results of what Devon had asked Schlumberger to perform.

Q. Let's talk about the data and then identify for us the parameters or values that you gave to the Schlumberger expert for purposes of his work and why you've chosen the various parameters you have for purposes of having him investigate this for you.

A. Okay. First you wanted to identify the data?

Q. Yeah, the drill stem test data.

A. Yes, it's from the drill stem test.

Q. Right.

A. That's correct, the data came from the drill stem test that EGL performed while drilling --

Q. And in order for Schlumberger to do the report, what if anything do they need from you?

A. Okay, from me they need a porosity value, a water saturation value, a bottomhole temperature value, a gas gravity value and a thickness value. I think that's all of it.

Q. Did you have them generate more than one report?

A. No.

Q. What input information did you give them so that they could generate that report?

A. I asked them to use a porosity value of 5 percent, reservoir temperature of 212 degrees, and that should be the same as what's on the bottomhole log -- excuse me, open-hole logs. A water saturation of 20 percent. We've provided them a gas gravity of -- I'm looking -- .61. And then I had asked them to utilize two different footages for the reservoir, combined in one report.

Q. Okay.

A. I had asked them to look at 18 feet of reservoir, which as Mr. Hulke pointed out earlier, that was the best bottom 18 feet that had been drilled into of the open-hole

section.

And then I had asked them to do a footage case of 200 feet. Again, as you've heard with prior testimony today, I think both parties believe that there's a big gas column there, down to the gas-water contact. So I wanted to see the buildup results with the 18-foot assumption that that's where all the flow was coming into the open-hole EGL well, or if the whole 200 foot of reservoir was contributing. I personally believe the 200 foot case is the more valid case.

Q. Describe for us what the report concludes using those parameters.

A. Okay. Well, buildup analysis first, the main result from it is a KH value, a permeability footage value. That's a value for the complete system that was tested in the DST. That number doesn't change as, for example, the footage will change. So in our case, our KH value was 500.

And then the other thing that remains constant in the buildup analysis, the result is the skin factor. The skin factor in this case is approximately 88, so for both footage cases the skin will remain the same at 88.

If you look at the right-hand column of data -- Well, another thing that's determined from buildup analysis is the ultimate extrapolated reservoir pressure. And as Mr. Landreth also pointed out earlier, that was calculated

to be 6136 p.s.i. That will remain constant for any further analysis.

If you focus on the data to the right, which is my 18-foot case, I did a calculation personally, a calculation trying to define the skin value. You'll notice that it says skin value total is 88. I have then calculated the skin that I call mechanical skin, which is a 51. I believe there's mechanical skin in this wellbore and represented by this buildup, due to the fact that the reservoir was partially penetrated.

You've got a 200-foot Devonian gas reservoir that we've drilled 92 feet into, and then we ran a DST. All of that gas is attempting to flow from 200 feet of rock through 92 feet of rock or 18 feet or 40 feet of rock, as Mr. Landreth had used. And the reason I ran that calculation was to determine if, in fact, that was a true assumption.

And by virtue of the fact that the mechanical skin is two-thirds or whatever that ratio is, 51 to 87, of the total skin, I believe it's a valid assumption that the EGL Rio Blanco 4 and the DST that has been run tested and saw the full 200 feet of reservoir.

If you -- however, if you -- Let me rephrase, kind of, what I'm describing. This mechanical skin, basically what I'm saying is, you're trying to take a

firehose volume of gas and get it through a garden hose. It's going to happen, but it's going to be a real high-pressure -- or a back pressure, which is what skin does to you in a reservoir. And you can see the pressure drop due to skin is about 1100 pounds, so there's quite a bit of pressure drop or back pressure on this reservoir due to the skin.

Q. As a reservoir engineer, do you see any basis at this point that there is compelling evidence to cause you to recommend to Mr. Catanach that he ought to change the spacing from 320 to 640?

A. No, not at all. In fact, I could go the other direction, 320 to something smaller. And the reason for that, if you look at what I -- on these two columns here, again, I didn't even talk to my 200-foot data, but the other thing that comes out of a pressure buildup analysis is radius of investigation. How far out did that test see in the rock? For the 18-foot case, it saw out 334 feet, which is an effective drainage of eight acres. So that DST, if you assume 18 feet, saw eight acres of reservoir. If you assume 200 feet of thickness, the DST saw a hundred-foot radius or .7 acres of reservoir.

The permeabilities for the two cases -- for the 18-foot case, the permeability calculates to be 27.8 millidarcies. For the 200-foot-thick case, the

permeability calculates to be 2.5 millidarcies. I think the 27-millidarcy case is unrealistic. I just ran that 18-foot case because you had to have a high side, so to speak.

