NEW MEXICO OIL CONSERVATION DIVISION

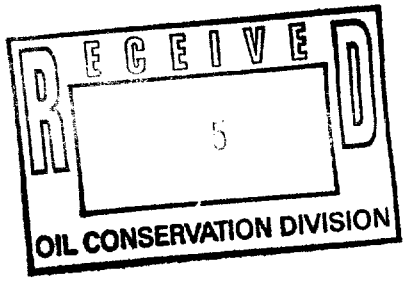
STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NOS. 11028, 11029, 11030, 11031, 11032, 11033, 11035 and 11036

IN THE MATTERS OF:

The Applications of Conoco, Inc., for Downhole Commingling; San Juan County, New Mexico.



BEFORE:

JIM MORROW

Hearing Examiner

State Land Office Building

September 1, 1994

REPORTED BY:

CARLA DIANE RODRIGUEZ, NMCCR No. 4
Certified Shorthand Reporter
for the State of New Mexico

ORIGINAL

A P P E A R A N C E S

FOR THE OIL CONSERVATION DIVISION:

State of New Mexico Oil Conservation Division
Room 206, Land Office Building
Post Office Box 2088
Santa Fe, New Mexico 87504-2088
By: **RAND L. CARROLL, ESQ.**

FOR THE APPLICANT:

KELLAHIN & KELLAHIN
Post Office Box 2265
Santa Fe, New Mexico 87504-2265
BY: **W. THOMAS KELLAHIN, ESQ.**

I N D E X

	Page Number
Appearances	2
WITNESSES FOR THE APPLICANT:	
1. **TOM SCARBOROUGH**	
Examination by Mr. Kellahin	6
Examination by Mr. Morrow	17
2. **BEN SARGENT**	
Examination by Mr. Kellahin	19
Examination by Mr. Morrow	37
Certificate of Reporter	46

E X H I B I T S

	Page Referenced
Case No. 11028	
Exhibit No. 1	9
Exhibit No. 2	11
Exhibit No. 3	11
Exhibit No. 4	14
Exhibit No. 5	23
Exhibit No. 6A and 6B	24
Exhibit No. 7A and 7B	25
Exhibit No. 8	25
Exhibit No. 9	26
Exhibit No. 10	31
Case No. 11029	
Exhibit No. 1	15
Exhibit No. 2	16
Exhibit No. 3	16
Case No. 11030	
Exhibit No. 9	28
Case No. 11033	
Exhibit No. 8	32
Exhibit No. 9A	33
Exhibit No. 9B	34
Exhibit No. 10	36
Exhibit No. 11	44
Case No. 11036	
Exhibit No. 9	30

[Exhibits 1 through 10 in Cases 11028, 11029, 11030, 11031, 11032, 11035 and 11036 were received into evidence. Exhibits 1 through 11 in Case 11033 were received into evidence. Only exhibits referenced in text have been indexed.]

EXAMINER MORROW: At this time, we'll call Cases 11028 through 11036.

MR. CARROLL: Applications of Conoco, Inc. for downhole commingling, San Juan County, New Mexico.

EXAMINER MORROW: And we'll call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm Kellahin & Kellahin, appearing on behalf of the Applicant. I have two witnesses to be sworn.

EXAMINER MORROW: Will the witnesses please stand to be sworn.

[And the witnesses were duly sworn.]

MR. KELLAHIN: Mr. Examiner, we're going to attempt to present these as a consolidated presentation. So that you have an idea of what we're going to present, let me describe that for you.

Each case is separately identified on the docket, and there will be a separate set of exhibits for each case.

There are two witnesses. Mr. Scarborough, who's at the witness stand, is a landman, and he'll describe the spacing

orientations, the spacing configurations, and the ownerships.

Mr. Ben Sargent is a petroleum engineer, and he will give the technical presentation.

The reason these cases are before you for hearing is because there is a difference in ownership between the two pools for which commingling is being sought. In addition, one case has three pools, but the ownership issue precluded Conoco from having these cases processed administratively.

The only other novelty, if you will, is that in Case 11033, there is a pressure relationship between the two zones such that the pressure of the lower zone, or the lowest pressure zone, is less than half of the higher pressure zone, and so it raises a cross-flow potential.

Mr. Sargent has analyzed that and he is here to describe for you his engineering conclusions that there will not be cross-flow, but that is an item that's a little different from the rest.

The rest of the cases are going to fall

into the same methodology of analysis. The technical presentation is that the zones are going to be uneconomic. All these wells are producing as dual wells or as a triple completion.

