STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF CASE 9420 BEING REOPENED PURSUANT TO THE PROVISIONS OF DIVISION ORDER NO. R-8768, WHICH ORDER CREATED THE BASIN-FRUITLAND COAL GAS POOL IN SAN JUAN COUNTY AND PROMULGATED TEMPORARY SPECIAL RULES AND REGULATIONS THEREFOR.	CASE NO. 9420 (Reopened)

REPORTER'S TRANSCRIPT OF PROCEEDINGS
PART II (Pages 189 - 301)
EXAMINER HEARING
BEFORE: DAVID R. CATANACH, Hearing Examiner
April 4, 1991
8:51 a.m.
Farmington, New Mexico

This matter came for hearing before the Oil Conservation Division on April 4, 1991, at 8:51 a.m. at San Juan College, Computer Science Lecture Center, Room 7103, Farmington, New Mexico, before Maureen R. Hunnicutt, RPR, Certified Court Reporter No. 166, for the State of New Mexico.

FOR: OIL CONSERVATION DIVISION

BY: MAUREEN R. HUNNICUTT, RPR
Certified Court Reporter
CCR No. 166

I N D E X

April 4, 1991
Examiner Hearing
CASE NO. 9420

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E X H I B I T S

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EXAMINER CATANACH: Call the hearing to order this morning for Case 9420, and I'll let Bob call the case.

MR. STOVALL: This is in the matter of the Case 9420 being reopened pursuant to provisions of Division Order No. R-8768, which order created the Basin-Fruitland Coal Gas Pool in San Juan, Rio Arriba, McKinley and Sandoval Counties and promulgated temporary special rules and regulations therefor. This is the second phase of the hearing. The original phase was held on March 7th -

EXAMINER CATANACH: February.

MR. STOVALL: -- February -- When was that held?

EXAMINER CATANACH: February 22nd.

MR. STOVALL: February 22nd; all right.

MR. McELHINEY: 21st (sic).

MR. STOVALL: -- 21st. Thank you, John.

EXAMINER CATANACH: Okay. At this time we're going to call for additional appearances of those parties who were not in attendance at the February 22nd hearing only. Are there additional appearances?

MR. ROBERTS: Mr. Examiner, my name is Tommy Roberts, and I'm an attorney in Farmington, New Mexico. I'm appearing on behalf of McKenzie Methane Corporation. We have no witnesses.

EXAMINER CATANACH: Are there any other additional appearances?

MR. STOVALL: Mr. Examiner, I am aware that representatives of the Bureau of Land Management -- Are there any other governmental agencies which are here and intend to enter a statement in the record besides BLM?

And Mr. Fellows, I believe, will be entering a statement at the conclusion of the testimony and presentation of the case. Is that correct?

MR. FELLOWS: That's right.

EXAMINER CATANACH: Okay. Procedurally, how we're going to go with this is, we're going to make available two witnesses from the last hearing, available for any cross-examination; and at this time we'll call John McElhiney.

MR. STOVALL: Mr. McElhiney.

I'll note for the record that Mr. McElhiney was previously sworn on direct examination and should be considered as still remaining under oath; and I have no questions for Mr. McElhiney and make him available for cross-examination.

EXAMINER CATANACH: Are there questions of Mr. McElhiney?

Mr. Bruce.

JOHN EDWARD McELHINEY,

the Witness herein, having been previously duly sworn, was examined and testified further as follows:

CROSS-EXAMINATION

BY MR. BRUCE:

Q. Mr. McElhiney, referring to your Exhibit No. 2, which is your --

MR. STOVALL: Excuse me. Jim, perhaps it would be easier if you went ahead and came up here for the court reporter and for everybody to hear you.

Q. (By Mr. Bruce) Anyway, Mr. McElhiney, referring to Exhibit 2, conventional well versus the coal gas, the well decline curves, are there areas of this pool where a coal gas well decline curve would look like a conventional well decline curve?