Mr. Landreth earlier was talking about 17 millidarcies of perm, and that's going to be a well capable of draining 640 acres. Again, I think it's incorrect to make those statements, because the DST -- that permeability only deals with what the radius is. That DST only saw 230 feet, or whatever it was on his report, 230-some feet. That's the only part of the reservoir that that 17 millidarcies is valid for. You could get five feet beyond that and there could be no permeability. It could be higher or it could be less.

The other thing that occurs, as I mentioned earlier, buildup tests come up with a KH, permeability thickness, for the whole box that it has tested. Again, as Mr. Hulke spoke to, this is a non-homogeneous reservoir. You've got vertical fractures, discontinuous horizontal permeability and porosity. So you might have, and I believe in this case you've got a horizontal -- a vertical permeability as well as a horizontal permeability.

So there are just a lot of potential unknowns. You just have to keep in mind that a buildup measures the whole mass of rock.

Q. On your Exhibit 16 there's an extrapolated

reservoir pressure of 6136.

A. Uh-huh.

Q. Is that the equivalent of a bottomhole pressure?

A. Yes, that's the equivalent of an original bottomhole pressure.

Q. Well, when I take that pressure and compare it to the Conoco 6, which back in July of 1998 had 3820 pounds --

A. That's correct.

Q. -- do you draw any importance to that differential?

A. Yes, I did.

Q. And what is that?

A. That these wells are in separate reservoirs, separate structures, they're not connected.

Q. If they were connected, what would the number be?

A. The number for the EGL Rio Blanco 4 would have had to have been this same bottomhole pressure as the Conoco Bell Lake 6 well.

You know, further to this issue of inefficient drainage and reservoir heterogeneity, if you just simply look at the DSTs that have been done in Rio Blanco Number 4 and the three wells in the Bell Lake North field, they've all had different pressures, different flow rates and different recoveries. None of them have been the same. So I honestly believe that these things are encountering

different parts of the reservoir. Even though it's the same structure, you're encountering different parts of the reservoir and adding incremental gas, if they were all producing.

Q. Mr. Linville, have you done a literature search? I know you're a registered professional engineer. Have you done a literature search to see what published papers within your discipline have told you concerning the expectation of recovery factors in a reservoir like this?

A. Yes, can I -- Can I speak to two other things on the buildups real quick?

Q. (Nods)

A. We have an AOF calculation on the Rio Blanco 4 -- as a matter of fact, it was provided to us by Mr. Wesley Perry of EGL -- and that well is calculated -- I'm assuming it's by the testing company -- to have -- the Rio Blanco 4 having an absolute open flow of 10 million a day, 10 million cubic feet a day.

I ran some of my own numbers as a double check and I came out with a number of 12 million cubic feet a day. I think it's important to note that, because Mr. Landreth previously made statements that wells of this caliber -- I think he was referring to Antelope Ridge -- down there had some AOFs of 12, 15 million a day, and he was equating that to 4.5 millidarcies.

But here we've got 10, 12 million a day. Is it 4 millidarcies? I think it probably is something in that range, which again ties back to my number using the 200 feet of reservoir, I've got 2.5 millidarcies.

The other thing I want to mention is, with that Mr. Perry gave us a gas analysis from the Rio Blanco 4 well.

Excuse me, I'm losing my voice.

We noted on the gas analysis from the Rio Blanco 4 that there's no H_2S in this analysis, so as far as Devon is concerned, we don't know if this Devonian gas has H_2S. If one assumes it doesn't, that's again another indication that this is in a separate reservoir from the Bell Lake North 6 well, because Devon has a copy of the gas analysis from the Conoco Bell Lake 6 well, and it has H_2S in the gas.

Jus as important, if you compare the two gas analyses side by side, the percentages of the components of the gas itself are different, the nitrogen, CO_2, methane and ethane.

So I just wanted to point that out, that we have some other data points to back up the fact that we, again, think we're tying this all together with geology, geophysics and reservoir production engineering, that Rio Blanco 4 is a separate field from Bell Lake North.

Q. Just because you've been able to calculate an absolute open flow is not going to give you any clue about how much acreage is being drained by this well, is it?

A. That's exactly correct. I wanted to point that out because I thought Mr. Landreth's statements earlier were not accurate.

Q. Well, even with that number there's no way to determine the gas in place in the tract?

A. That's correct.

Q. You don't know what the recovery is going to be, you don't know the reserves that are going to be produced, you don't know the drainage area.

A. That's correct.

Q. Let's go back to the literature search so we can see the range of expectation on the recovery factors that you have analyzed based upon the literature search.