We're asking that you apply the conventional Examiner's order that will delegate to the district the allocation process. We're going to show you what we think the allocation formula should be, but we would ask that you do what we've done in the past, and that is to delegate to the district office in Aztec the actual mechanics of meeting with the operator, looking at the proof, and assigning an allocation formula.

So that's what we're about to show you, and with your permission, then, we'll call Mr. Scarborough.

EXAMINER MORROW: Let's do it.

TOM SCARBOROUGH

Having been first duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Scarborough, for the record would

you please state your name and occupation?

A. My name is Tom Scarborough. I'm a senior landman with Conoco, Inc.

Q. On prior occasions, Mr. Scarborough, have you testified as a petroleum landman before the Division?

A. No, I have not.

Q. Summarize for us your education.

A. I obtained a degree in petroleum land management from the University of Oklahoma in 1982.

Q. Summarize your employment as a landman.

A. I was a consulting landman for several independent and major oil companies from 1982 through 1990. I have been employed by Conoco, Inc., since 1990.

Q. You reside in Midland, Texas?

A. Yes, I do.

Q. Within your area of responsibility, were you assigned the duty to determine the ownership with regards to each of the formations for which your company seeks to commingle production for these eight wells?

A. Yes, I was.

Q. In addition, were you assigned the responsibility to determine the offset operators to each of the spacing units, based upon whatever configuration applies in that pool?

A. Yes, I was.

Q. Did you do those things?

A. Yes, I did.

Q. In addition, did you send notification to all the interest owners that might be affected by this application?

A. Yes. We did send notification by certified mail.

MR. KELLAHIN: We tender Mr. Scarborough as an expert petroleum landman.

EXAMINER MORROW: I'll accept Mr. Scarborough's qualifications.

Q. Let's look at the spreadsheet, the little crib sheet. It's not marked as an exhibit, but it should be the first page of the exhibit packages. Describe for me, Mr. Scarborough, what is shown on the summary sheet. How is it organized?

A. Basically, we have eight wells that we wish to have downhole commingled between the various zones. We are showing the specific well,

the zones to be commingled, the proration unit size of the various formations, the actual spacing unit description, the fact that there are various interests between the formations, none of the interests are common, and the zones which are deemed uneconomic prior to downhole commingling.

Q. Are all these wells located in San Juan County, New Mexico?

A. Yes, they are.

Q. Conoco is the operator of each of these wells?

A. That is correct.

Q. Let's turn to the exhibit package that's marked for the first case, which is 11028, and describe for us how the exhibit package is organized.

A. Okay. Exhibit 1 details the well to be downhole commingled, the location of said well, and the pools to be downhole commingled. In addition, we've identified the state, federal or fee lease which is dedicated to the proration unit, and also the description of the proration unit for the various formations to be downhole commingled.

Q. When we deal with this well, as well as

the others, have you been in contact, or has Conoco been in contact with the appropriate state or federal agency that deals with commingling?

A. Yes, we have.

Q. Separate and apart from the Oil Conservation Division?

A. That is correct.

Q. For those cases involving state lands, then, you have discussed the commingling process with the Commissioner of Public Lands for the State of New Mexico?

A. Yes, we have.

Q. In each of those instances, there will be an attachment to the exhibit book that shows his approval?

A. That is correct.

Q. All right. And as to the two properties that involve federal leases, identify for us which cases involve federal leases.

A. Case No. 11035, the Graham C "WN" Fed. No. 14, and Case No. 11036, the Bruington No. 15E.

Q. You have been in contact with the BLM, then, and are in the process of obtaining the BLM's approval for commingling?

A. That is correct.

Q. Let's turn past the cover sheet for Case 11028, and have you describe the next display.

A. This exhibit shows the orientation and size of the proration unit for the State Com No. 47 well, Pictured Cliffs formation. In addition, it shows the offset Pictured Cliffs wells and their respective operators.

Q. If we turn past Exhibit 2A and look at 2B, what does 2B show?

A. 2B shows the orientation and size of the proration unit for the Mesaverde formation in the State Com No. 47 well. In addition, it shows the offset Mesaverde wells and their respective operators.

Q. With regards to the balance of the exhibits for the other cases, have you gone through, in a similar fashion, and prepared similar displays for each of the pools for which commingling is sought in those cases?

A. Yes, we have.

Q. Let's turn now to Exhibit 3. What is that?

A. Exhibit 3 is a tabulation of the

various interest owners in the State Com No. 47 well.

Q. Show us how you've organized the spreadsheet.

A. Okay. We have broken down the interest type between working interest, carried working interest, royalty interest and overriding royalty interest between the two zones, as they apply to the respective owners.

