STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DISTRICT

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

COPY

APPLICATION OF OXY USA, INC. TO REOPEN CASE NO. 8352 PURSUANT TO THE PROVISIONS OF ORDER R-7737-B AND TO REMOVE CERTAIN ACREAGE LOCATED IN THE BRAVO DOME CARBON DIOXIDE GAS UNIT FROM THE TEMPORARY SPECIAL POOL RULES AND REGULATIONS CURRENTLY GOVERNING THE "WEST BRAVO DOME CARBON DIOXIDE GAS AREA," HARDING COUNTY, NEW MEXICO

Case 8352

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID K. BROOKS, LEGAL EXAMINER
RICHARD EZEANYIM, TECHNICAL EXAMINER

June 4, 2013
9:12 a.m.
Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Legal Examiner, and RICHARD EZEANYIM, Technical Examiner, on Tuesday, June 4, 2013, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South St. Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: DEBRA ANN FRIETZE, CCR #251
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A P P E A R A N C E S

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I N D E X

EXHIBITS ADMITTED (Cont.)

EXAMINER EZEANYIM: Good morning, everybody. Nice to have you all here today. As you all know, today is not the hearing day, it's off docket. It appears you guys cannot settle it, so we have to settle it on a day that is not a hearing day.

So anyway, my name is Richard Ezeanyim. I'm going to be the Technical Examiner today in this case, and David Brooks is going to be the Legal Examiner on this special docket.

Today is Tuesday, June the 4th, at 12 minutes after 9:00 a.m. in the morning. We are going to continue Docket Number 20-13 off docket. Considering the case we have today, I hope we finish today. I really encourage us to finish today so we can get something else done tomorrow.

So with that waste of time, no other case, I'm going to read out this case that we are going to do today. Case number 8352, this is a reopened case. The application of Oxy USA, Inc., to Reopen Case Number 8352, pursuant to the Provisions of Order Number R-7737, in Harding County, New Mexico.

Call for appearances.

MR. FELDEWERT: If it please the Examiner, Michael Feldewert on behalf of the applicant here, Oxy USA, Inc.

I have two witnesses here today that we may call.

EXAMINER EZEANYIM: Thank you. Any other appearances?

MR. DEBRINE: Good morning, Mr. Examiner. Earl DeBrine, with the Modrall Sperling Firm, representing Reliant Exploration and Production, LLC.

We're going to have three witnesses today.

EXAMINER EZEANYIM: Any other appearances? Okay. The first order of business is for all the people who are going to testify will stand up, state their full names and be sworn in.

MR. VANDERBURG: The name is Fred Vanderburg, with Reliant.

MR. GIUSSANI: Alberto Giussani, with Oxy USA.

MR. SPARKS: Patrick Sparks, with Oxy USA.

MR. RAINES: Michael Raines, with Whiting Petroleum.

MR. BEEBE: Thomas Beebe, with Whiting Petroleum.

EXAMINER EZEANYIM: Stand up to be sworn.

[Whereupon, the witness were duly sworn by the court reporter.]

EXAMINER EZEANYIM: I don't know how we are

going to proceed on this. Do we have any opening statements?

MR. FELDEWERT: I have one, Mr. Examiner. I think it would help.

EXAMINER EZEANYIM: Okay. Let's go on with the opening statements. Who wants to go first?

MR. FELDEWERT: I guess I volunteered, so I will.

OPENING STATEMENT BY MR. FELDEWERT

Mr. Examiner, Oxy currently operates the Bravo Dome Carbon Dioxide Gas Unit, which is essentially everything to the right of this orange line which is on our Exhibit Number 2.

And if I may approach, I'm going to give you our exhibit books. Here's a couple of exhibits.

EXAMINER EZEANYIM: Okay. Thank you.

MR. FELDEWERT: The Bravo Dome unit, everything to the right of the orange line, which is -- if you want to reference it easier, we have a smaller copy. It's Exhibit 2 in our exhibit books.

The Bravo Dome unit was approved by the Commission in the early 1980s by Amoco. Amoco put the unit together. Oxy took over operations in the Bravo Dome unit around 2000. And since that time, actually more recently, they have been gradually expanding the

development from the eastern part of the Bravo Dome unit, which is over here -- I couldn't get it all on the map -- towards the west, towards this western boundary, including the subject area which is at issue here today, which is in yellow on Oxy Exhibit Number 2. That's what's at issue here today.

There are two units in this field. You have the Bravo Dome unit to the right of the orange line; you have the West Bravo Dome unit, which is operated now by Hess, to the left of the orange line. So we have two units, two operators in this area.

Originally, all of the Bravo Dome area, before any units were formed and even at the time that the unit was formed, it was all spaced on the customary statewide spacing rules of 160 acres.

In 1984, after the unit was formed and approved by the Commission, Amoco came before the Commission and petitioned to have the entire Bravo Dome, everything together to the right of that orange line, spaced on 640 acres.

The Commission took evidence. And they allowed 640-acre spacing on what they called the eastern part of the Bravo Dome unit, which is everything to the right of this purple line. Okay? But because no evidence was presented on the western part of the Bravo Dome unit,

they left that acreage at the statewide 160-acre spacing.

For reasons that were, quite frankly, lost to the record, because I can't find it, in the mid-'80s, Cities Service was putting together the West Bravo Dome. Okay? So this has already been formed. This was 640-acre spacing; this was 160-acre spacing.

Cities Service comes in. They put together the West Bravo Dome. And in conjunction with their effort to put the West Bravo Dome together, they petitioned to have the West Bravo Dome. And for what unknown reasons, the yellow acreage in the Bravo Dome was temporarily spaced on 640 acres, and the Commission approved that on a temporary basis.

So today we have the West Bravo Dome temporarily spaced on 640 acres; we have the yellow acreage in the Bravo Dome unit temporarily spaced on 640 acres. We have, within the Bravo Dome unit, what they called a 160-acre spacing area which used to include all of this, but now excludes this, at this point, on a temporary basis. And then we have 640-acre spacing over here. That's where we're at today.

Now, when this was done, under the request by Cities Service, the Commission said, "You come back to us when you have production from this area. Come back

to us when you have first production."

So if you look at what I've marked as Exhibit Number 5 -- and I won't go through all the history here, but this is the most recent order dealing with what they term the West Bravo Dome, keeping in mind the West Bravo Dome Carbon Dioxide Gas Unit Area. Okay?

But by happenstance, it doesn't just include the West Bravo Dome that has no acreage. It includes Bravo Dome acreage, a separate unit, operated by Oxy.

So the misnomer is confusing, you know, the language that they use, West Bravo Dome Carbon Dioxide Gas Area. It includes more than just the West Bravo Dome. It includes this piece of property. Again, I don't know why, but that's what happened.

And when you look at the series of orders, they always said, "Come back to us when you've got production." They came back in 1987, no production from the area. Came back in 1991. Under this Order R-7737. Again, no production.

So in 1991, here's what the Division said -- and I'm on page 2 of what I've marked as Oxy Exhibit Number 5. They said, "This case shall be reopened and an Examiner hearing two years from the date of first production from the subject area."

Okay, we now have first production. "At which

time the operator in the subject area may appear and show cause why the West Bravo Dome Carbon Dioxide Gas Area," this area and this area, "should not be developed on less than 640-acre spacing and proration units." Okay?

Now, as a lawyer, I read that as the Division saying: When you come back to us after the date of first production, if any of the operators in this area want to maintain 640-acre spacing, they're going to have to show cause as to why it should not go back to 160-acre spacing. In other words, they've got the burden. They've got to come in here and show why it should not go back to the customary 160-acre spacing. So that's our legal framework here today.

The other thing to keep in mind is that because we're Oxy -- and this is all we operate. Okay? This is the acreage that's at issue under our application, not the West Bravo Dome that's operated by Hess. It's a different operator. We don't have any data on that, and we don't have any control over that. This is what Oxy operates within the Bravo Dome.

So we're here on this acreage. And the first thing we're asking is that our acreage be removed from the special rules for the West Bravo Dome Carbon Dioxide Area because it's not the West Bravo Dome. It's

confusing, and it's a different operator. We're not the West Bravo Dome.

The second thing we're asking for, when we reopen this case, is to follow what the order says. The presumption is in favor of going back to 160-acre spacing. We've done the development, we've looked at the data. We believe it should go back to 160-acre spacing, just like it is to the north and to the south.

So we filed this application. And if no one appears to object to moving it back to 160-acre spacing, in other words, if nobody was here to show cause as to why it should not be developed on less than 640-acre spacing, it would be a pretty short hearing.

I would call the case. We would put our land witness on the stand. He'd testified what we're seeking, that it should go back, and we would provide Notice of the Hearing.

But Reliant has objected, and I'm not sure why. I guess we're going to find out. But they've objected. So it seems to me that under this language here, because they're here, they have the burden.

Now, I question whether they actually have standing because they're not an operator. They're not an operator in this yellow acreage. They have leases, but they haven't drilled a single well, not one well.

So I question whether they've got standing to sit here and object to what an operator here -- because Oxy is the operator.

We've done all the development in that yellow area. I question whether they've got standing to come in and say: Well, we don't want it to go back to 160-acre spacing.

But they're here, so they're going to be here. And if they're going to advocate that it should not go back to 160-acre spacing, then they have the burden. They've got to show you why, why they believe that this area should not be developed on less than 640-acre spacing. That's their burden.

We have two witnesses here today. And as necessary, we're prepared to call our land witness, Pat Sparks. He's going to discuss the history of this area through these orders. He's going to discuss the notice that was provided of this hearing.

We have Al Giussani. He's an expert in petroleum production and reservoir engineering. He was involved in the drilling of all the wells in the yellow area. He's conducted a study of the core data that we have for the area. He's conducted a study of production profiles from the wells, four years of production profiles from these wells.

He's going to demonstrate that the permeability is different from what it is on the eastern part of the Bravo Dome that we operate, and that the area that we operate on the western side of the Bravo Dome, the area in yellow, should go back to the 160-acre spacing that you see to the north and south.

So that's what we're prepared to present today, as needed, if they come forth, of course, with some hard evidence demonstrating why this acreage should not be developed on less 640-acre spacing. So that's where we're at.

EXAMINER EZEANYIM: Thank you, Mr. Feldewert.

Mr. DeBrine?

OPENING STATEMENT BY MR. DEBRINE

MR. DEBRINE: Yes, Mr. Examiner.

We believe that the burden to establish the relief sought by Oxy in its application rests on Oxy. Under the terms of the original order in Case Number 8352 and the subsequent orders that were entered by the -- initially the Commission and the Division, they provide the opportunity for operators to come forward in two years if they want to present evidence as to why the temporary rules should not be continued.

There was no -- even though Oxy was then

operating in the area in 1991 and they appeared before the Division in 1991, they did not, within two years of the entry of that order, come back to the Division and ask for a change in the rules that were in place in this area.

And it's important to understand that even though the Commission, when it established these rules, they called them temporary rules, but they've been in effect for 29 years. And there's a lot of equity and investment decisions that have been made by Reliant and others in reliance upon the existence of 640-acre spacing.

As recently as 2010, Oxy filed essentially the same exact application that it filed this year, seeking to change the rules from 640- to 160-acre spacing. And after continuing that case many times, that petition was ultimately dismissed. And so acting in reliance on the existing spacing rules that were in effect, Reliant has acquired acreage in the subject area.

And if I may approach?

If you look in the exhibit notebook for Exhibit 3, which is the Reliant Acreage Map, it shows the same area depicted there in yellow. But if you'll notice, the yellow-shaded area within the green, that is Reliant's acreage position within the subject area

that's subject to Oxy's application. It's a got Number 3 down at the bottom. It appears right after the summary outline.

So Reliant has a substantial acreage position within the subject area. It's almost a fourth of the total acreage that's affected by Oxy's application.

And we are here, prepared to demonstrate today that the area of interest has essentially the same permeability as the 640-acre spacing that's in place for the West Bravo Dome and the Bravo Dome unit. It is substantially different from the acreage on the north and the south, and that a single well on 640-acre spacing adequately drains the spacing unit that's established under the existing rules of the Commission for this area.

We believe that we're going to show that the drainage area established by one well adequately drains one area. And if the spacing were changed, that it would result in the drilling of unnecessary wells which would not add substantially increased reserves, given the economic cost associated with the drilling of four wells to a spacing unit, as opposed to one. Under the existing rules, the operator has the ability to infill drill up to four wells within a spacing unit.

So if the need is demonstrated, that ability is

available to Oxy, should it desire to do so. But the requirement, based on the evidence that was presented in the original case that established this area -- and I believe if you look at the record for that case, it does explain why this area was carved out from the 160-acre area.

Because in Cities Service's application, when they were taken to establish the 640-acre area in between the West Bravo Dome and the existing Bravo Dome, there were several ice plants that had been in existence for many, many years. And the order in that case reflects that it would be unfair to change the 160-acre spacing pattern that had been in place for many years and invest in decisions based on that 160-acre spacing.

So out of the Cities Service application, the 160-acre area that was in place was left in place, but the application was granted with respect to the subject acreage that's the subject of Oxy's application here today.

And we believe there are similar in equities that have been in place in the 29 years that the rules have been in place that need to be accorded by the Division when it considers the evidence here today.

Investment decisions have been made in reliance upon the 640-acre spacing. And we believe that the

technical evidence will clearly establish that the drilling -- the change in spacing from 640 acres to 160 is unjustified. And it's particularly unjustified for the Division to make that leap without even an interim step of looking at a 320 before it gets to 160.

You're not going to hear that there has been much development in this area since 1991, when the Oxy Pugh Clause came before the Division. There have just been a few wells. There still isn't a lot of evidence out there to make a decision with certainty.

We think we can present a case that establishes that the area is adequately -- the spacing unit is adequately being drained by a single well on 640 acres. But really, what the Division ought to do, if it's inclined to change the spacing rules for this area, Oxy is apparently planning on drilling some wells. It's drilled, but not produced, two wells in the subject area.

Reliant has a drilling program in place where it plans to drill 13 wells in the next two to three years. You're going to get a lot of information from those wells, which the Commission, if it wants to reopen the case and look at the evidence presented based on the production information from those wells, can make a determination whether there should be a leap to change

the spacing for the subject area.

And we ask that if it's inclined to change spacing area, that it look at the wells that have been drilled, the wells that will be drilled as essentially a pilot project.

We can report back to the Division the information that's obtained from the drilling of those wells. And then in two or three years, the Division could make an informed decision as to whether there should be a change in spacing.

EXAMINER BROOKS: Is that all?

MR. DEBRINE: That's it.

EXAMINER BROOKS: Now, in my limited acquaintance with this, I was under the impression that portions of the area are spaced on 640, with optional infills, and portions spaced on 160. Is that correct?

MR. FELDEWERT: The way it's currently structured?

EXAMINER BROOKS: Yeah.

MR. FELDEWERT: If you look at our Exhibit 2, under Order 7556, which is a different series of orders than what we're dealing with here, okay?

EXAMINER BROOKS: Right.

MR. FELDEWERT: This area to the north is permanently spaced on 160, this area to the south is

permanently spaced on 160, this area to the east is permanently spaced on 640.

In the series of orders that are before you now, this acreage over here, temporarily spaced on 640 acres, that's the West Bravo Dome. And then the piece of the Bravo Dome that Cities Service brought into their application at that time is also temporarily spaced on 640-acre spacing.

EXAMINER BROOKS: So the latter is the subject of this proceeding; is that correct?

MR. FELDEWERT: Correct.

EXAMINER BROOKS: And the current spacing is 640?

MR. FELDEWERT: The current spacing is temporarily 640, yes.

EXAMINER BROOKS: Now, that provides optional infills of up to 160 density; is that correct?

MR. FELDEWERT: Correct.

EXAMINER BROOKS: Okay. Double negatives are always a little hard to deal with.

EXAMINER EZEANYIM: A double negative is not funny.

EXAMINER BROOKS: Yeah. Well, that's sometimes what's meant and sometimes what's not. But I think that probably is what's meant here.

It says, "The operators in the subject area may appear and show cause why the West Bravo Dome Carbon Dioxide Gas Area should not be developed on less than 640 acres."

Now both sides, are we all in agreement that when it says, "the West Bravo Dome Gas Area," it means this area that we're talking about in this case?

MR. DEBRINE: I believe so, yes.

MR. FELDEWERT: In other words, the way I look at it is the subject acreage today is a subset of what they have defined as the West Bravo Dome Carbon Dioxide Gas Area.

EXAMINER BROOKS: Do you agree with that?

MR. DEBRINE: I think that's a fair characterization.

EXAMINER BROOKS: Okay. "The operators may appear and show cause why the West Bravo Dome Carbon Dioxide Gas Area should not be developed on less than 640 acres."

Now, nobody is contending it should be developed on more than 640 acres. So it not being developed on less than 640 acres is basically equivalent to the idea that the two have propositioned that it should be developed on 640, right, that if it should not be developed on less than 640?

MR. FELDEWERT: No. I think it's just the opposite.

EXAMINER BROOKS: Not be developed on less than 640?

MR. FELDEWERT: Right. In other words, if you take the negatives out --

EXAMINER BROOKS: "It should be developed on at least 640," isn't that what it's saying? "The operator should show cause why the West Bravo Dome Gas Unit should be developed on at least 640-acre spacing."

Isn't that what that sentence says?

MR. FELDEWERT: If you read this, what they're saying is the Division is saying, "You come back to us and tell us why this area should not be developed on less than" --

EXAMINER BROOKS: On less than 640.

MR. FELDEWERT: So take out the first negative.

EXAMINER BROOKS: Should not be developed on less than 640?

MR. FELDEWERT: Right. So in other words, if you take the negatives out, it would be 640.

EXAMINER BROOKS: "Should be developed on at least 640."

MR. FELDEWERT: I think what they're saying

here is: You have to come back and show us why it should not go back to the original 160-acre spacing.

EXAMINER BROOKS: I believe that is -- I think that is correct, if I can figure this out. Because if it should be developed on at least 640, then that means it should not be developed on 160.

MR. FELDEWERT: Which would be less than 640.

EXAMINER BROOKS: Right. So the burden then -- now, which side wants 640 and which side wants 160? Oxy wants 160?

MR. FELDEWERT: We want -- our request is twofold. One, let's eliminate this confusion by having this acreage on the West Bravo Dome Carbon Dioxide Gas Area, because they are not part of the West Bravo Dome, so our acreage should go back to the Bravo Dome unit.

EXAMINER EZEANYIM: Which acreage do you want to remove?

MR. FELDEWERT: The yellow.

EXAMINER EZEANYIM: You want to remove it from the West?

MR. FELDEWERT: Because it's not part of the West Bravo Dome unit.

EXAMINER EZEANYIM: Do we call it Central Bravo Dome unit?

MR. FELDEWERT: It's in the western part of the Bravo Dome unit. That's what gets confusing.

EXAMINER BROOKS: Well, it's called the West Bravo -- we have a separate pool designation for the West Bravo Dome Carbon Dioxide Gas Area. In fact, I think we have two different ones.

MR. FELDEWERT: That in and of itself is confusing.

EXAMINER BROOKS: Because I tried to write an order one time, and I used the wrong pool designation. Ed got me straightened out on that, but I think Ed is probably the only one that understands it.

MR. FELDEWERT: I've seen a lot of orders with the wrong pool designation. I've seen a nine-standard spacing request by Enron-Hess, where they cited a pool that, on the Division's record, is listed as 160. But they saw it at nine standard because they thought it was 640, and they wanted the 160-acre spacing that you see in pink here. So maybe I've touched on it.

The additional acreage that's already spaced on 160 is in blue, and the area is pink.

EXAMINER BROOKS: But you wanted --

MR. FELDEWERT: Our focus is here because this is where we have the data. This is where we have

the data.

So we want this acreage taken out of the West Bravo Dome Carbon Dioxide Gas Pool Rules.

EXAMINER EZEANYIM: What is the other number for that?

MR. FELDEWERT: R-7737 was created. Take it out of those pool rules and put it back in the Bravo Dome 160-area spacing area, which is its own pool, which is comprised of the acreage to the north and south. That --

EXAMINER BROOKS: I'm sorry. I don't mean to interrupt.

MR. FELDEWERT: That's fine.

EXAMINER BROOKS: Is 160-acre spacing the status quo? Is that why it is under the existing temporary rules?

EXAMINER EZEANYIM: No.

MR. FELDEWERT: The temporary rules that acted under this order is 640-acre spacing for here and here, with --

EXAMINER BROOKS: So it's currently 640?

MR. FELDEWERT: -- with the presumption, I believe, as I read it, that it should go back to 160, unless somebody comes in and demonstrates otherwise.

The permanent spacing is 160 acres to the north

of the subject acreage on Exhibit 2, and the 160 acres to the south of the subject area on Exhibit 2. That's permanent 160. That's the 160 -- that's what they call the Bravo Dome 160 area. To the east of this purple line is the Bravo Dome 640-acre area.

So we want this acreage in yellow brought back into the Bravo Dome 160-acre spacing area.

Does that make sense?

EXAMINER BROOKS: Yes, I think I understand.

Mr. DeBrine, your adversary here has spoken at length in response to my questions. Do you have anything to add?

MR. DEBRINE: Yes, Mr. Examiner. I believe, by the express terms of the Division's order that was entered in 1991, it says, "This case shall be reopened and an examiner hearing two years from the date of first production from the subject area, at which time the operators in the subject area may appear and show cause."

Now, that condition was not met, so the operative to create the language of the order was not satisfied within two years. So I don't think this order has any effect on who has the burden to show what or why in the proceedings here today. That's one issue.

Two, Oxy's application doesn't ask for relief pursuant to the terms of this order. It's asking for something very different. It's asking to have the acreage shown on that map in yellow removed from the West Bravo Dome Carbon Dioxide Area Gas Pool. That's a different relief being sought. It's not under the terms of this order.

And so we're here on Oxy's application. Under the Division rules, it has the burden to establish the relief that it's seeking. I don't believe that this order has any effect on the proceedings or the relief being sought by Oxy in its application here today.

Now, we're going to be presenting evidence with regard to whether 160 is -- whether there should be a change in spacing from 640 to 160. But that's almost a collateral issue from the main issue which Oxy is bringing, which is to remove this acreage from the West Bravo Dome Carbon Dioxide Area Pool and I don't know who was noticed for that proceeding, if it was just the operators in the subject area or if everybody in the pool was notified of this proceeding, and I think they should have been.

MR. FELDEWERT: Everybody in the pool was notified.

May I comment on that?

EXAMINER BROOKS: You may.

MR. FELDEWERT: If you read this order, "The application shall be reopened at an examiner hearing two years from date of first production," is the Division supposed to do that?

I don't know. Should the Division have had it on its calendar and called the case two years from that point in time? I don't know, but it didn't happen. It didn't happen for whatever reason.

And if you read it, it says that it was for the purpose of having someone to appear and show cause why it should not be developed on the 640-acre spacing. Now, if you didn't have a hearing, and nobody appeared to show cause in favor of 640-acre spacing, by the terms of the order, it goes back to 160.

So he's arguing that this order has expired by it's terms, and nobody appeared to show cause why it should be developed on less than 640-acre spacing at the time that they were supposed to. Then pursuant to this order, we should be done. It goes back to 160-acre spacing, and we don't need to have a hearing here today. That's the effect of this.

EXAMINER BROOKS: Okay. Mr. Ezeanyim and I discussed the fact that we need to press back. We need to work these orders a little bit differently.

MR. FELDEWERT: I admit this order is very confusing.

EXAMINER BROOKS: I believe that Mr. Feldewert's position is correct with regard to the appropriate spacing. Reliant has the burden of going forward with the evidence. Since I foresee that that will be the primary issue, then I think it would be appropriate for Reliant to start the presentation, although I recognize that to the extent there are other issues in the application other than the appropriate spacing, that the applicant would have the burden on those issues.

Do you concur, Mr. Ezeanyim?

EXAMINER EZEANYIM: Yeah. Well, anyway, before we proceed here -- I mean you guys are dealing with all the legal issues. But anyway, I'm just interested in looking at the technical issues. However, I want to make certain points here before we proceed.

Carbon dioxide is what we produce from the Bravo Dome. And as you know, Mr. DeBrine, pointed out in the nine years that we haven't done anything, I think it's due to the conventionality of the need for carbon dioxide.

When the oil price went down low, you know, to $8 a barrel, I don't think anybody would be fishing for

carbon dioxide to continue the tertiary recovery process without carbon dioxide. So everything, you know, maybe otherwise was shortened. And that's without this lag in time where this order come from.

That's my position. I may be wrong, but I think it's because the operator didn't need the carbon dioxide at the time, you know, in the '80s. I mean the oil prices were horrible. I mean I don't see anybody trying to do tertiary recovery at that point, unless you want to use the carbon dioxide for that. That's one point.

Another point is that I don't really care who goes first or whose burden of proof it is. What I'm looking at is the preponderance of technical evidence. Whoever goes first or goes second, that's what I'm looking at.

This is not a criminal or civil court. This is a technical -- this is a hearing where we gather technical evidence. We are trying to protect our rights. And I think that -- I hope that's what you have, unless there is something else that you guys are discussing that we don't know, because sometimes it doesn't really come forward that what you're trying to do is to present ways to protect our rights. It might be something else. It might be money. I don't know,

and I'm not supposed to know.

But what we are going to do today -- and I want to make sure we finish this today, because we have other things to do tomorrow. I hope we finish today. The witness are coming here to tell me why -- first of all, why it should be on 640 or why it should be on 160.

There is very good evidence to demonstrate that. It's an easy process. I don't know the land issues very well because what happened when I read it is in that area we're talking about, where the ownership is scattered, you might move something in a unit, but you don't have a tract that is going to be drilled, and that presents some problems. Technically, I will take care of that.

So when we talk about burden of proof, the burden of proof is on everybody. It's not on any one party. I don't want to say, oh, it's on Reliant, or oh, it's on Oxy. No, it's on everybody to prove what they are trying to say.

The language -- we are going to have to do better in the language in the order, so that we know exactly what we are asking you to do. We discuss it. And then when we come with the language, we may discuss it with the industry. As David suggested, we discuss with the industry how we put this in order so that it's

clear to everybody.

The language here with the two negatives, which is affirmative, I think this language will tell you -- it doesn't give me the confidence to see, does it go back to 160, or is this mainly 640? I don't know.

So those things we have done in the past, but now we are going to make sure that the operators know what they should do in these types of cases.

So as we proceed today, I want, when you come up here, to tell me why we should do it. Tell me how it's going to prevent waste, that's most important, and how it's going to protect our rights, all the legal issues I have. You know, you're here to be able to help me. But once you tell me why your case should prevent waste and protect our rights, that's where I'm going because that's what we are trying to do.

So I want to make it clear before we proceed that that's really what I'm looking for, and I don't want the wishy-washy. I want hard evidence, technical evidence to demonstrate that, and that's where we go from.

So it doesn't really matter to me who starts first. But let me tell you, I don't know, this is -- sometimes we bring up all this protocol here. I don't know who goes first or who goes second.

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EXAMINER BROOKS: Well, I believe Mr. Feldewert's position is correct, that Mr. DeBrine, since his client is advocating the 640-acre spacing, has the burden of going forward with the evidence and should begin the presentation.

EXAMINER EZEANYIM: Okay. With that, Mr. DeBrine, if you want to set up something, we might take a five-minute break for you to -- maybe if you thought you were going to go second, let me give you five minutes to get ready.

MR. DEBRINE: Thank you, Mr. Examiner.

[Recess was taken from 9:41 to 9:49 a.m.]

EXAMINER EZEANYIM: Let us go back on the record and start with the first witness.

Mr. DeBrine?

MR. DEBRINE: Yes, Mr. Examiner. Reliant calls Freddie Vanderburg.

EXAMINER EZEANYIM: State your name.

MR. VANDERBURG: Fred Sterling Vanderburg, Jr.

EXAMINER EZEANYIM: You know you have been sworn, so you are still under oath.

MR. VANDERBURG: Yes, sir.

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FRED STERLING VANDERBILT, JR.

having been first duly sworn under oath,

was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Please state your name.

A. Fred Sterling Vanderburg, Jr.

Q. Who do you work for, Mr. Vanderburg?

A. I work for the Reliant Exploration and Production.

Q. What is your position and responsibilities for Reliant?

A. I serve as the Chairman of the Board.

Q. And your responsibilities?

A. Well, it also gets involved in just the various activities associated with the lease acquisitions all the way to the actual production and development of the fields.

Q. How many employees does Reliant have?

A. Reliant has about 12 employees about this time.

Q. How long has it been involved in the production of carbon dioxide in New Mexico?

A. We started back in about -- it was 2005, I believe, along in that period of time.

Q. What was your position and employment history

prior to becoming the CEO of Reliant?

A. I was involved in agriculture. My degree was from Oklahoma State University in Animal Science.

We had acquired properties in the area of Union County and Harding County, surface properties which later on Amoco came in and started doing some development, which we took a working interest in some of the production in the Bravo Dome.

Q. Could you explain for the Examiner Reliant's business operations concerning the production of carbon dioxide in New Mexico?

EXAMINER EZEANYIM: Mr. DeBrine, is this a fact witness, or what type of witness?

MR. DEBRINE: Well, he's going to talk with regard to land matters.

EXAMINER EZEANYIM: So he's just a fact witness, not an expert witness?

MR. DEBRINE: He may have some opinions that we're going to be offering with respect to the land matters that are presented by the application.

EXAMINER EZEANYIM: For the record, do we need to present him as an expert or something?

MR. DEBRINE: Yes. And I'll try and establish a foundation.

EXAMINER EZEANYIM: All right. I'm just

trying to examine what we're doing.

MR. DEBRINE: Sure. And he's basically a practical oilman, essentially.

EXAMINER EZEANYIM: I have heard that before. We can reflect on the record that he's a practical oilman. So that's okay.

MR. DEBRINE: He's a practical carbon dioxide man.

EXAMINER EZEANYIM: Any objection to that? You are looking at me. Do you have any objection?

MR. FELDEWERT: I'm not sure what "a practical oilman" means in terms of his expertise to offer opinions. I haven't heard the opinions yet.

I mean if he wants to tout himself as a practical oilman, that's fine. But I haven't heard an opinion yet as to what is going to arise out of being a practical oilman, so I don't have any objection at this time.

EXAMINER EZEANYIM: Okay. You may proceed.

A. At the time that we began to have development of carbon dioxide from the field, we also involved ourselves in the marketing of carbon dioxide into our own liquification facilities in which we provide CO2 for well stimulation to people like Oxy, to people like

Hess. It's used actually in this field for developing other fields itself.

So many of the wells that have been drilled out there, we provide CO2 to the process of stimulating those wells.

Q. (By Mr. DeBrine) How many wells is Reliant currently operating?

A. Currently out there, we have right at -- we just drilled additionally 10 wells. We had four wells prior to that. And then some of the oldest production in the field, there was about five wells. So a total of the wells combined, new drilled wells, wells that we've been producing, around 19 wells.

Q. Let me direct your attention to Reliant Exhibit 3 and ask if you can identify that?

A. Yes. Exhibit 3 is the area that Oxy is wanting to take from the 640 down to the 160-acre area. That has incorporated within it the acreage positions of Reliant Exploration and Production, of which I made mention that we have, contrary to Counsel's statements, drilled a well within that area.

Q. If you could -- well, first, was Exhibit 3 prepared under your direction or control?

A. Yes. I went through, actually, the Oxy prehearing statement, according to their design of where

these locations were, and added those to the map, as you see on the board.

MR. DEBRINE: We'll move the admission of Exhibit 3.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: Exhibit 3 will be admitted.

[Exhibit 3 admitted.]

Q. (By Mr. DeBrine) Mr. Vanderburg, if you could point out on Exhibit 3 for the Examiners the location of Reliant's acreage within the subject area?

A. Yes. It is the darker area of the shaded portions, with little red flags kind of within those spots. Those designate the acreage position of Reliant E&P.

EXAMINER EZEANYIM: The one in yellow, right?

THE WITNESS: Yes. It's kind of yellow on your sheet. It's a little green on the projector.

EXAMINER EZEANYIM: Okay.

Q. (By Mr. DeBrine) Now, I noticed up in the upper left-hand corner, it also shows an area in green. Do you know why that is?

A. I do not know. I had a question as to why Oxy

has described that particular area way up there.

Q. Were you responsible for developing a drilling program for Reliant within the subject area?

A. Yes, sir, along with my other personnel.

Q. Could you describe for the examiner what that drilling program is, what it involves, and when you plan to implement it?

A. The drilling program is already under way. And it was implemented, you know, from the ground up. The acquisition of the leases, as well as us acquiring our own drilling rig, move it in to actually drill the wells ourselves, and --

Q. And if I could back up just a little bit, when did you acquire the acreage, the lease?

A. The acquired acreage was along around 2005 in that area. It's been about eight years ago, I believe.

Q. And when did you acquire the rig to begin your drilling?

A. That was acquired about three years ago.

Q. Okay. If you could continue to describe the program?

A. We have a substantial investment already put into the property, with the understanding early on that we had a 160-acre area of development and then also a 640-acre of development. So we began the process.

We have, along in this area where I'm kind of shining this light, a liquification plant there. What had happened, most of this mineral acreage is owned by a ranching family out there by the name of the Libby family, and this lease was not put in the unit.

None of this acreage is in the unit of the Libby family because they did not participate in the unit. That lease came available, as said, about eight years ago, when they were interested in looking at somebody else taking on the acreage.

EXAMINER EZEANYIM: You're talking about the acreage on the north?

THE WITNESS: Yes. It goes even farther up north, the acreage does.

EXAMINER EZEANYIM: That's not part of this case?

THE WITNESS: No. But it is this portion right here.

MR. DEBRINE: Just to clarify for the Examiner.

Q. (By Mr. DeBrine) Exhibit 2 shows acreage north of the green subject area, and I guess it's yellow on Exhibit 2?

A. Yes.

Q. And that includes Reliant's acreage as well?

A. Yes.

Q. And that's all under the Libby lease; is that correct?

A. That's correct.

EXAMINER EZEANYIM: And leased on 640?

THE WITNESS: It's 160 up there.

EXAMINER EZEANYIM: Yeah, on 160. Because that's what I know. That one north is 160, okay.

THE WITNESS: Since that time, as I mentioned, we have gone ahead and we've put in infrastructure to bring in the gas from the wells that we have already drilled out there. We've made provisions to go ahead and find ways to move the carbon dioxide gas out of the reservoir.

So there's been a substantial amount of funding already put in the project in excess of $10 million. I know that already.

EXAMINER EZEANYIM: In this unit?

THE WITNESS: Yes. We call it, you know, for our clarification purposes, the Central Dome, because it is --

EXAMINER EZEANYIM: You call it Central?

THE WITNESS: The Central Bravo Dome, because it helps us to understand what we're talking about from the West to the East Bravo Dome.

EXAMINER EZEANYIM: Go ahead.

Q. (By Mr. DeBrine) How many wells do you plan to drill once the horizon for drilling --

A. Are you talking in just the area of interest?

Q. In the area of interest.

A. In the area of interest, we have 31 sections that are involved that we have to develop at the 640-acre spacing.

Q. Does Exhibit 3 reflect the locations in which Reliant plans to drill on the subject acreage?

A. Yes, it does. It portrays the sections where we would be wanting to develop the acreage, yes.

Q. And how is it shown on the map?

A. Kind of with yellow, as it is in the drawing, but also kind of with little green flags that are on there. That reflects sections that we would have to develop.

Q. What effect did the existence of 640-acre spacing for the subject area have on your decision to acquire the Libby lease and develop your drilling program for the area?

A. Well, in the initial stages in setting up our drilling program and coming up with the funding that's going to be involved to develop it, we have to, you know, know the amount of wells that we're going to be looking at to develop.

So it was part of the development and the ideal economics that are going to be involved in the project.

Q. Speaking of economics, what is the approximate cost, estimated cost, of drilling wells in this area?

A. The cost that we're running into, with the gathering from the field itself, adding that to it, you're looking at about -- our budgeted number is around 700,500 a well.

Q. Does that cost include royalty and production taxes?

A. That's just the drilling and gathering cost.

Q. Have you ever proposed drilling a well to Oxy in this area?

A. Yes, we have.

Q. And did they elect to participate in the drilling of that well?

A. No, sir, they did not.

Q. If the Division were to grant Oxy's application and downspace the subject area from 640 acres to 160 acres, what effect would that have on Reliant's development plan?

A. Well, we would be looking at going probably from 31, 33 wells on 640 up to the need of drilling around 80-some-odd wells to protect our acreage interest.

Q. And why is that? Why would you need to drill

those additional wells to protect your interest?

A. Because of the fact that to hold the acreage, we would have to be on the 160-acre development.

Q. Do you have an opinion whether the drilling of additional wells on 160-acre spacing would allow you to economically recover additional reserves from your acreage?

MR. FELDEWERT: Object to the form of the question. I'm not sure he's qualified to talk about recovery of reserves from his acreage. He's not a reservoir engineer.

Q. (By Mr. DeBrine) Mr. Vanderburg, you've seen the study that's been prepared by the geologist and petroleum engineer, and we'll bring this back up later with regard to their testimony.

You've spoken to those individuals. And based on their analysis and conclusions with regard to reservoir characteristics and the amount of gas that's available and drainage, do you have an opinion with respect to whether you can economically recover additional reserves from the additional wells on 160 acres?

EXAMINER EZEANYIM: I have to make a ruling first on the objection.

EXAMINER BROOKS: Well, he was restating

the question, which was the reason I didn't. But I gather Mr. Feldewert is going to reiterate the objection.

MR. FELDEWERT: If I understand the question, he's going to base his next statement on the premise -- solely on conclusions reached by his geologist and engineer, and is not offering an opinion himself.

EXAMINER BROOKS: Okay. If that's the case, then I would overrule the objection.

A. In view of our technical evidence that's been brought by our team, together with information that's there, I believe that it could be adequately drained at 640-acre spacing.

Q. (By Mr. DeBrine) And the technical witnesses and geologists and petroleum engineer that are going to be testifying today, they work for Whiting?

A. That is correct.

Q. What is the connection between Whiting and Reliant with regard to the subject acreage?

A. We have joined into a business arrangement with Whiting that helps to bring the gas out of the field into tertiary recovery projects.

So we have entered into a business agreement with them in order to be able to accomplish that

effectively.

EXAMINER EZEANYIM: Who is Whiting?