A. Right.

Q. Identify and describe for us 17.

A. Okay, Exhibit 17, I believe there's 16 or so SPE papers that I've noted here, the paper number, the title of the paper, so that anyone can go back and pull that same information themselves.

I've then taken out key excerpts from those SPE papers, and then some observations are listed, which are some of my observations as well as they were conclusions

from the SPE papers themselves.

The first one, highlighted in red on the first page, I think it's important to point out this is from the *Petroleum Engineering Handbook*. It's basically a Bible of petroleum engineering; it's about a 6-inch-thick book. It states that for water drive reservoirs gas is trapped and bypassed by the advancing water. Typical recovery factors are 50 to 70 percent.

You'll recall earlier in my volumetrics I was using a 75-percent recovery factor. So that's the basis for that recovery factor. It's well known and documented.

Further in the body of this exhibit, on the second page, the paper noted, Number 6830, "Beaver River Middle Devonian", that's a field in Canada. And actually, I want to point out that in this literature search I encountered fields worldwide that were gas water drive reservoirs. They all spoke to the fact and the difficulty of predicting recoveries, predicting drainage, the difficulty of having minimal wells. They all concluded that multiple wells are the best way to go for water drive gas reservoirs. There's a field in Canada here, a field in Indonesia, a field in Venezuela, United States, and I even recall reading about one in the Middle East. Carbonate reservoirs just have that nature of -- they're nonhomogeneous.

Do you want me to go through any of the --

Q. No, sir, just make the major points that you want to out of the display. It speaks for itself.

A. Yeah, you know, the Canada -- some of the excerpts here talk about that the matrix porosity is probably less than 2 percent, but when you consider vugs and fractures, which Mr. Hulke and Mr. Hager spoke to, it can get up to greater than 6-percent porosity. And that gas is trapped by the advancing water. Again, that's evidenced by the Amerada DST in Well Number 3.

It also speaks in this reservoir search that I did that not only do you need good reservoir data for the gas portion -- gas-saturated portion of the reservoir, you need good reservoir data for the aquifer portion of the reservoir, you need porosity, perm, saturation, et cetera, from the aquifer portion of the reservoir, if you're going to do a true reservoir model. Well, EGL obviously hasn't gotten to the gas-water contact. Devon believes that we are going to get to the gas-water contact with our well in Section 33 and any subsequent wells that we drill in this area.

So we believe that we're going to be able to study, identify and portray and develop this reservoir more efficiently.

Q. Let's talk about that topic. When we look at the

potential for generating data out of the Rio Blanco 4-1 well and contrast that to what Devon is engaging in in the south half of 33 with the well they're now drilling, at the conclusion and completion of your well in the south half of 33 are you going to have the type of reservoir science that you envision being necessary to determine what appropriate spacing should be?

A. I believe that we'll have much more data that could lead to that conclusion. Again, it's well documented in our industry that one well doesn't describe a reservoir, one well does not a reservoir make, you know, essentially. We, however, will have much more data than EGL obtained from their open-hole completion.

If you'll refer to my exhibit -- is it 18?

Q. I have it down as Exhibit 18. Let's do that now.

A. On the far left I have a column titled "Test or Procedure", essentially what tests can be done, cased-hole logs and open-hole logs and cores and DSTs and so forth. I list whether Devon can obtain that and whether EGL can obtain that, and some of the results that you can gather from having those tests.

Well, if you just simply focus on the right-hand side, the EGL column, you'll see that they can't obtain any of the data until you get to the bottom where there's a DST, which they've done, or pressure buildup test, which

they've gotten a partial pressure buildup test from the DST, but I was referring to an extended buildup in this case.

So comparing the two plans of operation, if you will, Devon's is superior in that we'll be able to obtain a lot more information and learn more about the reservoir and be able to develop it properly, efficiently and prevent waste and the damage of correlative rights.

Q. Do you recall the period of time involved in Mr. Landreth's buildup on the Rio Blanco 4 well? We're talking about lengths of test for pressure buildup.

A. Do I recall what the time was for the flow periods and shut-in periods?

Q. Yeah, that kind of stuff. Is that shown in your drill stem report in your exhibit?

A. Not in what I've summarized. It might be on the -- attached to that was the Schlumberger report. If you look at page 4 of the Schlumberger report -- I think I'm looking at this correctly -- you would just have to know because it's not written, page 4 of that report. You see a horizontal dark line on the vertical scale starting about 4500. That would be the initial flow of the DST, which was 10 minutes or something. You can get the time off of the horizontal scale at the bottom of that plot.

Then they shut the well in, I believe it was for

an hour and a half, or maybe an hour, and then they flowed it for an hour and a half, then they shut it in for final buildup of approximately three hours.