A. Yes.

Q. What combination or combinations of reservoir properties might result in a conventional curve?

A. Well, there are a couple of different situations that might render the coalbed wells production curve appearing like a conventional well. One might be a case of extremely low permeability with a water-saturated cleat, in the case of the operator who has done an extremely good job of pumping the well down immediately so that the front-end portion or the negative decline would be almost nonexistent

in time.

In other words, if you were averaging 30-day production, or something as we normally do when we do a lot of economic evaluations, you might not see it. It might only appear in the very first few days of production. That might be one case.

Another case might occur when you're in an area of the coal where there is very little mobile water saturation, and the cleat is mostly filled with gas at the outset, and upon initial production there probably wouldn't be any negative incline to the curve at all. It would simply start at its highest point and decline, looking very much like a conventional well.

Q. So that second issue, that would be where there's low water in the well --

A. Yes.

Q. -- or no water in the well?

A. Yes, low or no water; that's right. Very little mobile water.

Q. Is the application of the simulator that ICF used valid under those circumstances?

A. Yes, it is.

MR. BRUCE: Thank you.

EXAMINER CATANACH: Are there additional questions of this witness?

(No response.)

EXAMINER CATANACH: You may be excused, Mr. McElhiney.

At this time we'll call Genevieve Young.

MR. STOVALL: Again, I would note for the record that Ms. Young was previously sworn upon direct examination and remains sworn for the purposes of this hearing.

EXAMINER CATANACH: Okay. I've got a few questions for Ms. Young.

GENEVIEVE B.C. YOUNG,

the Witness herein, having been previously duly sworn, was examined and testified further as follows:

EXAMINATION

BY EXAMINER CATANACH:

Q. Ms. Young, would you please explain fracture half-length and how that's determined?

A. The fracture half-length?

Q. Right.

A. You look at the size of your fracture, your total length from tip to tip. It's one-half of that length. So when we refer to a 100 or 300- or 500-foot fracture half-length, it is one-half of the tip-to-tip distance on the fracture.

And in terms of how we selected the one -- or the 100-, the 300- or the 500-foot values, those were values decided by the committee. They felt that that sort of

covered the size of stimulation jobs that would be considered or are currently being implemented for stimulating wells in the area.

Q. I see. Can you explain what factors determine the gas content of a coal seam?

A. What factors?

Q. Yes. What factors would determine how much gas is in a coal seam? Is that --

A. You mean how we would arrive at the gas content for coal? I'm not sure I'm clear on your question.

Q. Well, yeah. Let me just go on to my next question. How do you determine a sorption isotherm curve?

A. As it applies -- Let me clarify. Are you asking how we arrived at the sorption isotherm that was used for lots of this work, or just in general? Because those isotherms are generally measured in the laboratory, and then that would be where we would acquire the information.

Q. Okay. The sorption isotherm curve that you used was -- was that just one curve that was used in your studies?

A. In the sensitivity analyses that sorption isotherm represents an average value from the multiple curves that were measured during the western cretaceous coal seam project. That was funded by GRI and completed by REI. And so what we did is, we averaged the Langmuir constants

and came up with an average curve that was representative of that area of the basin.

In the case of the Cedar Hill history match, that particular curve was actually a measured curve on the Mesa Hamilton No. 3 well, and we used that because it's only two miles west of the Cahn well, and therefore, we thought it was applicable.

In the case of the Tiffany history, Amoco had measured that curve and then provided us that laboratory data.

Q. Do you necessarily need a core sample to generate that curve?

A. Well, it's preferable, you know, that you have a measured curve. Now, it's sometimes -- you know, there's questionable data or something, so you might make multiple passes at measuring the curve and then average it out, but that is preferable, yes, to measure the curve on a core sample.

Q. Now, would a curve generally be well-specific?

A. No. Coal-specific or site-specific, but I would --

Q. Site?

A. No, if you took a sample from a particular well and measured an ad iso on it, you might in fact move to another well location, take another sample and get a slight

difference in your measurements. That's just part of the laboratory, you know, part of that, but, the ad iso that, for instance, was used from the Mesa Hamilton 3 well and applied to Cedar Hill, was generally -- it was regarded as being applicable to that general area.