THE WITNESS: Whiting Petroleum. They're a publicly-traded corporation, I guess, based in Denver.

EXAMINER EZEANYIM: So it's a business entity that you joined in an effort to do this?

THE WITNESS: Yes.

EXAMINER EZEANYIM: Because I haven't heard about Whiting, so I need to know how they play their role here. So both of you are in concert with this operation?

THE WITNESS: Yes, that is correct.

EXAMINER EZEANYIM: Do they have an interest in Bravo Dome?

THE WITNESS: They have -- I guess I would say an interest through our business arrangement, through us, through Reliant E&P.

EXAMINER EZEANYIM: Are you talking about some type of agreement, or what type of agreement?

THE WITNESS: The business agreement consists of -- where they are an entity that will be purchasing gas from us, coming out of the reservoir.

EXAMINER EZEANYIM: I don't mean to be asking more questions. I want to understand how they come in, so that I can begin to process it better.

THE WITNESS: Yes. They're an entity that has a substantial amount of oil and gas development up in the Blackwell field in the Oklahoma-Kansas area, and they were one of the individuals that were looking for a source of gas. And we went into a business relationship with them to be able to accomplish that.

EXAMINER EZEANYIM: Okay.

MR. DEBRINE: I'll pass the witness.

EXAMINER EZEANYIM: Mr. Feldewert?

MR. FELDEWERT: Yes.

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Vanderburg, I'm curious about your -- a little bit more about your business arrangement, because you talked about the economics associated with this development.

You said your sole business arrangement with Whiting is that they're going to be purchasing CO2 from you?

A. They purchase CO2 from us. We also utilize the technical skills of the Whiting Group. You know, a substantial amount of funding source in the project is taking place as well.

Q. So it's a little more than just purchasing gas? They're going into a similar business arrangement with

you to provide technical assistance to your development efforts?

A. Yes.

Q. What type of technical assistance?

A. Geological and engineering assistance.

Q. Anything else?

A. That pretty much is probably --

Q. What's the funding source? What do you mean by, "the funding source"?

A. Through Whiting? They're providing a funding source for us, just as if it was a commercial bank.

Q. So funding for your drilling project?

A. Yes.

Q. And are they going to become an interest owner in the wells?

A. At this point, no, they will not be an interest owner in the wells.

Q. What type of owner will they be?

A. Just by virtue of like a long document.

Q. What's a "long document"?

A. Well, funding for us. There's a -- you know, I don't know whether you call it a mortgage or how exactly you would describe it, but there is a funding means which they're providing for us to be able to, you know, put together the drilling process.

Q. Are the leases collateral for the funding?
A. Yes.
Q. Is that the way of looking at it?
A. I think that's probably right.
Q. Is there any other way to describe it?
A. No. I think that may be a good way to describe it.
Q. Okay. So they're going to have funding for what?
A. The development, the drilling and development.
Q. Does that include --
A. I'm sorry. They're providing additional -- it's taking about a 20- or 30-mile pipeline to move the CO2 out of the field. They're putting that pipeline in for us so that we can get the gas out of the field.
Q. That would be the gathering line within the field, the Bravo Dome area?
A. Yes. It's a transmission line. We put in all the gathering system, and they put in the transmission system. They take it out of the field at a higher pressure.
Q. So is that like a trunk line?
A. Well, it could be considered, I guess, a trunk line to what's called the Transpetco Pipeline.
Q. So what pipeline are they putting in?
A. They will actually have a pipeline that will go

from our existing facilities and will go across all the way -- right near the Bravo Dome compressor station.

Q. And when you say "existing facilities," you're talking about your current plant that you have in the area?

A. Yes.

Q. And that is up --

A. Yeah, it's up in this area. It's hard to tell where the line breaks out, but it would be right in this area. I believe it would right up in here.

Q. So the area that's permanently spaced 160 acres?

A. Yes, sir. As I'm looking at that map, I believe that's correct.

Q. So you've got a plant up there?

A. Yes.

Q. So in terms of -- they're not contributing to the gathering cost, gathering line cost?

A. They're contributing the funding totally on that aspect of it. We put in already a lot of the existing gathering system. But additional future development, they're helping to fund that.

Q. Fund the gathering system?

A. Additional gathering.

Q. As well as the drilling?

A. As well as the drilling, yes.

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Q. You mentioned your drilling costs per well. And you said, "plus gathering," right?

A. That's right. In other words, the cost of drilling the well itself would be about $230,000, less than the 705,000.

Q. So that's what I was trying to get to. Let's break this down. How much is it for you -- how much has it been for you to drill a well, just a drill?

A. About 470,000.

Q. 470,000?

A. Yes, sir.

Q. And then your $705,000-per-well figure included the gathering cost?

A. It includes additional gathering to bring the gas to the compressor site.

Q. Now, once the gathering system is in place, then of course any additional gathering won't have a drilling cost, right?

A. Well, some of it. Some of it will be less costly because you will be in close proximity to an existing gathering line.

Q. So your figure is premised on the idea that you don't have a gathering line in place currently?

A. As the wells reach out further away from the central portion up there, there will be additional

gathering that will be put in place.

Q. Now, let me ask you, you said you started the CO2 in 2005?

A. I think that's about when the Libby lease development began, along in that time frame. I may be a little bit off on that date and time.

Q. And I was a little confused by that. When you say you started with the CO2 in 2005, you mean that's when you first went out and acquired some leases?

A. Along in that period of time is when the Libby lease was taken up.

Q. All right. So was your first effort into the Bravo Dome was acquiring the Libby leases in 2005?

A. Well, in this whole general area. Now, we also had a five-well program that we had picked up back sometime before that was -- the old Hayoz dry ice facility is out there, or dry ice plant.

Q. Let's just make it easy. I just want to focus on our subject area. Okay?

A. Okay.

Q. In the subject area, your first exposure was in 2005, when you acquired the Libby lease?

A. That's right. That was the Libby development.

Q. And then you held those leases, as I understand it, for at least three years before you actually

acquired a rig and started drilling?

A. We started pretty quickly drilling the first two wells. We drilled two wells out there as test wells, out just north of this area that is in question.

Then we came back in. And about three years ago, we bought our own drilling rig. And we started doing our own drilling again, of which we drilled two more wells in that area.

Q. When you say "that area," are you talking about --

A. In this area, right up in here.

Q. -- to the north of the subject area?

A. That's right.

Q. Okay. So when did you start your drilling to the north of the subject area?

A. That would have been shortly after 2005, when we first acquired the lease.

Q. Now, the leases you acquired, though, in 2005 included the leases in the subject area?

A. Yes.

Q. The acreage in yellow on Oxy Exhibit 2?

A. Yes, sir, that's correct.

Q. When did you first start drilling, then, in the subject acreage?

A. We drilled a well there just in the last month.

Q. In the last month?
A. Yes, sir.
Q. So you waited eight years before you started drilling in the subject area?
A. Roughly. That would probably be right.
Q. When you acquired -- I apologize to you.
MR. FELDEWERT: May I approach the witness?
EXAMINER EZEANYIM: Yes.
EXAMINER BROOKS: Yes.
Q. (By Mr. Feldewert) Would you do me a favor and turn to what's been marked as Oxy Exhibit Number 5?
A. Number 5?
Q. Please.
A. (Witness complies.)
Q. Now, Mr. Vanderburg, this order was entered in 1991 by the Division, 7737-B, correct?
A. Yes, sir. I see that.
Q. Have you reviewed this order before these hearings?
A. Probably. It's been some time ago, yes.
Q. At the time you acquired your lease in 2005, did you review this order?
A. I would have to defer that to my legal people. I couldn't recall.

Q. You would assume, though, that somebody would have examined the spacing rules governing the acreage that you were acquiring from the Libbys, though, correct?

A. We just understood it to be, in this area, 640 acres.

Q. That's what you understood?

A. Yes.

Q. But if you look at this order, it indicates in paragraph 2 that that was on temporary spacing, correct?

A. Which part are you referring to?

Q. Let's go to the second page. It's under, "It was therefore ordered," that paragraph 2.

MR. DEBRINE: And I'll object as calling for a legal conclusion. We spent 15 minutes at the start of this hearing trying to understand the language of this order.

EXAMINER BROOKS: Well, I'm going to overrule his objection. If the conclusion disagrees with mine, it probably won't have much weight.

Q. (By Mr. Feldewert) Well, let me go to paragraph 1. It talks about "the temporary special rules and regulations for the West Bravo Dome Carbon Dioxide Gas Area." Do you see that?

A. It says, "Due to public notice having been given

as required by law" --

Q. Let's go to page 2, under "It is therefore ordered that"...

A. Okay. "It is therefore ordered that the temporary special rules and regulations governing the West Bravo Dome Carbon Dioxide Gas Area, Harding County, New Mexico, are hereby continued in full force and effect until further order of the Division."

Q. So now in 2005, when you acquired your Libby leases, this area was under temporary 640-acre spacing?

MR. DEBRINE: And I'll object. I mean the rules have been in place for many, many years, even though they were termed temporary. So it's really a misnomer.

EXAMINER BROOKS: Well, again, I'll overrule the objection. I think that correctly states, as far as I can see, what the orders say. And I assume that this was being asked not to clarify the orders, but to confirm that the witness understands them.

Q. (By Mr. Feldewert) Well, the spacing in this area at the time that they acquired this Libby acreage, were you aware, Mr. Vanderburg, that when you acquired the Libby acreage in 2005, that the subject area was under temporary 640-acre spacing?

A. I was under broader knowledge that it was a

640-acre spacing.

Q. So nobody told you it was under temporary 640-acre spacing?

A. No.

Q. Okay. And you were aware, at the time you acquired the Libby acreage in 2005, that the acreage to the north and to the south of the subject area was on permanent 160-acre spacing?

A. We understood it was 160-acre spacing.

Q. The order in paragraph 2 also reflects that the case is to be reopened two years from the date of first production from the subject area. Okay?

A. Sure. It says what it says.

Q. When you acquired the leases in 2005, had there been first production from the subject area?

A. From Reliant Holdings -- I mean Reliant E&P?

Q. Yes.

A. No, we had not heard anything.

Q. Was there production by anyone?

A. There were a couple of wells that I'm aware of at some point in time that Oxy had drilled, from my understanding, by mistake on acreage that belonged to the Libby family, which was leased to Reliant E&P.

Q. Would that have been around the 2007 time frame?

A. Somewhere, possibly. I'm not real good on dates.

Q. And that's the only development you were aware of?

A. I know that they were in an effort to do more development down there. And when they found out something differently took place, they discontinued the process of drilling those wells.

Q. But in 2005, when you acquired the Libby acreage, the area at issue was under temporary spacing, whether you knew it or not.

And number two, there hadn't been first production for the parties to come back to ascertain whether it should be developed on less than 640-acre spacing?

A. All I can share with you is I believed -- and based on information, you know, that we worked through the leasing of this with a fellow attorney by the name Gene Gallegos, that this acreage was 640 acres.

Q. You may have to visit with Gene again.

Now, you mentioned that you finally started drilling a well in the subject acreage in 2013, and it was just completed a month ago?

A. That's correct.

Q. What's the -- have you done any initial testing on that well?

A. Just the logging of it.

Q. So you have a log?
A. Yes.
Q. Have you done any other testing?
A. No, sir, not at this time.
Q. Are you presenting any data today based on that well?
A. That would be coming from the technical people. I would have to defer that to them. I think they're bringing -- I don't know if it's inclusive of that, but I know that that's been done. I know the work has been done on it.

But I don't know what they're planning on actually -- what part of the evidence they're going to be bringing, if that's your question.

Q. So are you saying that they've done some kind of analysis on the well that you drilled and completed a month ago?
A. That and a number of other wells.
Q. But you don't know if they're presenting that evidence to the Division here today?
A. I can't tell you for sure which wells that they're planning on presenting. I have some idea of the areas.
Q. Is there a reason that you waited eight years to start developing the acreage in the subject area?

A. Well, it becomes -- sometimes when you're the little guy on the block, so to speak, sir, and you're working to try to bring gas out of a field that's controlled by, you know, two big major parties, it gets to be little difficult.

So yes, there's been areas that have been restrained of us being able to move forward and get the development done.

Q. Well, you have a plant just to the north -- well, let me back up. Can you point on here where the well is that you recently drilled and completed?

A. Yes. It's Section 22 in here.

Q. So is it the red flag on your Exhibit Number 3?

A. Yes, 221J.

Q. Okay. And you have two existing wells just to the north of that?

A. That we just drilled, yes, sir.

Q. And then you have a current plant just to the north of that, correct?

A. Yes, north and west.

Q. Now, you've mentioned that you drilled a number of wells. How many wells have you drilled up in the 160-acre area?

A. We're drilling 13 wells up there.

Q. You've drilled 13 wells?

A. Yes, sir.

MR. FELDEWERT: May I approach the witness?

THE WITNESS: It might be 12, 13 or 12.

EXAMINER EZEANYIM: Mr. Feldewert, is this an exhibit, or what is it?

MR. FELDEWERT: I hope to make it an exhibit. Actually, let me mark this for the record. Let's have this marked as Oxy Exhibit Number 10.

Q. (By Mr. Feldewert) Mr. Vanderburg, I had someone go to the business Website and pull down the wells that Oxy is listed as an operator. And I apologize, I don't understand some of this. And --

A. Excuse me, sir. Did you mean Oxy or Reliant?

Q. I'm sorry. Reliant is listed as the operator. And I believe -- you know, I'm hoping you can confirm to me as to whether Oxy Exhibit 12 -- 10 reflects the wells that your company operates.

A. What it looks like to me, some of the wells have been drilled, some of the wells are applications.

Q. All right. Now, the wells that have been drilled, would they reflect production numbers on the right-hand side?

A. Some of the wells would. Some of the wells are still to be completed. Because basically we're going

through doing the drilling and casing, logging, and we still yet have completion to be done.

Q. So how many producing wells do you have in the area?

A. That would be -- counting the Hayoz wells, it would be eight wells, I believe.

Q. Eight?

A. Yes.

Q. Okay. And then would they -- I see you have Hayoz wells. Would they be reflected on Oxy Exhibit Number 10, as those wells would show entries in the -- on the right-hand side?

A. Of production --

Q. Yes.

A. -- you're referring to?

I believe that's correct, yes.

Q. Now, what are the wells that are listed at the bottom of these exhibits, of this Oxy Exhibit Number 10? There's a list of wells there that we don't quite understand. Can you shed some light on that?

A. I think these are applications. It looks like they were in 1931. I believe those are, I think, additional applications.

Q. Okay.

EXAMINER EZEANYIM: Mr. Feldewert, the

Examiners are confused. What are we trying to do here?

MR. FELDEWERT: I'm trying to get an understanding of what current data sources they have in the field or in this area.

EXAMINER EZEANYIM: Are these wells in the -- I call it now Central, because I think that's what we are going to call it. When I use the word, "Central," that is the area in question.

Are these wells drilled in the Central Bravo Dome, or where are these wells drilled?

MR. FELDEWERT: That's what I want to find out. That's my next question, Mr. Examiner. That's what I was trying to figure out.

EXAMINER EZEANYIM: Because I want to be able to understand what is going on.

MR. FELDEWERT: Yes, I agree. Agreed. I'm trying to as well, and I haven't had a chance to visit with Reliant about this.

EXAMINER EZEANYIM: Okay.

Q. (By Mr. Feldewert) Now, Mr. Vanderburg, I want to go to the Hayoz wells. Can you -- it indicates, if I'm understanding it, that they're located up in 19 North, 30 East, in Section 12, correct?

A. Yes.

Q. Would that be up in here?

A. That would be -- it's kind of hard to identify that, using your map.

Q. You know what? If you need to -- because you can't see it -- because in our book, Oxy Exhibit Number 2, there is a small copy.

A. There's a highway that goes up through there, 102, I think. Does that say "102," right there, over here on the big map?

And then that goes over here, and somewhere it cuts back up. I think along about right here is where it cuts back up.

So these wells that you're talking about, the Hayoz wells, are in this area, right in here.

Q. So would that be -- if I'm looking at 19 North, 30 East, that would be this area. I'm looking for a Section 12. So it would be right in here?

A. That's probably about right.

Q. Okay. And you have two wells in there?

A. Four wells.

Q. Four wells?

A. Four wells in this area, right here.

Q. In 12?

A. (No audible response.)

Q. So can I put four Xs on here?

A. Yes, sir. It looks like it's --

Q. Are they each on 160?

A. That even gets more complicated, because this was stuff that was done years and years ago, and these wells have been there for a long, long time. They were drilled originally by Thriftway Marketing, I think was the name of them. So we don't even know ourselves whether it's 320, 160, or what it is.

Q. Can I put four Xs in each of the quarter sections? Would that be representative of where those wells are?

A. No. It doesn't show on here. It shows which section -- it looks like some of them are in Section 14, maybe.

Q. All right. I need your knowledge --

A. It looks like a couple of them -- I don't have that with me, but I think a couple of them are in Section 14 and a couple of them are in Section 12.

Q. Okay, so let's put two Xs in Section 12. Can we do that?

A. Okay.

Q. Is that correct?

A. I believe that's correct.

Q. And then two Xs in Section 14?

A. Yes, back down to the southwest.

Q. All right. And let's talk about those for a

minute. These are just to the north of our subject area. And you, as a company, I take it, have concluded that you needed to drill two wells in Section 12, at least, to drain the acreage?

A. These were wells that were developed, that we operate, before we took over the operations.

Q. What about Section 14?

A. The same thing with the -- those wells probably were drilled back in the '70s or '60s, somewhere along in that time, maybe the '80s. I'm not sure.

Q. So you took officer operations where they had at least two wells in each section?

A. Yes, sir.

Q. So let's try to focus on wells that you have examined or drilled.

It looks like you have a well in Section 6 --

A. Yes.

Q. -- of 19 North, 31 East, right?

A. Yes. That should be up in here somewhere.

Q. Right here?

A. Yes.

Q. And you have one current well in there?

A. Two.

Q. You have two?

A. Yes.

Q. That you drilled?
A. Yes.
Q. So you've drilled your first well?
A. Right.
Q. And then concluded that --
A. And then we drilled another well up in that northeast corridor, up in there.
Q. So you concluded that you needed a second well up here to drain Section 6, I take it?
A. Yes.
Q. And if I look at -- if I go down the list here, I see two wells in Section 8 of 19 North, 31 East, right?
A. Yes, there's been two wells drilled there.
Q. And it looks like back in that area we have our language here. So I have two Xs here?
A. Yes.
Q. Have both of those wells been drilled?
A. Yes. One is producing, and one's been drilled.
Q. One is being drilled?
A. Been drilled, but --
Q. So you have a producing well. And you have concluded in that acreage that you needed at least another well to drain the 640 acres?
A. Yes, sir.
MR. DEBRINE: Objection to the question,

lack of foundation.

EXAMINER EZEANYIM: What did you say?

MR. DEBRINE: Object to the question, lack of foundation. He's not an engineer.

EXAMINER BROOKS: Well, I think he can answer, if he knows. I'll overrule the objection.

Q. (By Mr. Feldewert) Then if I go to Section 10 --

EXAMINER EZEANYIM: Before you go, Mr. Feldewert, on that green area on the north, they're on 160, right? They're on 160, right?

MR. FELDEWERT: Correct.

EXAMINER EZEANYIM: So somebody can bring forward there, right? Is that what they are trying to --

MR. FELDEWERT: I'm just trying to understand whether they believe this area, the well up here, can drain 640 acres.

EXAMINER EZEANYIM: Okay. I just want to make sure I understand what you are trying to get at.

MR. FELDEWERT: That's what I'm trying to show. And I'm almost finished here with respect to this.

Q. (By Mr. Feldewert) If I go to 19 North 21 East -- I'm sorry, 31 East -- 19 North, 31 East, and I go to Section 10, I'm right in here, aren't I?

A. Yes.

Q. And you have -- how many producing wells do you have there?

A. We just drilled one well there.

Q. One well?

A. Yes, sir.

Q. And have you permitted the second well? According to this second record, you did, correct?

A. I think maybe so. Back earlier, we did.

Q. So you're drilling one, and you have another permitted in this section?

A. Yes.

Q. Okay. And if I go to Section 16 in that same area, 19 North, 31 East, now this is just north of the subject area?

A. Right.

Q. In Section 16, you have one producing well, right?

A. Yes.

Q. Have you drilled a second well?

A. Yes.

Q. All right. So in the sections that I've marked here on Oxy Exhibit Number 2, Mr. Vanderburg, your company has ascertained that it's necessary to at least have two wells to drill on the 640-acre section; is that

correct?

A. What our lease agreement involves is for us to hold the acreage, we've got to drill on 160-acre spacing. That's more the --

Q. That's what?

A. That's more the incentive for us to develop it that way.

Q. So your Libby lease dictates that you drill on 160 acres?

A. That's my understanding. In order for us to hold the acreage, we have to have, in the 160-acre spacing up there, a well on each 160 acres.

Q. And you're in the process of doing that?

A. Trying to do that, yes, sir.

Q. Okay.

MR. FELDEWERT: That's all the questions I have. Thank you.

EXAMINER EZEANYIM: Thank you, Mr. Feldewert.

Mr. DeBrine, any cross?

MR. DEBRINE: Just a couple of questions Mr. Examiner.

EXAMINER EZEANYIM: Okay.

REDIRECT EXAMINATION

BY MR. DEBRINE:

Q. Mr. Vanderburg, Mr. Feldewert asked you questions about the sections to the north of the area of interest of what you were calling the Central Bravo Dome, where a second well has been drilled by Reliant.

And as I understood your testimony, the decision to drill a second well wasn't based on any engineering analysis; is that correct?

A. That's correct.

Q. What was the reason a second well was drilled?

A. Well, to be in compliance with our lease agreement with the Libby family, we've got to develop those on 160-spacing in that 160-acre area.

Q. Do you know what a Pugh Clause is in a lease?

A. No, sir.

Q. Does that same provision in the Libby lease apply in the Central Bravo Dome area of interest?

MR. FELDEWERT: Objection. He just said he's not aware of the Pugh Clause.

MR. DEBRINE: Well, that's a poor question.

Q. (By Mr. DeBrine) The provision in the Libby lease that requires you to drill a well within a standard proration unit to hold the acreage, does that provision apply to all the acreage subject to the Libby

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lease, including the acreage that's in the area of interest in the Central Bravo Dome?

A. To my understanding, yes.

Q. So if the Division were to grant Oxy's application and change the spacing from 640 acres to 160 acres, then you would be forced to drill in each 160 in order to hold the acreage?

A. Yes, sir.

MR. DEBRINE: No further questions.

EXAMINER EZEANYIM: Thank you very much. Anything further?

MR. FELDEWERT: Not at this point, no.

EXAMINER EZEANYIM: Very good. Mr. Brooks?

EXAMINER BROOKS: Well, you said it was your understanding of the Libby lease -- of course, the lease itself would be the best evidence of what its terms are. But are you thoroughly familiar with the terms of that lease? Is your understanding based on having examined that lease?

THE WITNESS: Pretty much so, yes, sir.

EXAMINER BROOKS: Okay. Is all of your acreage up there in the Libby lease, or is just some of it in the Libby lease?

THE WITNESS: It's all Libby acreage.

MR. BROOKS: Thank you. That's all I have.

EXAMINER EZEANYIM: Thank you, Mr. Brooks. Before I start, Mr. Vanderburg, are you Fred or Scott?

THE WITNESS: Freddie.

EXAMINER EZEANYIM: You are Fred?

THE WITNESS: Yes, I'm Fred.

EXAMINER EZEANYIM: Because I see, "Fred or Scott." I'm sorry, I need to get it in the record. Because what we are going to do -- when we started this, Mr. DeBrine was to provide a witness. But in this case, we have a practical oilman.

So I would like the record to reflect that we have a practical oilman. So Fred Vanderburg will be a practical oilman, right?

MR. DEBRINE: Yes. We will submit him as a practical oilman.

EXAMINER EZEANYIM: Okay. Very good. I want to get that in the record before we continue.

And did you say you were the Chairman of the Board of Reliant?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: Okay. Very good. So at least your testimony will be, you know, given that way.

Now, let's start with the economics of drilling that well. And when I'm talking about drilling the well, I'm talking about the Central Bravo Dome. We're calling that well today the Central Bravo Dome to indicate the acreage in question, right?

When we use the words, "Central Bravo Dome," it is that yellow area that is in question, right?

MR. DEBRINE: I think that's good.

MR. FELDEWERT: I believe that some of the witnesses draw a distinction between the eastern area of the Bravo Dome, the central area of the Bravo Dome and then the western area of the Bravo Dome.

EXAMINER EZEANYIM: It's confusing.

MR. FELDEWERT: It is very confusing.

EXAMINER EZEANYIM: Mr. Feldewert, if we look at that yellow area you marked, what can we be calling it here --

MR. FELDEWERT: I call it the subject acreage.

EXAMINER EZEANYIM: Subject acreage? Is that okay with everybody if I use the words, "subject acreage"? When I use the words, "subject acreage," I'm not talking about that east or the north or the south. I'm looking at that yellow, because that is what we have today.

We can make mention to the east or the north or south if we are going to draw inferences. But when I use the words "subject acreage," we are talking about the acreage in question because that is the acreage you guys are fighting for.

You have nothing in the north or the west or the south, right, do you? You don't have any quarrel in those areas, right?

MR. FELDEWERT: The subject of our application is just the acreage in yellow.

EXAMINER EZEANYIM: The yellow? And then we're calling it, "the subject acreage"?

MR. FELDEWERT: Yes.

EXAMINER EZEANYIM: Okay.

MR. DEBRINE: Mr. Examiner, just with the one clarification that in looking at the Oxy application, we've got that stray section up in the northwest there.

EXAMINER EZEANYIM: Oh, okay. What is that?

MR. DEBRINE: I don't know. It's within the land described in the application.

MR. FELDEWERT: If that is indeed the case, then that was a mistake. Because the language -- the acreage that's described in the application is what has

been listed in the orders where they address the portion of the Bravo Dome acreage that was brought into 7737.

EXAMINER EZEANYIM: Let's talk about that. I see that it's like just a little station up there that looks like the color in the center.

So what is your objection? What point are you trying to make?

MR. DEBRINE: Well, the only point I was trying to make is we're trying to clarify what the subject acreage is. The Oxy exhibit shows it in yellow, and the Reliant Exhibit Number 3 shows it in green.

And when we looked at the description in the application, it also called out that stray section up there in the northwest, and it's not contiguous. And it's either a mistake -- as I understand Mr. Feldewert, if that's in the description in the application, then it was unintentional, and it should be excluded.

MR. FELDEWERT: I can clarify for the record that the subject acreage is what is identified in yellow in the middle on Oxy Exhibit Number 2.

EXAMINER EZEANYIM: Okay.

MR. FELDEWERT: And I don't know if -- I guess we can check, but it would not include that block. And if indeed it was described in the application, that was taken directly from one of the

orders. So I guess the mistake has been here for some time.

EXAMINER EZEANYIM: Okay. I don't think it has any business in what we are doing here.

MR. FELDEWERT: I don't think so, no.

EXAMINER EZEANYIM: Now, let's go back to the subject area. What do you want to do -- who gave me this?

MR. FELDEWERT: That was me.

EXAMINER EZEANYIM: Okay. Now, what do you want us to do with this?

MR. FELDEWERT: What's that?

EXAMINER EZEANYIM: What do you want me to do with this?

MR. FELDEWERT: I would move the admission of Oxy Exhibit Number 10 into the record. I was going to wait, but I can certainly do that now.

EXAMINER EZEANYIM: Before I admit it, are there any objections?

MR. DEBRINE: No objection.

EXAMINER EZEANYIM: Okay. Exhibit 10 will be admitted, so we get rid of this.

[Exhibit 10 admitted.]

EXAMINER EZEANYIM: Now, let's go back to the questions. Now, let's talk about economics. First

of all, before we go there, Mr. Vanderburg, let's look at that area in question.

EXAMINATION

BY EXAMINER EZEANYIM:

Q. Let's start with, have you drilled any wells in that area in question? Have you, on that land, drilled any wells to date?

A. Yes.

Q. How many?

A. Seven. One well has been drilled, which is 221J.

Q. Okay. In that area in question, you have drilled one well?

A. Yes.

Q. How many do you plan to drill in the future? How many do you plan?

A. Over the next three years, there will be 31 wells drilled in there -- 33, actually.

Q. Okay. When are you going to start drilling those wells?

A. We've got another -- right just south of there, we've have got another pad right now.

Q. Okay. So you are going to drill another 31 wells, right?

A. Yes.

Q. Okay. Over the next three years?

A. Yes. We've actually gone up into the northeastern -- what we call the northeastern quadrant right now.

Q. Okay. Now, on the -- this is important here. I would agree that one was on the assumption that the spacing is 640. That's the assumption you use to do that?

A. We would drill --

Q. I would agree with this when you said -- and let me ask you this question: If you were to downspace, you are going to drill six wells, right?

A. Yes. If we downspaced 160 acres, yes, we would have to drill, in order to hold the acreage, the way we understand it, around 82 wells.

Q. Okay. Eighty-two, not 81? Eighty-two wells you are going to drill if you downspace?

A. Yes.

Q. And you are projecting that, right?

A. Yes.

Q. And your engineering analysis will demonstrate that when you come up to that to say, "If we don't drill on that 640, we are going to drill on 82 wells for these three years that we are going to drill"?

A. Yes.

Q. Okay. But if we are allowed 640, we are only

going to drill 31 wells?

A. Yes.

Q. And my question there is: If you drill 31 wells, is that enough to drill all the acreage?

You don't have to answer that question. It's not for you to answer that question. That's what I want you to be saying. I want to get that information from you.

If you drill 31 wells, you're going to drill all the acreage there on 640?

I'm not asking you to answer that question. Somebody else has to, unless you know the answer, which we haven't done, you can answer that question. Now, I want you to prepare to answer that question because that is the crux of the matter.

If we drill six wells, is that in the west? Or if we don't drill six wells, is that in this west?

Because as you know, once they extract all the hydrocarbons -- or not hydrocarbon gas, carbon dioxide, they are going to extract all the carbon dioxide they need. You don't want to fight with the ground. You want to get them out.

So how many wells are you going to drill in that unit to bring them out? What would be the ultimate recovery? I'm just pointing this out because that's

where I'm really going. Because that's really what we are here for, whether we are going to develop them on 640 or 160.

So there in the economics you are saying, "If we are using 640, we're going to drill 31 wells. But otherwise, we are going to drill 82 wells."

Is drilling to the west? I don't know. Nobody can answer that question yet. And that's based off economics.

And then I think when your engineers come up here, they will tell me why only 31 wells you drill in the acreage you have in the subject area. When I use the words "subject area," it's the area we are talking about, right?

A. Yes.

Q. Okay. Good. It's my understanding that you plan to -- there's a rig already in place?

A. Yes.

Q. When are you going to start drilling that well?

A. We've got to finish up the northeastern quadrant, which is about 10 wells up there, and it's taken about a week to drill a well.

Q. Okay. Before you bring it in?

A. Yes.

Q. So it may be another two or three months?

A. Yes.

Q. Did you -- as a chairman of the board, did you try to talk to Oxy about this special problem? Did you try to talk to them about it?

You know, during that discussion, did you try to discuss whether or not they were going to develop this on 640 or 160? Or do you guys want to bring it here and then fight for it? Did you guys talk about it?

A. There's been conversations with Oxy, yes, sir.

Q. Were you part of it?

A. Yes, sir.

Q. And how did the conversation go?

A. Well, what happened is that there were a couple of wells that were drilled by Oxy on the Libby acreage. Of course, we tried to sit down and visit with them about the matter of what could we do? You know, we would like to go ahead and pay our cost, a portion of it, to drill the wells.

And it started out that Oxy was going to, you know, provide us with what the information was so that we could put our money into two wells that they had, for some reason, drilled over on our acreage. But those conversations, for some reason, kind of stopped happening.

The next thing we know, well, they've taken the

approach to go back and drill this on 160 acres so that they don't have to account for the acreage that they drilled on to Reliant.

So we think that probably the better approach that they have taken is, well, let's go back in here to 160 acres, instead of putting it on 640.

Because if you look at, you know, the effect of them being able to go to 160 acres versus doing it at, you know, the 640, it really, I think, affects the correlative rights of the Reliant Group substantially if you sit down and you look at that map and observe what can take place there. So that's a concern.

And I think they saw that it would be better for them to go that route. And that's probably the reason why we understand this whole thing is coming about.

So there were preliminary discussions that eventually went this direction, instead of trying to work it out there in the field and see what we could do together.

We would still like to go back to try to work something out in the field.

Q. It appears to me that nothing happened during the discussion, right?

A. Yes.

Q. Okay. Now, let me ask you this. If you can't answer it, that's fine. So in your opinion, is your objection to the 640 based on commercial economics or prevention of waste and protection of collective rights?

If you can't answer the question, that's what we are going to explore and get to today. But can you give me an insight, since I have you here, is it based primarily on commercial economics?

Like if I want to drill 31 wells, I'm going to spend less money than if I want to drill 82 wells. You know, that's a different question than how many wells do we actually need to explore the reservoir.

So do you see where I'm going to?

A. With the knowledge that we have at this time, I think it would be premature for us to jump into 160 acres. It might not be down the road that we would go along with this.

Right now, the best that we can get from our people that are studying this think that it's premature to jump into 160, and that 640 sure might be adequate enough to do it, or maybe 320. But 160, we think it's -- it's for other reasons that we're doing that, other than for drainage concerns.

Q. I understand. But you know, because you are the

owner of this company, because you are talking primarily about economics, is that why you want to do that?

A. Yes. It affects us tremendously on the economic side of it.

Q. That's what I want to hear. You know, you have the right to do that. I would do the same. I mean who --

A. But still, it's from a technical standpoint of what adequately can drain that and prevent waste, and we fully understand that.

Q. That's a different question?

A. Yes.

EXAMINER EZEANYIM: Okay. Good. I'm just trying to collect facts. You know, I don't make up my mind until I get all of the evidence and then review it. It takes months to review this evidence before you can make anything.

So when I'm questioning you, I'm not trying to pick on you.

THE WITNESS: No, that's okay.

EXAMINER EZEANYIM: I want to make sure you guys understand that. You might think, oh, yeah, he's picking on me. No. I'll make up my mind anyway, because I don't know what I'm going to get.

I'm trying to address these questions. They

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might be dumb questions, but they help me a lot. So don't worry about it when I ask you questions. It helps me to understand what's going on.

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: Okay. Good. Does anybody have any other questions?

MR. FELDEWERT: I have a question.

EXAMINER EZEANYIM: Okay. Go ahead.

FURTHER CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. I'm confused, Mr. Vanderburg, about -- you said Oxy drilled on the Libby lease acreage?

A. Yes. Two wells were drilled on the acreage that -- I think what happened, Oxy thought that they had this under the Libby acreage, still under lease.

For some reason, they kind of got -- they didn't let the field know what was going on, and they were really actively drilling some areas up there. So two wells were drilled on acreage that, you know, incorporated the need to pool because of this joint ownership --

Q. Let's step back a minute. I think we've got two concepts confused here. In terms of the acreage location where the well was drilled, okay, where the well was drilled, that was, was it not, acreage subject

to the Bravo Dome unit Agreement?

It was not on acreage held by you under the Libby lease?

A. It was drilled under acreage that would have taken a pooling arrangement, is the way I understand it.

Q. So the wells were actually drilled on acreage that is part of the Bravo Dome unit? They were not drilled on acreage that is subject to the Libby lease?

A. I think it was drilled on acreage that was subject to the Libby lease, based on a 640-acre proration.

Q. If there was a 640-acre proration unit, you're saying the Libby acreage would have been brought into the proration?

A. Yes, the Libby acreage would have been part of that proration unit. It was part of the 640 acres.

Q. But in terms of the physical location of the wells, the tracts on which the wells were drilled, those tracts are not subject to a Libby lease. They're subject to the Bravo Dome --

A. We just have to go back and look at the surface where the actual wells were.

Q. Have you looked?

A. It's been some time back. I just know that we had a problem there because it should have been pooled.

MR. FELDEWERT: I think Mr. Brooks is familiar with the issue. Thank you.

EXAMINER EZEANYIM: Mr. DeBrine, any more comment?

MR. DEBRINE: No, Mr. Examiner.

EXAMINER EZEANYIM: You are excused.

THE WITNESS: Thank you, sir.

EXAMINER EZEANYIM: How many witnesses do we have still left?

MR. DEBRINE: Reliant has two more witnesses.

EXAMINER EZEANYIM: You have two more witnesses? We have to finish today. We have to finish today, because I don't think we have tomorrow. I've got a lot to do.

I don't want to apportion a time number. We finished one. Now, do you want to take a break and do this, or do we want to take one witness and then take a lunch break? What do you want to do?

EXAMINER BROOKS: I think we probably should have one more witness before lunch, but I'd like to take a five-minute break.

EXAMINER EZEANYIM: Okay. We will take a five-minute break, and one more witness before we take a break.

[Recess taken from 10:57 to 11:07 a.m.]

EXAMINER EZEANYIM: Let's go back onto the record. I want to make a statement here. We have to apportion time. Nobody will do this, because I see this is going too slow. What I would like everyone to do is to streamline their questions. Streamline your questions so we can cut it down, instead of keeping -- giving you two hours here, two hours there and then keeping that time.

Let's streamline the questions and get on with it so that we can finish today. Because you've got to get your questions anyway, but try to streamline them.

Mr. DeBrine, call your next witness for the record.

MR. DEBRINE: Mr. Examiner, Reliant calls Mike Raines.

EXAMINER EZEANYIM: Okay.

MICHAEL ALLEN RAINES

having been first duly sworn under oath,

was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Would you please introduce yourself for the record?

A. My name is Michael Allen Raines.

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Q. Who do you work for, Mr. Raines?
A. I work for Whiting Petroleum Corporation.
Q. How long have you worked for them?
A. About four years.
Q. What is your area of responsibility and duties for Whiting?
A. I'm a geologist for the Reservoir Team on the CO2 Group and the Enhanced Recovery Group.
Q. Have you worked in that area during your four years with Whiting?
A. Have I worked in the area of CO2?
Q. Yes.
A. Yes, I have.
Q. What is your educational background and prior employment history?
A. I've got a Bachelor of Science Degree in Geology from West Texas State University in Canyon, Texas.
Q. What year was that?
A. That was in 1992. And a Master's of Science, also in geology, from the University of Oklahoma, in Norman, in 1995.
Q. And if you could, just take the Examiner through your employment history after getting your Master's degree and the different jobs and responsibilities you've held.