Q. When we look at the first column, does that contain the name or the identity of the interest owner, regardless of what formation?

A. Yes, it does.

Q. The next column represents what?

A. The next column is the type of interest that entity owns in that well.

Q. In relation to the next column, which is the Pictured Cliffs, in this case?

A. The Pictured Cliffs, which is the actual decimal interest that that party owns in that formation.

Q. Show us what happens to Conoco's interest when we look at the Pictured Cliff.

A. In the Pictured Cliff, Conoco has a .5886 decimal working interest.

Q. When we move over to the Mesaverde, what happens?

A. Conoco's interest decreases to a .3924 decimal interest.

Q. Have you satisfied yourself, to the best of your knowledge, information and belief, that you have tabulated a correct, current and accurate display showing not only the interest owners but their appropriate interest per pool?

A. Yes, I have.

Q. Based upon that information, the ownership interests and the offsetting operators, what, then, did you do?

A. We mailed a copy of the application for downhole commingling to all working interest owners, overriding royalty interest owners, royalty owners, and offset operators, a copy of the downhole commingling application.

Q. How did you send that?

A. We sent that certified mail.

Q. With what results?

A. Most of the letters were received. We did receive a receipt signifying the letter had been delivered. There was one instance where the letter was not delivered.

Q. When envelopes came back to you--I assume some of these initially came back to you?

A. That is correct.

Q. --did you determine more accurate addresses and subsequently mail them again?

A. Yes, we did.

Q. At the end of that entire process, with one exception, did you actually serve all interest owners and operators?

A. Yes, we did.

Q. When we look at Exhibit 4 in each exhibit package, what does Exhibit 4 contain, then?

A. Exhibit 4 is a copy of the return receipt for each of the interest owners or operator.

Q. Describe for us the one instance, then, in which, despite your efforts, you were unable to achieve actual service of the application to that owner.

A. In that particular interest, the interest owner was deceased, with no known heirs.

Q. Can you describe what case that situation occurs in?

A. Yes. That is in Case 11028.

Q. When we look at Exhibit 4, then, you've attached copies of the green certified mail receipt cards, and if you didn't have a green card, you attached proof of sending of notice?

A. That is correct.

Q. Did you go through the same methodology in all cases?

A. Yes, we did.

Q. With the same results?

A. Yes, we did.

Q. In any case, for any category of owner or interested party, did you receive any objection?

A. No, we did not.

Q. Let's turn now to the exhibit package for 11029. I won't spend much time on it, but thumb through your work product and take us to the spread sheet that shows the division of interest, okay?

A. Okay. Again, Exhibit 1 is the description of the well and the pools to be downhole commingled.

EXAMINER MORROW: Speak a little lounder for me if you would, sir.

Q. Exhibit 1 is a description of the wells

and the zones to be downhole commingled.

Q. You're looking at the exhibit package for Case 11029?

A. That is correct.

Q. All right, sir.

A. Exhibit 2A, again, is a description of the orientation and the proration unit for the Pictured Cliffs zone, the State Com G No. 2A well, showing the offset Pictured Cliffs wells and operators.

Exhibit 2B is a depiction of the orientation and the proration unit for the Mesaverde formation of the State Com G No. 2A well, again showing the offset Mesaverde wells and their respective operators.

Exhibit 3 is a tabulation of the ownership between the Pictured Cliffs and Mesaverde zone as it relates to each interest owner.

Q. All right, sir. And similarly, then, for Cases 11030 through 11036, you've done the same thing?

A. That is correct.

Q. And if you'll look at each of those exhibit packages, you'll find the same type of

information?

A. That is correct.

MR. KELLAHIN: That concludes my examination of Mr. Scarborough, Examiner Morrow. We move the introduction in each case of Mr. Scarborough's work product, which is identified as Exhibits 1 through 4 in each of those cases.

EXAMINER MORROW: Exhibits 1 through 4 in each of the Conoco commingling cases are admitted into the record.

EXAMINATION

BY EXAMINER MORROW:

Q. In your contact to the owners, you advised them of your pending application or your proposal?

A. Yes, we did.

Q. And requested their approval, or--

A. We advised them of our request for downhole commingling, yes.

Q. Okay. You did make contact with the BLM and the State Land Office and, I assume, got their approval, or a verbal indication at least?

A. That is correct, yes.

Q. Do your leases with the other owners--I guess, though--well, in all cases, is the royalty

interest owned completely either by the state or by the federal government?