So, sort of answer your question, they've got a total shut-in time of like four hours and a total flow time of an hour and a half.

Q. Is that a long enough test to be meaningful?

A. Not really. In this case we are fortunate that, as Mr. Landreth pointed out earlier, the final shut in, the pressure did break over. So when you look at Horner plotting of the buildup data and derivative plotting, you can extrapolate to an ultimate reservoir pressure.

The short flow period, though, however, doesn't get a pressure pulse or a pressure transient out into the reservoir very deep. As you've already seen, some of these radiuses of investigation are 100 feet out to maybe 300 feet.

So no on the flow data side. More flow data is going to be better to determine how far out the transient might move. And again, the pressure transient, just because it goes a certain distance, it doesn't mean it's going to drain that distance.

Q. Let's turn to the final topic, Mr. Linville. If Examiner Catanach denies the Application of Mr. Landreth, have you run an economic analysis to see what would happen

if, say, two wells were drilled instead of one?

A. Yes, I have.

Q. Take us to Exhibit 19 and show us what you're doing.

A. Okay. Well, what I did on this exhibit -- and I chose to focus on an existing field, in this case Bell Lake North, because we know what that well has produced and what that field has produced, unlike what Mr. Landreth did. He assumed a case for Rio Blanco, he just picked a number of 10 BCF. I chose to use something where I had hard data, hard facts.

On the upper left of this exhibit, you see I ran a one-well case. The assumption here is for the one -- I was trying to model the one Conoco Bell Lake Number 6 well, where the well recovery is approximately 30 BCF over a 40-year time frame. I had to make an estimate of the original initial production rate, because it came on in 1960. I didn't have that data.

I then said, well, what if two wells were producing in Bell Lake North, making the assumption also, what if they just produced the same amount of gas as one well? Hence an accelerated production case.

So the data in the upper right of Exhibit 19, you've got two wells producing at double the initial production, getting the same amount of reserves and half

the amount of life.

The conclusion from that is that you end up with -- the working interest owners have an incremental PV 10 of around $6 million, by having two wells just simply recovering the same amount of reserves from -- that one well would have gotten. Additionally, the State of New Mexico in severance tax collections gets almost a million dollars incremental, by in this case modeling an accelerated case.

The reason I put this together is, I wanted to demonstrate that just on the minimum chance that you only get the same amount from two wells, you're still better off. We truly believe, and we feel that we've demonstrated, that you're going to get incremental gas over and above, by having multiple wells.

Q. I asked Mr. Landreth this morning if the single well in Section 4, Rio Blanco 4, in his opinion would withdraw all the gas in the east pod of this Devonian feature, and he said that it would.

If you have Section 33, how are you going to get your gas, if you don't drill a well?

A. There's essentially no way to get the gas.

Q. Mr. Landreth takes it?

A. Yes.

Q. Under his map we've shown that the east half of 5

has acreage that appears to be gas-productive because it's above the gas-water contact in that feature as he's displayed it. How will the owners in the east half of 5 get their share of gas if spacing is 640 acres and the acreage dedicated is all of Section 4? They don't get their gas, do they?

A. Are you saying that if it's 640 spacing, how are the owners in 5 going to get their gas?

Q. Yeah.

A. Well, there would be one well in Section 5.

Q. You'd have to drill the well, wouldn't you?

A. Yeah. But keep in mind that the working interest owners in the east half of 5 are going to get diluted by the unproductive acreage in the west half of 5. We know it's unproductive, because there's a wet Devonian DST well over there. So we'd hope the OCD doesn't want to pull wet Devonian reservoir into productive Devonian reservoir.

Q. Anything else, Mr. Linville?

A. Can I check my notes?

Q. Yes, sir.

A. No, not other than what I just mentioned about correlative rights. You're going to have dilution of working interest owners. And then also the fact of -- If it's spaced on 640, I don't think that prevents waste because you're going to leave gas in place that's already

been shown at the Bell Lake North, because the Amerada Number 3 well has DST'd gas. There's gas there.

I'm done.

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

We move the introduction of his Exhibits 12 through 19.

EXAMINER CATANACH: Any objection?

MR. HALL: No objection.

EXAMINER CATANACH: Exhibits 12 through 19 are admitted.

Mr. Hall?

CROSS-EXAMINATION

BY MR. HALL:

Q. Mr. Linville, I wonder if you would take Mr. Hager's Exhibit 7. I think that's --

A. Uh-huh.

Q. -- the brightest exhibit we've seen today. Mr. Linville, would you agree with me that before there were any wells drilled in that anomaly covering Sections 5 and 6, that that anomaly was filled with gas? Any dispute about that?