But as you move -- As we move to the Tiffany location, which there's some distance between Cedar Hill and Tiffany, the ad iso characteristics changed, but it's still the Basin-Fruitland coal, so it is site-specific in that sense; but in a fairly tight, well-defined area, you would likely see a very similar ad iso if measured under the same laboratory conditions: moisture content, ash content and variety of temperature.

Q. From the isotherm curve could you then determine initial gas-in-place in an area, underlying an area?

A. From the sorption isotherm you can determine the initial gas content for the coal in standard cubic feet per ton. If you know, in fact, the conditions, like the initial pressure for the coal, so that you need to know that piece of information to go into the equation and calculate the initial gas content.

You also need to probably make some kind of correction for ash content, being careful not to apply -- determine an initial gas content on the basis of an ash-free coal if, in fact, your coal contains 30 percent ash. So

you've got -- those types of corrections need to be applied.

Once that initial gas content number is calculated from the sorption isotherm, it can then be placed in the general equation for calculating reserves in place, once an average value is found for an area.

Q. Could you please explain the effect that cleat porosity has on the producing mechanism in the reservoir? What factor or what part does that play?

A. You mean in terms of what you see in the production characteristics of the well?

Q. Uh-huh.

A. The cleat porosity is where the water is stored, and then once you --

MR. KENDRID: Excuse me. Would you folks talk to us? We came to the hearing --

MR. STOVALL: Al, why don't you move down a couple of rows too? If you can't hear, I would suggest -- Well, do that, but you've got to move down a little bit.

MR. KENDRID: You're not talking loud enough. You're talking from one end of the table to the other. Please talk to us. We came to the hearing. We'd like to hear.

A. The clete porosity is the water storage. It's where the water is stored in the coal. And once you can remove some of the water from the coal porosity, you can then make room for gas to desorb off of the coal surface,

move into the complete system where the porosity is; and then as the porosity -- I think what you're looking for is that as the porosity decreases, it means there is less water, initial water, in place, it takes less time to dewater the coal, and gas production -- the onset of the gas production is accelerated or it comes on sooner. The more porosity that the coal contains, the more water there is in place. It just takes longer. The dewatering process is lengthened.

MR. STOVALL: Hold on a second.

(Discussion off the record.)

Q. (By Examiner Catanach) Ms. Young, the dewatering process, is that generally a one-time process or an ongoing process with these wells?

A. That's a good question. If the coal is -- it's kind of like a water tank, you know, and if you have a finite volume that you're draining, and there's no influx from another source, it would be, what you would say, sort of a one-time process, as you remove the water and put gas in the cleat space to replace where the water once was.

Now, if for some reason that coal was linked, you know, to a source of water, an aquifer or something, if there was some connection where water could continue to flood into the system that you were trying to drain, you know, then it would not be a one-time process. You'd just

keep trying to make more water.

Q. In the wells that you've looked at, though, has this generally been a one-time process?

A. Yes. For what we've seen for the Tiffany location and the Cedar Hill history matches, there was not a replenishment of the water, as we understand it. I mean there may be -- in other areas of the basin this may not apply.

Q. I think I read in the study that the Cahn well during one of those periods was shut-in for a two-month period after which it experienced a rise in the reservoir pressure.

A. Yes.

Q. Do you think that was due to an influx of water back into --

A. No. Reabsorption of the gases. The pressure was -- while the pressure was going up, the gas was reabsorbing onto the coal; and no, the way the Cedar Hill problem was done, there was no replenishment. There was no aquifer hooked up to the model.

Q. So you don't really have any information as to whether or not if you shut one of these coal gas wells in, if in fact you'd lose some ground in the dewatering process?

A. In the immediate area around the well, yes, I think what you'd see is you'd see water moving in. You

know, if you were looking at the immediate drainage area around a well, and you had been pumping the well and removing water; and if for some reason you shut the well in for some period of time, a few months, you would see areas beyond the drainage area where it hadn't been dewatered. You'd see an influx in that sense. This would be in the immediate region of one well.