A. Okay. I started with Texaco Exploration in Midland, Texas, in 1995, and worked on the North Hobbs Asset Team, which is an area that included some CO2 properties. About 1997 is when I was first assigned to the CO2 properties, and I worked those until the end of my tenure at Texaco in 2000.

I then went to work for Kinder Morgan CO2 Company in the SAROC field in Scurry County, Texas, which was also an enhanced oil recovery project, and I worked for them until 2008.

I then went to work for a small company called Petro Source, which is also an enhanced oil recovery company. The other names Petro Source has gone by since then is Reata, when they bought their last partner; SandRidge Tertiary, and now they are part of Trinity CO2. But at the time I was working for them, which ended in 2009, they were Petro Source originally, and then SandRidge Tertiary.

I then came to work for Whiting in 2009 and have been there since.

Q. How long have you had responsibilities with regard to the Bravo Dome area?

A. A little over a year, since late 2011.

MR. DEBRINE: Mr. Examiner, we tender Mr. Raines as an expert in geology.

MR. FELDEWERT: Can I ask a couple of questions?

EXAMINER EZEANYIM: Sure.

VOIR DIRE EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Raines, as I understand it, you're not an employee of Reliant, you're an employee of Whiting?

A. Correct.

Q. Okay. And your experience, up until the Bravo Dome, has been, as I understand it, exclusively with enhanced oil recovery projects, where they're injecting CO2 and moving -- producing oil?

A. Not exclusively, but primarily.

Q. Prior to beginning your examination of the Bravo Dome just a little over a year ago, were you ever involved in fields that were producing carbon dioxide gas?

A. I briefly assisted at Kinder Morgan with the McElmo Dome.

Q. With the McElmo Dome?

A. Yes, but not to a significant extent.

Q. You didn't do any geologic studies of the McElmo Dome?

A. No. I helped them with well locations and with planning, fogging, things of that nature.

Q. And how long was your experience there?
A. In the McElmo Dome proper?
Q. Yes.
A. Probably less than a year, six months to a year.
Q. Okay. And then you moved to -- with Whiting and moved to examining Bravo Dome, I think you said, in late 2011?
A. Correct.
Q. And what have you done specifically with respect to the Bravo Dome unit? When did you start your analysis of the Bravo Dome unit, or the Bravo Dome area?
A. I guess that would have been in 2012 sometime, although I don't remember exactly. Because we were looking at Bravo Dome also as an analogue for the whole area, Bravo Dome and West Bravo Dome as a whole.
Q. As a whole? I guess my --
A. All formations.
Q. -- my questions is: When did you -- I'm assuming you have done a geologic analysis of the area at issue?
A. Yes.
Q. Okay. When did you begin looking at the geology associated with the Bravo Dome?
A. That was the same time, about late 2011.
Q. And was your focus at that point in time on the subject area?

A. No. That focus was on a broader area.
Q. A broader area?
A. Yes.
Q. Okay. And when did you begin your focus on the area that's the subject of this application?
A. When we started working with Reliant as a partner a, business partner.
Q. And when was that?
A. When I got involved with it was October of last year, I believe, October 2012.
Q. October?
A. Yes. And were more specifically looking at the area of interest subject to today's hearing.
MR. FELDEWERT: And you're qualifying him as just a general expert in petroleum geology?
MR. DEBRINE: Yes.
EXAMINER EZEANYIM: Do you have an objection to that?
MR. FELDEWERT: I have no objection to his general qualification in petroleum geology.
EXAMINER EZEANYIM: What do you mean?
MR. FELDEWERT: Well, he has very little experience with the Bravo Dome, but I have no objection to his qualification as an expert in petroleum geology in general.

EXAMINER EZEANYIM: Mr. Raines is qualified as an expert in geology engineering. Okay. Proceed.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Mr. Raines, have you performed a geological study of the subject area of Oxy's application in this case?

A. Yes, we have, as part of our work with Reliant.

Q. Could you describe for the Examiner what that study consisted of and then what you did?

A. Yes. I have some slides prepared that we can go through to address that.

Q. If we could turn to Reliant Exhibit 5?

A. This is --

Q. I'll just ask you to identify that exhibit and describe what you're intending to depict on.

A. Okay. For some of the work that we have done on the engineering side, of course, you need some basic geologic data for the variables that go into that.

So this is our key dataset that the parameters have been based on. Of course, Bravo Dome is in the dark outline; the West Bravo Dome is in purple; the 160-acre areas are highlighted in green; the subject area is in between those two; and the Reliant leases are in this other dark color, which is, I think, reddish on your hard copy.

EXAMINER EZEANYIM: Where is the subject area on this map?

THE WITNESS: It is between this green line and this green line. And then along the side, the east side, that's in the Bravo Dome portion. The dots are wells that met our search criteria and that we were able to get data for.

Q. (By Mr. DeBrine) If you could, describe for the examiner what your search criteria were.

A. Okay. Well, first of all, we pulled down all the hard copy logs that we could. We purchased those that were available from a private company, TGS, for the wells that they had. And we reviewed the OCD site, looking for additional logs where they did not have some. And then we looked for wells that had bulk density curves and resistivity curves that we could digitize to perform our analysis with. So those were our key criteria.

And then we tried to scatter wells in a representative area across the whole field, as opposed to digitizing every single well.

Q. And what was the reason for doing that?

A. To save time and yet still have a fair representation across the whole area.

Q. Was your method for selecting the logs that you

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studied standard within the industry?

A. I think it's a reasonable approach.

Q. What conclusions did you reach, based on your analysis of the logs?

A. One of our key findings was that we think that the Oxy model for the environmental depositions, which is shown on another slide, is a reasonable model.

The cutoffs that they're using for their log analysis, or at least the ones we have, look reasonable. Specifically, since the porosity on the sandstone matrix is a 12-percent cutoff was one of the things that they were using, based on our review of some documents that were subpoenaed in 2010, I don't think they're part of the record, so you may not have seen those yet. But we looked through the data that they had. And their saturation -- or their porosity cutoff, rather, was 12 percent, which we agree that that looked very reasonable.

The parameters that they used to come up with their analysis are shown -- some of them are shown down here. Those all look very reasonable.

They do not specifically say what the water saturation cutoff off that they were using was, but we felt that 30 percent was a fair amount. So that's an assumption that we did right there.

EXAMINER EZEANYIM: Who is "they"?

THE WITNESS: "They" being Amoco-Oxy.

Q. (By Mr. DeBrine) Just to clarify for the record, you looked at exhibits that Oxy had prepared in connection with its 2010 case, when it filed an application seeking to downspace the subject area back then?

A. Correct.

Q. So you were looking at the assumptions of parameters that were in the Oxy study for that case. And then you did a comparative analysis with regard to what you felt was adequate; is that a fair --

A. That's fair summary.

Q. Okay.

A. One of the differences between our work and what they did is that they had a variable Rw, for water resistivity. And we used a constant Rw that was an average or in-between value that we thought was typical, based on what we had seen without the detailed data that Oxy has is a fair representation, without any water analysis for us to be able to back that up. So we were basically using public data for all of this information.

Q. Is there anything else shown on Exhibit 5 that was pertinent to your study that you want to point out

to the Examiner?

A. Well, I would like to just point out that we did use the 166 wells, and there is a fair representation of the areas in general. So we feel like our results may not be as fine-grained as the OXY-Amoco data, but it should be a fair representation.

EXAMINER EZEANYIM: On the 166, how many of them came from the subject area?

THE WITNESS: I have not counted them, but you can see them on the map here.

EXAMINER EZEANYIM: Okay. So you obtained that from the subject area, too?

THE WITNESS: Yes.

Q. (By Mr. DeBrine) Did you exclude any data from wells in the subject area?

A. Yes. If they didn't meet our criteria of having a density/porosity log and/or or didn't have a resistivity log, or if they did not cover the whole Tubb interval for some reason, those would be excluded.

And we didn't specifically look into the subject area to try to get every single well. We tried to get a representative sample, so there may be some wells that are not in here.

Q. What was the purpose of your geological study here? What were you trying to identify and analyze,

what factors?

A. Well, the overarching thing that we were looking for is CO2 occurrence and distribution. And that's before we got to work with Reliant on this project.

And then specifically in the Reliant area, we wanted to know the criteria that would help us define where we should drill, or if there were areas where we should avoid, where we should avoid.

Q. Next one?

A. This is the result of our porosity times height map, which is a parameter that would go into the radius calculations when we were looking at, what spacing should we attempt to do for this area?

Q. And you're referring to Reliant Exhibit 6; is that correct?

A. Yes, that is correct.

Q. And what is Exhibit 6 designed to represent?

A. This represents a grid based on those 166 wells where we had data control points. It also represents, with the dots, where all the wells are currently active and shut in that we are aware of where those are. And then the same colors for the Bravo Dome outline, West Bravo Dome outline, 160s and Reliant areas.

This data is what we sampled back to all wells when we did our calculations on the engineering side,

which Mr. Beebe will address.

Q. And what is shown by the different chart on the right? And correlate it to the colors shown on the map?

A. The colors on the right are the porosity times the height. So it's a net volume map, the colors being 4, for the lowest darkest colors, and just below 40 for the highest oranges.

So an area in here, for example, on the east side, would be close to 40; areas around here would be lower numbers, below 10.

Q. So what conclusions can be drawn from the porosity map, Exhibit 6?

A. I think the key to take away from this is there is an area on the east side that's much better -- two areas, actually, on the east side that are much better than the areas on the west. But the west two-thirds is not that dissimilar in general, although there is a lower-quality area in a couple of places.

Q. And when you say, "lower quality," and "much better," what do you mean in geologic terms?

A. Lower quality being smaller porosity feet. That means the reservoir interval -- the net reservoir interval will be less, and the higher numbers being more reservoir quality interval.

Q. Is there anything else on Exhibit 6 that you want

to point out to the Examiner that is pertinent to your study or conclusions?

A. Not that I can think of at the moment.

EXAMINATION

BY EXAMINER EZEANYIM:

Q. Now, go to that square. It's not really a square. It's in green, that green outline.

Is that the subject area?

A. No. That's the current 160 area --

Q. Where what is the subject area?

A. Between these two and on east of the West Bravo Dome.

Q. Just use your pointer to point to the subject area.

A. That would be this area, here.

Q. Now, where does it fall on there? The CH on that, right there, what is that area for there? Because sometimes the color deceives me. Where does that fall? In the subject area, when you have CH? What is the identical CH here? Is it about 30?

A. Less than 4 -- is it the white and -- 4 and higher is where the first porosity starts.

Q. Okay. The white is less than 4?

A. Yes.

Q. And that's in the subject area?

A. Yes.

Q. Okay. Then go to the left of that white.

A. Over here?

Q. Yes. What is the CH there?

A. That's -- 4 is the darkest area --

Q. And that is the subject area?

A. Yes.

Q. Where do we have the highest CH?

A. Say that again.

Q. Where do we have the highest --

A. The highest CH? Over on the eastern --

Q. I'm not talking about this case. The first one gives us about 8 or 10 CH, right?

A. Right.

Q. Okay. I just want to understand what CH is. You know, what the CH is there. It's a very important parameter.

So if I look at the subject area, if you go out into the drainage, would you calculate the drainage of what type of CH you get, you know?

A. Right.

EXAMINER EZEANYIM: Okay. Good.

FURTHER DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Mr. Raines, if you wouldn't mind, just to help

the Examiner, if you could just walk up and correlate between the Oxy map, the yellow subject area, and the subject area as shown on Exhibit 6, so that it's clear what area we're talking about?

A. This yellow area on the Oxy map would be this area.

EXAMINER EZEANYIM: That's where the CH is 8, 10 or 12, right?

THE WITNESS: Correct.

EXAMINER EZEANYIM: Okay. Good. We take that as a point now. Good.

Q. (By Mr. DeBrine) The next one?

A. This is the core data that we were able to obtain from public sources. Our public source was the Oklahoma Geological Survey, which had a donation made by Amoco sometime in the past.

Q. And you're referring to Reliant Exhibit 7; is that correct?

A. Yes.

EXAMINER EZEANYIM: Excuse me, Mr. Counsel. You depict these exhibits, right, as exhibits?

MR. DEBRINE: There's a number -- and I apologize, Mr. Examiner. They're poorly marked. There is a number on the very right-hand bottom of each

exhibit.

EXAMINER EZEANYIM: Like 6 and then 7?

MR. DEBRINE: There's a 7 there.

EXAMINER EZEANYIM: Those are the exhibits. Before you go, you need to mark them because we need to mark it for the record to make sure they know what exhibit we are talking about.

MR. DEBRINE: We'll do that.

EXAMINER EZEANYIM: All right. Go ahead.

A. This map depicts the areas where we had core data available by the well spots. There is a number underneath the well number, which is the average horizontal perm out of the core data that we had for just the reservoir quality pay, and I'll talk about that in a second.

The lines on here, the dashed lines, are areas from the Amoco 1994 study, which was part of the Oxy 2010 subpoenaed exhibits, which depict environmental depositions, so they're broken into regions here.

So this is a single depositional environment from northwest to southeast and the northwest corner. Another one here, in the central area, this area is the third one. And then the final one is over here, on the east side.

EXAMINER EZEANYIM: Can you talk more about

those dashed lines? It's very important. What are those dashed lines? You are talking about permeability now, right? What are you talking about right here?

THE WITNESS: We're talking about core data, in general, and then specifically getting to the permeability, yes.

EXAMINER EZEANYIM: Talk more about those dashed lines.

THE WITNESS: Let's start at the south end. This is the 1994 study that depicted where the oil/water contact was from those same exhibits that we got. The colors are hard to see, but this area also is a water contact, and there's one more right here. On your hard copies, those are blue.

The pink lines here are the boundaries between the different environments of deposition as regional definitions that Oxy and Amoco came up with. So we've just taken that data and posted it on this map also.

So starting in the northwest corner, this is their mixed muddy and arkosic facies. This crosses -- this black line is an 8, where all of the Tubb is above the oil/water contact -- I mean the gas/water contact. But the environment of deposition crosses that to this next pink line that runs across the center here. So all of this area is what they call the channelized facies

area.

And then this area, which includes the subject area for today, is quite a big area, and it's called the transitional facies. And then the thickest portion of Bravo Dome, on the far eastern boundary, is what is called the massive facies.

Q. (By Mr. DeBrine) Is there anything else on Exhibit 7 that you want to describe that's part of your study and conclusions?

A. Yes. We should probably talk about it some more. The numbers that are posted underneath each well spot -- and again, the well spots are from where we had core data available from that Oklahoma Geological Survey Dataset.

We digitized all that data and ran an average in Excel to come up with an average horizontal perm for things that met certain criteria. And that criteria was the reservoir quality cutoff that Amoco and Oxy have been using, which is 12 percent on core porosity now, as opposed to log porosity.

So if a core point exceeded 12 percent porosity, then we put it in another column and averaged all those data for just the core portion that was in the Tubb formation proper.

Q. And what was your reason for doing that?

A. Because the Tubb is the main pay interval and is part of the unit definition. It's not 100 percent of the definition. But generally, when you get below the Tubb, it typically is wetter and not permed by historical practices. So we averaged all of those data, and that's the number that's posted underneath each well spot.

Then we'll zoom in on the next slide, if you're ready to see that on the subject area.

MR. DEBRINE: Mr. Examiner, we can wait till the end, but Reliant would move for Exhibits 5, 6 and 7 at this time be in admission.

Any objection?

MR. FELDEWERT: To Exhibits 5, 6 and 7?

MR. DEBRINE: Yes.

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: You want to move --

MR. DEBRINE: I'm just going to move to admit them after the witness discusses them, rather than admit them all at the end.

EXAMINER EZEANYIM: Okay. Which ones do you want admitted?

MR. DEBRINE: Exhibits 5 through 7.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: Okay. Exhibits 5 through 7 will be admitted.

[Exhibits 5 through 7 admitted.]

Q. (By Mr. DeBrine) So now we're talking about Exhibit 8, Mr. Raines?

A. Yes, which is on the screen there. We've added a highlight to certain numbers that are posted underneath the wells in yellow here. And those are wells that fit our criteria that that's a valid point to compare for the Tubb.

We based our validity of the points for this exercise just on how much of the Tubb was covered. If it had at least a third or more of the Tubb formation covered with the data, then we called that a good point and gave it a yellow highlight around the number.

And if it was less than 30, or if it didn't get into the pay section, for example, then we would not highlight the well.

So that's the difference between the wells that are highlighted and the wells that are not highlighted.

EXAMINER EZEANYIM: The ones that are highlighted, is that less than --

THE WITNESS: More than one-third of the Tubb is covered by the core data.

EXAMINER EZEANYIM: Okay. And those not

highlighted, what are they?

THE WITNESS: They are less than one-third of the Tubb, covered by the core information.

EXAMINER EZEANYIM: Okay. Thank you.

THE WITNESS: We've also got some circles on the map --

Q. (By Mr. DeBrine) And that's depicted on the bottom of the exhibit?

A. The core -- the colors of the --

Q. Yes. The yellow highlighted --

A. Yes, yes. That is true, yes.

And then the circles in red are the cores that have been used in the Oxy exhibits from 2010, which we'll refer to again later. So this is where those wells are located, and I believe they're referred to in the Oxy exhibits as the western core.

EXAMINER EZEANYIM: Are those numbers within the subject area, the validity? What are those numbers?

THE WITNESS: That is again the horizontal perm, averaged over only the pay quality rock.

EXAMINER EZEANYIM: Okay. And then the millidarcies, right?

THE WITNESS: Millidarcies, correct.

Q. (By Mr. DeBrine) And how did you determine the

pay quality rock?

A. We used the OXY-Amoco 12-percent cutoff as our definition also.

Q. Okay.

A. There's a blue circle in the middle of the area. This is a new Reliant well that has core data. And we have preliminary data back on that well, also, so it's been added to this group. It's the same criteria for the highlights, and more than a third of the reservoir was covered. And that number is the average horizontal perm for all of the Tubb that has met our criteria of 12-percent cutoff or more.

Q. And could you just orient the Examiner with respect to the map shown as Exhibit 8 and where we are within the subject area?

A. Okay. Again, the green box is the existing 160-spacing area, and the bottom 160-spacing area -- southern 160-spacing area goes partly behind the highlighted comments here. So the subject area is between these two, starting on this township boundary and going over to the West Bravo Dome boundary.

One thing that I'd like to point out with these highlighted numbers here is that they are very similar to the areas immediately to the east of the subject area, and they're not that dissimilar from areas over in

West Bravo Dome.

This is a high number, but it's not highlighted, again you'll notice, because it didn't cover the full Tubb interval.

Q. Is the Reliant acreage also shown on Exhibit 8?

A. Yes, it is.

Q. If you could point that out?

A. It's these red blocks, these red outlines. I should probably mention also that only the townships are marked on here. For the sake of clarity, I did not put the sections in this exhibit.

Q. Is there anything else on Exhibit 8 that's pertinent to your study or conclusions?

A. I would like to, I guess, note that there are some lower perms in this area, in general, including some of the Oxy presentations. But in this immediate area, it's not very dissimilar from the townships directly to the east of it, and we have one datapoint to the west of it.

Q. If you could be more specific so that the record is clear, the immediate area, describe its relationship to the subject area of interest.

A. Can you say that question again?

Q. Just orient on -- because the record is the immediate area, you need to be a little bit more

specific so that the record is clear as to what you're talking about.

A. I'm referencing the townships east of the subject area, specifically 18 North, 32 East, and the south half of 19 North, 32 East.

Q. And if you could reference the individual wells you're talking about that you conclude similar?

A. Okay. I don't have the full number of this well.

Q. That's the one showing the 13.8 highlight?

A. Yes. That would be about Section 13, I'm guessing, and then 341K Bravo Dome unit, 121G Bravo Dome unit. And we have one datapoint inside the subject area in 19 North, 30 East, which is Bravo Dome unit Number 361, and another one inside 19 North, 31 East, which is Bravo Dome unit 351.

Q. Anything else?

A. I'm sure the Examiner is already aware that this is logarithmic data. So when I say, "similar," I'm talking double digits to double digits would be in the same order of magnitude. That's what I refer to as similar.

And when you jump to something like that 100 or 200, that would be the next order of magnitude or a much higher quality than the similar data.

And if you were to go below single digits,

that's the next order of magnitude lower. So those would be similar, but of poorer quality, and would include some of these wells in the far northwest corner.

Q. And what are the factors that are depicted in the wells you're referring to?

A. That's again horizontal permeability in millidarcies.

Q. And the actual numbers, so the record is clear?

A. Oh, okay. 351J and 20 North, 29 East would be 2.8, although it's not what we would consider a valid number because it doesn't cover enough of the Tubb.

There is another datapoint in 20 North, 30 East, I believe that is. Yes, 30 East, Section 18, 181 Bravo Dome unit, which is calculated to 1.1.

We'll see that again, and you'll see why that one was eliminated from our high-quality or reasonable coverage map.

MR. DEBRINE: We move the admission of Exhibit 8.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: Exhibit 8 will be admitted.

[Exhibit 8 admitted.]

Q. (By Mr. DeBrine) Could you identify Exhibit 9?

A. Yes. This is the three wells that we referenced earlier as Oxy's 2010 subpoenaed well examples from the western core area.

What we're showing on here is some waterline data mixed with the core data. This data has not been depth shifted. So you can see an area like this on the first well on the left, which is in the 2100, 2200 area, where the curves are not exactly lining up. So we have not taken that next step to align those and correct the core depths to the waterline depths.

But the intention of this is to show the general character of the Tubb and where the core data falls within that.

The curve on the left of each of these three plugs is a gamma ray curve, in light gray. The tract to the right of the depth tract is a density/porosity curve in red.

And then the third tract on the far right is horizontal permeability, the same smoothed data that we've used to calculate the averages that are posted underneath the well symbols above there.

And then the last datapoint, again back in the middle tract, is the core porosity data.

The highlights that you can see on the hard copy a little easier than what's on the screen here --

here's a good example. In the middle well, the yellow highlight is 12 percent porosity or better on the waterline data. And in the core data, it's a pink color that's highlighted on a 12 percent core porosity or better.

Q. Is there any other information?

A. The box on the left side of the depth tract is the gross core interval, so the box is again the top and bottom of the core.

And then where we have actual datapoints, a curve will show up in the Porosity column if we have porosity data, or in the Permeability column on the far right if we have permeability data. And the perm is just highlighted over an arbitrary 2 millidarcies point to just highlight higher quality versus lower quality.

The middle of these three wells, Bravo Dome 2030, Number 181, formerly the State FC Number 1, is one of the three that has only a small portion of data available in the public data that we had access to. And that's the reason why this one was not included in the horizontal perm averages as a good point.

The numbers again at the top, underneath the well symbols, are averages for the pay quality rock inside each of those wells. The number at the bottom, in a box, is the average -- what I believe is the

average for the entire well core data that we had from the Oxy exhibits for the western core area.

So you can see, if you look at the whole core interval versus the pay quality intervals only, that there is a significant difference.

Q. And what conclusions can be drawn from those differences?

A. If you were to base an analysis on just the whole core numbers, you might be underestimating what your effective perm would be in the pay intervals only, is the conclusion I would draw from that.

EXAMINER EZEANYIM: You did the averages, right?

THE WITNESS: Yes.

EXAMINER EZEANYIM: In millidarcies?

THE WITNESS: In millidarcies, yes.

EXAMINER EZEANYIM: How did you come up with the averages?

THE WITNESS: We took the core data, digitized it from the Oklahoma Geological Survey dataset. We digitized those, and then we looked at the Porosity column. If it exceeded 12 percent, we counted that perm number that went with that porosity in our average. And if it was less than 12 percent, we ignored that number in our perm average.

Q. (By Mr. DeBrine) And the 12 percent cutoff again was used why?

A. Because that's the historical value that we found in the Oxy exhibits and Amoco exhibits. Not just the 2010 exhibits, but also in other case files. And it seems to be a very reasonable number.

Q. Is there anything else on Exhibit 9 that you want to point out to the Examiner pertinent to your study or conclusions?

A. I guess the only other thing that I didn't mention is that the boxes on the right side of the depth tract are where the completion intervals are. So that's what we based all of our geological parameters on that will be going into the engineering studies.

MR. DEBRINE: We move for admission of Reliant Exhibit 9.

EXAMINER EZEANYIM: Objection?

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: Exhibit 9 will be admitted.

[Exhibit 9 admitted.]

Q. (By Mr. DeBrine) So Mr. Raines, if you could just summarize for the Examiner what your conclusions were with respect to permeability in the area of study and how it relates to the permeability of the other

areas that were the focus of your inquiry.

A. The summary takeaway is that the areas inside the subject area and immediately adjacent to it on the east side and on the west side of the West Bravo Dome are not dissimilar to each other and seem to be in the same ballpark, or of similar quality.

There are some areas on the north end, especially in the northwest corner, that are lower quality. But we didn't see any direct evidence that this area in the subject area are -- that the lands in the subject area were significantly poorer, less high quality than the areas immediately adjacent to them on both sides.

Q. And with respect to your conclusions, how do they inform the Examiner's inquiry as to whether wells should be drilled on a 640- versus a 160-acre spacing?

A. My key expectation was that if 640 is adequate and appropriate to the east or west of this area, that it should also be adequate in this area, based just solely on us not having gotten to the engineering portion yet.

MR. DEBRINE: Pass the witness.

EXAMINER EZEANYIM: Mr. Feldewert?

MR. FELDEWERT: Sure.

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FURTHER CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Raines, if I look at your Slide Number 5, this was what you called your key dataset; is that correct?

A. Our key log data set, yes.

Q. Based on what you identified as your search criteria?

A. Correct.

Q. And what was your search criteria again?

A. It had to have a density/porosity log, and it had to have resistivity logs. So even it's a new well with modern data but had, for example, only a compensated neutron log with a gamma ray compensated neutron, that would not qualify it to be considered for digitizing.

Q. Did you utilize any data from your recently drilled well in the subject area, or in the northern part of the subject area?

A. I do not recall using any of that data, but let me review some of these well numbers.

Q. I didn't see it as one of your datapoints or in your maps.

A. Actually, there are a couple of those wells included in this.

Q. Let me step back. Maybe I wasn't clear. They

indicated that there was just a well that was recently drilled and completed in the subject area?

A. Right.

Q. Which is in yellow?

A. Okay. I see what you mean now.

Q. And I didn't see that as part of any of your datapoints.

A. I believe that it was included. I can't read that number on my screen, so let me look at. I don't see it on there, so I don't think that one was used in this particular setting.

Q. Is there a study in which that well was utilized?

A. It would be a study that's still ongoing. After getting wells drilled and completed, we add to the study.

Q. So you have the data?

A. We have the data in house.

Q. You just didn't include it in your study here today?

A. Right. This was done prior to getting that data.

Q. Okay. Can you identify for me how many datapoints that you actually utilized from the subject area?

A. 166.

Q. Let me back up. When I say, "subject area" --

A. Oh, subject area? I'm sorry.

Q. I'm sorry. I'm talking about the area in yellow in Oxy Exhibit Number 2.

A. Yes. We can count them up there. They are the wells shown with the well symbols in between this section right here.

Q. But you didn't do a study specifically of that area. You did a study of the entire area that is shown here on Oxy Exhibit Number 5, correct?

A. Correct.

Q. So you don't have any specific --

A. Including, but not limited to, that area.

Q. Okay. But you don't have any specific study to present on the subject area itself?

A. Not separate from the bigger study.

Q. Okay. And as I understand it, you didn't utilize -- you did not even utilize all the wells in your study that are in the subject area?

A. Yes. If they didn't meet our criteria, they would not be used in the generation of the porosity feet that goes into the reservoir engineering study.

Q. I think you mentioned in your study that it's not as fine-grained as the Oxy data. Is that what you testified to?

A. Yes, that's correct.

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Q. Okay. If you then go to Oxy Exhibit Number 6 -- I'm sorry, Reliant Exhibit Number 6.

A. (Witness complies.)

Q. Now, I'm not going to pretend I understand everything about this map. But as I understood it, this is a porosity times height map, phi-h?

A. Yes, that's correct.

Q. Is that what "Ph" stands for?

A. Yes, meeting certain criteria. Not just any porosity times any foot, but meeting certain cutoff criteria.

Q. Where was your cutoff criteria?

A. Our cutoff criteria are shown on the previous pages. It's 30 percent water saturation or less, and 12 percent porosity or higher.

Q. And where did you get those cutoffs?

A. The basic cutoffs that go into the density/porosity calculation and the saturation calculation are from the Oxy exhibit of 2010, except that we used our own estimate of what water saturation cutoff to use. That was not specified.

Q. So where did that one come from?

A. Empirical evidence. Looking at the gas pay flag crossovers and other information, such as: Where did Oxy complete wells?

That seemed to be a reasonable cutoff, based on a water resistivity of .08, which is again an assumption that we made that did not come from the OXY-Amoco information.

Q. And what was the data source for your assumption? Did you do it?

A. For which assumption?

Q. The assumption you just discussed.

A. The 30 percent water saturation?

Q. Yes.

A. That was done in this group. But not by me, personally, but by my manager.

Q. And what was the data source?

A. The data source was these 166 wells in the previous exhibit that have high-quality log data that we had digitized.

Q. And the 12 percent porosity cutoff you used, you said, was based on some Oxy documents from 2010?

A. Correct.

Q. So three years ago?

A. Yes.

Q. And they were produced pursuant to a subpoena?

A. Correct.

Q. You didn't try to update that at all?

A. No. That seemed to be a very reasonable number,

when we looked at the evidence presented.

Q. If I looked at this particular Exhibit Number 6, at least from a porosity or phi-h standpoint, I would see a distinction between the eastern area of the Bravo Dome and the area that is currently the subject area, plus the acreage that's identified or permanently spaced on 160-acre spacing, correct?

A. If I understand your question, yes. You could divide this map into two or more areas, yes.

Q. So the two areas would be, number one, you've got the eastern area, right?

A. Correct. Which would go probably all the way to the yellowish-green boundary, if you want to lump it into two categories.

Q. And at one time, this entire area was the Bravo Dome 160-area, correct?

A. I assume that based on things I've heard today, but I did not know that it --

Q. I'll represent to you that it was. Okay?

A. Okay.

Q. And the subject area then that we're dealing with today used to be in a 160-area, but is now temporarily spaced on 640?

A. That's my understanding.

Q. Would you agree with me that from that, at least

from a porosity feet standpoint, that this would appear to have similar -- this 160-acre area plus the subject area would appear to have similar reservoir characteristics?

A. It would have similar characteristics to the 160-area and to all this area to the east of it and to the north of it. Of course --

Q. Including the subject area?

A. Including the subject area, yes, and a significant portion of the rest of Bravo Dome.

Q. So I guess my question is: If I'm focussed just on our subject area and the two areas that are currently spaced on 160-acre spacing, you would see a similarity in the water reservoirs there, correct?

A. Would you say that one more time? The subject area and what other area?

Q. The areas you have highlighted in green on here.

A. Yes.

Q. Okay. Now, you then did some analysis of core data?

A. Correct.

Q. And as I understand your analysis, your core data that you felt sufficient, if the core data was analyzed, I think you said a third of the Tubb?

A. At least a third of a Tubb or more.

Q. Now, would you agree with me that if you had core data that represented, let's say, over 85 percent of the Tubb, that that would be the most pertinent core data to analyze?

A. That would, yes, be a larger area, which should be more representative, in general.

Q. Okay. So if you have core samples that show 85 percent or greater of the Tubb, those core samples would be more representative of the Tubb formation than, for example, the core sample you have that show less than 85 percent of the Tubb?

A. Yes, assuming that they were equally spaced and didn't miss some key zone or some other thing. But 85 percent is a large number.

Q. That's pretty good?

A. Yes.

Q. Can you identify how many of your -- I guess we ought to go to Exhibit Number 7.

Can you identify how many of your datapoints shown on Exhibit Number 7 analyze more than 85 percent of the Tubb?

A. I cannot.

Q. You cannot?

A. No.

Q. Do any of them analyze more than 85 percent of

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the Tubb?

A. Yes.

Q. But you don't know which ones?

A. I do not know which -- I did not do that evaluation myself. We do know from the 2010 subpoenaed work that there is a list of those wells available, but I didn't cross-reference those. I don't know which wells those are, and neither do I know how many there were.

And out of the exhibit area, I also don't know how many of those there are. Although, I do know that one of the wells that's listed in that 85 percent or more of the Tubb group didn't have data at the Oklahoma Geological Survey for 85 percent of the interval.

Q. Now, you said your data source came from -- your core data samples came from a donation from Amoco?

A. Correct.

Q. You don't have any core data yourself?

A. We have the -- not in the subject area. We do have one well with preliminary data, but it's to the north of the area, the subject area.

Q. Who did the interpretation of this core data that you utilized in your study?

A. I did.

Q. If I go to Oxy Exhibit Number 8 -- I'm sorry,

Reliant Exhibit Number 8, in this particular dataset, you only have two core samples shown for the subject area?

A. Correct, one of which is in the Oxy 85 percent or more group.

Q. Okay. So of the core data samples here, which one is in the 85 percent or more group?

A. The one with the red circle in 19 North, 30 East, in the southeast corner.

Q. And that had similar porosity to the area in blue that you circled to the north, correct?

A. The area in -- oh, yes. The well in blue, yes.

Q. If I look, for example, just at your sampling of the core data here, if I even go to the eastern area over there, we see some dramatic examples, for example, up in the 19 North, 33 East area, correct?

A. Correct.

Q. Now, we have one up there where your core analysis shows -- has a number of 229.4. Now, what is that number?

A. That's horizontal permeability averaged over only the reservoir quality rock, based on that 12 percent cutoff definition.

Q. And how do you define what the reservoir quality rock is?

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A. Just by the core porosity exceeding 12 percent or not. If it does exceed 12 percent, it's included in the averaging; if it's less, it's kicked out as nonpay.

Q. And even under your cutoffs, you show a dramatic difference between two wells that are shown almost side-by-side?

A. Yes, although this one is a short core that is not necessarily representative, if this is the well that you're talking about. The 42.3, is that the well you mean, 42.3 millidarcies?

Q. Well, when you look at the map, was it adequately representative or not?

A. It was not.

Q. It was not? So why is it on your map?

A. To show that we're not intentionally biasing the data; that we're including everything, and what those values are as a preliminary estimation of what could it be, not that it's a high quality --

Q. Let me ask you something. Did you include all the core data on your map?

A. Yes.

Q. You did?

A. Yes.

Q. Okay.

A. So back to your point, though, that there is a

significant increase in quality in 19/33, 19 North, 33 East.

Q. There's a variation in that area, based on the core data that you had available?

A. Yes.

Q. Okay. Now, if I go to your Reliant Exhibit Number 9, the blue lines -- or the area covered in blue, that reflects the core interval?

A. Correct.

Q. Okay. What is the dark box on the right, well to the right?

A. This box?

Q. The box to the right of your Exhibit Number 9. There's a dark box about halfway down.

A. Oh, right here?

Q. Down to the right.

A. Oh, right here?

Q. Yes. What's that?

A. That is a perf interval that's been squeezed, as opposed to these green boxes, which are perf intervals which are active.

Q. And apparently on the bottom, you're showing the average core permeability, correct?

A. As reported in the 2010 Oxy exhibit, yes. I don't know how that was calculated.

Q. Did you examine that?
A. It was not included in the data -- in the material that we had, just the --
Q. Do you have any reason to disagree with that data?
A. I don't know where that data came from, so I'm not qualified to comment.
Q. Okay. And then the core permeability that you put together is based on what you call your net pay cutoff?
A. Yes.
Q. And how did you define your net pay cutoff?
A. It just exceeds 12 percent core or it does not.
Q. And where did you come up with that?
A. That was from the OXY-Amoco exhibits from 2010.
Q. I'm not aware of any Amoco exhibits from 2010.
A. Well, they took some of the Amoco data as the basis for the Oxy thing, and it matches what the old information was.
Q. So you took old information and 12 percent core porosity and used that in your analysis?
A. Yes, based on Oxy's qualification that that was still valid in 2010.
Q. That's your interpretation of the exhibits that were -- or documents that were produced under a

subpoena?

A. Yes.

Q. There was no testimony, correct?

A. Correct. So for example, how those were calculated, I couldn't say.

Q. You just think you understand what they represented?

A. Correct, based on --

Q. You didn't confirm that with anybody?

A. I did not have anybody to confirm that with, so no, I did not. Just what the slide said is what I used for posting purposes and references.

Q. And you don't have any of those slides with you today?

THE WITNESS: Do we have some of those slides with us today?

MR. DEBRINE: We might have them somewhere.

Q. (By Mr. Feldewert) But you're not introducing any of the backup data today?

THE WITNESS: I'll defer to Mr. DeBrine.

MR. DEBRINE: We've got backup data for the analysis that was performed, and we can submit that if the Examiner wants to look at it.

MR. FELDEWERT: I'm just curious. What was the backup data for his decision to use a 12 percent

cutoff?

MR. DEBRINE: I think he's described what it was.

THE WITNESS: The 2010 Amoco exhibits, which also matched some previous cases that are on record.

Q. (By Mr. Feldewert) Okay. But you cannot tell me what those are?

A. What do you mean?

Q. How many pages -- of the documents you're referencing, how many pages does it comprise?

A. I don't recall exactly, but more than 20.

Q. And you don't have available here today or intend to introduce any of those pages that you utilized to come to the conclusion that a 12-percent cutoff was appropriate?

A. I do not have it. Again, I'll defer to Mr. DeBrine for that.

MR. FELDEWERT: That's all I have.

EXAMINER EZEANYIM: Thank you.

Mr. DeBrine?

MR. DEBRINE: No questions, Mr. Examiner.

EXAMINER BROOKS: I have no questions.

EXAMINER EZEANYIM: Okay.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. Now, most of my questions have been answered by the -- let's examine your Exhibit Number 5. We have 166 wells, right? And all those met your criteria --

A. Correct.

Q. -- before you could use it?

And now your cutoff was greater than 12 percent, and that was calculated for your sandstone matrix?