A. On a lease basis, yes.

Q. Okay. Except for the overriding royalty, then, all the royalty is either state or federal?

A. There are two leases that are fee leases.

Q. Oh, are there?

A. Yes.

Q. Which cases are those in?

A. That would be Case 11036.

Q. Both fee leases are in that one case?

A. That is correct.

Q. The offset operators were also included in your notification? Did you also indicate that in your testimony?

A. Yes, we did.

Q. In 11028, which one did you not get a reply from?

A. The Estate of Carl Senges.

Q. And you did learn that Carl was deceased, is that correct?

A. That is correct.

EXAMINER MORROW: Thank you, sir.

Appreciate your testimony.

MR. KELLAHIN: At this time, Mr. Examiner, we call Mr. Ben Sargent.

BEN SARGENT

Having been first duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. KELLAHIN:

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

A. Ben Sargent. I'm a reservoir engineer for Conoco.

Q. Where do you reside, sir?

A. I live in Midland, Texas.

Q. On prior occasions, have you testified as a reservoir engineer before the Division?

A. Yes, sir, I have.

Q. Describe for us what has been your function and responsibility concerning these eight cases that are before the Examiner?

A. Our responsibility on these cases has been to look at the production on each zone, try to determine if the wells are economic, versus uneconomic, and then look to see if they're going to benefit from downhole commingling.

Q. Did you complete that analysis?
A. Yes, sir, I did.
Q. Have you reached engineering conclusions based upon those results?
A. Yes, sir, I have.
Q. In addition, do you have opinions concerning a method or a procedure for downhole commingling allocation of production to the interest owners?
A. Yes, I do.
MR. KELLAHIN: We tender Mr. Sargent as an expert reservoir engineer.
EXAMINER MORROW: We accept Mr. Sargent.
Q. Let me have you describe for us in general, Mr. Sargent, what is the concept that you're trying to execute or implement for your company concerning these wells?
A. We've done a review for most of our wells in the San Juan Basin looking for candidates for downhole commingling, ones that will benefit from increased production, increased reserves for the zones that have reached their economic limit or close to their economic limit, to further enhance the reserves that we'll get

from those wells.

Q. Can you give us a general summary of the economic threshold criteria that you've applied for these wells?

A. Approximately less than 60 to 70 Mcf a day well is coming out marginal on our economics, with our operating expenses and overhead that we have in the San Juan Basin, so if a well was below that, and was a dual well, it became a candidate for downhole commingling.

Q. In each instance, have you determined, to the best of your engineering judgment, that commingling will result in the recovery of additional hydrocarbons that might not otherwise be recovered?

A. Yes, sir, I have.

Q. Have you also made a determination of the method for downhole commingling allocation?

A. I've given examples of how we intend to do it.

Q. Describe for the Examiner your general concept of allocation.

A. The general concept is to use the uppermost zone which has the more steady production, and the BTU factor applied to that

upper zone, and then taking the bottom reservoir of the bottom zone and whatever the future production we get after commingling, and we'll do a BTU sum total and then a BTU breakout with percentage per zone.

Q. Did you make that allocation analysis independent of any knowledge about the actual ownership or percentages involved in sharing in that production?

A. Yes, sir, I did.

Q. Would you be willing, if you personally owned an interest, to share based upon your proposed allocation formula?

A. Yes, sir, I would.

Q. Are you generally familiar with the Division's administrative rule, Rule 303, for downhole commingling of gas zones?

A. Yes, I am familiar with the rule.

Q. When we look at those procedures for administrative downhole commingling, are there any engineering problems for you, or questions with regards to any of those wells?

A. No, sir, there aren't. There is one well in our case that you brought up first that does have a pressure differential that's greater

than 50 percent, which is an exception to the rule.

Q. In each instance, then, do you find fluid compatibilities, if there are fluids produced?

A. We've got fluid compatibilities in every instance. They're dry-gas reservoirs, they've have had a history of commingling in the reservoirs, in other areas, with no apparent damage to the reservoirs.

Q. Based upon your engineering work, do you see any problem at all in having the Examiner approve downhole commingling of this production?

A. No, sir.

Q. Let's take him through an example of what you've done. Let's look at Case 11028, and if you'll pick up the exhibit package and start with Exhibit 5?

A. Exhibit 5 represents the Pictured Cliffs and Mesaverde. In the April production, it's the monthly production divided by 30 to give an average daily rate for each of the zones.

Q. How is this information useful to you in going through your downhole commingling review?

A. What we're looking for is the most representative rate, especially of the uppermost zone that we'll use in the future allocation percentage for downhole commingling of the reservoirs.