A. No, I would agree with that.

Q. Then along comes the Conoco well.

A. Yeah.

Q. It's drilled.
A. Right.
Q. And then we go over to the Amerada Hess well in Section 5 --
A. Uh-huh.
Q. -- and do you recall what that well DST'd in 1995?
A. Salt water.
Q. Where did all that gas go?
A. Conceivably, it could have been produced by the Bell Lake Conoco 6 well.
Q. All right. Well, let me reconcile that with what I think I just heard was the theme of your testimony, that this reservoir is highly discontinuous --
A. That's correct.
Q. -- and those wells are not in communication. Which is right?
A. Both are correct.
Q. You can have it both ways, then; is that what you're saying?
A. Right, Mr. Hulke mentioned that some of the porosity stringers, when we pull out his cross-section again, can be correlated well to well, some of them cannot. Vertical fracturing is throughout the whole gas column, sometimes maybe it's not.

One observation that could possibly be made here is that the directional permeability of Bell Lake North is such that it is higher east to west, hence it could have drained the Amerada Number 2 well that tested water. It's not -- The perm is not as great north to south, which is why there's gas left in place evidenced by the DST on the Amerada Bell Lake Number 3 well.

Q. So the perm variabilities and any other discontinuities are not sufficient enough to prevent the communication of gas from the Amerada Hess well in Section 5 and the Conoco well in Section 6; is that accurate to say?

A. Say that again? The perm variances --

Q. You and Mr. Hulke both testified that there's -- the perm of intervals do not correlate all the way across --

A. Right.

Q. -- consistently --

A. That's correct.

Q. -- but there are sufficient correlations across to allow for the communication of gas from the Amerada Hess location up to the Conoco location; is that correct?

A. I'd have to pull his cross-section, but I'm just making a logical conclusion on the reservoir data.

But again, keep in mind that I have done

volumetrics that said the Bell Lake North could have drained 300 acres. Well, if this was mine I might not have drilled that Amerada well, because that's within 300 acres. You've got to be able to try to figure out the direction the perm is, the porosity is, integrate the whole package.

Q. Do you disagree with the two locations Amerada Hess picked for that anomaly?

A. In retrospect. But at the time, the data Amerada Hess had, I had never thought about that. Seemed like logical choices.

Q. And you're advocating that additional drilling be done in that western anomaly to recover the gas you believe is still in the ground out there; is that right?

A. Western anomaly.

Q. In 5 and 6.

A. Am I advocating additional drilling?

Q. That's my question.

A. I'd have to run an economics. I can tell you this, if I and if Devon operated the Amerada Number 3 well and had rights to the Devonian, it would be perforated, producing, we'd be making 4 million a day, $20,000 a day.

Q. Well, is it your view that the Conoco well did not recover all the gas available to it?

A. Yes --

Q. Where else would you --

A. -- because that well is still capable of production.

Q. Okay. Where else would you choose to drill in that western anomaly?

A. I had not considered that until your asking, so I don't want to venture a guess.

Q. Okay. Let me ask you this way: You've advocated that we downspace from 640s to 320s or below.

A. No, I didn't say that.

Q. I thought I heard you say that on direct. Am I mistaken about that? You're saying that 320-acre spacing was not sufficient spacing to recover all the gas?

A. No, I didn't advocate downspacing. I said 320s is the appropriate way, current statewide rules, to develop the -- That was my intent. Because it's currently 320s, there's nothing that needs downspaced.

Q. North Bell Lake-Devonian Pool.

A. I'm sorry, I thought we were talking about Rio Blanco.

Q. But you're advocating additional drilling and development in North Bell Lake-Devonian, correct? I understood you to testify that there was substantial additional reserves to be recovered in that pool?

A. That's correct.

Q. Where would you drill?

A. If someone wants to drill it, that's their prerogative.

Q. Well, has Devon --

A. I mean, the owners of that have to drill it -- Mr. Landreth owns some interest in that, I believe.

Q. Well --

A. That's what I was told.

Q. -- if additional drilling is warranted, has Devon attempted to acquire any rights in the North Bell Lake Pool reservoir?

A. I don't know the answer.

Q. I understand what you're telling us here today is that you're advocating 320-acre drilling for North Bell Lake-Devonian gas pool reservoir anyway, correct?

A. No, I'm saying the current spacing at Rio Blanco, the proration unit that was approved back in April, is adequate and appropriate.

Q. I'm talking about the North Bell Lake-Devonian --

A. I know you're --

Q. -- anomaly to the west.

A. I'm answering your question. I stated today that -- my intent was to state today, if you felt it was different, that -- Rio Blanco is where I'm saying 320s are appropriate.