A. Yes.

Q. Okay. And now, those were taken from Case Number 1112?

A. Correct.

Q. Order Number 10253?

A. Or the values with the star?

Q. Yeah, yeah. The values that show your sandstone matrix was 2.688?

A. Correct.

Q. And then that your fluid density was 1.04?

A. Correct.

Q. And even your m is 1.776, and then the n is 1.28. Because I added these -- it's very important. That's how you calculated your other leads, you were using the IT equation?

A. Yes.
Q. That's how you calculated it?
A. Yes.
Q. Based on those parameters in this order that is -- so if I go to the order, I will see those parameters?
A. Correct. And you'll see the backup data in that order, also.
Q. And then based on that value, you decided to use 12 percent as your cutoff?
A. Yes.
Q. I think the question was asked, why did you use 12 percent? Is that the --
A. That's the historical information that I was referring to.
Q. Okay. We are going to examine it together to see what is going on here on this.
A. And to not make our analysis significantly different from some other analyses.
Q. Okay. Go to Exhibit 6.
A. (Witness complies.)
Q. What we have here -- that issue is very important, you know?
A. Yes. So this phi-h grid is based on 166 wells. Then we resampled all wells to a 5,000-foot radius and

got a value, a phi-h value, for each well. That would then be transferred to the engineering group to run their analysis with.

Q. If you look at phi-h that you demonstrated there, I asked the question before, when you were attempting to find that the green outline is in the north, right?

A. Correct, the north.

Q. And inside of it is the subject area?

A. Yes.

Q. If you look at them, do you distinguish any difference between phi-h from the north and that area?

A. There are variations from north to south. But the range is similar, except for this far northeast corner, which is a higher-quality area here. But in general, ignoring that part, they are pretty similar.

Q. Yeah, that's what I'm looking at.

If you look at that green outline, and then below it is the subject area, they are similar, right?

A. Correct.

Q. The phi-h is similar?

A. Yes.

Q. There is no question about that?

A. Correct.

Q. Okay. Go to Exhibit Number 8.

A. (Witness complies.)

Q. We come back to the same question about the well -- I mean the acreage being operated by Reliant. I thought those in red -- if you look at those in red, it's operated by Reliant, right?

A. The red circles?

Q. No, no. No red circles.

A. The red --

Q. The red -- I don't know how -- you know, those red things there.

A. Oh, the lease outlines?

Q. Those things are in red, right?

A. Correct.

Q. Those are acreages operated by Reliant?

A. Correct.

Q. Okay, so you see those acreages in the north. And the acreage in the south that is the subject area, what is the difference between those two, in terms of permeability?

It appears to me they have identical --

A. I would say they're similar.

Q. That's what I thought. So they are similar, right?

A. Yes.

Q. And the north, as you look on 160, the subject area is currently on 640?

A. Correct.

Q. So from your geological opinion and experience, there's not really any difference between that north and the subject area?

A. Right.

Q. In terms of horizontal permeability, you know, that's one parameter?

A. Yes.

Q. And in terms of phi-h, there is no difference?

A. Right. And also, I'd like to point out it's similar to the areas immediately adjacent on both sides.

Q. Oh, they are similar, too?

A. Yes.

Q. Very interesting.

EXAMINER EZEANYIM: I don't have anything further for this witness. Does anybody else have anything for this witness?

MR. FELDEWERT: I have no further questions.

MR. DEBRINE: No questions.

EXAMINER BROOKS: No questions.

EXAMINER EZEANYIM: That's a good point to start for lunch.

[Recess was taken from 12:11 to 1:14 p.m.]

EXAMINER EZEANYIM: Let's go back on the record and continue the testimony of Reliant

Exploration.

Call your next witness.

MR. DEBRINE: Mr. Examiner, we call Tom Beebe.

EXAMINER EZEANYIM: You have been already sworn. So you are under oath.

THE WITNESS: Yes.

THOMAS BEEBE

having been first duly sworn under oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Please introduce yourself.

A. I'm Tom Beebe. I'm a reservoir engineer at Whiting Oil and Gas.

Q. How long have you worked for Whiting, Mr. Beebe?

A. A little over five years.

Q. What are your responsibilities and duties for Whiting?

A. My primary job is as a reservoir engineer for the North Ward Estes CO2 Flood. It's in Ward and Winkler Counties. But some of my responsibilities are primarily around the budget, reserve forecasting, project development, AFE writing. I also do some acquisition work, as well as some special projects. For example,

working on the Bravo Dome.

Q. Prior to working for Whiting, if you could just take the Examiner through your educational and employment background?

A. Okay. I graduated from the University of Missouri at Rolla. I have a Petroleum Engineering Degree, a Bachelor's. I've got 25 years' experience in the industry, all in the Permian Basin.

My employers over that time, I started out from college with Amoco Production Company and worked there for 10 years. Then we became Altura Energy, a joint venture between Amoco and Shell. Then Oxy purchased Altura, so I worked for Oxy for eight years. So that was in 2008. Then I moved over to Whiting for the last five years.

Q. The properties that you oversaw for Amoco-Altura, did any of those properties involve CO2 flooding of oil and gas properties?

A. Yes, they did.

Q. Where did they get their CO2 for those floods from?

A. Primarily it was from Bravo Dome. There was gas that came from McElmo Dome, but it was primary from Bravo.

MR. DEBRINE: We tender Mr. Beebe as an

expert in petroleum engineering.

EXAMINER EZEANYIM: Mr. Beebe, have you ever testified before this Division?

THE WITNESS: What?

EXAMINER EZEANYIM: Have you ever testified here before?

THE WITNESS: I have not.

EXAMINER EZEANYIM: You have not? Okay. Any objection?

MR. FELDEWERT: Can I ask a couple of questions?

EXAMINER EZEANYIM: Yes.

VOIR DIRE EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Beebe, when you were working with Amoco, then Altura, and then with Oxy, did you have any responsibility for the Bravo Dome unit?

A. I did not.

Q. The CO2 projects that you have been involved with, those have been limited to enhanced oil recovery projects, and CO2 floods?

A. Water floods, as well.

Q. When did you first conduct any kind of an examination on the Bravo Dome unit?

A. I'm a little sketchy on the date. But it's been

over a year that I started doing some work on the Bravo Dome, looking at performance.

Q. So about a year ago --

A. Yes.

Q. -- you did some performance analysis?

But nothing prior to that time?

A. Correct.

Q. So you haven't been involved with any of the drilling of the wells in the Bravo Dome unit?

A. No.

Q. Did you do any performance analysis of the well that Reliant recently drilled in the subject area?

A. No, I haven't.

MR. FELDEWERT: I have no objection to his being tendered as an expert witness in petroleum engineering.

EXAMINER EZEANYIM: Mr. Beebe is so qualified.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Mr. Beebe, did you undertake a study for purposes of analyzing whether the Division should change the spacing for the subject area from 640-acre spacing to 160-acre spacing?

A. I did.

Q. Could you describe for the Examiner the study or the work that you did?

A. My area of emphasis was looking at a drainage radius calculation and how that is -- what that drainage radius would look like throughout the whole field, as well as the subject area and the adjacent areas to the subject area. That was a big part of the outcome that I am going to show you here in a few minutes.

Also, I looked at some interference effects. When new wells were drilled, what effect did they have on the existing wells? And these were wells that were drilled, it appeared to be, on 320 acres of spacing, and the existing well that was impacted was on 640-acre spacing. So those were the two different areas that I really honed in on.

Q. Did you prepare some exhibits as part of your study?

A. I did.

Q. If we could just turn to those.

A. (Witness complies.)

Q. Exhibit Number 11, could you identify that?

A. Yes. Okay. This is a performance plot for the entire Bravo Dome producing area, which includes the West Bravo Dome and the east in the Bravo Dome unit.

The reason I put this in here is it includes --

it shows my dataset that was included in my evaluation work, the data that I acquired was from IHS. That's Information Handling Services. And from that information, we built an OFM database, which is a Schlumberges software, to look at every individual well and look at performance in groups across the field.

The plot here shown is a performance perf for the entire area. The top red curve is the total produced gas rate for the Bravo Dome area. It's producing 350 million cubic feet a day of gas. That's CO2 gas.

The water production shown in the blue curve, it's producing 300 barrels of water total for the entire area. Active well count for the area is 636 producers, giving an average, a gas rate per well, of 549 Mcf per well. And that's as of February this year.

EXAMINER EZEANYIM: Average gas well?

THE WITNESS: I'm sorry?

EXAMINER EZEANYIM: Average gas well, the well is how much?

THE WITNESS: 549 Mcf per day per well.

EXAMINER EZEANYIM: Is that here on this red --

THE WITNESS: Yes, sir. It's the magenta-colored curve.

EXAMINER EZEANYIM: Good luck with magenta.

THE WITNESS: I would call it pink. It's the curve from the top.

EXAMINER EZEANYIM: It's the average gas of the well, right?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: And you said the average is how much?

THE WITNESS: 549.

MR. DEBRINE: Mr. Beebe, it might help the Examiner if you could point on the overhead when you're describing it, so that we can orient ourselves.

MR. BEEBE: With the mouse here, this is the average gas rate per well shown here. And I also included the rate in a text box, showing 549 Mcf per day.

MR. DEBRINE: I move the admission of Exhibit 11.

EXAMINER EZEANYIM: Before we move it, let me ask a question of this -- do you have any objection?

MR. FELDEWERT: Well, I guess I'm wondering -- I have a question of Mr. Beebe.

Your gas rate per well is for the entire Bravo Dome CO2 producing area?

THE WITNESS: Correct.

MR. FELDEWERT: That's the area to the east, on our Oxy Exhibit 2?

THE WITNESS: Yes.

MR. FELDEWERT: Including the West Bravo Dome?

THE WITNESS: Yes.

EXAMINER EZEANYIM: Regardless of where they were spaced, they are all included?

THE WITNESS: The total area.

EXAMINER EZEANYIM: It's the total area. Okay. It's 336, right, 336 wells?

THE WITNESS: Actually, there were 799 wells in my database. Not all of them were active, but I'm showing an active well count of 636 wells.

EXAMINER EZEANYIM: Maybe those were perhaps your criteria, maybe?

THE WITNESS: They were just wells that were either plugged or inactive for reasons unknown.

MR. FELDEWERT: I guess I'm curious as to the relevance of the exhibit, because it has nothing to do with the subject area.

EXAMINER EZEANYIM: Well, anybody can present evidence, but then we will ask questions.

So that we understand, on that page, the east, which is 160, and then the west, every area is included

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in this graph, right?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: Okay. Maybe we are going to see it on that graph that shows the subject area.

THE WITNESS: Well, I don't have a graph for the subject area. I didn't pull that. What I'm trying to show is that, you know, I looked at the entire Bravo Dome area.

I didn't just look at the narrow area that the subject area is. For drainage calculations, I looked outside, beyond the area, to make it analogous information to this area.

EXAMINER EZEANYIM: Let's not get into what you are going to -- because I don't know what your testimony is going to be.

Let's go back to the admission of Exhibit Number what?

MR. DEBRINE: 11.

EXAMINER EZEANYIM: 11. Any objections?

MR. FELDEWERT: Subject to those qualifications, I have no objection.

EXAMINER EZEANYIM: Without objection, Number 11 will be admitted. Is that okay?

EXAMINER BROOKS: Yes.

1d854e3d-2870-4f8b-bd5c-659bcc5b18fb

[Exhibit 11 admitted.]

MR. DEBRINE: And Mr. Examiner, with regard to the relevance of it, we've got 640-acre spacing on the east and 640-acre spacing on the west.

So what Reliant has done in this case is looked at all of the producing area to compare what we're calling the subject area to determine if it bears characteristics closer to the east and west or north and south, where you've got the 160.

EXAMINER EZEANYIM: Okay.

Is that okay with you?

MR. FELDEWERT: Well, I understand what they're trying to do, yes.

EXAMINER EZEANYIM: Okay. Go ahead.

Q. (By Mr. DeBrine) Could you turn to Exhibit 12?

A. (Witness complies.)

Q. What does that represent, Mr. Beebe?

A. This is the cumulative gas production per well. It's a bubble map, and it represents the well production, the actual production that's produced.

The point that I want to bring out is the bigger bubbles represent the larger-volume wells. The yellow circles, which, if you look on the east side of the property, in the area, you have more yellow bubbles, between 15 and 30 Bcf. So those are the

better-producing wells.

The blue is also large-volume wells. They produce between 5 and 15 Bcf. This coincides with the production that Mike showed -- Mike Raines showed with the net pay map. The east side is obviously the better-producing area. It's reflected here on the production.

If you'll notice in the 160-acre blocks, there are very few wells that we have production on. They're just scattered throughout those townships and ranges.

Q. If you could just point those out on the map, where we are?

A. This is the 160 area to the north. Right south of it is the subject area that we're talking about today. And then to the south, there are no wells in my dataset in the southern 160-acre space area.

So you can tell the well count, with development, has primarily been on the east side of the unit.

EXAMINATION

BY EXAMINER EZEANYIM:

Q. And that's on 160?

A. Actually, the east side is 640-acre spacing, but there are wells on 320s.

Q. But if I understand, then on the east they're on

160, right?

MR. FELDEWERT: The area to the eastern part of Bravo Dome is permanently spaced on 640. But as he indicated, there are a number of wells that are actually drilled on 320.

EXAMINER EZEANYIM: The east is on 640?

MR. FELDEWERT: The east is on permanent 640, the areas in green are on permanent 160, and the area in yellow is on temporary 640. And then the West Bravo Dome is also on temporary 640.

Q. (By Examiner Ezeanyim) Okay. So on that map, we have a lot of that -- on the east side, you included that to demonstrate what?

A. What I'll show is that the drainage area is overlapped on this area. I'll also show, from the development map, that there are wells drilled down on 320, but very few -- well, I didn't really come across wells on smaller spacing than 320.

When you take that drainage radius that you see on the east side and move towards the west, you'll see similar or large drainage areas adjacent to our subject lease, or subject area.

And we -- Mike Raines showed that the permeability was comparable to the east, adjacent to the subject area, as well as to the west. And we have

drainage areas in the 640-acre range that are showing adequate drainage.

So it's part of the whole picture of what the drainage looks like in our subject area when you look at the east, as well.

Q. Okay. Let's go back to that map, because I need to understand. This is important.

If you look at 19 North, 20 East, is that part of the subject area? In this map, it looks like 19 North, 31 East?

A. Look on 30 East?

Q. 19 North, 31 East, is that part of the subject area?

A. Yes, it is.

Q. It's part of the subject area? Okay.

And then it looks like there are no words there that give you any information, right?

A. Correct.

Q. Okay. Now, you move back to the east side, and we are looking at 640, right?

A. Yes.

Q. The blue -- okay. The yellow is 15 to 30, right?

A. Yes.

Q. Those words on yellow, do you know whether -- how was it?

Because the way that is developed in the east, one was the 640, plus an additional three infills, right?

A. Yes.

Q. You are aware of that?

A. They did go down to 320s in that section.

Q. Okay. So one infill?

A. Yes.

Q. When you say, "320," are you talking about on infill?

A. Yes.

Q. And based on the one infill, we are getting either the yellow or the blue?

A. We'll have to look on the -- you can kind of tell. Like in an area right in here, the green dots, this is in 20 North, 30 -- I guess it's 34 East. The little green dots would be infill wells in between with the blue dots.

So those wells hadn't cumed as much as the existing wells prior to the second well being drilled, so I don't have the specific volumes for those infills. But you can tell they cumed a significant volume as well.

Q. If I look at this exhibit here, I can't rule out any conclusion for what you have here on the subject

area, because there is no difference on the subject area that I can cross-check. Because right now, I don't know whether it's 160 or 640. It depends on this. I don't know which one it is. We still have to find out.

If you look at the area I pointed out that's in yellow in the subject area, I don't see anything there that corresponds with the one on 640 here to tell me, oh, yeah, we have to have it on 640. There is no evidence here, so I don't know whether this acreage is going to be developed on 640 or 160.

I guess that's why we are here. But that's what I'm looking at to see which one is best to develop this acreage.

A. I hope that the rest of the remaining exhibits that I have to show will put the whole picture together, so it will give understanding of -- a lot of this initial slide here is more background to understand where production has come from in the field.

What the well density looks like in some of these areas, that's what I'm trying to convey.

Q. So when you developed this as feet, you were trying to give us the background. I want to know why you put it in there.

A. Yes, sir, to give them background for my case.

MR. DEBRINE: And Mr. Examiner, you'll see

the first three or four or five exhibits are just background information. And then we're going to get into the core information that you want to see.

EXAMINER EZEANYIM: If I know the background. I thought you were trying to make a point on this. Okay. If it's background, then I can accept it as background.

But if you are making a point, I wanted to see what point it is. Thank you for making that point.

THE WITNESS: That's all I concluded on Exhibit 12.

MR. DEBRINE: We move the admission of Exhibit 12.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No objection on the ground it's just a background exhibit.

EXAMINER EZEANYIM: Exhibit Number 12 will be admitted.

[Exhibit 12 admitted.]

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Could you turn to Exhibit 13, Mr. Beebe?

A. Okay. Similar to the prior exhibit, this is a bubble map that shows current performance for the Bravo Dome area. This is the gas rate on a per-day basis.

The yellow dots are in the largest circles, and they show up over here, primarily in the West Bravo Dome. So the best producing wells today are in the West Bravo Dome area, and that's in the yellow.

The next best group of wells are the blue dots, which is between --

EXAMINER EZEANYIM: Where are you pointing? Are you pointing at it? Okay. That light is fading. I can't see it.

THE WITNESS: I'll use my mouse. Okay?

EXAMINER EZEANYIM: Okay.

THE WITNESS: If you'll notice, there are no yellow wells in the East Bravo Dome -- or on the eastern side of the Bravo Dome area.

If you look at the blue wells, where the concentration of blue wells are, between 1 million and 2 million a day, a lot are in the West Bravo Dome unit.

We have some good wells -- good rate wells, that is adjacent to our subject area, in Township Range 19 North, 32 East, as well as in 18 North, 32 East. So we have some good producing wells today adjacent to our subject area. And --

EXAMINER EZEANYIM: Are those on 640?

THE WITNESS: Yes, sir, on 640.

But anyway, this is -- like I said, it's

background. And they kind of give you a flavor of where the wells are being produced and what kind of rates we're looking at.

MR. DEBRINE: We move the admission of Exhibit 13.

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: Exhibit 13 will be admitted.

[Exhibit 13 admitted.]

Q. (By Mr. DeBrine) If you'll turn to Exhibit 14, Mr. Beebe?

A. (Witness complies.)

Q. What are you trying to represent on Exhibit 14?

A. This is similar to background, but I think we're getting -- this is the date of first production for the wells. And what's implied from the date of first production bubble map are when wells were drilled and put on production.

Now, if you look at the bubble map on the far right, on the bottom -- or the legend, excuse me -- these are in five-year increments. 1980-1985 are the black dots, and those are the group of wells that came on line, on production, beginning in 1980 to 1985.

Obviously, there were wells drilled and in place prior to 1980. You know, the field was discovered

in 1916. In 1931, many of the ice plants were in place and producing wells -- or producing gas from wells to supply it for the ice plants.

But it wasn't till 1982, when Amoco put in their pipeline, that the development really started. So the black dots -- notice they're all in a concentrated area on the east side of the unit. That's when the first development, big development, really started.

The next phase of development are the red dots, from 1985 to 1990. And that's the southern part of this eastern side.

Just jumping down to where we are today, if you go look at the light blue, the cyan color, that shows the current kind of development.

And if you'll notice, most of the development is occurring on the fringes of the unit. You know, the reservoir limits are being pushed out beyond the core area of the reservoir, the thick reservoir area, which is on the east. You know, that's been developed. So they're being pushed out to extend the reservoir limits.

You also start to see infill wells in between the black dots, and those are representative of wells that were infill drilled. And if you look at the zoomed-in portion of this map -- this is one Township

Range -- the black dots represent wells drilled on 640-acre spacing.

The little squares within that Township Range are the section lines, and you can see the timing of when the second well in that section was drilled. So this pink or magenta colored well in this example was drilled between 2005 and 2010. And that would be the 320-acre-spaced well drilled in that section.

So once again, it's more background. But it shows, you know, when production first came on, the units being expanded out to the limits, away from the reservoir thick. And really, the densification done out here is only down to 320-acre spacing.

If you look at our area of interest, there are very few wells also that are on production, that are producing. You don't see the density of wells in the subject area that you see in the east. So we're not as densified or developed on the subject area like we are in the east. I think that concludes that part.

MR. DEBRINE: We'll move the admission of Exhibit 14.

EXAMINER EZEANYIM: Before I do admit it, Counsel, could you finish with the others --

MR. DEBRINE: We can do that.

EXAMINER EZEANYIM: So right now we will

admit Exhibit Number 14?

MR. DEBRINE: Fourteen.

EXAMINER EZEANYIM: No objection?

MR. FELDEWERT: Nope.

[Exhibit Number 14 admitted.]

Q. (By Mr. DeBrine) I'd like to turn now to your calculation concerning the drainage area, Mr. Beebe.

If you could turn to Exhibit 16?

A. (Witness complies.)

Q. What does that represent?

A. The drainage radius calculation. I'm trying to determine how much acreage an individual well is draining. The formula in the upper right is the gas-in-place formula. That's a standard industry formula for gas-in-place. Listed in that box are all the inputs that go into the formula.

So algebraically, I manipulated the formula to be able to solve for area or acres. And I need to then provide all the other inputs to be able to solve for acres.

Now, my gas-in-place -- obviously, I don't know the gas-in-place. But it's inferred, when I know the ultimate gas produced, which is current production plus remaining reserves. And then I divide that sum by the recovery factor. And I'll explain all my inputs as I go

through here.

But that's the standard formula, is gas-in-place. The inputs into it, this was all done on every well that I had performed its data on that I could calculate it. So it was done on an individual basis.

I calculated the ultimate recovery per well, and that was done using my OFM software application. So I forecasted the individual well remaining reserves using an exponential decline method. And from that method, I came up with volume lump remaining.

Once again, the ultimate gas produced is calculated from the current gas produced plus that forecasted remaining reserves from my exponential declining method.

The porosity height, the phi-h map, that came from Mike Raines, from his work that he showed earlier. So we had Whiting's net pay map.

The recovery factor, the initial water saturation and temperature, came from the Oxy previously provided data that we had gotten from our counsel.

The initial reservoir pressure came from Broadhead, Ron Broadhead's publication for pressure regions for the Bravo Dome area. I'll show a plot on that as well.

And then the z-factor for the gas was from the

SPE Monograph, "Practical Aspects of CO2 Flooding."

And like I said, the whole objective of doing this calculation in this output was to calculate the area.

So I calculate that area in acres, and then convert the acres into feet, assuming a circular drainage radius. That's the process for the procedure to determine this radius.

Q. And did you prepare any exhibits to depict the drainage radius of the individual losses?

A. I have three examples coming up here, as well as the whole field example.

Q. Could we turn to Exhibit 17?

EXAMINER EZEANYIM: Before you go to Exhibit 17, I want him to explain what -- because it's going to be interesting.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. What is your OFM model? You have a model to predict the forecast something. What is that OFM model?

A. OFM is -- Oil Field Manager is the name of it. It's abbreviation for that software program. And it's really just a surveillance program. It's a Schlumberges program. You load the XY location of the well into the

program so you have a map, you can build a map.

You load the production history for that well as well, and then you can -- it's a visual-type program. You can -- with your mouse, you can click on the map and you can draw a well-performance curve.

Also in the program, you can do a decline curve analysis, whether it's exponential, hyperbolic or harmonic, whatever you want. You can do just some basic mapping.

The bubble maps that I showed in my background work were all from OFM, where I generated those maps with the bubbles from that application.

So it's just an industry standard. It's actually an application I used when I was at Oxy as well.

Q. Well, anyway, in any case, you have to make certain assumptions, you know?

A. Uh-huh.

Q. Like z, you talked about z. Is z -- is this an idea you have or an impression? You know, that's why I wanted to understand what your OFM is in relation to your assumptions.

A. Uh-huh. Right.

Q. But I think after you go through that, I will begin to understand what your assumptions are, because

the answer you get will depend on the parameters you put into that equation. The equation you put on there, it depends on what you put in there?

A. Uh-huh.

Q. Sometimes -- I know this OFM is developed by Schlumberges. So if it doesn't work, you put in there -- I mean I'm trying to get information, because it will prepare me to see what you are going to show me next?

A. Yes.

Q. Okay. Go ahead.

MR. DEBRINE: And Mr. Beebe, you've answered the Examiner's questions by saying "uh-huh." And the court reporter --

THE WITNESS: Oh, I'm sorry.

MR. DEBRINE: It appears you're agreeing with the Examiner.

THE WITNESS: Okay.

EXAMINER EZEANYIM: Go ahead, Mr. DeBrine.

Q. (By Mr. DeBrine) Is there anything else on Exhibit 16 you want to point out with regard to the analysis you employed?

A. No, sir.

EXAMINER EZEANYIM: We'll come back to that equation later.

Q. (By Mr. DeBrine) Turn to Exhibit 17.

A. (Witness complies.)

Q. Can you identify it?

A. What this is, this is the result -- this is actually the drainage radius map for the entire area. As I've mentioned, I have done an arid calculation for every well that I had data for.

This is the entire Bravo Dome area. And what you're looking at in the blue circles, that is the calculated drainage radius in feet for every well that I had data on, estimated ultimate gas produced.

So just at glance, what you can see when you look at the east side of the unit, where we have 640-acre spacing, you see these large blue circles overlapping each other, implying that, you know, wells are draining into each others drainage area.

If you go to the West Bravo Dome area, to the far left of the map -- I've got my mouse, and I'm highlighting it -- a lot of those circles are small, implying that, you know, they could maybe densify potentially in the future and continue to drain more of the reservoir.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. That area is developed on what, 160?

A. 640.

Q. 640? Okay.

A. I've taken one township range, the 18 North, 32 East, adjacent to our subject area, and I've kind of zoomed in on it. That's what's shown here in the upper right.

The blue circles are showing -- you know, you see two wells, in particular. If you look at the brown dot in the center of the blue circle, the brown dot represents the well. The brown dot represents the well; the blue circle represents the drainage radius that's been calculated. And what you see is that you see a number of wells with overlapping drainage areas on 640-acre spacing.

On your handouts, you can see better than -- well, you can see it on the overhead. But the light gray lines are section lines. And you see in this area, there is only one well per section, yet you still have drainage radius circles that are overlapping each other on 640-acre spacing. And this area is 640-acre spacing.

Q. Which one is then the smaller circle, and which one -- you were just telling me that there is

interference, even if you had 640. And what you just said there, is that there is interference, even though it's spaced on 640?

A. Right.

Q. Is that what you're saying?

Because the area you just predicted is on 640. And you are still saying that even though it's on 640 -- do you want us to make it 1280 because there is interference.

If you use words -- you are telling me that even though it's for 640, there is interference. So are we going to widen it to 42, 13, if it's radius is 1280?

A. I see that because the drainage radiuses overlap, the potential for interference exists. And that's why after we get through the drainage radius portion of it, we'll look at some interference effects.

There's a potential for -- you see wells that have some interference. Now, it may be debatable if that's reservoir-related or surface-issue-related, but you do see interference existing.

Q. Okay. Now, on that projected demonstration, you have smaller circles and bigger circles. And what are you trying to demonstrate there?

A. Well, the sections -- if you see the section lines, they're light. But when the blue circle takes up

the entire little square, that implies that it's draining a 640-acre area.

So like this circle here that I'm pointing to, it's basically a 640-acre area because its approximate area is equal to a little square, which is a 640-acre section.

Q. Okay. The big circle is what?

A. It's even larger. It's encompassing several sections of what this is showing.

I have examples that will help -- I think I have three wells that I show as large, medium and small in my upcoming exhibits, as far as drainage radius. In those drainage radiuses, I show the inputs and how it was calculated. So maybe that will help clarify.

Q. Okay.

A. But this shows that, you know, we have a lot of overlap in the drainage area. I want to point out that the wells on 640-acre spacing are showing significant drainage adjacent to our subject area, as well as within the subject area. 19 North, 30 East has large drainage radiuses. And these are wells that have drainage areas larger than 640 acres in 1930 East. Also, I show 1830. I also have 19 North, 31 East.

There's like one well in there that has a large circle, a large drainage area. 19 North, 32 East,

that's one Township Range to the east, outside the subject area. It has large drainage areas, as well as the -- I don't know if you're a little bit -- 18 North, 32 East, just outside the drainage unit.

Q. Are those the -- when you say, "outside the unit" --

A. Outside the subject area.

Q. Which is being developed on 640?

A. Yes, sir.

Q. Okay.

A. I also want to point out that in the area of the subject area, in the area of interest, 7 out of the 19 wells have calculated radiuses greater than 160 acres.

So in these blue circles, there are 7 out of the 19 wells that I made a calculation on to have greater than a 160-acre drainage area.

Q. Seven out of 19?

A. Yes.

Q. The rest are less than 160? I want to see the examples.

A. Yes. I think that's all I have to point out.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. If you'll turn to Exhibit 18, what are you intending to show through this exhibit?

A. This is one of my examples that shows the inputs into the drainage radius calculation, as well as the forecast.

I've zoomed in on an area. That's actually in the subject area, 19 North, 30 East. This well, 271, it points to this little brown dot, which is the physical location of the well, and then the blue circle is the drainage area.

This calculates a large drainage radius. And actually, just to jump down to the punch line, under Outputs, at the bottom here in the table, this is calculating a very large drainage area of 2,666 acres, which is very large.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. Okay, this is outside of the subject area. This small square --

A. No, sir. It's in the subject area.

Q. That rectangle is in the subject area?

A. Yes.

Q. Well Number 271 is in the subject area?

A. Yes, sir.

Q. Is that where you did the calculation?

A. Yes, sir.

Q. And you said -- what was the drainage radius at?

A. I calculate a 2,600-acre drainage area.
Q. For that well?
A. Yes, sir, For that one well.
Q. And that would transfer how many feet?
A. My inputs are shown here, and this might help you. But going to the top, this is the basic data for the well, the API number, the year it started production.

This particular well is producing 1.3 million a day gas. It's cumed 8.272 Bcf already today. The gas -- remaining reserves are almost 24 Bcf, for a total of 32.25 Bcf. This is in my pressure region, being -- I'll show you that in the minute, from the Broadhead study -- for 644 psi initial reservoir pressure.

The phi-h that we calculated from the net pay map from our geology was 8.9 phi-h. You can see the SWI, which we had taken from the previous Oxy-provided data was .132 for water saturation. And then we're using an ultimate recovery of 65 percent, or .65, that we've also gotten from that presentation.

The z-factor that you calculate at the 644 pressure is at .7549. And we use the temperature of 90 degrees Fahrenheit, or 550 Rankine. Those are the inputs that go into our gas-in-place equation. When we calculate the acreage that it drains.

Now, I do want to point out in this box here in the graph that the current production to date, 8.272 Bcf produced today, that calculates a drainage radius of 680 acres today.

Q. What did you say?

A. The current production today calculates a drainage area of 680 acres today. That's already exceeding the 160-acre --

Q. How long were these produced?

A. This was produced since 1994. In this plot here is shown the production of this well starting in 1994 to the current 2012. And this is the delicit on the decline that I have for that particular well.

Q. So if gas produces directly proportionate to your acreage, then at abandonment pressure, you will see more than 80 acres. Is that what you're telling me now?

A. Yes. I --

Q. Because right now you are just telling me as of today, based on those cumulative productions --

A. Right.

Q. -- the well is still producing?

A. Yes, it is.

Q. Let's say we forgot our abandonment pressure of 400. What is the current pressure; do you know?

A. I don't have that information, no. Some of the

Reliant wells that have been drilled recently, we've got some preliminary data to show we're in the 600-pound range, which on a couple of wells I've seen some datapoints.

Q. So let's get this thing straight, because this is important. I'm not going to add a word. I just want to understand the parameters and the criteria you used. Based on those data, what did you call it? Inputs, right?

A. Yes, sir.

Q. As of the time you did it -- I don't know when you did it -- you forecasted the ultimate recovery to what point?

A. I let it go out 100 years.

Q. Okay. See, that's why I should know, because those times are very important. I should know that. I thought as of maybe two weeks ago or three weeks ago, as you were preparing to come here, you know, that was your basis then.

The well, if it produces -- maybe you put it in your OFM and forecast up to 100 years. I wish you could go up to 200 years that it would be producing. That would be nice, but that's okay. I mean that's what you forecast, and not what you want to do. And that's what gives you the 680, right?

A. No. 2,666 acres.
Q. Okay. 2,666 acres, right?
A. Yeah, 2,666 acres of drainage.
Q. Okay. Very good. So that's when it goes to 100 years?
A. Yes, sir.
Q. Do you see why I'm probing this? I want to be able to understand it better, because this here is very time sensitive. So that's what I'm asking. I'm not trying to prove too much, but I'm trying to make sure I understand what you are doing and then try to follow your calculations. But I'm going to follow your calculations to determine what you are doing. The 2,666 is forecast over 100 years, right?
A. Yes, sir.
Q. Then as of present, it's draining 680?
A. Correct.
Q. So you are saying that over 100 years, you're going to drain 2,666, right?
A. Yes.
Q. That's what you are showing today?
A. Yes, sir.
Q. Okay. Because if I don't ask the question, I wouldn't know what you are trying to show. It's important that we know what you are trying to show.

See, it's helping me now to go back and see how you come up with the parameters, because those are important, and then to see what you are doing, to agree with you or disagree with you.

I'm not making it a point one way or the other. I don't know what's going to happens, so don't even look at the duration in my questions. That's because I have to ask to try to follow what you are doing, right?

A. Yes, sir.

Q. Because if I don't follow what you are doing, we can't do anything. So don't think I'm trying to be hard on you. I'm sorry, I have to ask these questions.

A. No. I appreciate the clarity, so please ask.

Q. Okay. These started in 1994 to produce, right?

A. I'm sorry. What?

Q. They started in 1994 to produce, right?

A. That's right.

Q. Well, 100 years from now will be 2094?

A. Yes. Actually, it was 100 years from the end of 2012, the year 2012.

Q. 2012? Okay, not even now. But the well is still producing, right?

A. It is.

Q. Do you know what the current production rate is?

A. Yes. It's 1.3 million a day, shown right here.
Q. Okay.
A. Just to reemphasize, it's already cumed 8.3 Bcf to date.
Q. From 1994 to date?
A. To date, correct. So that calculates a drainage radius of 680 acres.
Q. Okay. So if you use the forecast of abandonment in 100 years, you are going to use the 32 billion, right?
A. Yes.
Q. That's how you come up with the 2,666 acres, right?
A. That's right.
Q. Based on your assumptions?
A. That's right.
Q. Okay. Good. I think you understand what are doing now. Go ahead.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Could you turn to the next example, Mr. Beebe?
A. This is a similar example. This is a well that has a -- what I was just categorizing as a medium drainage radius. The well is located in the subject area. It is this 191J.

The brown dot, once again, is the location of the physical well. I'm using my map here to -- my mouse to highlight it. The drainage radius is shown there in the blue circle, and it overlaps the boundaries of the section shown in gray.

The inputs on the well are the same type of inputs on the prior slide, the prior example. The production on this well, it is today producing 803 Mcf of production. It is cumed at over 1 Bcf, a little bit over 1. That's in the table here to the left.

We have remaining reserves of 3.9 Bcf, for a total of ultimate recovery of 4.9 Bcf. This is in Pressure Rate Region C, which has a pressure of 602 psi. This well has a porosity feet or porosity thickness of 5.1, from our geologic study.

The same factors are shown that I mentioned previously. Going down to the bottom, to the output, the drainage area that we calculate with the remaining reserves is 790 acres drainage. So that's obviously greater than the 160-acre area. This has a drainage radius of 3,309 feet.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. This well and this well, who is upgrading those wells?

A. These are Bravo Dome units, so they're Oxy's.
Q. Oh, these wells belong to Oxy?
A. Yes, sir.
Q. Okay. The first one was 271. It's Oxy. And you got this information from?
A. From the IHS Data Source.
Q. Okay, so they are being operated by Oxy.
And then do you know what Oxy dedicated it to, 640 or 160?
A. Well, these are currently the only wells in this section, so I'm making the assumption that they're 640-acre spacing.
EXAMINER EZEANYIM: Okay. Proceed.
THE WITNESS: That's all I have on this second example.
CONTINUED FURTHER EXAMINATION
BY MR. DEBRINE:
Q. Just so the record is clear, we were talking about Exhibit 19?
A. Yes.
Q. Could you turn to Exhibit 20?
A. Example 3 is a short drainage radius. This is a smaller drainage area. This well, the Number 91, the arrow shows where it's located. This is actually in the 160-drainage area. So it's outside the subject area,

but it's right on the edge.

And this well, 91, shown here on the brown dot, you can see the blue radius circle I'm highlighting with my mouse. It doesn't fill up, obviously, that square, which is the section. So it's less than 640 acres.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. So you are saying that that arrow that's on the north, it's not within the Unit?

A. Within the subject area. It's just outside the subject area.

Q. And that north is on 160?

A. Yes, it is.

Q. Okay. And then you calculated the 130?

A. I calculated the 130, yes.

Q. Thank you. Based on those assumptions, which I'm going to look at. Okay?

A. Yes, sir.

Q. And then it's 130 over 100 years, correct?

A. Plus 100 years. So this well came on line in 2009 and produced until 2000 -- it's currently active, and then 100 years plus.

Q. How many years plus 130, right?

A. In this particular well, I put a 1 Mcf -- or actually, I put in a -- I don't see it offhand, 1 or

10. I put in 1, excuse me. 1 Mcf is the abandonment rate, so whichever came first. If the decline hit 1 or if it hit 100 years, it would stop.

Q. It would stop? Okay?

A. If this particular example hit a 1 before it hit 100 years. So in the table, the chart shows it going out to year 2077. That's the reserve date, so this didn't make it out 100 years.

EXAMINER EZEANYIM: Okay.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Mr. Beebe, did you use that same rate cutoff when you were using that example in your study?

A. I did.

Q. Could you just turn back and point those out, where they're depicted on the exhibit?

A. Okay. Exhibit 19, in the table on the plot, shows a reserve date of the year 2098. And that was to 1 Mcf per day, final rate, shown there in the table

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. You are looking at 19?

A. Yes, sir.

Q. Okay. Now, where is 2098?

A. Do you see the Reserves Date label?

Q. If you look at the overhead, Mr. Examiner, he's trying to point it out?

A. I've got my mouse, and I'm going back and forth. It shows 2098.

EXAMINER EZEANYIM: Okay.