But as to a continual water supply in an aquifer sand or something replenishing the Fruitland, in a general sense I thought that's what you were asking me, is you know, is there just a continual influx of water coming from somewhere else? Not to my knowledge in this area.

But in the immediate region of the well, it's only dewatering out to a certain radius; and then as you shut it in, and it's no longer moving that water, more water from further out then would move in; and then, yes, in that sense you have set things back a bit, but you haven't lost any gas. During that pressure rise that gas is reabsorbed onto the coal, so it is still there to be produced.

Q. I think I also read in the report that the coal -- there was some relief in the Cedar Hill and Tiffany area.

A. Yes.

Q. Did you see any evidence that the water was concentrated in the lower structural part of the coal and less up structure, or did you even look at that?

A. Initially, at initial conditions we assume that the coal was 100 percent water-saturated at both -- at all elevations. Then as dewatering began, what we saw was the appearance of gas in the core space of the coal in structurally high positions, moreso than at structurally low positions, so from that point of view, yes, there would have been -- once equilibrium had been interrupted -- I mean you were no longer in equilibrium conditions -- you were seeing gas in structurally high places form as pressure -- as pressure fell, and it was coming off the coal, water saturations being higher in structurally low positions where dewatering wasn't taking place maybe as effectively; so yes, you see some structural overframing on the development of the gas, the free gas saturation.

Q. So a well that was producing from a lower structural well, that would necessarily benefit a higher structural well?

A. It could. It could.

Q. Am I correct in understanding that the face cleat and butt cleat directions, the permeability, that was determined by core analysis?

A. Oriented core analysis from the Mesa Hamilton 3 well.

Q. Is that the only method by which you can determine the direction?

A. No. There are other methods for determining -- I mean, looking at cores is an extremely good way of doing it. If there's a tendency, if you have a situation similar to Cedar Hill, where you have not only wells, production wells, coalbed methane wells, but you also have strategically located pressure monitor wells, that can say something about how fast the pressure way is moving in any given direction, you know, north, south, east, west, you might be able to make some kind of a qualitative determination about a preferential direction for flow versus a direction 90 degrees to that, or approximately 90 degrees to that, where things weren't moving quite as fast.

You might not be as precise, but it would confirm, for instance, oriented core analysis or something like that. There's also -- I believe there are some seismic techniques applied to look at open-fracture directions in these coals. You know, but that's really beyond my knowledge, though.

Q. Okay. Let me ask you this: Is that information critical in running the simulator, the direction?

A. The face cleat versus butt cleat direction?

Q. Yes.

A. Yes, I believe it's an important factor in designing your grid.

Q. Would the drainage area of a given well, would

that be more pronounced in the direction of the face cleat?

A. I didn't hear all of your question.

Q. Would the drainage area of a well, would that follow more along with the direction of the -- would it be parallel to the direction of the face cleat?

A. If that were the direction of preferential flow, you would get -- a drainage area would tend to get elliptical in shape, you know. It's sort of an analogy there in conventional oil and gas, and you had a fractured carbonate reservoir, and you'd see development of elliptical, you know, drainage areas. It's the same kind of thing.

Q. Let's talk a little bit about the fixed parameters that were used in the study and generally how those were determined.

A. With regard to sensitivity analyses? Is that what you're --

Q. Yes. Okay. When these fixed parameters were used in the sensitivity analyses, were these averages of the various wells in the area?

A. Well, for Area 1 some of those parameters were actually determined by averaging the values from the four wells in the western cretaceous coal seam project, and I believe that input data is summarized on Exhibit 15.

There were four wells in that study that were --

sort of had a microscope -- put under a microscope, and this information, this tabular summary, is taken directly from REI's report, topical report, that was prepared by the Gas Research Institute.

So some of the parameters that you see, the values that you see, in Exhibit 78 actually represent averages from those four wells. Others were pulled from the literature or correlation charts or something of that nature. But those parameters, once they were gleaned from the literature or the public domain, were presented in tabular form to the committee.