Q. With respect to the North Bell Lake-Devonian Gas

Pool, do you agree that 640-acre spacing is appropriate?

A. No, I do not.

Q. You're advocating we go to 320s in that pool?

A. That's already an established pool. I'm not here to --

Q. Let me ask it this way --

A. -- change the pool rules. I'm not going to change those pool rules.

Q. Let me go about it this way --

A. If I own something in that -- and I might; I'd have to run the economics --

Q. Let me go about it this way: You're saying that the reserves underlying the North Bell Lake-Devonian Gas Pool reservoir have not been adequately recovered with 640-acre spacing units?

A. That's an accurate statement.

Q. And so you are advocating that we downspace that pool to recover those additional recoverable reserves?

A. No, I'm not advocating changing those pool rules. I'm saying that in my opinion Bell Lake North could have and could still be developed more efficiently if it had 320 spacing. I'm not here to get that changed today.

Q. I understand that.

A. I'm here to argue about Rio Blanco.

Q. I understand that. So you're advocating the

drilling of additional wells at what, the cost of $3, $3.5 million?

A. Additional wells where?

Q. North Bell Lake-Devonian Gas Pool, to recover what you said is recoverable gas.

A. No, I'm not.

EXAMINER CATANACH: Mr. Hall, I think he's --

THE WITNESS: I don't own anything --

EXAMINER CATANACH: -- answered your question.

THE WITNESS: I'm not advocating it. I'd have to run Devon economics, if we were involved in -- our -- $3 million is something different, $2.3 million.

Q. (By Mr. Hall) Let me ask you about your Exhibit 12, the montage. I want you again to review the data you utilized in reaching your conclusions, and if I understood you correctly, you admitted that this data was not reliable; is that correct?

A. No. I admitted the last data point 16 p.s.i. for the BTA well was probably not reliable.

Q. How about the last two data points on the Continental Bell Lake Number 6 well? It shows September of 1997 and July of 1998 --

A. Uh-huh.

Q. -- pressure increased a little bit.

A. That's correct.

Q. Are these actual measured pressures, or calculated, do you know?

A. I don't know. It's PI Dwight's public data, it says bottomhole pressure when you go to the PI data source, websites, et cetera.

Q. How does Dwight obtain this data?

A. It's provided by the operators to -- I believe in this case it's an annual shut-in test, State of New Mexico, OCD, and then PI Dwight's sources the OCD data at websites, et cetera.

Q. In your opinion are these data reliable or unreliable?

A. I'm going to have to say they're reliable, because industry worldwide uses PI Dwight's as a data mark.

Q. When you look at the pressures you're showing on the Bell Lake Number 1 in Section 18, the BTA well --

A. Yes.

Q. -- you look at data showing 1985, 1986, 1987, you go from 988 to 850 to 16.

A. Uh-huh.

Q. How do you reconcile that with the 5000-pound approximate pressures that have been observed in the Amerada Hess wells?

A. Well, you reconcile it that they're separate reservoirs. I've already told you that Bell Lake Middle is

a separate field from Bell Lake North. If there was pressure data versus time on the Amerada well, there's a couple of pressure points. In 1995 it had a pressure point of 5000, 6000 pounds, I don't remember exactly.

Again, the key here is that Mr. Landreth stated pressure data was gospel. I mean, it tells you what it is. BTA well depleted, it's not connected with the Bell Lake North.

Q. Mr. Linville, do you know when Devon made the final decision to commence drilling its well in Section 33, what triggered that?

A. I don't know when we made it. What triggered it was essentially we were able to get a rig on the contract, so that was timing, you know, the timing factor.

Q. You had not been able to get a rig before this particular rig?

A. Not the rig that we -- as told to me, you, the rig that we wanted, the one that we felt was capable and appropriate to drill this complex of a well.

Q. Mr. Linville, do you know whether Devon is attempting to acquire any rights in the south half of Section 4 from OXY?

A. I'm not aware that we are attempting to.

Q. Do you know whether it's been discussed in-house?

A. I have asked our landman Richard Winchester if we

had considered that, and he stated that no, we haven't, and no, we are not pursuing it because of the nature of this case and the ethics involved in that happening.

Q. Did you recommend that the land department consider obtaining a top lease on the OXY acreage?

A. No, sir.

MR. HALL: Nothing further, Mr. Catanach.

EXAMINER CATANACH: Any questions, Mr. Bruce?

MR. BRUCE: I have no questions.

EXAMINATION

BY EXAMINER CATANACH:

Q. Just a couple, Mr. Linville. The pressure data that you derived from Dwight's, are you aware that that is a -- that's not a bottomhole pressure, that's a shut-in surface pressure that was obtained?