THE WITNESS: And then on the prior exhibit, on Exhibit 18, this one, the final rate, I had 1 as the target. It never got down to 1 at its current decline. It got down to 265, which was 100 years later.

So if you look at the reserve date on the table there, it goes out to 2113.

Q. (By Examiner Ezeanyim) How many of you will be here in 2113?

A. Hopefully most of us. Modern medicine.

Q. You can change it to 160-acre spacing?

EXAMINER EZEANYIM: Okay. Go ahead.

THE WITNESS: I think that includes everything on the examples that I have to show.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Mr. Beebe, let's turn to your next exhibit, 21.

A. Okay.

Q. And if you could identify that and explain what relevance it had to your study?

A. This was an important exhibit, the estimation of

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original reservoir pressure. This exhibit came from Ron Broadhead's publication in 1993 for the Bravo Dome area. One of the pieces in that publication was the reservoir pressure.

Actually, if you look at the text at the bottom on the -- the plot on the right, or the figures on the right, it says, "Figure 4," and it shows the source of the data. It says, "Based on 119 original shut-in bottom-hole pressures submitted by Amoco to the New Mexico Oil Conservation Division."

So this graph or these regions were developed by Ron Broadhead from the 119 bottom-hole pressures submitted by Amoco. The regions shown are A through G. He divided the reservoir up between those regions, and each region has its own pressure associated with the region.

If you look at the table at the top, you have depth versus bottom-hole pressure. And then you have the regions, groupings by region. So if you start with Group A, it shows a maximum pressure of a little over -- well, almost 1,110 psi.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. It's not clear.

A. THE WITNESS: It's hard to see, but this came

from Broadhead's information.

You see, if you measure, you get a maximum pressure of 1,083 and a minimum of 1,087 when you just read the plot. You can't read it. You have to measure it out to do the -- with a ruler to be able to make the calculation.

Q. Is it to scale?

A. Yes, it is. It is to scale, but I didn't have the raw data. I just took it from his publication.

If you look at the table on the left, I calculated the max and the min, and I used the average pressure for that region as the pressure to calculate my z-factor and the pressure that goes into the gas-in-place formula to determine drainage area.

Q. The average pressure is at current production, right?

A. No. That's on original discovery. We don't have access to any current pressure.

Q. Okay. What depth are we talking about in these pools? Is this the Tubb, it's about 2,700?

A. We're talking about the Tubb formation. We're in that 2,200/2,300-foot range. The plot on the top here shows depth, on the Y axis in feet. So you can see these different pressure regions that show the depths that there was well data for those pressure regions.

So Pressure Region G, which is the largest area, you can see it has a max and a min pressure that I calculate on the table for an average pressure of 383 psi as the average for that G Pressure Region.

It's important -- the data does show -- Ron Broadhead pointed this out -- that the pressure increases as you go from east to the west. So Pressure Region A is the highest pressure, and Pressure Region G is the lowest pressure. So you have different z-factors going to the calculations for each one of the pressure regions.

Q. Who is Ron Broadhead? Where does he work?

A. I'm not really clear on his background. I want to say he's a professor at Texas Tech -- I'm sorry, New Mexico Tech. He has published a tremendous -- I don't know how many papers. But just looking at the volume of papers that he published on this area of New Mexico and Bravo Dome, he comes across as an expert.

Q. He's a current professor at New Mexico Tech?

A. He has been. I don't know what he's currently doing now.

Q. Okay. That's fine. Let's assume that his work is okay?

MR. DEBRINE: We believe he still is a professor at New Mexico Tech.

Q. (By Examiner Ezeanyim) Okay, go ahead.
A. That's really all I have to conclude. This just shows some of the data that goes into the gas-in-place calculation to determine the drainage radius.
Q. Assuming you are -- let me add this before you conclude. Assuming your parameters or your assumptions that you listed here are correct, when I go back to -- where is that equation?
A. It's on --
Q. Okay, now. Exhibit Number 16?
A. You should be able to go back to your office and calculate it. With these three examples that I provided, you can take those inputs from the three examples and you can calculate the area, the drainage area, on your own, and they'll match.
Q. I'm wondering. Okay. Is that Gf or Gi?
A. Gi, for gas-in-place.
Q. Is that "i"?
A. Yes, it is.
Q. Is that initial gas-in-place?
A. Yes, sir.
Q. Why would you use initial gas-in-place? Why wouldn't you use the gas produced, because that would drain the area?
A. Correct. Well, to determine the area --

Q. You are not going to produce any initial gas-in-place?

A. Correct.

Q. So we are using the initial gas-in-place instead of GP, or gas produced, or the ultimate recovery over 100 years?

A. Right.

Q. Over 100 years, I might have 1 trillion initial gas-in-place, but I can produce maybe 10 billion. The rest is left there?

A. Right.

Q. I mean you demonstrate that -- I mean the recovery is probably about 65 or something percent. Why are we using Gi, then?

A. The gas-in-place -- you have to use the gas-in-place because it's in the formula. That's part of the formula. So to calculate the gas-in-place, you take the total gas produced, your ultimate recovery, and divide it by the recovery factor.

So if you're expecting a 65 percent recovery factor, you take your ultimate gas produced, divide it by the ultimate recovery factor, and that is gas-in-place.

Q. I don't see that constant of the factor?

A. On the bullets -- I'm going to go back to Exhibit

16.

Q. I need to see that. Because if you only -- if I use this 65 percent, then I can use Gi, or whatever you think over 100 years is going to drain. But if I look at the equation, where is the factor?

A. It's 65 percent. And in the example pages, I list the ultimate RF, recovery factor. Ultimate RF, that is the recovery factor that I'm using.

Q. I multiply that by that RF?

A. You divide the gas produced -- ultimate gas produced divided by the recovery factor to calculate gas-in-place.

Q. I'm trying to make sure I get what you get. And if I don't get what you get, I'd be asking questions. What I wanted you to do is if you have Gi -- Gi is initial gas-in-place, right?

A. Yes.

Q. Yes. And you know -- what's your name?

A. Tom Beebe.

Q. Mr. Beebe, you know that we can't call it GI. Then the water can now run out of this finite commodity, because you know that there are billions and billions of trillions of this gas that we can't recover.

But now when I look at the equation -- because you know, you are right. I can't do it now. If I go

back, I'm going to program your assumptions. And if I have questions after the assumption, I can ask.

But what I'm saying is that we cannot cover Gi.

Therefore, we are going to use the over-100-years GP to calculate your factor?

A. Right. So you can't calculate gas-in-place unless you make an assumption for the drainage area. And see, that's the whole question: What is the drainage area?

So the formula that I show on Exhibit 16, I algebraically put all the variables with the gas-in-place on that side and leave an area on the -- by itself, and so I solve for area. I solve for the drainage area because that's an unknown.

That's the whole question here: Are we draining 640 or 160? So I solve for area, but I don't know gas-in-place. But I have to make the assumption that the ultimate gas produced, divided by the recovery factor, equals the gas-in-place.

Q. Okay. So in that equation -- now, when I plug in on Gi, if I plug in all the factors that you assumed, I would get initial gas-in-place, right?

A. Yes.

Q. When I get the initial gas-in-place, then I will

get my recovery factor, right?

But if I know the forecast -- if the forecast has shown us whatever billion cubic feet, I can get the recovery factor and then use it to calculate my area then. Because it's not the correct gas that has -- that's how you drill the area, not the initial gas-in-place.

I don't know whether you understand my problem here. I think you understand it, because we cannot use Gi to calculate the area. I don't think you did that. Did you do that?

A. No.

Q. So what did you do?

A. I used the ultimate gas produced divided by the recovery factor, and that is the implied gas-in-place. And then I solved for Area A. That is the drainage area for the calculated gas-in-place.

Q. And then the recovered gas is, by estimation, over 100 years for your model?

A. Yes.

Q. Maybe you are using a hyperbolic exponential, whatever, to get that ultimate recovery?

A. Yes.

Q. So you have to go back -- do you have any new examples?

A. Well, the three wells that I showed in Exhibits 18, 19 and 20 are the examples that I provided.

Q. Are you using the forecast of gas ultimate recovery?

A. The second input, under the inputs, that is the -- like on Exhibit 18, the 32.258 Bcf, that is the ultimate gas produced for that well.

Q. Okay. And that's what you used to calculate those drainage areas?

A. Yes, sir.

Q. Okay, that's where I'm concerned. I don't want to adjust for area and use Gi. I'm sorry.

A. I'm glad.

Q. I'm glad that you pointed that out to me.

Okay. Go ahead, Mr. DeBrine.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. Would you turn now to Exhibit 23, Mr. Beebe?

A. Okay.

Q. What are you trying to show here for Exhibit 23?

A. Well, I want to investigate that interference that may exist out in the field. What I had done was I looked at every well in the Bravo Dome area, and I calculated wells that were within a half-mile distance from an existing well. And that's approximately

comparable to like a 320-acre well spacing.

In general, out of the 799 wells that I had in my database -- it was a Visual Basic Program -- I identified 169 wells. And out of that 169 wells, I wanted to have at least 12 months of production overlap with the existing well and the second well that was drilled to see if there was a change in performance on the existing well.

And also, the third criteria that I had was to see if there were -- I had to have at least a half of Bcf of gas produced to represent a significant producer.

Out of all the wells identified using these three criteria, I identified 75 wells that I wanted to review for interference.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. Which area?

A. The whole field, the whole entire Bravo Dome.

Q. Okay. It doesn't matter whether they are coming from 640 or 160. Some of them are on 640, some of them are on 160. I wanted to see more on those 160 to see if there are interference.

Are you going to demonstrate on the 160 that there is more interference than in the 640?

A. Well, interestingly enough, there are no wells that are within -- no active wells that are within a 160-area that are producing that I identified. I don't know that Oxy will come up with any performance areas. But I didn't come across any sections or areas that had four wells in a given area -- in a given section, excuse me. I only saw primarily two, at most.

So what I'm evaluating here under the interference are wells that are on 320-acre spacing.

Q. I know you are trying to do that because of a lack of data. But it's going to be more appreciated if you go to 160, because that would help us, if you go to 160 and demonstrate that interference is occurring.

A. Right.

Q. If what we do is override the whole broad range of the Bravo Dome, including the west, the north, the central, the east, then I don't know where to begin to make the distinction.

You know, with all that data, I know we can -- I don't blame you. You can't just compress the data if there is none.

But you can see -- if you are coming here and saying, "Well, on the 160, I saw this on another, this 160," see, it's causing interference. I mean we can take that into consideration. If on the south, the

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demonstration is causing interference, then when we can take into consideration.

See, you are trying to get me to say -- well, because of interference, we call out on what our argument is covering. Okay? In that case, we can take a look around.

But when you do it over a broad area in the Bravo Dome, I don't know how I can begin to process it.

What do you want me to use?

A. What I want to prove to you or show to you is that if you have a -- well, if you have interference on 320-acre well spacing, it's going to be even worse on 160-acre spacing for comparable quality wells.

Q. Where do we have 320?

A. On the east side of the Bravo Dome there are a number of infill wells that were, you know, drilled down to 320-acre well spacing.

Q. So like say in the east, which is 640? They drilled the first well, and then they drilled infill. And that's what you use --

A. The percentage of the wells saw interference.

Q. Okay.

MR. DEBRINE: I think to clear up the confusion, Mr. Examiner, even though on the east and on the west there's 640-acre spacing, I think Mr. Beebe,

what he's saying is that his study indicated that although you have the option of drilling up to three additional wells on the 640-acre spacing, there's only one infill well.

So as a practical matter, there's 320-acre spacing, even though the rule provides for 640. They haven't been drilled down to 160 yet.

EXAMINER EZEANYIM: Yeah. I understand what you said, 320. You have drilled one infill. I understand that, but this is on the east. I'm familiar with that.

Q. (By Examiner Ezeanyim) In the subject area, did you do any study there?

A. Yes, I looked at the whole area. There were no wells that met the infill criteria -- that met my interference criteria in the subject area.

There's no performance to say what would happen when you infill down to 160-acre well spacing, any long-term performance to evaluate it.

Q. So what you are telling me is there is no data to infer one way or the other, right?

A. Yes.

Q. You are creating problems.

A. I'm starting to wonder what problems I'm creating.

Q. You are creating problems for me because you are telling me -- now I don't even -- we don't even know whether we are going to do it on 160 or 140. That's one thing. Because there is no data.

A. The evidence that I'm wanting to show you, is the drainage radius and areas adjacent to the subject area, with the interference that exists. Elsewhere in the unit, or the Bravo Dome area, interference exists.

So I want to be able to -- from my engineering standpoint, I want to be able to show that if we infill to tight spacing and require that, likely we will have wasted money because the drainage radius that I calculate shows that we do not drain a large enough area. And I show that we have interference that exists in the field today on larger spacing than 160s.

EXAMINER EZEANYIM: Okay. Well, I'm coming to you, Mr. Feldewert. As you know, I'm not trying to badger you. I'm trying to get the truth.

MR. FELDEWERT: Sure.

EXAMINER EZEANYIM: I'm trying to get the truth out of you, you know, because you did the work. So I want to understand what you did.

What do you have to say? I mean I'm coming to you. Now, when they are done, I'll come to you.

MR. FELDEWERT: Okay.

EXAMINER EZEANYIM: Do you have a point that you must make now?

MR. FELDEWERT: No, not that I must make now.

Well, I think your observation is a correct one. And that is: Why are we looking at interference of wells in the eastern area of the Bravo Dome, when our own evidence has shown that's a different type of reservoir than what we're dealing with here?

So I have -- I guess my objection would be: What is the relevancy of this?

EXAMINER EZEANYIM: Okay.

EXAMINER BROOKS: Well, I don't think objections to relevance are really particularly relevant, if I may.

We have a technical person making the judgments here, and I think Mr. Ezeanyim is quite capable of understanding what's relevant and what's not. It's not as though we have a lay jury making decisions in this matter. So I would overrule the objection.

EXAMINER EZEANYIM: Well, yeah, I will overrule it, because I want to understand that.

Because as you all know, when we want to make an inference, we use what are called offsets. The way we are talking about it is an offset to the subject

area.

It's important to also understand what is happening there. And then is it spaced on 640 or 160? What's going on there?

If you understand what is going on there, then I guess you can begin to -- that's why we drill wild cards. You can't drill a wild card on this, if you have something to -- of course, sometimes you drill wild cards, and what you get are these Tubb intervals.

But what happens here for everybody is that we can use, you know, the offsets to determine what we might expect in that subject area, you know, the wire cut or whatever, or where we don't have data.

Unfortunately, in this area, the subject area, it is occurring to me that we don't even have enough data. Because if we have enough data and do these calculations, we can begin to now determine whether we're going to do it on 640 or 160, which I don't know.

So maybe before the end of this presentation, after you have presented, maybe we can begin to get it together for me. And then we decide to -- it might be a wash, "Oh, let's go back and get more data." I don't know. I'm not making that decision yet. Maybe we will find it out after the hearing today.

So let me not take more time. Are you finished

with this witness?

MR. DEBRINE: No. I've got a couple more things to discuss.

THE WITNESS: I do want to point out, you know, of the interference wells, 75 were identified for review. No wells were identified that met the criteria, as I've described it, in the subject area.

But the results of the interference affects -- in our 75 candidate wells, for 34 wells, I did not -- I didn't see any observed interference; for 24 wells, I did see interference. And 17 wells I categorize as inconclusive because they were either a redrill, and that existing well production did not overlap, or there were more than two wells in a half-mile radius.

So I didn't want to skew my results with that grouping of wells.

Q. (By Examiner Ezeanyim) And this is in the east side, right?

A. Well, I'll have a map on the page. It will show the location of all of these wells.

Q. But they are not from the subject area?

A. Correct. They are not in the subject area.

Q. Okay.

A. So the statistics are 41 percent of the wells had interference. That is, 24 out of the 58 wells that I

could identify as interference or not interference. I will show some examples of that here in just a moment.

That's all I have for this slide.

EXAMINER EZEANYIM: Okay.

CONTINUED DIRECT EXAM

BY MR. DEBRINE:

Q. If could you turn to Exhibit 24?

A. (Witness complies.)

Q. Is that the map you're referring to, showing the interference?

A. Yes.

Q. Could you just explain to the Examiner what it depicts?

A. What I've highlighted on the map are in the big circles -- I have red, green and blue circles. Those are the locations of the wells that were identified as interference candidates.

And then by evaluating each one of those 75 wells, I determined whether it was interfering with -- and that's a green circle. A red circle is no interfere, and blue is inconclusive.

You can see there are green circles located all throughout the eastern side of the east side of the Bravo Dome unit. There's actually one well in the West Bravo Dome area that is identified as having

interference.

I do want to point out the relevance of this is previously, in the data provided from Oxy, they identified these environments of depositions; EODs they called them. There was a channel area, there was a transition area, and there was the massive. These green dots cover all three of those environments of deposition.

And the implication is if a well is in an environment of deposition and you follow that across that region, then could you potentially have similar characteristics as you would in that region that saw -- or the well that saw interference.

So if you had a well up in the north that was in the channel area or the transition area, and you go to the west, like our subject area, which is primarily transition, you could potentially have a similar response.

That's why looking at the east is relevant, because of the environments of depositions that were identified, and the implications that they make.

Q. Mr. Beebe, if you'll turn to Exhibit 7 -- or were those deposition environments depicted in Mr. Raines' Exhibit 7? Is that what you're referring to?

A. Yes.

EXAMINER EZEANYIM: Before you go back -- this is very important. Number 24, please, Counsel, we are going to admit it.

If you need to, mark them, so that the court reporter will know which one was that page.

MR. DEBRINE: Yes, we'll do that.

EXAMINER EZEANYIM: So when somebody is reviewing it, Exhibit 24, they will be looking for it. I know what you -- I mean I'm sorry. I'm going to say it's because we need that information in our record.

MR. DEBRINE: We'll do that. And I apologize that we didn't do that.

EXAMINER EZEANYIM: That's okay. Now, let's go back to this. It's very important. I'm going to ask you a question on that inference, because I'm not a fan of interference.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. Now, if you look at that, what we are talking about, here's the offsets. If you look at the east side, those are the 640, right?

A. Yes, sir.

Q. Then I can see a bunch of red dots, which is no interference. But I can see also green, which is interference. And all of them -- and this is 640 acre,

right?

A. Yes.

Q. Some of them are interfering and some of them are not?

A. Right. But there are also 320-acre wells in there as well.

Q. Okay, I see what you mean.

So for the interference, it may have the 320. That's the point you are making. So maybe -- are you saying that the red dots is only one well?

A. There is one well that -- yes, every dot represents one well. But there's a well within a half-mile radius inside the actual dot that was part of my candidates for review of interference.

I have some examples that I think will help show that. You can't see it very well, but there's another little brown dot inside each one of the little radiuses there, inside the blue, the green and the red, for a second or third well that was drilled.

Q. Good. Go to the north of the subject area. Go to the north, over there. Over there, those are still 160; is that correct?

A. No. 640 pooling --

MR. GIUSSANI: Can I approach just for a second?

From here on is also 640. Up here is 160, down here is 160. Here is the area in question. Would you agree to that?

EXAMINER EZEANYIM: Those dots over there --

MR. GIUSSANI: Up here?

EXAMINER EZEANYIM: Yeah. What is that?

MR. GIUSSANI: 640.

EXAMINER EZEANYIM: Okay, 640. Let's go back and use the analogy here.

Q. (By Examiner Ezeanyim) In that 640, how many green do we have?

A. There were 24.

And actually when you count the bubbles, you won't find 75, because there are some wells that were -- that had two offset wells, so I counted them. It's like -- I forget now.

It's like 65 or 66 bubbles in here. And that's just because some of the same wells were identified twice because there might have been two infills adjacent to that existing well.

Q. So if we take one second and point to that north, that is on 640? On that north, those circles there -- do you have your pointer on your computer? Over there, let's point to one.

One of them is green?

A. Yes, sir.

Q. Is that one where it includes all the infills?

A. Yes.

Q. It includes the infills?

A. Yes.

Q. Whether it's 320 or more -- I mean or less?

A. Right.

Q. Okay. But you go by one dot, and that's 640?

A. Right.

Q. Because as you look on 640, and then you are given the authority to drill more than -- well, given the authority to drill three infills, did you see anywhere on green that have four wells on that 640?

A. In my analysis, I haven't come across that, where they were all active at the same time.

Q. And then in that area, there is some inconclusive in blue?

A. Yes, sir.

Q. And then the rest is green. There is no -- okay. And there are 640?

A. Yes, sir.

Q. And we don't know whether that are four wells in that unit or not? Or you think there are only 320?

A. Well, the infill well was 320, and I think that's

pretty much all you see going down. But the rules are for a 640-acre well spacing.

Q. Yeah, that's what it is. But they have the option to go to four wells if they want to?

A. Right.

Q. I'm trying to determine how many wells they drilled to cause this interference. Because what you are is if I drill one well on 640, and I see how many interference, for what? I don't know. See what I mean?

So there must be at least 320 or something other than that to cause this interference?

A. And I don't identify that in the data.

Q. Okay.

A. I do have some examples to follow here that I think will help clarify. I am getting towards the end here.

EXAMINER EZEANYIM: Okay, go ahead.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE.

Q. Turn to Exhibit 21.

A. (Witness complies.)

Q. If you could turn to that, Mr. Beebe?

A. Okay. I've zoomed in actually on the area of interest that you had mentioned before. Not the subject

area, but that we were just discussing, and I show a circle here. It's a little bit difficult to see. And I have named it a little bit differently here because I've set it up as a pattern.

P16, the well in the center, I show a green radius, a green circle around it. That's the half-mile radius. There's one little dot that is on the edge of the radius. That would be the 320-acre spacing. You can see it on the paper copy. You can't see it on the --

EXAMINER EZEANYIM: Yeah.

THE WITNESS: And what I've done here on the plots, down here on the bottom, for that particular pattern, P16, I've got the top graph shows the total gas produced in red, and then the magenta or that pink-colored curve is the average gas production rate for the two wells. And then in that same top plot, on the lower half of the slide, there's a black line that shows a well count.

So we started out with one well, the original 640-acre well. And in this case, in 2005, a second well was put on production, so that increased the well count to two. And then you can see the total gas produced increase in red, at the top, and then the average rate per well of the two wells decreased.

So to look at what the impact was on that original well, you go down to the bottom little plot, graph. And the red curve represents the production from the existing curve -- I'm sorry, the existing well. It's shown in red. And the 2005 well, the infill well that was brought on in 2005, is shown in blue. And I've highlighted in the oval when that occurrence happened.

And if you look at the red curve, you can see a reduction in the gas rate for that red-colored well, the existing well. And that would be an immediate reduction in rate from putting production on -- or putting on production of that second well.

Now, I've acknowledged up front that there are two things that could be occurring here: It could be a reservoir phenomenon, where it's a reservoir performance issue; or second, it could be surface impact.

So you can have -- when you bring on additional wells and continue to pack the line in the gathering system, you cut back on existing wells. I don't know which of the two this is, but it's still interference. It still has an impact on the overall project's incremental rate from the drilling of the second well.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. Let's look at that interference you are talking

about, the first one on the far left. Now, one well is producing until you drill the infill?

A. Yes, sir.

Q. And there are the points you drill at the top producing, and you see those interference?

A. Right.

Q. Okay. I think that occurred in the middle of 2004 in the fourth one?

A. Yes.

Q. Is that when the well was drilled?

A. When it came on production, yes.

Q. Yes, when it came on production.

And the same thing -- when you say, "interference," the same thing with this one? Okay. I you see one well, and then you drill an infill. And if you go to green, you are going to see red dots. You are demonstrating there on 320?

A. Yes.

Q. They're on 320. And then that's what is causing this interference?

A. That's what I can tell from the data, yes.

Q. And those are small, because you can't see them. I hope we can see them. When I see that small red dot, it means there are two wells in those units that are causing interference?

A. Yes.

Q. So the second example is on the right. And this well is a P18 pattern -- those are arbitrary names. But the original well is in the center of that green circle, the second well is towards the edge of that half-mile radius that's highlighted in green.

And if you could just jump down to the punch line, if you go to the bottom half of that plot on the right, you see the red curve is the existing well. And when the blue curve is --

EXAMINER EZEANYIM: Where are you pointing at? I can't see it. Okay.

A. And when the blue curve -- when the second well came on line in 2005, you see a slope change in performance of the first well, so that interfered. I'm calling that interference as well.

Q. Okay, there is no second well. You are going to have only the red curve?

A. Yes. So you focus on the red curve to see the impact of interference from the second well.

Q. And that red curve is projected?

A. No, that's actuals. These are actuals.

Q. Okay.

A. That's all I have for Slide 25.

Q. It's even worse on the left. Do you see the

image of reduction on the left there?

THE WITNESS: Correct. There's a significant change in slope.

I have a couple more examples to show you. They will be the same format.

EXAMINER EZEANYIM: Okay.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. If you'll turn to Exhibit 26?

A. (Witness complies.)

Q. The P44 that I've highlighted with mouse, this is a well that saw interference. If you look at when -- I'm just going to jump to the punch line. If you drop to the bottom chart, the bottom graph on the left, you'll see the red is existing performance.

When the second well came on line in 2003, that's the blue, you see a slope change as well on the existing red curve. In the second well I put in, I did not see interference. There was no significant change, and this is the P35.

There was a second well, an infill well that was drilled within the half-mile radius. And you can see, when it was put on production in 2003, there was no significant change in the red curve. So I called that a no interference.

So I was trying to make sure I was fair on my identifying interference or not.

That's all I have for the example.

FURTHER EXAMINATION

BY EXAMINER EZEANYIM:

Q. I think you are being truthful. There are interference; there are no interference. You demonstrated -- they are from the same area, right?

A. Correct.

Q. And maybe they are also spaced on 320. If I look at -- these are slides also on 320?

A. These would be represented -- the second well, the infill, would be representative of 320.

Q. So we have what appeared to be -- I'm not saying it's interference. It appeared to be interference, and what appeared to not be interference, right?

A. Right.

Q. And what is your conclusion?

A. You know, I'm saying that 41 percent of the infill wells on 320 show interference. Not every well has interference, but a portion of them do. 41 percent is what I calculated. So that would -- you know, that's important to know when you go into an infill program.

Q. Okay.

A. That's all I have for Example 2.

CONTINUED DIRECT EXAMINATION

BY MR. DEBRINE:

Q. If you could turn to Exhibit 27?

A. Okay, similar. In my last example of interference, I show one well with interference, the P3, the pattern. You see the blue dot in the center of the circle, the green circle, P3, and then you see a well within that half-mile radius.

When you look at the -- go to the bottom left-hand corner and just look at the punchline. You see the existing well shown in red.

And when the infill well in 2012 was drilled, there was an approximate 200 Mcf per day reduction in rate in the existing well, the red colored well.

And then I'll show you one well that didn't have interference in the PT10 example. And as you see, this is on the bottom right. The infill well was drilled also in 2012, and there's no appreciable change in rate for the red curve.

But I will point out, on that infill well in 2012, it's not a very high-rate producer, so it's probably not draining very large.

I didn't go look and see what its calculated drainage rate would be. But it wouldn't be surprising that it doesn't have much impact on the offset wells

because it's such a low-rate well.

I do want to point out that this area that I've highlighted is immediately adjacent to our subject area.

EXAMINER EZEANYIM: Which one?

THE WITNESS: There is an example of interference adjacent to the west of our subject area.

EXAMINER EZEANYIM: And that --

THE WITNESS: Is the green, this P3.

EXAMINER EZEANYIM: I think it's still on 640, right? That one you pointed is on 640, right?

THE WITNESS: Yes, I believe so.

EXAMINER EZEANYIM: Okay.

Q. (By Mr. DeBrine) Mr. Beebe, have you prepared a summary of the conclusions that resulted from the study and analysis from the subject area?

A. I have.

Q. What exhibit is that?

A. It's Exhibit 28.

Q. If you could, just explain for the Examiner your conclusions resulting from both the study of the engineering and the geologic study and how they inform the Examiner's decision with regard to whether there should be a change in spacing from 640 to 160 acres.

A. I will. Well, on Exhibit 28 are my conclusions, starting off with the core permeability that Mike

showed. And the point that I want to make with that first bullet, shown under Core Permeability, is that similar permeability in the area of interest, or the subject area, exists also in the adjacent areas that are under 640-acre spacing in the same way we saw permeability in two examples in the subject area that were comparable to the adjacent townships to the east, as well as to the west.

Also, we show significantly higher permeability calculated for the net pay than what we have seen from the previously provided Oxy data for permeability, so there is obviously a difference in how permeability is being calculated. But our calculations of permeability show that we have comparable permeability in wells adjacent to our subject area.

Drainage area, overall point: When you look at the entire area, 640-acre well spacing that's currently draining large portions of the reservoir, it looks like it's doing, overall, a pretty good job.

But I do want to point out in our subject area, 7 out 19 wells that I could calculate a drainage area for show a drainage area greater than 160 acres. So we're already draining something greater than 160 acres in 7 out of the 19 wells in the subject area.

I show also a significant overlap of drainage

on wells in 640-acre well spacing immediately to the east and immediately to west of the subject area. There's also interference that has been identified, so we have evidence of significant interference occurring as a reservoir is being infilled.

I don't know, from the evaluation, whether that's reservoir related or surface facility issues. But either way, its interference affects as you infill drill.

I also want to point out that there were no wells densified in the area of interest or the subject area to evaluate interference. We can't evaluate it because there are no wells identified to 160-acre spacing and producing that I found.

I didn't really discuss re-stimulation efforts. But as we went through the database that we had created, there were wells that had significant improvements in their rates well after they were first put on production, implying that there were some stimulation efforts done that -- the bottom line is there might be an opportunity for more stimulation work out here in the field that increases rate and increases drainage area and reserves.

So there may be an opportunity here for more re-stimulation, the application of new technology to

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restim out here.

EXAMINER EZEANYIM: If you do it and get more carbon dioxide, do it. I mean if it's cost-effective, what are you waiting for?

THE WITNESS: Right.

EXAMINER EZEANYIM: Just go ahead and do it and get the carbon dioxide.

Let's discuss what are you going to be on, 640 or 160? Anyway, do you see what I mean? I'm encouraging you to do the re-stimulation if it's possible to get the carbon dioxide more than leaving it underground. I hate to have to leave it there.

THE WITNESS: Right.

EXAMINER EZEANYIM: But that's beside the point. I have not a question.

THE WITNESS: That concludes everything that I have concluded on Exhibit 28.

MR. DEBRINE: Pass the witness.

EXAMINER EZEANYIM: What about your exhibits? Do we have to admit them?

MR. DEBRINE: Yes. We move for the admission of Exhibits 16 through 28.

EXAMINER EZEANYIM: Any objection?

MR. FELDEWERT: No objection.

EXAMINER EZEANYIM: Exhibits 16 through 28

will be admitted.

[Exhibits 16 through 28 admitted.]

EXAMINER EZEANYIM: Mr. Feldewert, it's up to you now.

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Beebe?

A. Yes, sir.

EXAMINER BROOKS: Could we take a break or a recess?

[Recess taken from 2:50 to 3:03 p.m.]

EXAMINER EZEANYIM: Let's go back onto the record and continue with the testimony of Mr. Beebe.

Mr. Feldewert?

MR. FELDEWERT: Thank you.

Q. (By Mr. Feldewert) Mr. Beebe, I was looking at your interference study. In particular, I was first focussing on Slide 27.

Let me ask you first: I mean isn't this study kind of secondary to what we're looking at here? I mean ultimately what we're looking at here, in this hearing, is the estimated ultimate recovery from a particular acreage area. I mean that's what we're trying to get to; is it not?

A. Well, we haven't drilled very many wells in this

subject area to know what that is, so it won't be as hard to determine what that is. That's why the offsets are important.

Q. So Reliant has not drilled very many wells in this subject area yet?

A. Nobody has the density is low.

Q. Okay, and I want to get to that point. Let's keep that aside for a moment.

But you're saying because you feel that there's not been any development in the subject area, you go to interference.

But you agree with me that it would be nice to have production data, production profiles, correct?

A. Yes.

Q. That we could then use to ascertain an EUR for the acreage and submit an ultimate recovery, correct?

A. Correct.

Q. And then use a certain recovery factor to ascertain what the appropriate acreage should be associated with that production profile?

A. That's right.

Q. Now you used, in your analysis, a recovery factor of 65 percent?

A. I did.

Q. Now, you're aware that there are a number of

studies out there that suggest that the recovery factor that should be used and analyzed is anywhere from 70 to 90 percent, depending upon your reservoir type?

A. Correct.

Q. Now with that in mind, I just want to talk briefly about your interference study. First off, the wells you have here on Slide 27, as I understand it, are located roughly -- and I'm going to go off the square here. It seems to correspond with this, okay?

A. Okay.

Q. Roughly right in here, correct?

A. That's right.

Q. And you're aware, are you not, that this blue area is permanently spaced on 160-acre spacing?

A. I wasn't aware of that, but that's okay.

Q. That was part of the product of the AmeriGas acreage, and it's part of the spacing under the 7556 order?

A. Okay.

Q. And it's permanent spacing there. So were you aware of that?

A. I was not.

Q. Okay. Are you also aware that the pink areas here on Oxy Exhibit Number 2 identify areas where Hess, in the last two years, has sought to change the spacing

for the West Bravo Dome, the temporary spacing, from 640 down to 160-acre spacing?

A. Okay.

Q. And they have received administrative orders approving 160-acre spacing for these areas in pink. Were you aware of that?

A. I was not.

Q. Okay. And if I look at your interference study here, of this area that's on 160, according to your study that met your criteria, two of the three wells you looked at showed no interference, despite the fact that they had wells in close proximity of each other?

A. Two out of three, that's correct.

Q. And if I then go to -- and that's just that particular area. If I go to your Slide 24, you haven't talked about it. But in your study down in the West Bravo Dome area, so here, which corresponds to here, okay, your wells that met your criteria, of the seven wells you analyzed, six of them showed no interference?

A. That's correct.

Q. Even though they had wells within close proximity to each other, correct?

A. Correct.

Q. And in your study here of interference, while you did look at West Bravo Dome, didn't you have some

qualifying wells up here in the north area?

A. I did not.

Q. You didn't? Because I thought that the earlier witness for Reliant testified that on Sections 14, 12, 6, 8, 16 and 10, they had wells within close proximity.

A. The data from public records did not allow -- did not have the history for those wells.

Q. So you didn't look at those?

A. They didn't come up under my screening criteria.

Q. And Reliant didn't give you the information to ascertain whether -- for example, was there any interference in the two wells they drilled Section 14 or in Section 12?

A. There was not.

Q. I want you to look at your Slide Number 21.

A. (Witness complies.)

Q. Would you agree with me, Mr. Beebe, that the pressure area that is -- that would incorporate the subject area looks like it's Pressure Area C?

A. It could be B. I'm not real sure, but that's the general, B and C. C probably would work, but...

Q. Or it could would be B?

A. It could be B.

Q. So it could be B and C?

A. Right.

Q. All right. And as I understand the analysis that you are presenting here, what you're showing is that as you move from the eastern area of the Bravo Dome, Area G, over towards the western area, which ultimately ends in your Area A, that you're seeing higher pressures?

A. That's what the data says.

Q. That's what the data says?

A. Right.

Q. You don't disagree with that data, do you?

A. No.

Q. And would you agree with me that pressures can be a factor of permeability?

A. No.

Q. You don't?

A. No.

Q. Were you aware that Cities Service witnesses testified in the 1984 and '87 hearings that permeability would be -- pressures would be a factor of permeability?

A. Well, performance would be a factor. The performance of the well could, depending on the pressure. But permeability is a measure of fluid flow through rock, through a porous medium. So that's not -- it's independent of pressure.

Q. All right. But wouldn't -- if you had similar permeability throughout this area, wouldn't you see the

same pressures?

A. No.

Q. You would not?

A. Part of that region, those pressure regions, were identified by Broadhead. There were believed to be maybe some fractures. Faults come into play there to help generate the regions, but I just went with the data that was established.

Q. Would you agree that pressure variations can indicate a discontinuity in a reservoir?

A. Yes.

Q. You would agree with that?

A. Yes.

Q. But you wouldn't agree that if you had constant permeability throughout the area, you wouldn't see any pressure differences?

A. Unless there are other geologic reasons. But permeability being the same all by itself is not a reason for pressure differences.

Q. But it could be?

A. No.

Q. You don't think so?

A. No.

Q. Okay.

MR. FELDEWERT: Let me have you look at one

of the transcripts from the '87 hearing.

Can I approach?

EXAMINER EZEANYIM: Yes.

MR. DEBRINE: Mr. Examiner, we would object to the use of the transcript under the Division's rules.

If they want to use a transcript of a prior proceeding, they have to notify us in advance and designate the portions of the transcript they wish to use in the proceeding. That hasn't been done in this case.

MR. FELDEWERT: Well, I wasn't aware that the witness was going to refer tp the testimony of the Cities Service witness back in 1987.

MR. DEBRINE: And I don't think it's a proper ground for impeachment to use the testimony of another witness in another proceeding to impeach this witness, his testimony.

EXAMINER BROOKS: What rule are you referring to, Mr. DeBrine?

MR. DEBRINE: I don't have the cite, Mr. Examiner. But I believe, under the Division's rules, if you're going to rely on transcripts from prior proceedings, it's designated in advance.

EXAMINER BROOKS: Well, the reason I asked

you that is because I'm not aware of what rule that would be. It's quite possible there's a rule I'm not aware of because as I have become aware of rules, I forget about them. I've become reminded of them when they come up in hearings, but I'm not aware of that rule.

So you know, if you can't cite it or find it for me, I'm going to have to overrule it.

MR. DEBRINE: It may be -- I'm not sure if it applies to Division hearings. I know it came up in the Pit Rule hearings, where there were attempts by some of the environmental groups to rely upon the testimony from the original Pit Rule case. And there was controversy and objections made as to what --

EXAMINER BROOKS: You're talking about the Pit Rule case in the last year?

MR. DEBRINE: Yes.

EXAMINER BROOKS: Of course, I wasn't present there. But I think that there was a ruling by the Commission early in the proceeding that they would not consider the transcript.