Because of their working knowledge of the area, they could review those parameters, make appropriate adjustments, based on their own experience, and sort of set those as being typical of the area.

Q. That was for Area 1; is that correct?

A. Yes.

Q. What did you do for Areas 2 and 3?

A. Areas 2 and 3, it was a similar process. Generally, a table just like this one was constructed through the collective experience of the committee members. Just going down the list, quite simply going down the list and saying, you know, "For pressure or for gas content, what are the kinds of values? People who are working in this general area, what are you seeing?" and then constructing,

you know, representative averages for those areas.

I might also add, you know, some of this data is based on laboratory measurements that these operators are taking and some of it is field experience, you know, things that they're seeing; but I couldn't specifically tell you in Areas 2 and 3 what is lab-measured versus not.

Q. Are most of these parameters, are they site-specific generally?

A. To a degree, yes. It's why, you know, averages have been taken. Yes, they will vary from one area, one well location or one area to another. So, yes.

Q. So when you're running your simulation, it's important that you have some accurate, fixed parameters?

A. Yes. Yes, it is.

Q. Generally, in the study areas what type of well completion were you dealing with? Was it generally perforated, or were there some open-hole completions? Do you know?

A. In the sensitivity analyses, it was just assumed that these were case fracture, stimulated kind of completions in terms of looking at the variations in fracture half-length. In terms of the cavity completion technique, we never really addressed that type of stimulation technique in the sensitivity analyses. That also was not applicable to either Tiffany or Cedar Hill.

We were running some very slight, negative scan on some of the wells at Tiffany because they had -- Again, there was a little bit of stimulation work, but they weren't highly stimulated wells; and at Cedar Hill, by and large they weren't stimulated.

Q. Can the simulation be done on an open-hole completion-type well?

A. Oh, yes, certainly.

Q. Looking at Exhibit 25, which is -- this is in the Cedar Hill area, the permeability -- it seems to indicate that the permeability and porosity can vary over a relatively short distance, can vary a large amount over a relatively short distance. Is that your understanding?

A. Yes.

Q. Was it this way in the Tiffany area as well?

A. Yes.

Q. Well, due to these abrupt changes in porosity and permeability, might the decision to allow an infill well or some decision like that, might that not have to be on an individual well basis rather than an area basis?

A. On a specific area basis?

Q. Right, because of these changes in the permeability and porosity.

A. Well, realistically, I think -- yeah, I think each area should sort of be viewed in terms of the data

available for that particular area.

Q. Permeability is one of the main parameters in determining if a well will drain a certain area or not?

A. Yes.

Q. What I'm saying is, if these permeabilities vary so much in a given area, the division might have to look at this on a well-by-well basis instead of an area basis.

A. It may be a semantics problem. I mean, when I said "area," I wasn't referring to like Area 1 or Area 2 or Area 3 of the basin. I meant more a field-site kind of basis where you're developing something on a localized basis. To view it, that is a site-specific -- look at that site-specific basis to make your determination. I think, yes, that's reasonable.

Q. Let me ask you this: What geologic factors would cause such a variation in this relatively short distance? Do you have an idea as to what might cause that?

A. Good lord. Nothing in geology is homogeneous and isotropic, and unfortunately we quite frequently make that assumption when we're doing some of our modeling work, and there's probably a list of a thousand reasons for why it's not.

Q. Okay. That's fine.

Now, in the study in the simulation that you ran, consideration was given to what or whether or not a well was

producing from one or two or more coal seams; is that correct?

A. Yes.

Q. That was all taken into consideration?

A. At Cedar Hill it certainly was where we had a dual-layer system.

Q. Were there any wells where they were producing from more than two seams?

A. Not at Cedar Hill, no.

Q. Tiffany was a single layer?

A. Primarily the area we modeled was a single-layer coal. Now, in part of the model area, actually the coal split up into two sections, and we collapsed that and modeled that as a single layer, so in that sense we were basically honoring the bulk of the grid area. But in the Tiffany area, the coal geology becomes rather complicated; and if you were doing a far more detailed kind of analysis and simulating a much larger section of Tiffany, you would certainly have to do it as a multilayer problem.