A. I wasn't a hundred percent aware of that, but I had pondered that thought. I wasn't sure as to the method.

Q. The test that we used to require, which is not even required anymore, would be a 24-hour shut-in surface pressure that they would have had to report to us.

A. That's been abated this year.

Q. Right. Would that affect your numbers here --

A. Well, like I say --

Q. -- if you're looking at bottomhole pressure?

A. Correct. Like I say, I had pondered that and I

was not aware that that was the case. But in the event that it was, my answer to the question is, you're going to see that same sort of a fall-off of the bottomhole pressure as you will with your surface pressure. It's going to be a consistent relationship. The slope would be the same.

You know, I also come back to the point that -- my perception is that Dwight's data is used in front of the various commissions daily, people just sort of probably have to go on faith, you know, that it gets calculated to a bottomhole and the same trends are going to be valid.

Related to the pressure, the other fact is, the BTA well ceased production, it depleted. You know, if it had been connected to that same water aquifer reservoir that Landreth suggests, it should have been producing gas all along.

Q. Can you tell me why -- If these are separate reservoirs and they're not in communication, can you tell me why the difference between the original bottomhole pressures in these reservoirs, why there's a difference? Shouldn't they be all fairly the same?

A. Yes, to your question. I believe that they are all fairly the same, all the original bottomhole pressures.

Q. Well --

A. If we -- Go ahead. Or I can explain.

Q. -- I was looking at some of the data here, and I

think -- in the North Bell Lake I think we had an original bottomhole pressure of about 6400 or so.

A. Correct.

Q. And the data from the Rio Blanco well appears to be somewhere in the 6136 range?

A. Uh-huh.

Q. I'm just wondering about the difference in that. Is that not significant to you, that pressure difference?

A. It's not to me, because I view it as, okay, you've got all the Devonian deposited and charged with water and hydrocarbons at a similar geologic time, as my colleagues have spoken to. So yeah, you're going to assume that you drill into these individual pods, you're going to have a similar original bottomhole pressure.

To me, a couple hundred pounds doesn't matter. I mean, you've got errors in gauges, gauge sensitivity, you know, you're talking a DST a Bourdon-tube-type gauge in 1960 versus an electronic quartz gauge right now in the year 2003. The accuracies are going to be different.

Also depending on potentially where the gas-water contacts are, the structural positions of the field, just due to hydrostatics you might have a couple of hundred pounds' difference.

Q. Okay. Do you know if these -- if the Rio Blanco 4 -- it wasn't stimulated at all, it wasn't fracture-

treated or anything?

A. That's correct, it had a drill stem test run while it was drilling.

Q. Do you know if they intend to do any treatment on that well?

A. I don't know if they intend to. I can speak to the fact that we have had conversations with EGL prior to drilling the well, and I think stimulation may have been kicked around in the conversation, but my perception is they don't intend to.

Q. Does Devon intend to do that in their well in Section 33?

A. I don't know. If you look at the one exhibit, 18, where I compare the plans of operations, one of the things I point out, in Devon's plan of operations we'll have a cased wellbore through the whole Devonian section, including the aquifer, so we will have the luxury of isolating zones for separate DSTs, separate buildups, if we want to stimulate, swab, inject, we have that capability. We're just not that far along on the plan to conclude are we going to stimulate?

Q. So according to your calculations, you've arrived at the conclusion that the Rio Blanco 4 Federal Number 1 is going to drain a very small area?

A. Yes, sir.

Q. And I think you've got two scenarios, one is actually .72 acres?

A. No, I'm not saying that that's going to be the drainage.

Q. What are you saying there?

A. I'm saying the effective drainage of that DST analysis, using 200 foot of thickness, that DST saw .72 acres of the reservoir.

Q. Okay, but you can't calculate a drainage area for that well based upon these parameters here?

A. Yes, I can. I didn't do it for the purposes of this because I felt I'd be making too many assumptions. We didn't have --

Q. There's not enough data?

A. We didn't have open hole log porosity data -- I've done it in notes, you know, if I use 200 feet of thickness and again 5-percent porosity, it's going to be a dead-on analogue to Bell Lake North. You're going to have a 300-acre-type drainage, because the fields are pretty much identical when you look at overall gas column, porosities, you know, if you make that assumption.

And similarly on pressures, like you pointed out, 6400 pounds, Bell Lake North original, versus 6136 here.

Q. So you would have to produce the Rio Blanco 4 Federal Number 1 for a time to do a decline curve, to

calculate a drainage radius; is that your -- Do you think you'd have to do that?