And I don't think it's a matter of a rule. Because in the previous Pit Rule hearing that was conducted in 2007 and 2008 that I -- well, there have been so many Pit Rule proceedings it's hard to remember,

and it's hard to designate which one.

The ones that resulted in the 2009 amendment, the transcript of the previous proceeding that resulted in the 2008 rule was incorporated by reference.

I do not believe that was covered in the Commission ruling. If it was, I'm not aware of it, so I'm going to overrule the objection.

Q. (By Mr. Feldewert) Mr. Beebe, when this hearing occurred in 1987, the Cities Service, first off, did you look at any of the record from 1987?

A. I reviewed some to have an overview of it to say in detail -- I know the gist of some of the cases, but --

Q. You didn't look at the transcript to see --

A. One of the transcripts I did. And I think it was this 8352, but it's been a while.

Q. So as part of your analysis, you did glance, you said, at the 1987 hearing?

A. I read some of the examination of some of the individuals.

Q. Do you recall that the Cities Service witness testified at that time -- she agreed that if permeability was indeed constant throughout the area, that the pressure would be pretty much the same throughout the area?

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MR. DEBRINE: And again, I would object. It's improper impeachment of a witness to impeach through testimony of a completely different witness.

EXAMINER BROOKS: Well, I don't believe this really is impeachment. This is simply asking the witness about some possible prior testimony, so I will overrule the objection.

THE WITNESS: Will you restate the question?

MR. FELDEWERT: Will you read the question back?

That's all right. Let me try again.

Q. (By Mr. Feldewert) Mr. Beebe, do you recall, in your review of the transcript, that Mr. Kaplan, who was an examiner that year, asked a witness for Cities Service whether she would expect that if the permeability was consistent throughout the area, that the pressure would be pretty much the same?

A. I don't recall reading that in the transcript. But I would agree with the statement that the pressure, if it's the same perm, has the potential to be the same in that area.

Q. Okay. So you would agree then that if we see pressure differences as we see in Exhibit Number 21, that that could indicate a discontinuity in the

permeability as you move across the area?

A. Well, if permeability is different, it's not a function of pressure. There's something else.

Q. I'm not sure that you answered my question.

A. Could you restate it? I'm not understanding what you are asking.

Q. Would you agree that if the permeability was consistent throughout the area, that the pressure would be pretty much the same across the area?

A. I would agree that's a true statement. However, if the permeability is different, you can still have the same pressure in that same area.

Q. Okay. That's all I was trying to get to.

A. Okay.

Q. Then I want to ask you about your actual drainage analysis that you did on Slide 18.

First of all, Mr. Beebe, Reliant testified they held their leases in this subject area for over eight years. But as you pointed out, they didn't provide you any production data because they haven't done anything in the area and have left it to Oxy to develop the production data for this subject area.

Were you aware -- or are you aware that there are currently 18 producing wells in this subject area?

A. I had counted 33 wellbores. I think that's what

I had, 33 or 35. And I showed there were 19 that I did a drainage radius calculation on.

Q. Nineteen?

A. Yes.

Q. So you actually did a drainage radius calculation on all 19 producing wells in the subject area?

A. Yes, I did.

Q. But you only presented 2 of the 19 that you analyzed?

A. And my three examples were all within an area that -- two of them were in the subject area, and then one was outside.

Q. That's right. So you had 19 data sources showing the production profiles for the subject area, and you've only presented two of them here today, correct?

A. Correct.

Q. And would you agree with me that the well that you chose to present here on Slide 18 is a well whose production profile is completely inconsistent with the remaining wells that we see in the subject area?

A. It's definitely one of the better wells, if not the best.

Q. Isn't it an anomaly?

A. It's the best well in the area. It's still -- I don't know if I'd call it an anomaly or not.

Q. Let me ask you something. If you had a well -- if you had 19 wells in the subject area, and the average of 17 of those wells was 200 -- let's do it this way.

Pull up my notebook, and turn to what's been marked as Oxy Exhibit Number 8, and turn to Slide 18.

A. (Witness complies.)

Q. Now, the well that you presented here on this Slide 18, it's the well that's shown on the blue line there on what has been marked as Oxy Exhibit Number 8, Slide 18?

A. The blue line? Okay.

Q. It says the well in Section 27, 19 North, Range 30 East --

EXAMINER EZEANYIM: Where are we reading, Mr. Feldewert? Where are we?

MR. FELDEWERT: I'm sorry?

EXAMINER EZEANYIM: Where are we?

MR. FELDEWERT: I'm on Slide Number 18 of Oxy Number 8.

EXAMINER EZEANYIM: Slide 18?

MR. FELDEWERT: Eighteen. I'm sorry.

Q. (By Mr. Feldewert) The well you presented here on your Slide 18, let's just call it -- on your Slide 18, the well that you presented is the same well as the production profile that's shown on Slide 18 and Oxy's

Exhibit Number 8 as the blue line; is it not?

A. That looks correct.

Q. Okay. And that blue line shows an average production that is almost seven times the production that you see from the wells in the subject area?

A. Right.

Q. Is that correct?

A. That's correct, yes.

Q. Okay. Now in your analysis of the wells -- now, you did an analysis at some point of over 600 wells in the entire Bravo Dome field, correct?

A. That's correct.

Q. How did the production from this well relate to the other wells that you looked at throughout the entire Bravo Dome area?

A. How this one well, 271, relates -- I mean obviously today, it's better than average. The average, as I said, was 549 Mcf per day per well. So this is definitely a well that's performing at a better rate.

Q. Isn't this one of the three best wells in the entire Bravo Dome unit area?

A. I didn't go look to see what the pecking order was, as far as the highest, the lowest. I know there were some wells that were making more than 2 million a day gas, and it was more than just a couple.

Q. But for the subject area, rather than using all the datapoints you had, you just chose the well that had the greatest production in that particular area?

A. I chose a large, medium and small drainage radius as the example?

Q. You said you chose the small one?

A. Well, the small one was just on the edge of the subject area.

Q. Okay. Let's just focus on the subject acreage here in yellow.

A. Okay.

Q. You had 19 datapoints that you did a study on?

A. Correct.

Q. You chose the well with the highest production to present to this Division here today, correct?

A. Correct.

Q. Okay. And you chose one other well of those 19 wells, and that's shown on Slide 19; is that right?

A. Yes.

Q. And the other 17 you just put aside?

A. Correct.

Q. Now, as an expert who is presenting an opinion to the Division here, would you base an analysis of the proper drainage area for the entire subject area solely on the data from 2 of 17 wells?

A. Of course not. That's why you saw the drainage radius map on the prior slide, because there were 7 out of 19 wells that we were able to calculate had greater than a 160-acre drainage area.

Q. So in other words, you would agree that the better analysis is to get the drainage profiles from all the datapoints we have in there and then make a decision?

A. I agree.

EXAMINER EZEANYIM: Before you continue, let me make this clear here. There is Reliant, page 18. Is that the same one, Number 271, on your page 18? Is that the same well?

MR. FELDEWERT: Well Number 271 on their Slide 18.

EXAMINER EZEANYIM: It's not that Exhibit Number 8, right?

MR. FELDEWERT: On our Exhibit Number 8, Slide 18.

EXAMINER EZEANYIM: On Slide 18 for Reliant -- I mean Exhibit Number 8 for Reliant is the same well? I just want to see what happened there.

MR. FELDEWERT: We're going to get to that.

EXAMINER EZEANYIM: I know. But they are the same well?

MR. FELDEWERT: Yes.

EXAMINER EZEANYIM: Okay. 271?

MR. FELDEWERT: Yes.

EXAMINER EZEANYIM: Slide 18 is 271 for you?

MR. FELDEWERT: Yes.

MR. GIUSSANI: Physically located is this well, right here. Excuse me. If you want to look at it, physically the --

EXAMINER EZEANYIM: What did you say?

MR. GIUSSANI: Physically, the well is located right there.

EXAMINER EZEANYIM: But the number is 271.

MR. GIUSSANI: That's Section 27, Well Number 11930.

EXAMINER EZEANYIM: This is important to me. I want to see the work you did and the work he did to see how they compare.

MR. FELDEWERT: I agree. So my note is, Mr. Ezeanyim, if you look at our Slide 18, the well he presented is the blue line on our Slide 18. Okay?

EXAMINER EZEANYIM: Okay.

Q. (By Mr. Feldewert) And in all of your analyses of your -- well, in the drainage areas that you calculated for two of the 19 wells in the subject area,

your analysis was premised upon an ultimate recovery factor of 65 percent?

A. Correct.

Q. And it was premised upon a timeline of 29 years, if I'm understanding this correctly?

A. Well, this well had production starting in 1985 on the Example 1 well, the 271 well.

Q. But you took the production out to 2029?

A. 2113. I just added 100 years from today's date and allowed it to decline.

Q. Do you know what the projected life of the field is?

A. No. That would be internal Oxy.

Q. And you don't have any data on that?

A. No.

MR. FELDEWERT: That's all the questions I have.

EXAMINER EZEANYIM: Thank you. Any redirect?

MR. DEBRINE: Just one question.

REDIRECT EXAMINATION

BY MR. DEBRINE:

Q. If you look at your Exhibit 17, Mr. Beebe, does it show that you actually calculated the drainage radius for all the wells in the subject area and depicted them

on your map?

A. I did.

Q. So you weren't trying to cherry pick or hide anything?

A. I was not.

Q. What was your intent in calling out the three examples that you presented?

A. Really, I just wanted to show a large acre drainage radius, which obviously was that Well 271, kind of a medium, which I was calling a 640, and then a small one. So I was just showing the inputs so somebody could follow how I did the calculations.

Q. And of the 19 wells within the subject area, how many of them had drainage areas greater than 160 acres?

A. Seven wells.

MR. DEBRINE: No further questions.

EXAMINER EZEANYIM: Very good. Anything further?

MR. FELDEWERT: No.

EXAMINER EZEANYIM: Anything?

EXAMINER BROOKS: No.

EXAMINER EZEANYIM: Let me start with wells on the cross-exam.

Mr. Beebe, is there any reason why you did not present data from those -- I mean more data from those

19 wells in the subject area? Is there any reason why you didn't do that? Why did you use only two out of those 19?

THE WITNESS: Well, those were just intended to be examples to show you through the calculation. I still have all the same recovery factors, the same SWi.

EXAMINER EZEANYIM: Okay. Now, this is what you have. I don't know what Oxy is going to do here. You don't know that Oxy knows that there are 19 wells in the subject area?

MR. FELDEWERT: What's that?

EXAMINER EZEANYIM: Do you know there are 19 wells in the subject area?

MR. FELDEWERT: Yeah. We're going to present data on all those wells.

EXAMINER EZEANYIM: Okay. So what I want to do -- if you don't have data, I want to see at least half of the wells, say 12 of the wells, and calculate the drainage area. Because that's my problem --

MR. FELDEWERT: We're going to give you the hard data that you've been looking for.

EXAMINER EZEANYIM: I know you are going to do that. But before we do that, also tell me what you are doing. What I will need from both parties is to

give me data from that subject area: We have 19 wells which have been producing. We can use them to calculate the drainage area, you know, for that subject area, which is not even outside.

MR. FELDEWERT: We have that. That's what Mr. Giussani is going to do.

EXAMINER EZEANYIM: Okay. Very good.

And if you have that, I will require that Reliant, who is right here, Mr. Beebe, to give me more calculations from those 19 wells. However, I don't want to say, "Do the whole 19." Whatever you need to do to give me at least more calculations showing the drainage area, if you have the data to do it.

If you don't have the data to do it, I won't force you to do magic. But if you could -- you know, I don't want you to do magic. But if you could do that, I mean I would appreciate it because I want to look at the data to see what we're going to do.

I don't want to hear, "Oh, we don't have enough data." But those 19 wells have been producing at least for two, three or four years. We can do something here by calculating those drainage radiuses and see which way to go.

MR. FELDEWERT: I have that information.

EXAMINER EZEANYIM: We are here to find the

technical truth. So by calculating the drainage area using the 19 -- if I had 20, I would calculate all of them. Here you go. All of them is -- you know, at least for 1 percent of them. If you had 160, or if you did that, you know, if you used two examples, well, I don't know what would happen with the other 17.

THE WITNESS: I did do the calculation for all 19 wells.

EXAMINER EZEANYIM: Okay. So you have that data?

THE WITNESS: I have the data, yes. I just showed examples of two of them.

EXAMINER EZEANYIM: Okay, I will make sure we get those. With your permission, opposing counsel, we are going to get those.

I hope you are not objecting to me getting those calculations from them, the calculations of the drainage areas of those 19 wells.

MR. FELDEWERT: You've put me in a very difficult position.

EXAMINER EZEANYIM: I don't want to do that.

MR. FELDEWERT: Mr. Ezeanyim, I am not in a position to say what you should and should not get. I only know what's being presented here at this hearing in

evidence with a witness. Okay?

The problem that I would see is they had their opportunity to present the data. They had notice in advance of this hearing of what this hearing was all about. Okay? They chose to present their case as they chose to present it, and they chose to present the data that they chose to present. We're going to present the data that we have available for you. Okay?

In my mind, that is what you have to consider in your analysis, because that's the evidence that has been presented in a format that was subject to cross-examination. That would be my opinion.

Now, I'm not the counsel for the Division, but that would be my opinion.

EXAMINER EZEANYIM: Help me here. Here is what I want: I want you to give me all -- because I don't know what you are saying.

For me to do this, I will need that information, if it's possible. I don't know. We don't have it here, but they agreed to present it. Please help me here. Am I wrong in requesting that information? Because it's very important to me.

EXAMINER BROOKS: I think administrative law is rather different from judicial proceedings. Mr. Feldewert is quite correct about the way courts

proceed. Each party gets to present what evidence they have.

The court is absolutely neutral, does not ask for more evidence, does not question the evidence that's presented. The court just analyzes what's presented and makes a decision.

EXAMINER EZEANYIM: I'm not a court.

EXAMINER BROOKS: Well, that's the point. Administrative law doesn't work that way.

I think it's appropriate. At least it's certainly very frequently done by administrative agencies. And I've never heard a court decision that said they could not do it, that the administrative agency -- that the agency request additional information be submitted, as long as it is submitted to the agency and to the opposing parties simultaneously, and the opposing party is given a chance to respond to it and, if they feel necessary, move to reopen the proceedings in order to properly respond.

Well, of course, we always hope that would not happen because that delays a decision. But I think, in the context of administrative as opposed to judicial proceedings, that's an appropriate procedure.

EXAMINER EZEANYIM: Don't blame me. I should have done engineering and law, but I didn't do

law. I'm not a lawyer. So don't kill me because I'm requesting --

MR. FELDEWERT: I am not at all. I'm not at all, and I'm not going to disagree.

EXAMINER EZEANYIM: Because my job is to make a recommendation here, and I want to do that. Like I told you, we are not a civil court or, you know, a criminal court. We are an administrative hearing. And when we collect the technical truth, that's all we're asking for. And that's why I requested that.

If I'm wrong, I think we can straighten it out. We can ask for that. Otherwise, I will make a recommendation in a vacuum.

Of course, you know what you just said. If you agree that we get that information, we give it to you. I have an opportunity to either reopen or whatever we need to do. I don't know. Believe me, I don't know what we need to do.

MR. DEBRINE: Mr. Examiner, if I could comment?

I believe that it's within your discretion. And if I'm remembering correctly, we did do something similar to that when we were dealing with the Yeso pool cases last year that were filed by COG. And then we submitted additional evidence for you to consider that

was outside of the context of the actual hearing.

So I think the Division's practice would be consistent with -- it wouldn't be unprecedented to make that request. We're happy to give you the information that you're asking for. And we only found out at the outset of this proceeding that the burden of persuasion, at least the initial burden, was placed on us. And we would like to have the opportunity to present that evidence to satisfy your curiosity.

EXAMINER BROOKS: Well, of course, just to make the record straight, what I meant in that ruling was I said the burden of going forward with the evidence was probably seeking a larger radius, and I didn't make any ruling beyond that.

But I agree that the appropriate procedure is you submit the additional evidence, submit it to the other parties simultaneously. And by the time you submit it, the parties will have had the opportunity to respond to it.

Now, what we got into in the Concho case that you mentioned, we might have to do the same thing, if it gets to that point, is at some point, we have to say, "Okay, everybody responds by a certain date, and we won't consider anything filed after that date." And that's just a matter of practical administration.

Let's proceed.

EXAMINER EZEANYIM: Okay. With your permission, we might make a request for that. And then, of course, you'll get the copies, you know.

MR. FELDEWERT: I understand.

EXAMINER EZEANYIM: So in doing that, you give us your own today. You don't have to do that. You have the opportunity to reopen the case or something.

We don't want to upset everybody. You know, we are just trying to collect information to make a recommendation.

MR. FELDEWERT: I understand.

EXAMINER EZEANYIM: So I'm glad I have you here. Because otherwise, you know -- I mean don't blame me. I'm not an attorney. I don't claim to be one.

MR. FELDEWERT: I think we can get our case done here before the end of the day.

EXAMINER EZEANYIM: Oh, sure, even if we stay here until 12:00 midnight. I have a lot of things to do tomorrow, so we need to do that.

EXAMINER BROOKS: You're examining the witness. Is that what's happening?

EXAMINER EZEANYIM: No. I don't know -- where are we?

EXAMINER BROOKS: I believe you were

examining the witness, Mr. Ezeanyim.

EXAMINER EZEANYIM: Yeah, I was doing that before you stood there. I thought you were the person cross-examining.

MR. FELDEWERT: No. I was finished. I was very short.

EXAMINER BROOKS: You asked Mr. Feldewert if he had any objection to your requesting the witnesses to provide additional data, and he did.

Now we've ruled on it, and let's go ahead with your examination.

EXAMINER EZEANYIM: Very good. Based on the question that we are crossing on, that were in the cross. And I think I have gotten my answer about the 19 wells.

Those 19 wells are critical to this point. And I think for now, that's all I have. I'm going to look at these two wells that are the same well. And then if everybody agrees, we get the generic calculation for all the 19 wells and we take a look. Everybody will tell me what their assumptions were, and then we can do something here.

I thought we don't have data. We have data, so let's go ahead and you can finish it. I don't have anything with you. I think we are done with that.

Mr. DeBrine, do you have any comment?

MR. DEBRINE: No.

EXAMINER EZEANYIM: Okay. Good. If you'll step down, then we'll go to Mr. Feldewert?

MR. FELDEWERT: Yes.

EXAMINER EZEANYIM: How many witnesses do you have?

MR. FELDEWERT: I have one, Mr. Giussani, who might take maybe an hour, at the most. And then I have a very short land witness, just to verify the issues associated with --

EXAMINER EZEANYIM: You want to go with --

MR. FELDEWERT: So let's go with Mr. Giussani, since we're right in the middle of --

EXAMINER EZEANYIM: For engineering?

MR. FELDEWERT: Yes.

EXAMINER EZEANYIM: That's very smart.

EXAMINER BROOKS: Well, I don't understand engineering, so I'm going to go and get myself some more coffee.

EXAMINER EZEANYIM: Let's take five minutes.

[Recess taken from 3:40 to 3:48 p.m.]

EXAMINER EZEANYIM: Let's go back on the record and continue with Oxy's testimony and witnesses.

Mr. Feldewert?

MR. FELDEWERT: We'll call Mr. Albert Giussani. And I believe you've already been sworn, correct?

THE WITNESS: Yes, sir.

ALBERTO GIUSSANI

having been first duly sworn under oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Would you please state your full name, by whom you are employed, and in what capacity?

A. My name is Alberto Giussani. I'm employed by Oxy USA. My title is Engineering Advisor Senior.

Q. How long have you been with Oxy?

A. I started working with Oxy in the year 2000, when Oxy bought the Arauca province.

Q. And was that the time that Oxy acquired the Bravo Dome unit?

A. Yes.

Q. And how long have you been involved in the Bravo Dome unit itself?

A. I started working Bravo Dome in October 2003.

Q. 2003?

A. Yes, sir.

Q. So 10 years ago?

A. Pretty much so.

Q. Have you previously testified before this Division or the Commission?

A. No, sir.

Q. Would you give us a summary of your educational background, please?

A. I graduated from Purdue University in 1979, with a Bachelor's in Chemical Engineering. I then went to Colorado School of Mines, where I received a Master's in Science in Chemical Engineering. And then I graduated from the University of Houston in 1985 with a Master's in Engineering and Petroleum Engineering.

Q. And what has been your work history since you graduated from the University of Houston with a Master's?

A. Basically, I've worked for several oil companies. My main area of responsibility was reservoir work and production work, going from evaluating prospects for drilling, managing large waterfloods, large CO2 infill programs. Then I did a stint in property acquisitions.

And then about the year 2003, I moved as a resident engineer, for lack of a better word, for Bravo Dome and Sheep Mountain, which is our other CO2 source.

Q. Are you a member of any professional associations or organizations?

A. I'm a member of the Society of Petroleum Engineers and the American Institute of Chemical Engineers.

Q. And how long have you been a member of those societies?

A. I think I just got, a couple of years ago, my 25-year card for SPE. And I joined the American Institute of Chemical Engineering when I was a senior in college, so a long time.

Q. Do you also teach on occasion?

A. Yes, one of the things I like to do. I teach over at Texas Tech. I've taught one class every year since 2006.

Q. And what class do you teach?

A. The class is in two pieces. The first portion of the class is basically teaching the students how to do a property valuation. And the second half of the class is to basically give them, one, an individual project. And the second one is a team project, in which they evaluate a property, come up with the value and a big price.

Q. And are you talking about petroleum properties?

A. Yes, sir.

Q. Do you assist them in coming up with reserve

estimates, things like that?

A. Reserve estimates, production functions, capital estimates. You know, all the pieces you need to do an economic evaluation.

Q. And how long have you done that type of teaching at Texas Tech University?

A. I started in 2006.

Q. And do you do a spring class or a fall class, or how does that work?

A. So far, it's been spring classes. But the curriculum has been changed. So starting in the fall of 2013, it will be a fall class.

Q. What have been your primary responsibilities at the Bravo Dome for the last 10 years?

A. Well, the first thing I did when we joined the Bravo Dome property was we spent a couple of years looking at the property. The property was kind of at a point where we had developed a lot of the real estate, and we felt pretty comfortable.

So the first thing we did was we did a review in-depth of the whole field. And then after that, we started drilling what we call development programs for two purposes. One was to look at recovery efficiencies, and the second one was to expand the limits of the production area.

We started in -- actually, the program started in 2002. I inherited it in 2003, and we've been drilling wells at Bravo Dome every year until 2007. In 2007, we implemented a great expansion to the west, which over two years, we drilled over 100 wells. And then we took a break until 2011, when we drilled 48 wells.

Q. Now, were you involved in the production and reservoir engineering associated with the Bravo Dome development?

A. Yes, I was part of a team. And my responsibility was working with a geologist/petrophysicist in assisting the drilling engineers to develop the wells.

So we picked the wells, drilled them. I was responsible for the completion and any feedback analysis on their performance.

Q. As a result of those responsibilities, did you have to become somewhat familiar with the geology associated with the Bravo Dome unit?

A. Yes. At least in my mind, if you are a reservoir engineer, you've got to have some understanding of the geology. The two go hand in hand.

Q. Are you familiar with Oxy's application in this case?

A. Yes, sir.

Q. And have you conducted a study of the area that is the subject of this application?

A. That I have.

MR. FELDEWERT: I would tender Mr. Giussani as an expert witness in petroleum production and reservoir engineering.

EXAMINER EZEANYIM: Do you have any objection?

MR. DEBRINE: No, as long as his opinions don't embrace geological opinions, because he hasn't been qualified as a geologist.

EXAMINER EZEANYIM: Mr. Feldewert?

MR. FELDEWERT: I guess we'll reach that when we get to it. But I think he testified that as part of his work over the last 10 years, he had to analyze and understand geology to do his work specific to this area.

EXAMINER EZEANYIM: Okay. Good. Mr. Giussani -- did I say that right?

THE WITNESS: Yes, sir. Very good.

EXAMINER EZEANYIM: Where do you live?

THE WITNESS: Levelland, Texas. It's just west of Lubbock, 30 miles west of Lubbock.

EXAMINER EZEANYIM: That's where I'm coming from. So because of that, you teach in the evenings?

THE WITNESS: That's correct.

EXAMINER EZEANYIM: Because you work for OXY, right, in Levelland?

THE WITNESS: Yes.

EXAMINER EZEANYIM: Then in the evenings, you go to Texas Tech to teach, right?

THE WITNESS: Correct.

EXAMINER EZEANYIM: So you work and teach?

THE WITNESS: Yes. I teach Mondays and Thursdays.

EXAMINER EZEANYIM: Okay. You have a ChE in chemical engineering?

THE WITNESS: No, I don't have a PhD. I have a Master's.

EXAMINER EZEANYIM: I said C. C, as in chemical. You have a Master's in chemical, right?

THE WITNESS: And a Master's in petroleum.

EXAMINER EZEANYIM: Why?

THE WITNESS: I like to learn. I think learning is important.

EXAMINER EZEANYIM: Well, you know, it's a good thing.

THE WITNESS: Yes.

EXAMINER EZEANYIM: You know, I did the same thing, but I didn't know why. That's why I wanted

to ask you.

THE WITNESS: Well, I came out of Colorado School of Mines. My area of expertise was natural gas hydrates. I worked for a small consulting firm, and I was their leading investigator in natural gas hydrates.

At that time, it was the early '80s. People were thinking natural gas hydrate as a source of energy, right, not just a nuisance. The more I worked in that area, the more I got into petroleum engineering.

EXAMINER EZEANYIM: You must have loved it in that area. Because in the '80s, that's when the oil price --

THE WITNESS: That's correct. Nowadays, most kids get five, six, seven job offers. I got one, and I was very happy to get that.

EXAMINER EZEANYIM: Okay. Mr. Giussani is so qualified.

Q. (By Mr. Feldewert) Mr. Giussani, I'm going to try to short circuit what we were originally going to run through, but I need to do a couple of pieces of homework here.

Would you look at what's been marked as Oxy Exhibit Number 1 in our notebook?

A. Sure.

Q. Is this an accurate map, kind of a location map

of the Bravo Dome --

A. That is correct. Bravo Dome is in the northeast corner of the state of New Mexico.

Q. Okay. Now, there are two lines that are depicted on here. Are those CO2 transmission pipelines?

A. That is correct. The one coming out of the white sort of box, which represents Bravo Dome, is the Bravo Dome pipeline. It goes from there all the way down to Levelland, Texas, and eventually to Denver City.

And the other one just to their left, it would be the Sheep Mountain pipeline that starts at Sheep Mountain, arrives at Bravo Dome, and then continues on down to Seminole, through Denver City.

Q. The acreage shown in white on this map extends across three different counties?

A. That is correct.

Q. Approximately how many acres are associated with the Bravo Dome Carbon Dioxide Gas Unit operated by Oxy?

A. Give or take, that figure is about 920,000 acres.

Q. So almost a million acres?

A. Almost a million acres.

Q. If we turn to what's been marked as Oxy Exhibit Number 2, is this an accurate map of the current spacing in the portion of the Bravo Dome unit that is operated by Oxy?

A. That is correct. It shows the 640, the 160 areas, and then the overlapping West Bravo Dome Bravo/Dome area.

Q. And the area in blue, shown on the left-hand side, is spaced at 160-acre spacing?

A. That is correct.

Q. And the area in pink on the left-hand side of this exhibit is also spaced 160-acre spacing?

A. That's my understanding.

Q. And this particular area of the map, Oxy Exhibit Number 2, is currently all operated by Hess?

A. That is correct. Everything, I would say, to the left of the orange line is operated by Hess.

Q. Okay. Then everything to the right of the orange line is operated by Oxy?

A. That is correct.

Q. That is within the Bravo Dome Carbon Dioxide Gas Unit?

A. Yes, sir.

Q. And then there is certain acreage within this area, as we've seen on the map, that is not committed to the area?

A. That is correct.

Q. Because this is a voluntary unit?

A. That's my understanding.

Q. And some of that acreage is held by the Libbys, and has been assigned to Reliant?

A. Yes.

Q. Okay. Now --

EXAMINER EZEANYIM: Excuse me.

MR. FELDEWERT: Yes?

EXAMINER EZEANYIM: On that map, the yellow -- do you see that yellow there?

MR. FELDEWERT: Yes.

EXAMINER EZEANYIM: Did it cross that solid line? Does that 640 cross the solid line in the subject area?

Can you point out the outline of this 640, the subject area, the subject area we are talking about today?

MR. FELDEWERT: The subject area we're talking about is the area in yellow.

EXAMINER EZEANYIM: Okay, yellow. Including the ones in the well?

MR. FELDEWERT: No. Just the acreage in yellow, which is operated by Oxy. That's what's at issue here today.

EXAMINER EZEANYIM: Including this L?

MR. FELDEWERT: Yes. I'm sorry.

EXAMINER EZEANYIM: You point to that, but

that may include that. Okay.

Q. (By Mr. Feldewert) Are you familiar with the spacing history in the Bravo Dome area?

A. I've read and tried to get as much knowledge as I can.

Q. Was there CO2 production prior to the formation of the Bravo Dome unit back in the early 1980s?

A. Yes.

Q. And what was -- who was doing the CO2 production?

A. It would be CO2, then it was Ross Carbonics, and I'm trying to remember, AmeriGas. Those are the three companies I remember.

Q. And what spacing governed this historical production of carbon dioxide gas in the Bravo Dome unit?

A. 160 was the spacing to begin with.

Q. Is that under the statewide rules?

A. Yes, sir.

Q. In the early 1980s when the Bravo Dome unit was formed by Amoco, was it initially subject to 160-acre statewide rules?

A. That is correct. It was the original spacing.

Q. Okay. If we then turn to Oxy Exhibit Number 3, is this the order, Mr. Giussani, that created an exception to the standard 160-acre spacing for the eastern portion of the Bravo Dome unit?

A. Yes, sir.

Q. And have you examined the evidence that was presented by Amoco in support of the spacing that was eventually adopted for the eastern portion of the Bravo Dome unit?

A. That I have, sir.

Q. Did any of the data that Amoco presented in 1984 to support its request for an exception to the 160-acre spacing involve the western portion of the Bravo Dome, which is depicted on Exhibit 2 in the areas of green and yellow?

A. No. All the information that was really presented was on the eastern portion.

Q. So it would be to the right of this purple line?

A. That's correct.

Q. On Exhibit Number 2?

A. That's my understanding.

Q. All right. And if I look at this order and I turn to page 3, paragraphs 15 and 16, does that reflect what you just testified to?

A. Yes, sir. Fifteen and 16, they do.

Q. If I then turn to what's been marked as Oxy Exhibit -- so we were previously on page 3 of Oxy Exhibit Number 3?

A. Yes, sir.

Q. And we looked at paragraphs 15 and 16?
A. Correct.
Q. If we then turn to what's been marked as Oxy Exhibit Number 4 --
A. Yes, sir.
Q. -- is this the initial order that adopted temporary spacing for what was eventually called the West Bravo Dome carbon dioxide gas area?
A. Yes, sir.
Q. Okay. And even though the acreage in yellow is not included in the West Bravo Dome for some reason, it was included in this temporary spacing?
A. That's correct.
Q. Did you review the -- or let me back up, then.

If I look at this order, which has been marked as Oxy Exhibit Number 4, and I look at page 6 of that order, this order eventually adopted what they call, Special Rules and Regulations for the West Bravo Dome Carbon Dioxide Gas Area?

A. That's right.

EXAMINER EZEANYIM: Which one are you talking about?

MR. FELDEWERT: So it would be Oxy Exhibit Number 4, Order 7737. And I'm on page 6.

EXAMINER EZEANYIM: Okay.

Q. (By Mr. Feldewert) And if I look on that same page and I look at paragraph 3, it references in Exhibit B as the West Bravo Dome Carbon Dioxide Gas Area?

A. Yes, sir.

Q. And if I go over to Exhibit B, to that order, does the acreage that was included in Exhibit B to that order include not only the West Bravo Dome that was being put together, but also the acreage in yellow that is shown in Oxy Exhibit 2?

A. I believe that's the case.

Q. Did you review the record from this case, R7737? Did you review what Cities Service presented --

A. I reviewed the transcript, and I tried looking for all the attachments that were on the Website.

Q. Did City Service present any production or pressure data, testing data, from the area in yellow?

A. No, sir.

Q. Could you ascertain why the Commission included a portion of the Bravo Dome acreage in with the temporary spacing rules for the West Bravo Dome Carbon Dioxide Gas Area?

A. I guess my answer, in the vernacular, would be: That's a great mystery to me.

Q. But the end result is what we see here on the map?

A. That is correct.

Q. All right. Then if we looked at Oxy Exhibit Number 5, that reflects, does it not, that up until now, the Division has been waiting on production information from the subject area to ascertain whether the area should remain on temporary 640-acre spacing?

A. That is my understanding.

Q. And we've already been through paragraph 2 of that order on the second page, so I'll not do that.

You said Oxy took over operation of the Bravo Dome in 2000?

A. That is correct.

Q. At that time, was there any production from the subject area?

A. No, sir.

Q. Now, have you put together some slides to assist you in your presentation here today?

A. Yes, sir.

Q. And if I turn to what's been marked as Oxy Exhibit Number 8, does it contain those slides?

A. Yes, indeed.

Q. And are there a total of 20 slides in Oxy Exhibit Number 8?

A. That's what it shows.

Q. Let's turn to the first slide. I guess there is

some animation associated with this; is there not?

A. I want to explain it to you. For the folks that have a paper copy, this slide right here is in two slides, 2A and 2B.

Q. So we're going to look at Slides 2A and 2B. What does the initial portion here of Slide 2A show?

A. What I was trying to show here is the development of the Bravo Dome CO2 unit until 2006, which coincides with the expansion of the unit to the west.

What you see here in blue are the active wells in black, with some sort of a line across are the plugged and abandoned wells. And then in green are shut-in wells. The shut-in wells are wells that Amoco had drilled during the exploratory phase of the development.

They are so far away that we could not have a collection system to produce those wells.

Q. When did Oxy begin moving development towards with the western area of the Bravo Dome?

A. The drilling program started in May 2007.

Q. Okay. And when, then, did production begin from the area that's actually the subject of this hearing today?

A. The earliest it could have been was March 2009.

Q. Now, what does the rest of this slide show?

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A. The first kind of greenish-yellow color depicts the area on 160 acre. So what you see in this picture is everything that is in white within the unit is 640.

EXAMINER EZEANYIM: Are you still on 2A?

THE WITNESS: Yes, sir.

MR. FELDEWERT: Yes, sir.

EXAMINER EZEANYIM: Which portion are you talking about?

THE WITNESS: It's that 2A, and it's that box right there.

Q. (By Mr. Feldewert) And then your other animation brings in the --

EXAMINER EZEANYIM: That's not shown there.

THE WITNESS: It's just covered. What happened is you get an overlap. So the first thing you see in green color, solid green, is on the 160 area. And then everything else is this 640 area in Bravo Dome.

EXAMINER EZEANYIM: In the subject area -- subject unit? A unit is what we are talking about?

THE WITNESS: Yes. Everything we're talking about here is Bravo Dome, nothing with West Bravo Dome. It's just the Bravo Dome unit.

Q. (By Mr. Feldewert) And then we just brought in the area that was put in place for temporary spacing?

A. That's correct. The area in blue now is the area

that was brought in place during the West Bravo Dome unitization or unit work, and it overlaps Bravo Dome.

Q. And that would be the area in --

A. Light blue color.

Q. Okay. Is that where we are here today, or do I need to go one more in?

A. One more. It's basically just the title. Basically what you see now is all the development that has occurred since 2006 going to the west. And then in yellow, which matches the color of the large map on the tripod, is the area -- subject area in question for the hearing.

Q. So that gives us a picture of what -- overall, what we're looking at here?

A. That is correct. It also shows clearly what's 640, what's 160, what's overlap.

EXAMINER EZEANYIM: Do you have a pointer there?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: Can you use that pointer and demonstrate what you are talking about?

THE WITNESS: Everything that is white, like this, everything here, all of this is 640 spacing. That green area right here, the green area below, is 160. The area in light blue color that protrudes into

Bravo Dome is temporary 640.

EXAMINER EZEANYIM: That's why we are here today?

THE WITNESS: No. We are here for this area right here.

EXAMINER EZEANYIM: Yes. That's one on 640?

THE WITNESS: Yes. But we are not really -- you know, we don't have anything to do with this portion of the -- just this area that is in yellow. And that area in yellow matches the area in yellow you see right there.

Q. (By Mr. Feldewert) On Exhibit Number 2?

A. Exhibit Number 2. See, right here is this line right there. And this line going south, it's this line right here, and the line coming across is the line on the bottom. And this jagged line here is the boundary between West Bravo Dome, operated by Hess, and Bravo Dome operated by Oxy.

Q. Now, did the company notice differences as it moved from the Eastern Bravo Dome to the western part of the Bravo Dome area?

A. Yes, in the sense that the first thing we noticed in actually drilling the wells and completing the wells, prior to moving through this portion of the field, we

had never had to have an acid stage in front of our completion jobs.

When we started moving towards the west, we added that because the rock became a lot tougher to break down.

We also noticed increasing pressure, similar to what was shown before. Pressure around this area right here was maybe 400, 450 pounds. As we moved to the west, it was 500, 550. And we have seen some high 600s in this part of the field.

Q. So the nature of the reservoir was changing as you moved?

A. Yes. The other thing we noticed was significant fingering. And you know, we got concerned because of the presence of gas/water content.

Q. Given the size of this area, did it surprise you that the reservoir would change as you moved from the east to the west?

A. No, sir. I mean Bravo Dome is about, like we said, a million acres. So it's a huge property, and you would expect to see some differences in such a large area.

Q. I think in this slide here, Slide Number 4, is an area that's actually bigger than Rhode Island?

A. One of the generals that worked for us in the

geological is from that part of the county, and he realized that he was working in a field that was bigger than the state of Rhode Island. So it's a huge property.

Q. Have you analyzed the production data from Oxy's expansion efforts?

A. Yes, I have.

Q. Have you also analyzed available core data for the Bravo Dome area?

A. Our geological group has done that, and I'm familiar with the summaries.

Q. And what are you going to talk about here today?

A. I'm just going to give you a very brief introduction or just an overall idea of petrophysics and geology. And then I'm going to talk about performance and then make some conclusions.