Q. In each of the exhibit packages, do we find a similar C-116 for each well?

A. Yes, sir, we do.

Q. When we look at this production, some of this production is prorated gas production, is it not?

A. That is correct.

Q. In each instance, is that production categorized or properly classified as marginal gas well production?

A. Yes, it is.

Q. Let's turn now to Exhibit No. 6. This is subdivided into a 6A and a 6B. What is contained on Exhibit 6A?

A. Exhibit 6A is the monthly production from the Blanco-Pictured Cliffs plotted to show what the well will represent in the future for an allocation basis.

Q. And then Exhibit 6B?

A. Exhibit 6B is the Mesaverde, the lower

zone, and it's a production history plot of its production.

Q. Behind that, do you start another series of exhibits numbered 7A and B?

A. Yes, sir.

Q. What do those represent?

A. 7A and B are the gas analyses for each reservoir, that shows the BTU factor that we'll use for the allocation purposes.

Q. Let's turn now to Exhibit 8. You said earlier that you had gone through an economic analysis to determine what level of daily gas production would cause a well to be a potential candidate for downhole commingling. Describe for us how you've reached that conclusion based upon the information shown on Exhibit 8.

A. Exhibit 8 at the bottom, we show our economic limit calculation; we have our direct operating expense that we incur in the field on these wells. All these wells are very similar in production, water production, et cetera, so they all have a similar operating expense.

Then we have our overhead and our accounting expense, to get to our total operating costs. Then, at the same time, I have an

estimated workover cost to work over the wells, with the current gas price on a Mcf basis.

Without workovers, I come up with an economic limit of 37 Mcf a day. With the workover, it's 49 Mcf a day, and that also takes out the royalty interest.

Q. Have you applied that same volume as the economic criteria, then, when we look at all the exhibit books?

A. The calculation is the same for all cases.

Q. And it results in the same number?

A. Yes, it does.

Q. Let's turn past that and look at your projection for this well on Exhibit No. 9.

A. For the uneconomic Pictured Cliffs zone, I've got a plot showing what the added reserves will be through commingling.

Q. Show us how to read the display.

A. The display is Mcf per day plotted on the Y axis, and the cumulative gas for each year that the well will produce through for a 10-year period.

Q. So, if we start at the top of the Y axis, what's the significance of the number 24?

A. 24 is the current producing rate of the Pictured Cliffs, which is uneconomic, so we're at the point now where we need to shut the well in, squeeze off the Pictured Cliffs and produce the Mesaverde by itself.

Q. What does the plotted decline curve on the display represent, then?

A. That's the normal decline of the well that you would see, if you were able to continue to produce it.

Q. The only way you can continue to produce this well is to commingle that production with Mesaverde in this well?

A. That's correct.

Q. What are the benefits of doing that for this well?

A. The benefits for this well will be an additional recovery of 41 million cubic feet over a 10-year period.

Q. That's in the dark, outlined box on the display?

A. Yes, and that's the total you see in the year 2003 on the X axis.

Q. Have you gone through a similar process of analysis for each of the other wells?

A. Yes, sir, I have.
Q. You're going to show that, in each well, there's no more than one zone that is economic?
A. That is correct.
Q. In this instance, there are only two zones, and you're demonstrating the Pictured Cliffs is going to be uneconomic?
A. And you'll get additional recovery.
Q. You have $41,000 plus Mcf of gas that's at risk if you don't commingle?
A. That's correct.
Q. Are there any examples of economic analysis where the current starting point of the uneconomic zone is above your economic threshold?
A. Yes, sir, there are.
Q. Can you tell us which ones those are?
A. I think 11030 is an example, on the State Com R No. 14.
Q. Yes, sir. If you'll take a moment and let us all turn to the exhibit book for 11030?
All right. If we turn to 11030, tell us what exhibit number in that book illustrates this issue?
A. Exhibit 9, on 11030, is the plot.

Q. All right. This plot, the current rate on the Pictured Cliffs is 54 Mcf a day?

A. Which is 5 Mcf a day above my calculated economic limit.

Q. Why is this well now a candidate for commingling, even though it's slightly above your economic threshold?

A. No. 1, you have a high potential for packer leakage on this well. It's very, very close to its economic limit, and it's at the point now where, if you wait much further, you may not be able to have the economics to do it in the future, for potential loss of reserves.

Q. If commingling is approved for this well, in this case, what is your calculated estimate of additional gas recovery?

A. 114,000 cubic feet.

Q. Are there any other examples where your individual well slightly exceeds the economic threshold that you've established?