A. Oh, most definitely.

Q. How long do you think that would take, to get some good data?

A. I can't predict. You know, a couple of things. Yeah, you're going to look at a decline curve, but that doesn't tell you a drainage radius. You can do extended drawdown analysis, which -- producing the well would provide you that data. You can do subsequent buildup analysis.

But again, I think the key is, even if you did that and say you're going to drain 300 acres, bear in mind that that is an average composite drainage. You may have one lens draining 50 acres, you may have one going north-south draining 10 acres, and one skewed at this azimuth draining 400 acres. You know, industry key to infill drilling or multiple-well drilling is heterogeneous reservoirs, that's the reservoirs you want to do it in.

Q. When you get your well down in Section 33 ad you've done the logging and the testing, is it going to be a lot more data that we can use to maybe evaluate a drainage area for these wells, at least initially, or would you have to produce that well also?

A. Well, initially you would have the open-hole

data, you'd have a porosity. Again, you could make that single wellbore volumetric attempt. But in the end you're not going to know what is it draining until you produce the well for some X amount of years, in my opinion.

I'd like to suggest, to steer you back to the economics, you know, this well is on an accelerated basis, but I truly believe you're going to have incremental gas recovery.

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

Any more questions of this witness?

MR. KELLAHIN: No, sir.

EXAMINER CATANACH: Okay, this witness may be excused.

MR. KELLAHIN: We rest our case.

EXAMINER CATANACH: Oh, I'm sorry, Mr. Bruce?

MR. BRUCE: Mr. Examiner, I have one little item to submit. I can do it through a witness. My proposal is just to make a brief statement, and if Mr. Hall has any questions he can do so. It will shorten the hearing by a few minutes.

Mr. Examiner, I do have a witness who can support this through testimony if necessary. In Mr. Landreth's Exhibit 12 he submitted a listing of numerous Delaware Basin Devonian gas pools in Texas that are spaced on 640

acres.

My client has done a little research on these pools. I have submitted to you as Southwestern Exhibit A data pulled from the Texas Railroad Commission website which shows that yes, these pools are spaced on -- not all of them that are listed in Landreth Exhibit 12, but the ones that I have submitted as Southwestern Exhibit A have optional rules, which you can see, like on the first page the optional spacing is 160 acres. If you turn to the second page, the Elsinore-Devonian Pool, that is based on statewide rules, which is 40 acres in Texas. Whether it's oil or gas, in Texas the spacing is 40 acres unless you obtain statewide rules.

And I won't go down through the list, but there are a number of these that do have optional or statewide rules involved, which are substantially different than what is shown on Landreth Exhibit 12.

I would move that this be admitted into evidence. If necessary, again, I do have a witness who can testify about these.

Thank you.

EXAMINER CATANACH: Any objection, Mr. Hall?

MR. HALL: No objection, Mr. Catanach.

EXAMINER CATANACH: Okay, Southwestern Exhibit A will be admitted.

Gentlemen, would you like to make brief closing statements or not?

MR. HALL: I propose we submit draft orders.

EXAMINER CATANACH: Expedited?

MR. HALL: As best we can.

EXAMINER CATANACH: Mr. Kellahin, are you agreeable?

MR. KELLAHIN: We'll do everything we can to accommodate the problem of trying to get a draft order before you so that you can make a decision before Mr. Landreth's term assignment expires. It's getting very close, and it will probably take us at least a week to get a draft order in to you. You'll have to do it without the benefit of a transcript, we're going to have to use our recollections, because I think Steve takes several weeks to do a transcript, particularly in a case like this. So you might ask him how long we might wait for a transcript.

EXAMINER CATANACH: Steve?

COURT REPORTER: In this case I think probably 10 days maximum.

EXAMINER CATANACH: Still not going to help you.

MR. HALL: Let us take a crack at it. I would propose getting drafts to you a week from today.

EXAMINER CATANACH: We'll shoot for that. Even if -- and I'm saying I don't know. I mean, even if you

guys get draft orders in, I can't guarantee --

MR. HALL: We understand that.

EXAMINER CATANACH: -- that we can get this order out by the time that you requested. I mean, it's even beyond my control. If I get it out, I still can't -- I have no control over how long it takes management to get it through, so...

MR. HALL: You don't need to tell us.

EXAMINER CATANACH: In any case, we'll do our best to accommodate you and see what we can do.

MR. HALL: Thank you very much.

EXAMINER CATANACH: Anything further? Okay, if there's nothing further in this case, Case 13,085 will be taken under advisement.

(Thereupon, these proceedings were concluded at 4:46 p.m.)

* * *

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

_____, 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 October 8th, 2003.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 16th, 2006