Q. All right. Let's turn to what's been marked as Oxy's Exhibit Number 8, Slide 7. What is this showing us?

A. It's just a typed log. It's just to kind of get everybody --

EXAMINER EZEANYIM: Where are you?

MR. FELDEWERT: It should be Slide 7 in your book.

EXAMINER EZEANYIM: We are going backwards?

MR. FELDEWERT: No, no. Slide 7 is the Oxy Exhibit Number 8.

EXAMINER EZEANYIM: Oh, okay.

A. Basically, this is just a typed log for the unit. What we're trying to show is that the top of the unit is well defined by the Cimarron Anhydrite. The average is about 15 feet, as seen as 630 and as seen as 12.

Here is the Tubb formation. We usually identify three different portions: the upper Tubb, the middle Tubb and the lower Tubb. And then the bottom of the unit is basically defined by the granite.

So you really have two mechanical constraints at the top, the Cimarron Anhydrite, and at the granite. We use those in some cases for advantage in our completion work.

Q. (By Mr. Feldewert) Are there differences in the producing intervals within the Tubb formation?

A. Yes, sir.

Q. Let's go to the next slide, which is Slide Number 8 in the book.

A. The first, you know, maybe 20 or 30 feet are defined as the upper Tubb and really don't have a lot of volume. They don't store a lot of gas. They're pretty tight. Then we come to the work horse of the property,

which is the middle.

Basically, you can recognize this. You have some thicker beds, a good porosity. And then we slowly turn the rest down to the lower Tubb, where the pay quality becomes a little poorer. You don't have continuous sands. And then eventually we come into the granite and the granite basement.

MR. DEBRINE: And I'll repeat my objection about this witness giving any geological opinions. He hasn't done any geological study, and he doesn't have personal knowledge with respect to the geology out there in the area. He's just presenting information that's been developed by someone else. They should bring that witness to the hearing.

EXAMINER BROOKS: I thought he testified that he had done some geological studies, and he didn't claim to be a geologist. I will accept that as going to the weight of the evidence, not to the admissibility. So I'll overrule the objection.

Q. (By Mr. Feldewert) Did you see changes, Mr. Giussani, as they were moving from the eastern portion to the western portion, in terms of deposition and the permeability and the porosity between the middle and lower Tubb?

MR. DEBRINE: Same objection, and lack of

foundation.

EXAMINER BROOKS: Overruled.

Q. (By Mr. Feldewert) In other words, was it uniform across the Bravo Dome area?

A. No. From the results of the studies I saw, it's not.

Q. Does that surprise you, given the size of the unit?

A. Not really.

Q. Do the available core samples reflect the depositional differences as you move across this large unitized area?

A. They do.

Q. Then let's turn to what's Slide 9 from Oxy Exhibit Number 8.

A. (Witness complies.)

Q. Now, what does this slide reflect, Mr. Giussani?

A. In this unitized slide, what we're showing is a summary of the core data of all the core wells that we have. We chose to pick nine wells where the core interval is at least 85 percent of the Tubb interval. Then we're showing geographically where all these wells are located, and here is the area of the subject area.

Q. So unlike what we've seen before, the core analysis that you did here reflects an analysis of

samples that had greater than or 85 percent of the Tubb, correct?

MR. DEBRINE: And I'll object again for lack of foundation. There's been no testimony that he did the analysis or analyzed the core samples or did any studies. If all he's doing is presenting something that somebody else did, then we ought to have that witness and have the opportunity to cross-examine him.

EXAMINER BROOKS: Well, I'm going to overrule the objection. There's really no need for running objections in this proceeding. It's not going to be on the record. So we can save some time just by assuming that objections to this witness' qualifications will be overruled.

MR. DEBRINE: And my objections weren't to the qualifications. It's just to his lack of personal knowledge.

EXAMINER BROOKS: Well, same ruling.

Go ahead.

Q. (By Mr. Feldewert) Now, I think Mr. Raines testified that he used various core data, but that if he had had core data that showed at least 85 percent of the Tubb, that was your best data. Is that what you utilized here?

A. Yes, sir.

Q. And what does it show us then, in terms of permeability, as we move across the Bravo Dome unit?

A. The wells range from west to east on the table. The first column shows the estimate of actually how -- not an estimate, how many feet of the formation were cored.

The next column is: How many feet of the core were analyzed? That's the sparsification, which is an indication of the homogeneity of the rock. And then a calculated number, which is the average permeability for each of those cores.

And as you can see, moving from west to east, you're moving from the top down, and the core permeability is changing.

Q. In fact, it changes dramatically; does it not?

A. You would think so.

Q. It goes from less than 1 in the area to the west to 10 or 15 in the area to the east?

A. That's correct.

Q. Was there any mention of this core data in the transcripts that reflect what was presented in 1984 and in 1987 by Cities Service?

A. No. The only mention of a core well was in the West Bravo Dome. It was just one core well.

Q. They didn't have a core analysis?

A. They only stated the average permeability for that well.

Q. So is this hard data that you now have available that you utilized for your study in this area?

A. Yes, sir.

Q. Anything more about this slide?

A. No, sir.

Q. Now, if I go to the next slide, what does this show us, which is Slide Number 10?

A. Basically, it's again a summary of the nine wells' core data, and again from west to east. The first three wells are on the eastern portion of the field, the next two wells are in the central portion of the field, and the last four wells are on the west side.

Q. Did you reverse that?

A. This is on the west side; 21, 29 and 35 is on the west.

Q. Yes.

A. And then it's moving this way to the east.

Q. So it moves from west to east?

A. Yes.

Q. All right.

A. And what is posted here on the red line are those values. Average permeabilities were calculated in the

previous table, and then here is a breakdown of the distribution of pore-throat sizes for each of those cores.

Q. What does that mean? Does the matrix of the material change as you move from west to east?

A. It's a technique by which the people actually look at the direction of the size of the pore-throats, and that usually is tied to permeability.

Q. And where does this show if you compare the west area, which is under 160-acre spacing, versus the eastern area, which is on 640-acre?

A. The bottom portion is the tighter pore-throats, and the upper portion of the bar is the larger pore throats. And you will see that the larger pore-throats are increasing as a distribution as you move from the west to the east.

Q. And then your comparisons between the western part of the Bravo Dome, the central portion and the eastern portion are shown on the bottom?

A. That is correct.

Q. Now, based on this core data that you have available today, what conclusions do you draw?

A. I would say that, you know, the permeability is changing going from the east to the west. It's better in the east portion of the field, and it's not as good

in the west portion of the field.

Q. All right. Now, in addition to this core data that you had available to you to study the area, did you also look at some cross-sections?

A. Yes, sir.

Q. And if I turn to Slide Number 12 of Oxy Exhibit Number 8, does this contain the wells that comprise the cross-section that you have here today?

A. That's correct. There's a cross-section that comes across the field from the west side to the east side.

Q. And what wells were utilized for that? Are those the core data wells?

A. Those are some of the core data. You can see the core data wells posted. You can see the wells that were actually included in the cross-section.

Q. And you used the southernmost core data wells that you could find that corresponded to --

A. The closest possible to the subject area.

Q. Now, the next slide has, does it not, a cross-section itself of the wells?

A. That is correct. That is a cross-section from the west moving to the east.

Q. Now, is Oxy Exhibit Number 9 in the notebook a larger copy of that cross-section for the Examiner?

A. That is correct.

Q. Should we get that out and analyze that?

A. If he would like to see it, that's fine.

Q. So Oxy Exhibit Number 9, which we have out in front of us, corresponds to Slide Number 13 in Oxy Exhibit Number 8?

A. That's correct.

Q. All right. Using these two documents, can you explain to us what this cross-section -- first, how is this cross-section organized?

A. The cross-section is you've got your wells on the west side, on the left-hand side. And you're moving from west to east, so that you will have the east wells on the right-hand side of the cross-section.

Q. And what does this show us?

A. What I was trying to point out with this cross-section is, one, the thickness of the pay. You know, there's fairly large thickness over here, a couple hundred feet. It stays fairly constant as you come across the field. When you come --

Q. Let me stop you right there. Now you're pointing to the right side of the exhibit, dealing with the eastern portion of --

A. That is correct. This is the eastern side. That's a well-developed part of the field. As you come

sort of to the middle, your thickness becomes significantly less. And then finally, you get all the way to the west.

The other thing I wanted to point out is, you can see that a little bit better. You have a little thicker beds, and you can see that a little bit better in your cross-sections on the two logs on this side. Those thicker beds tend to sort of disappear if you go to the west.

And the other portion I would like to sort of point out to people is the gas/water content, which has a significant impact on the completion side.

Here I can afford to complete wells with a gross age of sediments over a couple hundred feet. As you get to the east, I'm limited to maybe 30 to 40 feet, maybe 50 to 60 feet. That has an impact to my ability of complete the wells.

Q. Does it also have an impact on drainage?

A. If I cannot stimulate a well that's comparable between the west side and the east side, it will have some impact on the drainage ability of the well.

EXAMINER EZEANYIM: So what you're saying is that on the east side, in that bed, is better than the west side? Is that what you are trying to say?

THE WITNESS: There's two things I'm trying

to say. That's one.

EXAMINER EZEANYIM: Okay. What is the second one?

THE WITNESS: The second one is when I'm stimulating the well, I have a significantly thicker portion. I can design my frack job, and that would allow me to contact gradually more pay.

When I'm on the western side, I don't have a lot of room to frack my well in. Because if I try, I'm going to get into the water. And basically that's not a good idea on a gas well.

So here I can be a little more aggressive on my fracturing; over here, I have to be very careful.

Q. (By Mr. Feldewert) And that can impact the drainage area?

A. Yes, sir.

Q. Anything else about this cross-section?

A. Not really.

Q. Does this support your prior conclusion concerning the permeability and the ability for you to drain as you move from the east to the west?

A. I think it ties in, it kind of adds. You can see, you know, the thickness and maybe a little bit about the pay continuity. And then the fact that my completion technology or technique is different on the

eastern from the western side.

Q. All right. Now let's get into then the actual performance production data that we have for the subject area. Okay?

A. Okay.

Q. Now the performance data, the production files, is something the Division did not have in 1991, when they entered the last order in this case, correct?

A. That's correct.

Q. It only reflects that this is the information they have been waiting for?

A. That's my understanding.

Q. How many wells do we have in the subject area for which you were able to create production profiles?

A. Nineteen wells.

Q. In your opinion, is that performance data important in determining the actual drainage capability of a well in a particular area like this, which, in our case, is the subject area?

A. I would say that is the most important information you can gather.

Q. When using production profiles to determine drainage, is there a slide that reflects what you need to consider?

A. Well, you know, the way I look at this is the

most important thing is to look at recovery efficiencies.

Q. Okay. So if I go to Slide 15 of Oxy Exhibit Number 8, what does this indicate?

A. Early on, in looking at the performance of the field, we wanted to try to understand what should be the goal, and just not look at our own field itself. Sometimes if you just look at your own field, you might be missing things.

So we did a search. And basically what this table summarizes -- it's a published paper by this gentleman right here in 1979. And it just states that, in general, statistically speaking, if you like the site, if you have a drive mechanism, an oil expansion, so on and so forth, this should be the range of recoveries that you should expect. If your recovery is within that range, you're doing a pretty good job of recovering.

So we have used this as a benchmark for Bravo Dome. We are under gas expansion. We are a gas field, regardless if we are CO2 or not. So we are trying to get our recovery efficiencies up to that number, somewhere between 70 and 95 percent as a whole, not just on each individual well, but for the whole field. That's the key.

Q. So is this kind of a benchmark, a published benchmark, for determining the effective and efficient drainage area for a well?

A. That's the way we have used this information.

Q. Okay. Are there calculations that are then required to use this efficiency benchmark to determine drainage?

A. Yes. There are two calculations, really.

Q. Should I move to the next line?

A. Please.

EXAMINER EZEANYIM: No. I'm sorry.

MR. FELDEWERT: If you have questions, go ahead.

EXAMINER EZEANYIM: I have a question here, Mr. Feldewert.

Now, let's look at that gas expansion. And it's through a range of 70 to 95. What did you actually use?

THE WITNESS: I didn't use a given value. I'm just saying in that area, I'm expecting to recover somewhere around at least 70 percent. If I'm not recovering at least somewhere around 70 percent, I've got some room. I'm doing as efficient a job as I can do.

EXAMINER EZEANYIM: You don't know what it

is until you -- you know, it's abandoned. But these are the assumptions you know?

THE WITNESS: That's right.

EXAMINER EZEANYIM: You wish, on those, that you could get up to 70 percent?

THE WITNESS: That's right.

EXAMINER EZEANYIM: You might not, unless you have an initial gas cap. Maybe you can get there, and they withdraw gradually. But we are not talking about that today. We are talking about the gas expansion?

THE WITNESS: That's correct.

EXAMINER EZEANYIM: Now, before you can do the calculation which is coming forward, I wanted to know what you used between 70 and 95.

THE WITNESS: If I look at an area, right, I do my calculation or my estimated ultimate recovery. Then I divide those by my gas-in-place estimates. And if I'm not somewhere between 70 and 95, I'm not doing a very good job.

EXAMINER EZEANYIM: Oh, yeah. You are not.

THE WITNESS: So I have room for improvement. I can infill drill, I can restimulate my wells. It opens the door for additional work.

EXAMINER EZEANYIM: But in this case, you

are not supposed to know whether or not they are abandoned, so you don't know whether they are doing a good job or not?

THE WITNESS: Well, I know if I calculate my estimate ultimated recovery, which would be the amount of gas produced by this well to the economic limit, and I take that number and divide it by my estimate of gas-in-place, I get a recovery efficiency. If that number is not at least in the 70 ballpark, then I decide to --

EXAMINER EZEANYIM: What type of decline are you talking about here? What type of decline are you using?

THE WITNESS: Usually, most of our wells decline exponentially.

EXAMINER EZEANYIM: Okay.

Q. (By Mr. Feldewert) So Mr. Giussani, is this a benchmark for determining whether a well is efficiently and effectively recovering from a certain acreage area?

A. That's what we use the numbers for. We feel that we're draining a certain volume efficiently if we at least get somewhere close to 70 percent. If we don't, then we have room for improvement.

Q. So spacing is based on what a well will efficiently and effectively drain, then? Is this a

benchmark for determining whether a well is efficiently and effectively draining?

A. That's the way we have used it, yes.

EXAMINER EZEANYIM: Have you done a calculation of where you've got 95 percent?

THE WITNESS: No, sir. This is just to --

EXAMINER EZEANYIM: I know it is, but I'm just asking.

THE WITNESS: Yes. I have wells within the unit that have recovered 95 percent.

EXAMINER EZEANYIM: That's pretty good.

THE WITNESS: Yes.

EXAMINER EZEANYIM: Okay. Go ahead.

Q. (By Mr. Feldewert) I think you mentioned it. But actually, the recovery percentages are going to vary from well to well, correct?

A. You bet. I guess I should say yes.

Q. All right. Let's move to the next line, which is Oxy Slide Number 16.

A. (Witness complies.)

Q. Now, is this a slide of a well in the east?

A. That is correct. The well --

Q. Are you using this just to simply show the type of calculations that you did for this well that you then applied to the wells in the subject area?

A. That is correct.

Q. So tell me how you used this efficiency benchmark on the prior slide to ascertain whether a well in the eastern portion was actually meeting that benchmark.

A. As you can tell, the graph itself looks quite similar. Or by now, you should be familiar that this is just a rate-versus-time semilog. If you have a straight line, there should be an indication of exponential decline, which you have in this case.

And basically, after choosing a certain portion of the data and extrapolating my data, we usually use 100 Mcf as our economic limit, somewhere around there. And you can see right here where it says, "End rate 100, Mcf."

So based on that extrapolation, I could calculate my estimate ultimated recovery because I've got my cum, my future forecast. And that's the number you see right here. In this particular well, as of February 2000, I had recovered 5.7 Bcf. I was estimating to have an additional 3.8 Bcf of gas to reproduce, for a total recovery of 9.5 Bcf. So that's the one portion of the calculation.

The other portion is basically calculated at original gas-in-place. And what you have to do there is you have to assume an area, which is 640 acres, and

similar parameters, where you have your phi-h, your saturation, your pressure, and you calculate a gas-in-place. Then you divide your estimated ultimate recovery by your gas-in-place. And for the 640 acres, the recovery efficiency you obtain is 86 percent.

Q. So what did that tell you about this existing well in the eastern portion with respect to whether it was efficiently draining 640 acres?

A. Because my recovery efficiency is between the two values of my benchmark, there's not really a huge amount of potential for additional work, in my mind.

Q. All right. So we saw some different calculations from Mr. Beebe. What is, essentially, the difference between what he did and what you are doing here?

A. The equation is exactly the same. It's the way you solve the equation. In his case, he assumed a recovery efficiency of 65 percent.

Q. Hold on. So he just took and assumed a recovery efficiency of .65 and started with that?

A. Yes.

Q. Okay.

A. And then he basically turned the equation around and calculated an area for that recovery efficiency. And that's why he had various drainage radiuses for each of the wells.

Q. So he didn't actually look at production profiles and ascertain what they reflected, in terms of the recovery efficiency for that particular well? He just assumed a recovery efficiency and applied it across the board?

A. That is correct. That's my understanding. In all the examples shown here, his recovery efficiency is 65 percent.

Q. Okay. And what were you doing is you calculated a recovery efficiency based on the oil and gas-in-place --

A. On a 640-acre spacing.

Q. -- and an estimated recovery?

A. That's right. In my mind, what I would say is given 640 acres, I'm recovering 86 percent of the gas-in-place.

Q. And that then fits within your recovery benchmark and indicates that you are efficiently and effectively draining 640 acres with that one well?

A. That is my understanding.

EXAMINER EZEANYIM: Excuse me. I have a question here. This well is not in the subject area, right?

MR. FELDEWERT: Correct.

EXAMINER EZEANYIM: It's in east?

MR. FELDEWERT: Correct.

EXAMINER EZEANYIM: So what you are telling me now is Order Number 7556 is incorrect. Because in the east, it would be at 160? That's what you're demonstrating --

MR. FELDEWERT: No.

THE WITNESS: The east is right here, sir.

MR. FELDEWERT: 7556 is a --

EXAMINER EZEANYIM: Okay. That's the east you are talking about?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: Is this based on 160?

MR. FELDEWERT: No. It's based on -- the eastern area, where this well is located, is based on 640 acres.

EXAMINER EZEANYIM: It says "160" here.

THE WITNESS: You're right there, sir.

EXAMINER EZEANYIM: Where? Oh. Did you say, "160"?

MR. FELDEWERT: It says 640.

EXAMINER EZEANYIM: Why do I have here it says, "160"?

EXAMINER BROOKS: Well, you have the notebook turned a different direction. The map on the board has the green area at the top, the yellow in the

middle --

EXAMINER EZEANYIM: Why did you give me something wrong? I mean I'm looking at the eastern area.

LEGAL EXAMINER BROOKS: This is east.

EXAMINER EZEANYIM: Oh, okay. It's always east. I'm sorry. So I'm looking at this. What is this, east or -- this is north?

EXAMINER BROOKS: No, that's south. North is toward the --

EXAMINER EZEANYIM: Oh, okay. See, that confuses me a lot.

MR. FELDEWERT: I apologize. So what I do is I keep my spiral notebook turned like this.

Q. (By Mr. Feldewert) So that would indicate, Mr. Giussani, that the spacing is correct in the area where this well is located, at least for this particular acreage?

A. That would seem to be the case.

Q. Okay. Now, did you then use this same type of approach of ascertaining the recovery efficiency based on actual production data for the 19 wells that are producing in the subject area?

A. That's correct.

Q. Okay. Then let's turn to the next line, which is

Oxy's Slide 17 in Exhibit Number 8.

A. (Witness complies).

Q. Does this -- why don't you tell us what this -- first off, what area is involved with this slide? Is it just the subject area?

A. That's correct. This area right here matches what you see over here.

EXAMINER EZEANYIM: Where?

THE WITNESS: This area right here. You go from this point across, down and across. It's the same if you follow my dot from there to there to there and to there.

EXAMINER EZEANYIM: And that is the subject area?

THE WITNESS: That's the subject area.

EXAMINER EZEANYIM: Okay.

Q. (By Mr. Feldewert) So these are all of the wells that have been drilled in the subject area?

A. There's 33 wells. We've got 18 wells currently producing. Nine have never been produced, and six wells are TAed.

Q. Now --

EXAMINER EZEANYIM: So we have 18 wells, not 19.

THE WITNESS: That's correct.

MR. FELDEWERT: I may have misspoken. I'm sorry.

EXAMINER EZEANYIM: But anyway, it's 18 that's currently producing?

MR. FELDEWERT: Correct.

EXAMINER EZEANYIM: From the subject area?

MR. FELDEWERT: Yes. You have all the wells that have been drilled in the subject area, and you have 18 --

EXAMINER EZEANYIM: Okay.

Q. (By Mr. Feldewert) Now on the right-hand side it shows a number of -- now you have the pictures on here as to what is producing, what is actively producing, what is P&Aed and what is temporarily abandoned, right?

A. That's correct. It's kind of hard to see, but they're depicted that way.

Q. If I'm looking on the right-hand side here, for example, there's a well up there, 1931-231G?

A. This one right here.

Q. What's the circumstance with that one?

A. That's a plugged well.

Q. Why is that?

A. When the well was drilled, it was analyzed and was deemed to have very little to no pay.

Q. Then if we move south to 1931-351F, what's the

circumstance of that one?

A. Same thing -- idea. The well was drilled. The logs were looked at and tested, and it was P&Aed.

EXAMINER EZEANYIM: Who drilled those wells?

THE WITNESS: Amoco Company.

EXAMINER EZEANYIM: Okay. And they are wet? The wells were wet --

THE WITNESS: We are not aware of it. They had very little to no pay. They might have been wet, but they were not deemed a successful well.

EXAMINER EZEANYIM: So they were probably abandoned?

THE WITNESS: Yes, sir.

Q. (By Mr. Feldewert) Now as we move south into that 1831-021G well, is that the area where Reliant was pointing out that you had drilled some wells?

And then we had some confusion over whether it was drilled on Bravo Dome acreage versus Libby acreage.

Is it your understanding those wells are drilled on a tract that's within the Bravo Dome unit?

A. That's my understanding. And the wells in question are 1831-021G, right there, and the one just to the south, 1831-111G, I believe.

Q. So these were just south of some unsuccessful

wells?

A. That is correct.

Q. Have those wells been TAed?

A. Yes, sir.

Q. And as we move -- and right there in that area, it looks like there's a third well?

A. Basically there was an original well, 1831-121G. That's one of the wells in our core analysis that was drilled and plugged. And then we went back and redrilled it, and it's now the 1831-122G.

Q. Was that original well a core well?

A. We had some questions, so we decided to go ahead and redrill it.

Q. Okay. And then as you move south, 1831-131G, is that a good well, or what's the circumstance with that?

A. No. A lot of the wells down at this part of the field are in some wet margins.

Q. All right. Now, you show on this Slide 16 some wells over in the western part of the subject area. Two wells there are within your red circle?

A. That is correct.

Q. Oblong?

A. Yes. It's a little area highlighted in red. It highlights wells 1830-271P and 1830-021F.

Q. Now, what is the significance of those two wells?

A. I could not explain those wells' performance with a simple regular model. Their recovery is just huge. The rates are well above anything expected. In fact, Well 1930-271P was shown to have, you know, a significantly higher rate than anything else. And 1830-021F has even higher rates than that well.

EXAMINER EZEANYIM: Why did you hide them? They are good wells?

THE WITNESS: I didn't hide them. I --

EXAMINER EZEANYIM: I said why do you hate it? You say you don't know what --

THE WITNESS: It's better to be lucky than beautiful.

Q. (By Mr. Feldewert) It was your testimony, in other words, that you cannot explain why these wells are doing so well?

A. That is correct. I completed this well down here myself. When I looked at the log, I was not very encouraged. When I put it on production, I was just flabbergasted.

Q. Now, what about the wells surrounding it? What's been the production like in --

A. They're not bad wells, but they're nothing -- the ultimate recovery of the surrounding wells is significantly lower by an order of half or less than

that in these two wells right here.

Q. Now these two wells right here, was one of those wells one of the two wells that Mr. Beebe presented in his analysis?

A. Yes, sir. 1930-271P.

Q. All right. Now, keep in mind those two wells. Go to the next slide. That's Slide Number 18.

A. (Witness complies.)

Q. Does this depict the unusual condition that you see with these two wells, as it compares to all the other wells that we have surrounding it in the subject area?

A. That is correct.

Q. There's the well with the red line that shows production, what, that's almost 15 times what you're seeing in your other wells?

A. This well is producing currently just short of 3 million a day. And our average well in the area is probably producing about 200,000, 250,000 Mcf a day.

Q. Okay. And then the second well on here is producing what, almost seven times what you're seeing from the other wells --

A. I believe so.

Q. -- in the area?

A. Yes. But the key is also -- you know, the rate

is important. But even more important is the cum recovery, as well as what you are cuming -- estimated recoveries two or three times what anything else does.

Q. Now, you labeled these "Anomalous Wells in the Subject Area"?

A. That's correct.

Q. Why is that?

A. These wells' performance are almost as good as wells in the eastern portion of the unit, where we have 2- to 300 feet of pay and probably 160 feet, 170 feet of net pay.

Q. But if I go back to Slide Number 17 in the book, and I look at the wells surrounding it. For example, there's Well 1830-011G just directly to the right of your red-shaded area.

Are you getting any kind of production like you see in the red area --

A. Not anything close to this well right here.

Q. In the wells surrounding this red area, are you seeing anything close to these two anomalous wells that you see?

A. Some wells might be close to the blue well, but nothing comparable to the red well.

Q. Okay. Can you explain why this particular area has this certain -- this anomaly?

A. Not really. I mean we have some theories, but they're just theories. When you look at the log, especially for this well right here, and it's followed up by the stimulation job that we did in this well, the stimulation for that well was not very big because the amount of pay between the Cimarron, the gas/water content, was probably 50 to 60 feet.

So we were just very, very surprised when the wells started making these kinds of rates.

Q. When I go back then and look at these wells in the subject area, were they all drilled in about the same time frame?

A. Let me think. Yeah, pretty much. All of these wells here, in this area right here, were probably drilled in the summer of 2008. And then there were a couple of wells that were existing wells that we went in and refracked.

Q. Did you supervise the drilling in these wells?

A. Yes, sir.

Q. Did they utilize the same completion principles?

A. I completed every one of these wells.

Q. With the same --

A. Same technique. It just applies to each individual well.

Q. And are they all subject to the same compression

system?

A. They all fit into the same leg, which we call Leg Number 10.

Q. So there's no distinction between the two anomaly wells and all the other wells we see, other than their particular location?

A. That's the best of my understanding.

Q. Okay. As a result, then, did you do -- when you conducted your study, did you remove these two anomaly wells from the study?

A. Yes, sir.

Q. And is that because of the tremendous differences you see between all the other wells in the subject area and these two wells?

A. That -- more so, though, is the ultimate recovery. These wells dwarf anything that we have in that part of the field.

Q. All right. So then putting aside these two anomaly wells, you still had 16 remaining producing wells, correct?

A. That is correct.

Q. In the subject area?

A. Yep.

Q. If I then go to what's been marked --

EXAMINER EZEANYIM: Excuse me. Before I

lose my thought. I'm sorry. Again, I need to interrupt.

I need to ask a question on this area right here. On that well, you know, 1930-261F, and then 271P, in the red. You weren't expecting something like this, right?

THE WITNESS: I was not.

EXAMINER EZEANYIM: But you were so surprised that you got this?

THE WITNESS: That's correct.

EXAMINER EZEANYIM: What completion technique did you use? Is it the same from completion technique to order 16 wells?

THE WITNESS: No, sir. I can give you some insight on our completion technique.

EXAMINER EZEANYIM: As long as it's not contentious, it's okay. I can get that. I just -- you know, are they put in from the same pool?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: So what is your opinion why these are so different? I mean this anomaly, why is it?

THE WITNESS: You know, there's some evidence there might be some fracturing in the field, and we might be lucky enough that we tie in to one of

those fractures. Some of the theory says that as you move to the west in the subject area, we're going from, you know, thicker sand to more of a braided stream environment.

So if you drill the well smack into the middle of a braided stream, you have a great well. And it will recover along the braided stream, but it will not really touch on each side. But those are just conjectures right now.

EXAMINER EZEANYIM: These are some natural fractures. It should be seen on geology that there are some natural fractures?

THE WITNESS: Yeah. But the struggle here is you're on one-mile spacing. So you can hide a lot of things between wells, and you will never find out.

EXAMINER EZEANYIM: So you -- for that knowledge, you used these two anomalous wells?

THE WITNESS: Yes. I just put them to the side. Because I said their performance is such that -- you know, even in Mr. Beebe's analysis, he was draining, you know, several thousand acres. You know, that's very difficult.

EXAMINER EZEANYIM: Okay. I just wanted to see what -- of course, I'm not unhappy with the well.

THE WITNESS: Me neither. Unfortunately, I

would like to find out what it is so I can replicate it. So far, I have not been able to.

Q. (By Mr. Feldewert) But if you're doing a production profile in order to ascertain what the wells in the subject area are actually draining, these two wells would throw everything out of whack if you include it in your analysis?

A. It would have a significant impact, especially on the ultimate recovery from the area. It was skewed to one side.

EXAMINER EZEANYIM: And this was on the subject area we are talking about?

THE WITNESS: That's correct, sir.

EXAMINER EZEANYIM: Okay. Go ahead.

Q. (By Mr. Feldewert) All right. So then focusing on the remaining 16 wells, did you do a production profile on those wells?

A. Yes, sir.

Q. Is that reflected on Slide Number 19?

A. That is correct. I tried to line them up going from, you know, west to east and south to north.

Q. And you have at least four years of production data for these 16 wells?

A. That's correct. Starting in 2009 -- you know, April or so 2009 up to today.

Q. So you have four years' worth of actual production data from 16 wells in the subject area?

A. Yes, sir.

Q. And then did you perform, in the same type of calculation that we've seen previously to determine the efficiency rating --

A. That's correct.

Q. -- for these wells in terms of their drainage areas?

A. That's correct.

Q. And is that reflected on the next line?

A. Yes. The next line summarizes two calculations. The way we have our equations set up, we have to define an area of production to calculate gas-in-place.

So what we found out is, on the average, for all the wells that we have production, except for the two wells that we call anomalous wells, our average recovery is 1.9 Bcf.

EXAMINER EZEANYIM: Based on your extrapolation?

THE WITNESS: Yes, based on our extrapolation to an economic level.

And then what we have done is we have, for each individual well, taken the well recovery and divided it by the gas-in-place. We've done the calculation twice:

One when we assume it's 640-acre spacing, and then the second time when we assume 160 acres. And you can see that what we calculated is recovery efficiency.

So if you assume that your well is draining 640, based on the average estimated ultimate recovery, you get a recovery efficiency of about 18, 19 percent.

If you now say that my well is only recovering the volume contained in 160, then your recovery efficiency is getting closer to that benchmark, 70 to 95 percent.

Q. (By Mr. Feldewert) In other words, based on the production profiles, you only meet the recovery efficiency if the area of recovery is 160 acres?

A. That's correct, if you look at the whole area.

Q. You're just talking about the subject area?

A. That's right, the whole subject area.

Then if you're on 160 spacing, the amount of gas you produce will recover about 74 percent of the gas within that area.

Q. Okay. And so am I correct that you only meet your recovery benchmark for these wells if the spacing is on 160 acres?

A. Yes, on the entire spacing. And that's as a whole.

Q. Now, then what conclusions have you drawn from

your analysis of the core data that we now have available, the cross-section that's utilized and then the performance data from the wells in the subject area?

A. My overall understanding is as follows: Pay quality and pay thickness is changing. As you go from the east to the west, we seem to have lower pay quality on the west. We have thinner pays. The distance between the seal on the top and the gas/water content is a lot thinner. And based on the 18 wells that we have done, it looks to me that those wells efficiently, really as a whole, drain something around 160 acres.

Q. Were Oxy Exhibits 1 through -- I'm sorry, let's go back. Were Oxy Exhibits 1, 2, 8 and 9 prepared by you or compiled under your direction or supervision?

A. Yes, sir.

MR. FELDEWERT: I would move the admission of Oxy Exhibits 1, 2, 8 and 9 at this point.

EXAMINER EZEANYIM: Any objection?

MR. DEBRINE: Yes. We object to 8 and 9. The witness lacks personal knowledge with respect to the geological observations that were drawn on those exhibits, and he didn't undertake the study himself.

EXAMINER EZEANYIM: You are objecting to at least 8 and 9?

MR. DEBRINE: Yes.

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EXAMINER BROOKS: On the same basis as my previous rulings, I'll overrule the objection.

EXAMINER EZEANYIM: Okay, the objection has been overruled. Exhibits 1 and 2, 8 and 9 will be admitted.

[Exhibits 1, 2, 8 and 9 admitted.]

MR. FELDEWERT: And then the only thing I will also point out then is Exhibits 3, 4 and 5 comprise the Division's orders, which is a matter of public record. So we move the admission of those as well.

EXAMINER EZEANYIM: Any objection to that?

MR. DEBRINE: No objection.

EXAMINER EZEANYIM: Okay. Exhibits 3, 4 and 5 will be admitted.

[Exhibits 3, 4 and 5 admitted.]

MR. FELDEWERT: And that concludes my examination of this witness.

EXAMINER EZEANYIM: Mr. DeBrine?

CROSS-EXAMINATION

BY MR. DEBRINE:

Q. Mr. Giussani, I'd like to turn your attention to Slide 15.

A. Yes, sir.

Q. The gas expansion factor that you talked about of between 70 and 95 percent, isn't it true that the gas

expansion recovery is based on the fluid properties of CO2?

A. That's correct.

Q. And those would have different properties and different recoveries; is that true?

A. No, sir. If you're using the right BG factor, formation factor, that should not be the case. The gas is a gas. You're using the same equations to define the gas log.

So as long as you use the correct properties and values, that will be the case.

Q. What other factors would cause a lower recovery benchmark?

A. Pay discontinuity, number one. You are not compacting the whole area. Probably a completion that is not optimum. Those are the two that come to my mind.

Q. If you'll turn to Slide 9?

A. Yes, sir.

Q. This represents average permeability figures on the right-hand side of that chart; is that correct?

A. That's correct.

Q. Did you calculate those permeability numbers?

A. No, sir.

Q. Who did?

A. Our Geological Department.

Q. How did they determine them?
A. Based on the techniques they used to do core analyses.
Q. And what are those techniques?
A. I'm not privy to those.
Q. Do you know what they used as a pay cutoff to determine those?
A. Yes. For porosity cutoff, we use a 12 percent pay cutoff.
Q. And were you looking at net pay or gross pay?
A. What do you mean? Gross pay is just the distance between the top and the bottom of the formation. We were looking at what they consider net pay, with a 12 percent cutoff.
Q. With the figures where you show less than a 1.0 average permeability, how were you able to determine those figures of less than 1 from the core data?
A. That I couldn't tell you, sir.
Q. Do you know what methods were used to estimate those figures?
A. No, sir.
Q. Do you know what the geologists used to determine those permeability figures that are less than 1?
A. No, sir.
Q. So all you're doing is representing other

information that people gave to you, and you have no idea how they determined it?

A. Yes, sir.

Q. Who is the geologist that prepared the information?

A. There was a group of geologists that presented this information. It was just not a unique individual.

Q. And who were they?

A. Some of them were J.B. Ward and the other gentleman, Craig Kemp. Those are the two that I can remember.

Q. Do they still work for Oxy?

A. Craig Kemp does; J.B. Ward does not.

Q. Is there a reason that they weren't brought to the hearing to explain the calculations that were made?

A. Not that I'm aware of.

Q. Did you consider calculating a drainage area for the 19 wells in the subject area?

A. That is just a different technique. You have to make certain assumptions. It's not something I did in my analysis.

Q. Did you ever consider doing that?

A. No, sir. I have found it, in other places, not as reliable as the recovery efficiency.

Q. How far are the wells in the subject area from

Oxy's compression facilities?

A. About 30 miles.

Q. Are there constraints in the gathering system that would impact the production from the wells in the subject area?

A. Not any different than some of the other two -- if I may point to the -- would you please put up that map of the Bravo Dome unit? I might be able to answer your question a little bit better.

Q. Which slide is it?

A. The slide that has two or three different things popping up. Right there.

If you look at it, the wells we are talking about are right here. The plant is right here. The pipeline goes down this way. That distance is about the same as what we see on the wells up here, which we call the Leg 9. And what we see over here are the wells on Leg 8. So the only thing you would have to say is different is the contour of the land. Both are 24 inches from here to there, and there's 24 inches from here to here, 24 inches, 24 inches.

So the size of the pipe is about the same. The distance is the same. And you're basically just at the mercy of the landscape in the area.

Q. And is there any geographical issue with regard

to the landscape that causes any constraints in the western area?

A. The only thing I have, there is a draw right here, similar to some of the draws we have over here and up there.

Q. Earlier you talked about the development in the western area of the Bravo Dome, which is the area immediately to the east of the subject area; is that correct?

A. That's correct. This area right here.

Q. Did you undertake any study to compare the characteristics and production from those wells to indicate whether they exhibited similar characteristics to the 18 wells in the subject area?

A. I just basically looked at the wells' performance rate versus time. And I didn't see anything that was dramatically different that would force me to start the study here, so I concentrated my study here to begin with.

Q. But you don't have any evidence that you're here to present evidence concerning the performance of those wells and whether they're efficiently draining 640-acre spacing?

A. No. That's not the area that's in question, so I didn't really look into that.

Q. And all of the acreage in the Bravo Dome unit is not subject to being lost if a well is was not drilled on the standard spacing there; is that correct?

A. That's my understanding. But I don't know all the details, so I don't think that's the case.

Q. So you don't have the same problems that Reliant does, where it's subject to loosing acreage if a well is not drilled on a standard spacing unit, if the spacing unit acreage is changed?

A. I don't think so.

Q. So if the Division were to grant the application, you've got those two anomalous wells. Do you have any intent to drill any wells -- any infill wells within those 640-acre sections around those wells?

A. Not right now.

Q. Is that because those wells are efficiently draining the 640-acre sections?

A. Probably so.

Q. And there may be other wells located within the subject area that could exhibit those same characteristics?

A. I think that's something you'll see throughout the field, and it was also shown by the drainage radius on the previous calculations. You are not dealing with just uniform 640 sections and recoveries. The

recoveries per 640 change throughout the field.