A. Yes, sir, there is.

Q. Which one is that?

A. I think it's the Bruington.

Q. The very last one, 11036?

A. Yes.

Q. Let's turn to that exhibits package book. Are we also looking at Exhibit No. 9?

A. Yes, sir, we are.

Q. All right. If you'll turn to 11036 and look at the very last display--

MR. KELLAHIN: I misspoke a while ago. These are millions, and I said "thousands," cubic feet.

Q. When you look at Exhibit 9, what is your potential incremental additional oil recovery for downhole commingling of this well?

A. It's 111,000 Mcf.

Q. This is one that's also slightly above your economic threshold?

A. Yes, sir, it is.

Q. What's the basis for inclusion of this well?

A. Once again, it has the potential for packer leakage, in which case we would have to go in there and repair the well and, if you do that, it's marginally economic.

Q. Okay. All the rest fall below your economic threshold?

A. Yes, they do.

Q. Let's look at the exhibit book that we

started with, which is 11028. You just described Exhibit 9. Exhibit 10 in that exhibit book is the Land Office approval letter?

A. That is correct.

Q. When we go back to 11028, describe for us how you would go about the downhole commingling allocation.

A. What the process for allocation will be, if you look at the production curves for the Pictured Cliffs zone, which is Exhibit 6A, we've got an established rate of 24 Mcf a day for 1994.

The zone is the uppermost zone. It doesn't produce under packer. It's Pictured Cliffs. It has the least likelihood of producing liquids, and it has the most steadiest rate that the dual well has.

After commingling, we're going to combine the rate of the two reservoirs, and that combined rate, should the Mesaverde unload or come up with higher production, then its allocation will change based on what the commingled rate is. Because I do see the potential for the Mesaverde benefiting, in terms of increased rate with downhole commingling.

If you look at Exhibit 6B, the Mesaverde has a lot higher fluctuation in production, as well as oil production, which indicates that it does have a loading problem. And wells in the San Juan Basin that produce under packer will always have this potential loading problem.

Q. How do you propose to address the specifics of the commingling allocation process?

A. To work that out with the Aztec office, like we do with the normal downhole commingling cases.

Q. Mr. Sargent, let's turn to the exhibit book that contains the well that has a pressure differential that exceeds the range for administrative approval.

A. That's Exhibit 11033.

Q. And in that package, Mr. Sargent, what exhibit do we need to start with?

A. Let's start with Exhibit 8.

Q. All right, sir. What does that show?

A. Exhibit 8, at the top, I show bottomhole pressure data, and I show that the bottomhole pressure of the Fruitland Sand is greater than 50 percent, or it's less than 50

percent of the highermost pressure, which is the Dakota.

Q. Based upon these pressures, that percentage is 28 percent?

A. That is correct.

Q. What kind of rates or percentages of total production do you get from the Fruitland and the Dakota in this well?

A. The rate on the Fruitland well currently is 13 Mcf a day; the Dakota is 133 Mcf a day. The Fruitland Sand is subeconomic.

Q. How did you, as a reservoir engineer, analyze the potential for cross-flow?

A. The potential for cross-flow in this well exists when the well is shut in for state tests once every two years, or should there be a pipeline problem.

What I did was, I simulated a--if you look at Exhibit 9A, I used an Imex Black Oil Simulator with the dry gas reservoir in two zones, with the physical parameters that I've listed here on Exhibit 9A, to try and get a history match of the two reservoirs.

Q. With this input data and the engineering assumptions that you made, did you

get a history match?

A. I got a history match. If you look at the production of the wells, they've been highly erratic, so the history match was the best to my ability.

Q. Based upon that work, what conclusion did you obtain?

A. I simulated a condition of shut in, after I got the history match. And, if you look at Exhibit 9B, what 9B represents is a Fruitland flowstream, which is the bottommost curve, the zone currently producing 13 Mcf a day; the Dakota flowstream making 133 Mcf a day; and then a commingled flowstream which shows that, in a producing state, you're getting more production from both zones combined, which shows absolutely no cross-flow in a producing condition.

Q. You know the Fruitland flowstream?

A. Right.

Q. So you could simulate that with a known rate and volume?

A. That is correct.

Q. You knew the Dakota flowstream, so you could model that?

A. That is correct.

Q. And then you simulated what would happen if those were combined?

A. That is correct.

Q. That is the top curve which says "Commingled Flowstream"?

A. That is correct.

Q. When you shut the well in, it says, at the end of the curve "Flow Shut-In"?

A. Right.

Q. You have the computer assume the well had been shut in?

A. Demonstrating what would happen as the pressures begin to mix in the wellbore.

Q. If there had been significant cross-flow between the two zones, what would have been plotted?

A. What you would have seen on the Dakota flowstream, since it would have been a higher pressured zone, you would have seen that curve not drop off to zero, as it is represented on the graph.

In the Fruitland flowstream, it would have actually dropped down below zero and you would have gotten significant negative production from the Dakota flowstream.

Q. Despite the pressure differential, what is your engineering conclusion?

A. That you have no significant cross-flow from the Dakota under the Fruitland.

Q. Would that pressure differential, in your opinion, cause this well not to be a suitable candidate for commingling?

A. Absolutely not.

Q. Turn to Exhibit 10 in the same exhibit book. If the commingling is approved for the uneconomic Fruitland Sand zone, what's the additional incremental gas recovery from that zone?

A. We'll get 26,000 Mcf additional, over a 10-year period.

Q. Apart from this pressure exception, all the rest of them fell within the administrative guidelines on the pressure differential?

A. That is correct.

Q. Do all the exhibit books contain your own personal engineering work product and analysis for these wells?

A. Yes, they do.

Q. What's your ultimate conclusion about all these wells?

A. That the wells should be allowed to be downhole commingled to increase the reserves for the economic zones in each case.

MR. KELLAHIN: That concludes my examination of Mr. Sargent, Mr. Examiner. We move the introduction of his exhibits, which I believe in each instance, with one exception, would be Exhibits 5 through 10, Mr. Examiner, in all cases, Exhibit 10 being the letters from the Commission of Public Lands.

EXAMINER MORROW: Exhibits 5 through 10 are admitted. And I guess you have one additional exhibit in this last case, 11033, that you need to admit there?

MR. KELLAHIN: Yes, sir, that's the single exception, and there's an extra page in that exhibit book.

EXAMINER MORROW: Exhibits 1 through 11 are admitted in Case 11033.

EXAMINATION

BY EXAMINER MORROW:

Q. You calculated the economic limit on each zone separately, is that correct?

A. Yes, sir.

Q. Why did you do that?

A. Because that's what's currently being produced. Each zone is separate. The owners that see the reservoir, see it as a separate billing.

Q. So your costs, like your workover cost and pumper cost, those are divided up and allocated to the zone, prior to charging those owners, I would assume?

A. That is correct.

Q. On the allocation as you went through it, I didn't really understand what you said you would work out with the Aztec office, as you had always done, and you alluded to a BTU allocation and a well test allocation.

Tell me again how that would work out.

A. What we've got in every case, the uppermost zone has a fairly steady production rate, production history, because it hasn't exhibited much unloading. It's the Pictured Cliffs. It doesn't have much fluid. That's the zone that won't change significantly, if at all, when you downhole commingle.

So, using that as the representative test, after we get a commingled test, if you look at the sum production and subtract off the

uppermost zone steady rate that you established before, the difference in those two will be allocated to the bottommost zone, and then the BTU factors will be applied to each, and you'll actually allocate on a BTU basis versus an Mcf basis.

Q. What's the purpose of that first calculation if you're going to use the BTUs anyhow?

A. You need to get what the uppermost zone--we need to agree with the Aztec office what the uppermost zone number will be for the subtraction, when you get the commingled total sum.

Q. You couldn't do it by looking at the total BTU and then allocating back on a BTU basis?

A. The volume on the bottom zone, I think, has the potential to change, versus what it's producing now.

Q. You would have to have a continuous BTU, I guess, if you did it like I'm thinking about, to just do BTUs?

A. What I'm thinking of, right now in the well is a dual case. Let's take a Pictured

Cliffs/Mesaverde example. You have the Pictured Cliffs producing 20 Mcf a day and 1,100 BTUs. You've got the Mesaverde which has, say, 1,200 BTUs, and it's got 100 Mcf a day.

So, if you add that up on a BTU basis, you take 100 times 1,200, and then you take 1,100 BTUs times the 20 Mcf a day to get a total BTUs coming out of the well, and the Pictured Cliffs has so many BTUs and the Mesaverde has so many BTUs.

When you get the commingled production stream, the increase in production that I expect to see, the Mesaverde probably won't be 100, it will probably be 120. So, instead of the well being 120 now, as a dual, it might be 140. If you'll take 20 off for the Pictured Cliffs, then the 120 will be considered Mesaverde production.

Q. So, whatever the Pictured Cliffs makes now is what you're going to assume it's going to make, I guess, initially, after you commingle it?