Q. You talked about the two wells that were drilled on the eastern edge of the subject area in which they were drilled on 640-acre spacing that included Reliant acreage in order to form the 640-spacing unit?

A. Let me make sure I understand. Those wells -- when those two wells right here were drilled, they were permitted on 160 acres. We got permission to drill on 160. We drilled the wells.

After the wells were drilled, we were told that that was not correct. That because of the confusion between the overlapping areas, those wells actually were on 640.

Q. And you agree that the spacing unit for those wells embraces the Reliant acreage in order to form the 640-spacing unit?

A. I'm not sure what you mean by "agree." It was just a matter of fact. We thought it was 160. And instead, the rules say 640. So that's all there is to that. I'm not sure.

Q. And you filed amended paperwork with the Division to reflect that the spacing unit for the wells is 640 acres, which embraces the Reliant acreage?

A. I believe that we refiled some paperwork, but that's not something I do.

Q. And those wells are currently in temporary abandonment status?

A. That is correct.

Q. What is the plan with respect to those wells?

A. We're trying to understand how we're going to develop this whole area right here and see if we want to continue. Unfortunately, both wells are not very good wells.

This well right here made a couple hundred Mcf and was tested. This well right here, just to the south of it, similar. And then wells to the east of this wells are also becoming very marginal.

Q. So do you have any plans to restore them to production?

A. We're looking. I mean we are always continuously looking for an opportunity to increase our gas production.

Q. And are you asking the Division to retroactively change the spacing for those two wells?

MR. FELDEWERT: Wait. I object to the form of the question. The wells are TAed. The paperwork was filed pursuant to the Division's form. I mean the issue here today is what should the spacing be in this subject area for either new development of those wells or any other wells in the area?

EXAMINER BROOKS: So you are asking that the units for those wells be changed? You're not asking -- you do not contemplate any grandfathering of existing wells in your request to change the spacing?

MR. FELDEWERT: That is correct. That's correct.

EXAMINER BROOKS: Okay.

THE WITNESS: You might have to restate your question.

EXAMINER BROOKS: I actually think Counsel was the better person to respond to that question than the witness because Counsel knows what is being asked in the application.

EXAMINER EZEANYIM: So where do we go from here?

EXAMINER BROOKS: Well, I really don't think that was a proper question to ask of the witness, so let's go on to the next question.

Q. (By Mr. DeBrine) You're familiar with the application that's been filed by Oxy; is that correct?

A. Yes, sir.

Q. Did you have any involvement in its preparation?

A. Not in the actual preparation of the document. I just worked on the information and data to support the application.

Q. What is your understanding of what Oxy is asking the Division to do with respect to the subject acreage?

A. I think it's two things. One, we would like to clear up a little bit the situation and make sure that the subject area that is operated by Oxy, which is this area right here, is no longer lumped with another area that is operated by another company. That is creating a tremendous amount of confusion.

Second, based on the information we have shown, we believe that the proper spacing would be 160 in this area right here, which will take it back to the original 160 that was set up for this area in 1987 or so.

Q. Although it was confused at one time, Oxy no longer has any confusion as to what the spacing area and the subject area is; is that correct?

A. That's my understanding.

Q. Would you have any objection to carving out the Reliant acreage from the Division's order?

A. You're asking the wrong guy.

MR. FELDEWERT: I object to the form of the question.

A. I have no understanding of that area.

Q. (By Mr. DeBrine) Well, you testified earlier that your motivation was --

EXAMINER EZEANYIM: Are you making an

objection?

MR. FELDEWERT: I object to the form of the question.

EXAMINER BROOKS: It seemed to me there was a question that was asked and then was answered, and then he's going on to another question now.

EXAMINER EZEANYIM: Which one?

MR. FELDEWERT: I'm not sure which question the objection is to.

Go ahead, Mr. DeBrine.

Q. (By Mr. DeBrine) Yeah. Mr. Giussani, my question to you, as I understood your testimony, you said that partially your motivation in asking for a change in the spacing order is that it would make it easier for Oxy to operate its acreage within the subject area?

A. No. What I said is -- I don't think that's what I said. I just said that Oxy would like to separate this area right here, which is within the Bravo Dome, from an area that is operated by somebody else. That's the first thing we would like to do. That's all I said.

Q. And that's why I asked you: Would you have any objection to separating the area within the subject area to the area that's operated by Reliant?

A. I could not answer that. It's not my area of

expertise. I would have to let a landman or a lawyer answer that question.

Q. Well, if you look at the original boundary separating the subject area from the West Bravo Dome, that's not a geologic boundary, is it?

A. No, sir.

Q. That's simply an ownership boundary?

A. That's correct.

Q. And you're not aware of any study that's been done that would support a change in spacing in that area from 640 to 160?

A. You now have me confused.

Q. Are you aware of any geologic or any engineering evidence that would support a change in the spacing in the West Bravo Dome area that's currently subject to 640-acre spacing to 160-acre spacing?

A. I'm not aware of any of those things.

Q. So if the entire area was originally subject to temporary spacing in one proceeding, why would you attempt to carve out just a portion of it in this proceeding?

Why not ask for the whole area to be changed if the geological evidence that was presented to the Division initially was for the entire area.

MR. FELDEWERT: Object to the form of the

question. The assumption is incorrect It was not for the entire area, the evidence that was presented initially. That's clear from the record, and he's testified to that.

Number two, Oxy is here as an operator in this acreage. And the only parties that can appear would be the operators in this acreage, and that's Reliant and Oxy. In fact, they're both -- in fact, Reliant is not even an operator.

So Oxy is here to discuss its acreage and the data that it's developed on its acreage. It has nothing to do --

MR. DEBRINE: Yeah. I think the evidence has been that Reliant is operating a well.

EXAMINER BROOKS: You hadn't finished what you were saying?

MR. FELDEWERT: Correct. Neither Oxy nor Reliant nor the witness has done any study of which is the appropriate spacing for the West Bravo Dome unit. So there is no basis on which to treat it the same as you would for the subject area.

The issue here is: What should the spacing be in this subject area? What does the data show? And that's what he's testified to here.

EXAMINER BROOKS: Mr. DeBrine, did you want

to respond?

MR. DEBRINE: Well, only to the mischaracterization that Reliant isn't an operator in the subject area. I mean the testimony was clearly that they have drilled --

MR. FELDEWERT: You're right. They just recently drilled a well. I had forgotten.

EXAMINER BROOKS: Okay. Very good. Well, I've forgotten what the question was after all this lengthy argument.

Do you want to go on to the next question? Otherwise, we would have to have the question read back.

MR. DEBRINE: I'll ask another one.

Q. (By Mr. DeBrine) With regard to the -- well, strike that.

What was the date of first production for the wells drilled by Oxy in the subject area?

A. I believe it was March 2009, give or take a month or so.

Q. And if you look at the Division Order which required the operators to come back in two years, what year was that order entered?

A. Tell me again, please.

Q. You earlier testified with regard to a Division Order that was entered requiring operators to come back

to the Division within two years of the date of that Order to present data as to why the spacing should be changed?

A. Yes. That would have been in two years. So it would have been sometime in March of 2011.

Q. So the date of first production was when?

A. March 2009.

Q. And when was the application filed by Oxy?

A. Which application, sir?

Q. The current one.

A. Sometime in 2013.

Q. There was a prior application filed by Oxy in 2010. Are you familiar with that one?

A. Yes, sir.

Q. Why was that application never presented for hearing by the Division?

A. That I couldn't tell you. I know that I prepared the material, got ready, came out here and then just -- I don't know anything else.

Q. How many years did Oxy wait to begin drilling in the subject area after it acquired an interest in the Bravo Dome?

A. Oxy started operating the Bravo Dome in the year 2000, and we did not start the drilling program on the west area until 2007.

Q. Why wait seven years?

A. First of all, we had to do a review of the performance of the eastern portion of the field. Second, we had to basically go back and look at the data. The original data had been developed by Amoco. A lot of that stuff had to be re-looked at. And eventually, we had to sort of look at visibility studies.

You don't put a 30 mile, 24-inch pipeline in the ground on a whim, so we had to do that. We also had to look at some land issues when you put that kind of line in the ground. So all that took considerable time.

If I recall correctly, the start of my project to move to the west started sometime in 2005, and I was able to get AFEs out sometime in late 2006.

Q. What is Oxy's net income?

A. For the property?

MR. FELDEWERT: Object to the form of the question. It has nothing to do with this case.

Q. (By Mr. DeBrine) You would agree that Oxy has substantially more resources than Reliant, wouldn't you, Mr. Giussani?

MR. FELDEWERT: Object to the form of the question. What does that have to do with spacing?

MR. DEBRINE: Well, you were faulting Reliant for the amount of time it took them to develop a drilling program and evaluate the properties. So I'm just trying to draw a comparison between the resources of the two companies and the amount of time it took Oxy versus Reliant.

EXAMINER BROOKS: Well, I think both of you, the amount of time it took either of you is irrelevant.

The question is what the drainage radius is, which is the question. It doesn't make any difference how long or when either one drilled the well. I think, in the interest of moving along, I'll sustain the objection.

Q. (By Mr. DeBrine) Why wouldn't you ask for an interim step to change from 640- to 320-acre spacing before going to 160?

A. You know, I just looked at the performance of the wells and tried to come up with estimates of what's the best drainage area. I'm not really familiar with how you would try to change from one space into the other, so I really couldn't answer your question.

Q. What is Oxy's current cost for drilling wells in this area?

A. It all depends. Define "drilling cost."

Drilling a well is probably in the $400,000 range. And then on top of that, you have to add completion, which is probably around -- if I get really busy and am very efficient, I can do three per day. So it comes down to about maybe $60,000 a pop.

And then the distance from the wells to the major trunk line is what determines the cost. So I would say it's pretty comparable to what the cost is for -- Reliant quoted $700,000 per well for oil development costs.

Q. Mr. Beebe talked about his study identifying where there had been more than one well drilled on a 640-acre spacing unit in the Bravo Dome, eastern area.

Do you know how many of those 640-acre spacing units have an infill well on them?

A. I wouldn't know exactly the number, but what he quoted is in the ballpark. We have done some infill drilling using the same idea as we have used for the recovery on the western side.

Q. Are you aware of any wells in which there has been more than a second well drilled on the spacing unit?

A. I want to say there might have been only one well at the crest of Leg 9 that might have three wells. If you find usually three wells in a section, one of the

wells has had some casing problems during the drilling, so that's why you have three wells.

But the only one that I can recall having three wells, and all three wells produced, is one well at the very crest.

If you look over here, this is Leg 9. Right here, there is what is called the horst and graben features. So right at the very top there, we have one well like that.

Q. Does Oxy have any studies that were undertaken before in order to justify the drilling of a second well on any of those spacing units in the Bravo Dome?

A. It's just standard practice to look at recovery on a 640-acre spacing and see what number we obtained. And then based on that, we decide if it's worth drilling a second well or not.

Again, it goes back to that benchmark I showed you, 70 to 95 percent recovery. If we don't get close to that, then we start thinking about infill drilling.

Q. Does Oxy sell any CO2 production to third parties?

MR. FELDEWERT: Objection. I don't understand how that's relevant to the issue in a case of spacing.

EXAMINER BROOKS: Well, I would have to

agree, especially at this time of the afternoon. I'll sustain the objection.

Q. (By Mr. DeBrine) Isn't it true that Oxy's well economics are determined in part by the price of oil in its CO2 floods?

MR. FELDEWERT: Object to the form of the question. Their well economics has nothing to do with spacing. We didn't present any economic case. We presented a drainage case.

EXAMINER BROOKS: Well, I'm going to overrule that objection.

Go ahead. You can answer, if you have it -- if you know the answer.

THE WITNESS: Ask me again, please.

Q. (By Mr. DeBrine) Isn't it true that Oxy's decision to drill a well is determined in part on its economics with respect to the price of oil in its CO2 flood areas?

A. No, sir. We basically have a price for the gas product, and we really do not deal absolutely with prices whatsoever when we do an evaluation in Bravo Dome. The project has sustained itself.

Q. Do any of Oxy's royalty obligations depend on the price of oil?

MR. FELDEWERT: Object to the form of the

question, Mr. Examiner. That has nothing to do with spacing in this case.

EXAMINER BROOKS: Well, that's probably true. I'll sustain the objection.

If we can stay on the point, we'll have a better chance of getting through this afternoon.

Q. (By Mr. DeBrine) In your study in the subject areas of the 18 wells, you eliminated the top two producers; is that correct?

A. Yes, sir.

Q. Did you also eliminate the bottom two producers?

A. No, sir.

Q. Why not throw them out as outliers as well?

A. The reason I eliminated these two wells is that their performance cannot be, in a way, you could say physically displayed.

If you look at the logs and you look at the volume recovery, even with the calculations that Mr. Beebe did, you would get some number that is just out of sight. I mean you don't even see those kind of recoveries in the best part of the field, there's something inherent with those two wells that I cannot explain. So it would not be fair to put those two wells with wells in which I can explain their performance.

Q. If you look at your Slide 19, it shows wells with

essentially no -- zero production, doesn't it?

A. There are some wells that have produced very little, but they cover the area in question.

Q. So you don't consider wells with zero production an anomaly?

THE WITNESS: All the wells have production. They might have very little production, but it's still production. It's still reflective of the performance of the wells in that particular section or area.

MR. DEBRINE: No further questions.

EXAMINER EZEANYIM: Any redirect?

REDIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Giussani, do you have any data, either by way of core samples or cross-sections or production data, that would support treating the Reliant acreage within the subject area different from any of the other acreage in the subject area?

A. That I don't, sir.

Q. We're here in 2013. And by virtue of being here in 2013, we now have at least four years of production data from 18 wells in the subject area, correct?

A. That is correct.

Q. So we've benefitted by having the opportunity to

be here not in 2010, but in 2013?

A. That's probably true.

Q. We have at least a four-year production profile to look at?

A. Yes, sir.

Q. Okay. And based on the core data that you have, the cross-sections that you have, and the four years of production data from the existing wells in subject area, in your opinion, is that enough to determine what should be the proper drainage in the subject area?

A. That will be my opinion, that we have sufficient data to sort of stipulate that 160 might be the appropriate spacing for this part of the field.

Q. And we don't have any data that would support continuing 640-acre spacing for this subject area?

A. I don't -- no, sir.

MR. FELDEWERT: That's all I have.

EXAMINER BROOKS: No questions.

EXAMINATION

BY EXAMINER EZEANYIM:

Q. Well, what is your cutoff porosity?

A. 12 percent, sir.

Q. Okay, we are agreed to that. But what is the highest porosity you see in this area?

A. We've seen some stringers as high as 25 percent

porosity, maybe even 30 in some cases.

Q. Okay. Now, let's go to -- let me ask this question before I come to where I think I want to be. Let's go to page 20 of Exhibit Number 8, I think.

THE WITNESS: Page 20?

EXAMINER EZEANYIM: Yes. Do you see those numbers there?

Now, you are using recovery efficiency, and there must be a calculation that you did?

A. Yes, sir.

Q. If we look at -- you told me the average of the well recovery, when you extrapolate that, it's 1.9 Bcf?

A. That's correct.

Q. Okay. Now the recovery efficiency of 19 percent on 640 acres, how do you get that number?

A. What you do is you take your estimate of values, or your phi-h, your saturation, your temperature and pressure, and you assume a 640-acre area and you calculate the gas-in-place.

Then you take your decline curve analysis, you extrapolate those, and you calculate your estimated ultimate recovery. And then you divide one by the other, and you come up with your recovery efficiency.

Q. Is there a reason why you didn't present that

calculation here to demonstrate -- I mean I can't just take it on its face value that when I have 640 -- I mean you are giving -- I don't have time do this. I can do them.

Since you are coming to the hearing, I want you to demonstrate, if you are on 640 acres, the recovery efficiency would be 19 or 18.5 percent. If you are on 160, it would be 74.

I mean you don't expect me to just agree with you without demonstrating it with calculations. I mean see what I mean? Why not -- I know you calculated -- I'm not questioning whether you got this or not. But what I would need -- I'm just saying it for everybody now -- is to demonstrate that when you are on 640 acres, you are approximately 19 percent; and when you are on 160, you are approximately 74 percent.

You can make the point that if I go to tell somebody something, how are you they going to be sure? You know, we are dealing with technical information here. I can't just agree with the numbers without seeing the calculations.

And that's where I go back to there is work to be done, because this is a contested case. Let's start with Reliant. They are to do the calculations. They did it only on two wells, and those two wells may be the

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outliers we are talking about.

So this is what I want the two parties to do. If I go to this page, I think it's 19?

A. That is correct.

Q. Okay, page 19. Those are not the outliers. We need to have the production rate go to zero on some of the wells. I would like to see calculations, because this is important.

Do you have the two to do these calculations?

A. Sure.

Q. Actually, I would like to see calculations on all the 18 wells, including the outliers.

A. Okay.

Q. And then we'll see how those drain, in comparison with the rest of the work.

Then I'm going to have to come in -- I said, about 16 of them. Well, maybe not 16. Because somewhere in that production includes zero, so we can look at it there.

That's what I expect both parties to present today, to show me that if we are on 160 -- I mean to show me what the drainage area is going to be 160 or 640, depending on calculations. And I want you to lay down all the assumed parameters to do those calculations. So it's my job now to look at those

parameters, get a sample calculation that you are going to give me, and see what you are doing.

Don't you think, when both parties do this, it's going to be -- it's an easy job to tell me: Are we going to be on 640 or 160?

I mean I'm going to look at this and assume -- because I am going to have to assume something to get to something. There is nothing that is clear-cut in this case. So I want both parties to calculate the drainage area for these 18 wells.

A. Let me make sure I understand. You would like the Reliant folks to do their drainage calculations --

Q. And you, too?

A. -- and you would like for us to do our recovery calculations?

Q. Well, what are you using to do this drainage?

A. In our case, it would be recovery calculations.

Q. Okay. If you do recovery calculations, you are going to be using the acreage, right?

A. We're going to be using both types of acres. We're going to have a calculation on 640 and then a calculation on 160 to show the difference in recoveries.

Q. What's wrong with using a simple equation to calculate the drainage area?

A. You have to make an assumption of the recovery

efficiency.

Q. No. But you know, you calculate the recovery using your decline. I assume the decline is exponential. Everybody would assume that?

A. In the methodology that Mr. Beebe presented, there's two variables here that you can pick. Okay? In his case, he picked recovery efficiency. He had to define the recovery efficiency so he could solve for the area.

In my case, I have to pick and I have to assume an area so I can calculate my gas-in-place. And then I can use -- we're basically using the same methodology for the estimated ultimate recovery. We're just using the equation in two different ways.

Q. I think both of you can do a simple calculation. Let's use -- I don't want anybody to use a different decline. Use exponential, because it appears it might be exponential, right?

A. We're using the same exponential decline.

Q. Okay, use exponential, too. It's a very simple calculation to calculate drainage area, whether you're using recovery efficiency or you calculate gas-in-place. Tell me why it should be on a 640, instead of 160. I haven't got that point right now.

So there is more work to be done. And the more

work to be done is both parties have to go back to the drawing board and calculate those drainage areas. Show me sample calculations, whether you're using recovery efficiency, which you are using -- or you know, you don't have to assume a recovery efficiency. You can calculate it better in your extrapolation. You can calculate those?

A. No, sir. I don't think so.

Q. You could. I mean you have to assume you are -- you know, what you are going to be, like you assumed here. You can calculate that once you learn the initial gas-in-place?

A. In order to calculate initial gas-in-place, I have to make an assumption on my area I'm draining.

Q. Because you don't have the parameter to calculate it? Gas-in-place is so easy.

A. For gas-in-place, I have to have my phi-h, my saturation, temperature and pressure --

Q. You don't have those?

A. Yes, I do. I have everything. The key in my calculation is I assume a volume that I'm calculating for my gas-in-place, and then I'm calculating how much of the volume I'm producing by using my exponential decline.

Q. I want you to go the opposite way. Do

assumptions and calculate that area. That would be the best way to go. Whatever you need to do, calculate the area. I mean you can do it. You have the production data. I want you to do that. Talk about the efficiency. Calculate the area that the well will drain.

Tell me why -- even if you assume 640 or 160, tell me how you arrived at that. That's what you're trying to do here, right?

A. I can do that calculation that way. The catch is if you're asking me to do that, then the folks at Reliant, they're going to have to have a calculation with different recovery efficiencies.

Q. I don't want you to assume recovery efficiency?

A. I'm not; they have. In order to do their calculation, they have to assume a recovery efficiency.

Q. Well, okay. Stop worrying about Reliant. You need to tell me which one is better?

A. There's two different ways of doing it. You know, basically we're using the same equation with similar inputs. We're just solving the equation in two different ways. And --

Q. You are calculating a recovery, and they are assuming a recovery? Is that what you're saying?

A. That's correct.

Q. That's why we're here.

A. Yes. So you can look at the two numbers, and the answers should be comparable one way or the other.

Q. So I want those calculations.

A. We'll spell it out for you, similar to what he has done. It should be no problem.

Q. Because we have to agree on that page 20, that the way you use, you know, 640 recovery alone is 19 percent.

Without showing me the calculation -- you know, sure. I mean would you agree to that without demonstrating it?

The one you did is an offset well. This is not the well?

A. This is just an example of the calculation methodology.

Q. Okay, but you have data. It's inside the subject area. But calculation, I need calculation in the subject area.

MR. FELDEWERT: Mr. Ezeanyim, if I'm understanding it, you want him to do a slide like this, with the wells in the subject area, to show --

EXAMINER EZEANYIM: Well, yeah. To show how the decline is projected, and then calculate whether they are using recovery efficiency, or whatever they are

doing. Calculate how much each of those wells are draining.

MR. FELDEWERT: Okay. So something like -- it's on -- for example, what's depicted here on Slide Number 16.

If I'm understanding what you're asking for is that for each of the wells in the subject area, that they create a slide like --

EXAMINER EZEANYIM: Wait. You know, there's a lot of numbers here that are calculated. I don't know what numbers are -- I want to see the calculations demonstrated in those numbers. But if you can show the decline, are you using about 99 Mcf, 100 Mcf, approximately, as your abandonment?

THE WITNESS: Yes. Do you see there where it says, "end rate"?

EXAMINER EZEANYIM: Yeah, okay. So use those -- I mean it's a simple calculation.

THE WITNESS: We basically do the calculation for each well and spell out for you where each end-rate variable come from?

EXAMINER EZEANYIM: That's what I want to see. I want to see the numbers you used to come up with those answers. That's what I'm looking for. If you show me the end product, I don't know how you arrived at

it. It becomes bothersome to me, but it is okay.

Here are the numbers. Everybody can plug into that equation to see, of course, if we add it up, that those numbers are correct.

THE WITNESS: Sure.

EXAMINER EZEANYIM: But I know what you're doing. You're trying to simplify it. But here I ask questions.

THE WITNESS: That's fine.

EXAMINER EZEANYIM: If you're coming here, you need to show me how you got those numbers.

THE WITNESS: I can do that.

EXAMINER EZEANYIM: I don't want to sound like I'm perfect, but I want to make sure what I'm doing. Because if I just assume all those numbers are correct, I don't think I would happy with myself until you demonstrate it.

The same thing with Reliant. I want those calculations.

However you want to calculate it, you're going to calculate to demonstrate the work you're asking for. And then let me have the job of the reviewing them and seeing what's going to happen. Because you're going to show me the data you used and the parameters you used.

If I had a parameter like Z, you know, gas

comparability like you use in the calculations, if you're at this .33, and somebody's at .86, then I begin to wonder, because that would make a whole lot of difference in the calculation.

How did you come about that? You know, that's what I want to see from both. I'm not talking to you alone. I'm also talking to Reliant. I want to see all those parameters and the calculations and the calculations split up. I'll be able to look at it and it can tell me what you're saying is good, is correct or not. I think that's how we're going to handle this demonstration.

Is that going to be onerous for anybody to calculate that?

MR. BEEBE: Not at all. Not for me.

THE WITNESS: We can just whoop it up.

EXAMINER EZEANYIM: Then my question is: Why didn't you do it before you came here?

THE WITNESS: Well, we might have done it, but not presented it.

EXAMINER EZEANYIM: It appears you are not serious. Because that's what I wanted to hear today. I was thinking I was going to see all those explanations and then decide, what is it? But now I don't have it. I have to ask you to do it.

Well, you know, it's not easy. It's not easy now. When you come before me, I have to require you to show evidence, because that's a very light area. We want to make sure we get it right. Otherwise, we will be losing waste and maybe violating somebody's correlating rights, and I don't think you would like that.

So when we make a determination here, we are going to get it on what you present because you are the operator. I'm not there. If I'm there, I know what I should do, but I'm not. You guys are there to tell me what I need to use to make that recommendation for that area we're talking about. Anything you can do.

So please give me those calculations with all the assumed parameters, whatever you used to calculate those Zs, even the permeability that is involved, or if it's costing -- whatever you use to come up with the drainage area, I think that would be very helpful.

We have enough data now. Sixteen wells would be enough to show whether we are going to go 640 or 160. I'm trying to get those data. I'm sorry I'm preaching, but I think -- I'm glad I'm preaching to get those numbers.

Let me see if I have any questions before we proceed here. Okay. Now these wells, these 18 wells

have been producing since 2009?

THE WITNESS: March 2009.

EXAMINER EZEANYIM: That's about four years?

THE WITNESS: Yes, sir.

EXAMINER EZEANYIM: Okay. Those four years can be extrapolated to do what we need here. We can do it. Four years of data that are declining, you can just -- once we understand the type of decline, then we can extrapolate. It's simple arithmetic, I call it. So we are going to do that.

I think I have one more question for you, Mr. -- how do you spell your last name?

THE WITNESS: G-i-u-s-s-a-n-i.

EXAMINER EZEANYIM: Very well. Thank you. I missed one S.

Now, I would really like to see the calculation on those anomalous wells and those wells that are not producing anything. The wells that are not producing will not drain anything. But it's my job now to look at the whole 18 wells and see how I can then do it, based on the data.

Please, when you are giving me parameters, be very cautious on what you are giving me, because I'm going to check it. If you give me anything, I'm going

to check whether that assumption is valid or not. So I want to make that point.

Because it's very important we get it right, now that we are here talking about it after hours. So please, I want both parties to get me that information.

I know we have one more witness. Are you ready to call the next witness?

MR. FELDEWERT: Yes. I think he can be fairly short. We just need to dot some Is and cross some Ts.

EXAMINER EZEANYIM: I think I would like to have one five-minute break.

[Recess taken from 5:47 to 5:54 p.m.]

EXAMINER EZEANYIM: We are going back on the record and continuing with Oxy's testimony.

MR. FELDEWERT: We will call our last witness, Mr. Patrick Sparks.

PATRICK SPARKS

having been first duly sworn under oath,

was examined and testified as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Would you please state your name, by whom you are employed, and in what capacity?

A. Patrick Sparks. I'm a landman for Oxy USA.

Q. And how long have you been a landman with Oxy?
A. Over 30 years.
Q. Have you previously testified before the Oil Conservation Division?
A. Yes, sir.
Q. And also, have you recently testified before the Oil Conservation Commission?
A. Yes, sir.
Q. And in each case, have you been recognized before the Division Examiners and the Commission as an expert in petroleum land matters?
A. Yes, sir.
Q. Are you familiar with -- how long have your job responsibilities included the Bravo Dome unit?
A. I've worked off and on on Bravo Dome for the last couple of years.
Q. Are you familiar with Oxy's application in this case?
A. Yes, sir.
Q. And are you familiar with the status of the lands in the subject area?
A. Yes, sir.
MR. FELDEWERT: I would tender Mr. Sparks as an expert witness in petroleum land matters.
EXAMINER EZEANYIM: Any objection?

MR. DEBRINE: No objection.

EXAMINER EZEANYIM: Mr. Sparks is so qualified.

THE WITNESS: Thank you.

MR. FELDEWERT: Give me one minute here. I'm cutting things down.

EXAMINER EZEANYIM: Take your time.

Q. (By Mr. Feldewert) Mr. Sparks, did Oxy identify and provide notice of the hearing to all of the operators in the subject area?

A. Yes, sir.

Q. And did Oxy identify and provide notice of this hearing to all the lessees or royalty owners in the existing spacing units with producing wells in the subject area?

A. Yes, sir.

Q. Did Oxy also provide notice of this hearing to Hess, which is the operator of the adjacent offsetting acreage in the West Bravo Dome area?

A. Yes, sir.

Q. And does Hess currently operate, as well, the AmeriGas acreage shown in blue on Oxy's Exhibit Number 2, which is spaced at 160 acres?

A. Yes, sir.

Q. Okay. Did Oxy also identify the Bureau of Land

Management and the New Mexico State Land Office of this hearing?

A. Yes, sir.

Q. Is Oxy Exhibit Number 7 an affidavit with the attached letters providing notice of this hearing today?

A. Yes, sir.

Q. Okay. If you'll look at -- and are you familiar, Mr. Sparks, with the operator history in the Bravo Dome unit?

A. Yes, sir.

Q. As well as the West Bravo Dome?

A. Yes, sir.

Q. If I look at Oxy Exhibit Number 6, does it accurately identify the operators of these two separate units from the period of time that they were formed to the present?

A. Yes, sir.

Q. And was Oxy Exhibit Number 6 compiled by you or under your direction and supervision?

A. Yes, sir.

MR. FELDEWERT: I move the admission into evidence of Oxy's Exhibits 6 and 7.

EXAMINER EZEANYIM: Any objection?

MR. DEBRINE: No objection.

MR. FELDEWERT: That concludes my

examination of this witness.

EXAMINER EZEANYIM: Exhibits 6 and 7 will be admitted.

[Exhibits 6 and 7 admitted.]

EXAMINER EZEANYIM: Mr. DeBrine?

MR. DEBRINE: No questions.

EXAMINER EZEANYIM: Are there any questions?

EXAMINER BROOKS: Not really. I'm curious about some things, but I don't think they're relevant. I will not ask those questions.

EXAMINER EZEANYIM: Okay. Of the land person?

EXAMINER BROOKS: Well, yeah. But you know, people have a right to do what they're doing, whatever their reasons are. What I'm curious about is selfish reasons, but they don't have to state the reasons.

EXAMINER EZEANYIM: What did you say?

EXAMINER BROOKS: What I'm curious about is why Oxy is taking the position they are. And that's really not relevant, in the sense that they have a right to protect their position, and it doesn't really matter what their motivation is.

MR. FELDEWERT: I can answer that.

EXAMINER BROOKS: Okay.

MR. FELDEWERT: Should we finish with this witness first?

EXAMINER BROOKS: I have no questions.

EXAMINER EZEANYIM: I have no questions for you.

EXAMINER BROOKS: Now, Mr. DeBrine explained Reliant's reasons, because they have a Pugh Clause in their lease. That makes sense.

But since Oxy can drill on 160, and if Reliant goes out and starts drilling a bunch of wells to comply with their Pugh Clause, it's just going to make it necessary for Oxy to drill wells they might not otherwise want to drill to offset those and prevent their acreage from being drained.

It just seems funny to me that Reliant got it reduced to 160.

MR. FELDEWERT: Well, you have to remember -- let's think about the legal framework that we're in, which is Order R-7737B.

EXAMINER BROOKS: Right.

MR. FELDEWERT: It states that the operator's case shall be reopened to examine the space in West Bravo Dome and in the subject acreage.

Now, we're an operator of the subject acreage.

Reliant is recently an operator of that subject acreage. Okay? So whether the case should have been called by the Division on its own or whether it should have been called by one of the operators, the current spacing is temporary.

And the current spacing states that they're required to come back to the Division for the purpose of demonstrating why this area should not be developed on less than 640-acre spacing units. So that's what we were under, that's what they were under.

I'm assuming when it comes back before the Division and it examines what the spacing should be out there, that it's not going to be based on the individual economics of any particular operator. Because to my knowledge, spacing and proration units are not based on economics associated with an operator.

LEGAL EXAMINER BROOKS: Well, that's why I said it was -- my question was irrelevant. It doesn't matter what reasons you have for wanting the spacing. We have our reasons. Your function is to present evidence so we can apply our reasons. It doesn't matter what your motivation is.

MR. FELDEWERT: So what was our motivation? I looked at this and said: We're the operator of this acreage at this time, because Reliant

was not. Here's this order. It says that it's supposed to be reopened so they can examine the spacing once there's sufficient production from the area to determine spacing.

As Mr. Ezeanyim recognized, we do have a sufficient amount of production now. We have a number of wells. We have log profiles that we can examine. So the Division can do with that evidence as it deems appropriate.

EXAMINER BROOKS: Okay. Very good.

MR. DEBRINE: We would submit, given the terms of that order, that since Oxy didn't come here to present evidence within the terms of the order, they lack standing.

EXAMINER BROOKS: Well, the order is -- unlike some of our temporary rules orders, this one isn't ambiguous to the extent that it says that the temporary rules will remain in force until further order of the Division. So it seems to me there's no ambiguity.

Unless and until somebody brought this proceeding, then the current rules would remain in effect. The spacing would remain 640.

Of course, that has the problem that because of that other proceeding, Oxy can't produce those two wells

without pooling them in a 640 unit.

But I can't imagine that Oxy is motivated in how their -- what they want to do with this entire unit by those two wells. Because those are just two wells, and there are many, many, many wells in potential locations.

MR. FELDEWERT: Spacing is whatever the drainage is. We have enough data -- as an operator, we've come back to the Division, now that we have enough data. You know, we think that it should be developed on less than 640-acre spacing, based on our data.

They're saying, no, it should not be developed on less than 640-acre spacing. So they've got to demonstrate why. That's where we're at.

EXAMINER BROOKS: Yeah, and that's what the rule says. And that's why I ruled the way I did.

EXAMINER EZEANYIM: Okay. Are we are not done yet?

EXAMINER BROOKS: Okay. I'm through.

EXAMINER EZEANYIM: You are excused. We have no more witnesses, right?

MR. FELDEWERT: Correct.

EXAMINER EZEANYIM: Okay. Good.

We are agreed that doing the calculations for the 18 wells should be presented by each party, right?

We are agreed to that?

MR. DEBRINE: Yes.

EXAMINER EZEANYIM: Okay. Now, by what time do you want to submit the information? Time is of the essence, because I've got a lot on my plate. If you'll just tell me what time you can get it in, but I want it done right. I don't want to start asking question when I get the information. I want every information that I need to have. So we are looking for what time can you submit that information?

Of course, the information is shared, because this is a contested case. So you get your share to them and then give it to me. And they share it with you and give it to me.

And then if there is's control as to who might have a meeting, but I can't control anything.

MR. FELDEWERT: We would propose that we have this simultaneous delivery by July 1st.

EXAMINER EZEANYIM: Is that okay with Reliant?

MR. DEBRINE: Yeah, that's fine. We were going to suggest two weeks.

EXAMINER EZEANYIM: July 1. Okay.

So you can do it, right?

MR. DEBRINE: Yes.

EXAMINER EZEANYIM: So it's a little more than three than weeks.

Now, also along that line, I want Counsel to -- you know, if you don't mind -- and this is a request -- draft an order in this case stating what your plans are and then what should be granted and what you're asking for.

Is that okay with everybody, to --

MR. FELDEWERT: You would like a proposed order?

EXAMINER EZEANYIM: A proposed order.

MR. FELDEWERT: Okay.

MR. DEBRINE: By the same date?

EXAMINER EZEANYIM: Yeah, by the same date. Is that same date okay with everybody? I want them to come on the same date.

MR. DEBRINE: Yes, we can do that.

MR. FELDEWERT: So we'll submit the data, or the calculations, and the proposed order on July 1st?

EXAMINER EZEANYIM: On July 1st. I think that's enough time to get it to me so that I can start. Let's get it by July 1. Is there anything -- I mean there's no hurry here, right?

MR. DEBRINE: I don't believe so.

EXAMINER EZEANYIM: Then this is the time for me to ask a question, David, if I may?

EXAMINER BROOKS: Of course.

EXAMINER EZEANYIM: There are two wells that you have drilled that are shut in. What's happening with those wells?

MR. FELDEWERT: Well, I think there's a number of wells that have been shut in because of their economic performance.

EXAMINER EZEANYIM: Okay, I'm not talking about those. You know, we're not talking about them. But there are two wells that were drilled in 2010 by Oxy that were shut in?

MR. FELDEWERT: No. Those were drilled back in 2007.

EXAMINER EZEANYIM: And they are a short distance from there? Are they economic?

MR. FELDEWERT: I think you testified on the record the condition of those wells?

MR. GIUSSANI: They're making less than 100 Mcf a day, and they're wet. I mean when a well starts making water, basically it just kills itself because they don't have enough gas to bring the water to the surface. Pretty soon the well will be dying out.

EXAMINER EZEANYIM: I tell you, what I'm

asking you guys -- and by the way, I'm not on the witness stand. But anyway, I just wanted to know, so there's no need for you to object. I'm not going to use that information.

MR. DEBRINE: That's fine. And I think the record will reflect that the witness testified with regard to other wells, not the two wells that were drilled, that the Reliant acreage was necessary to form the 640. I think he testified there was 2- to 300 Mcf per day production that was shown on those wells.

MR. FELDEWERT: Whatever it was.

MR. DEBRINE: He's nodding his head yes.

EXAMINER EZEANYIM: So it's clear now what we need to do, right?

MR. DEBRINE: Yes.

EXAMINER EZEANYIM: Okay. Very good. If there's no -- let me see if I can find that. We are going to come to conclusion by taking this case under advisement. Therefore, at this point, Case Number -- finally -- 8352 will be taken under advisement.

This case has been here for almost -- how many years? Since 2001 or something.

EXAMINER BROOKS: I have no idea.

EXAMINER EZEANYIM: So Case Number 8352

will be finally taken under advisement. And that concludes the hearing today.

Thank you very much.

MR. DEBRINE: I would just note that I did mark exhibits, and the notebook with the court reporter has the exhibit numbers marked on it.

EXAMINER EZEANYIM: Thank you very much.

[The proceedings concluded at 6:09 p.m.]

REPORTER'S CERTIFICATE

I, DEBRA ANN FRIETZE, New Mexico Certified Court Reporter No. 251, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings and was reduced to printed form under my direct supervision.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this case.

DEBRA ANN FRIETZE
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