A. That's correct.

Q. And then, down the road, how are you going to determine, a year from now, how much will the Pictured Cliffs get? Will it still get 20?

A. The reservoirs, no. Once the percentage is set, it will set for the life of the well.

Q. You'll do a percentage and then just do it from there on?

A. That's correct. If you look at the reservoir characteristics in San Juan, they all exhibit similar declines. They're all tight reservoirs. They all have 5, 6 percent decline rates, and you don't see a significant difference between Pictured Cliffs and Mesaverde.

Q. You're going to establish the initial rate by your test, or your production volumes, what you call the test here, and then, after you downhole commingle, you'll use the BTU to check to see what adjustment you need to make?

A. That is correct.

Q. And that's the last time the BTU will be involved in it, or the test, for that matter?

A. That is correct.

Q. So that math is what you want to work out with the Aztec office?

A. Because it's going to change, once we get the well commingled.

Q. Okay. And you'll evaluate that change

based on the BTU total?

A. That is correct.

Q. Has Conoco done some commingling like this in the San Juan Basin already, or is this your first time?

A. Yes, we have.

Q. In the prorated pools, how do you run deliverability tests, or do you run deliverability tests? Are they exempt?

A. No, they're not exempt. What you do, you run the test for the lowermost zone when it comes up scheduled, and you use all the factors that are presumed for the lowermost test, and then the percentage calculation is applied to both zones, using the lowermost zone test date and factors.

Q. I believe wellhead pressure is involved in those deliverabilities tests? You use the combined wellhead pressure?

A. Right, and you assume that's applied to the lowermost zone.

Q. I believe all the wells are at their economic limit now, or at least one zone in the wells is at their economic limit?

A. Economic limit or very close to it.

Q. Except that one?
A. Right.
Q. Have you identified somewhere in the material you submitted which zones are in prorated pools and which ones are not? I don't believe I saw that.
A. No, sir, I didn't. The Blanco-Pictured Cliffs, the Mesaverde and Dakota are prorated pools.
Q. Are all these in the Blanco-Pictured Cliffs prorated gas pool?
A. Yes, sir.
Q. And Pictured Cliffs, I believe it was, and the Blanco-Mesaverde prorated?
A. Yes, sir.
Q. Wherever Mesaverde is shown here, is it a prorated pool?
A. Yes, sir.
Q. How about the Dakota? Is that Dakota the Basin Dakota?
A. Yes, sir, it is.
Q. And it's a prorated gas pool?
A. That's correct.
Q. So, everything in with the exception of the Chacra and the Fruitland Sand on here is a

prorated gas pool, if I understand you correctly?

A. I think I was mistaken on the Pictured Cliffs. There's a Blanco-Pictured Cliffs South that's a prorated pool, and the Blanco-Pictured Cliffs is not prorated.

Q. Some of these are in each of those categories, those pools?

A. Right. With the Pictured Cliffs it various. And in all cases in the Mesaverde and the Dakota, they're in the Blanco-Mesaverde and the Basin Dakota prorated pools.

Q. Would you all furnish me a list, and if it is in here, tell me where it is--well, I guess it's identified on the exhibit page there--can we tell from that which are prorated and which are not, from the pool identification?

I believe we can. That's good enough. If I need something else, I'll ask you for it.

A. I think if you look on the C-116 form, we may actually get into more detail on the pool description.

Q. Okay. Do you have the number of a recent order that's been issued concerning Conoco-operated wells that you could refer me to on this commingling?

A. No, sir, I don't.

MR. KELLAHIN: We'll supply that to you, Mr. Examiner.

EXAMINER MORROW: Okay. That's all I had. Thank you, Mr. Sargent. Appreciate it.

MR. KELLAHIN: That concludes our presentation, Mr. Examiner.

EXAMINER MORROW: Thank you, Mr. Kellahin. Cases 11028 through 11036 will be taken under advisement.

[Discussion off the record.]

MR. CARROLL: Mr. Kellahin, was 11034 dismissed?

MR. KELLAHIN: One of these cases was dismissed, and I think it's 11034. 11034's gone.

EXAMINER MORROW: Okay. Then, with the exception of Case 11034, they'll be taken under advisement, and 11034 will be dismissed.

(And the proceedings concluded.)

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Carla Diane Rodriguez, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL September 16, 1994.

CARLA DIANE RODRIGUEZ, RPR
CERT NO. 4

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11028, 11029, 11030, 11031 heard by me on Sept 1 1994. 11032, 11033, 11035 + 11036

Examiner
Oil Conservation Division