Q. Is it possible that various coal seams within a given area have different characteristics, different --

A. Absolutely, absolutely.

Q. Could they have different drainage characteristics as a result of --

A. Yes, because they're going to have different

permeabilities, different KH products.

Q. Ms. Young, a lot of effort was apparently put forth into the history match portion of the simulation. Is it advisable for an operator who wants to come in with an individual case to attempt to history match his area?

A. Here's my own prejudice coming through: I think simulation work is a very effective tool for analyzing performance data, so I would be inclined to answer that question yes, but there are other points of view too.

Q. Can you run the sensitivity analyses without doing a history match?

A. Yes, you could.

Q. Presumably it won't be as accurate?

A. Well, part of the point of doing the history match work was to further characterize the coal properties, which would then be used as input in the sensitivity analyses; but if, for instance, you know, for a specific field site those coal properties were fairly well defined through core measurements and a variety of other methods, and you chose to run a series of -- simulate a series of sensitivity runs on that specific area where you hadn't necessarily done a history match as such, you still may have valid input data. But part of what we wanted to do, in terms of the history match work, was to obtain additional information on coal properties, and then, you know, validate

the tool that was being used to make the sensitivity runs, to provide a comfort level on its ability to predict performance.

Q. I just want to talk a little bit about the simulation, the actual simulation results, and I think you can just refer to these -- there's just some general questions about the chart that you presented.

A. Could you tell me the exhibit number so I could --

Q. 80, I was using.

A. Okay.

Q. Now, the percent of initial gas-in-place, is that assuming that this is a standard -- this is a section, a 640-acre section, that we're talking about in each of these cases?

A. Well, the answer to your question is yes and no. It really doesn't matter, because if you had, let's say, as an example, 160-acre well spacing, if you did one well sitting in 160 acres, whatever that cumulative production at some point in time is as a fraction of what was initially there, that percentage will be the same whether you have one well in 160 acres or four wells in 640 acres, because the cumulative volume just went up by four, but so did the initial gas-in-place, so the ratio will remain the same. These percents of IGIP sort of have that -- and how much in

the way of acre-feet you're looking at has sort of been normalized out of the value.

Q. So it's all relative to what its spacing size is then?

A. Yeah.

Q. A well on 160 acres will drain 8.7 percent --

A. Right.

Q. -- of the reserves under that 160-acre tract?

A. Right.

Q. What the chart is basically telling us then -- Well, at some of the higher levels of permeability, you're not going to recover a whole lot more gas by drilling two wells than you would by drilling one well?

A. No. At a higher permeability the whole process is a lot more efficient.

Q. But in areas where your permeability is quite small, the drainage is not very efficient, and you may, in fact, have to drill two wells?

A. In terms of drainage efficiency, that's true.

EXAMINER CATANACH: I think that's all I have. I think Bob has a couple of questions.

MR. STOVALL: I would like to follow up, Mr. Examiner, if I might, with just a couple of questions on what you've asked just for clarification.

REDIRECT EXAMINATION

BY MR. STOVALL:

Q. As I understand the examiner's questions, Ms. Young, he's looking at -- Well, let me back up. The study that you did is, you took this very large basinwide area and broke it into the three -- for the sensitivity study -- three subdivisions which are still quite large; is that not correct?

A. Yes. And very poorly defined as well.

Q. And in making those sensitivity analyses in those areas, what you did was try to find an acceptable value as determined by the committee.

A. Yes.

Q. And then you plugged those values into the simulator and came up with what's really what you're calling some generalized results, and you could predict some trends; is that correct?

A. Yes, on the basis of certain variations, yes.

Q. Now, am I correct in assuming if you were to take that same model and reduce the area of study and therefore eliminate the -- reduce the range of the variable input, that you could actually probably get a more accurate analysis within a -- we're not talking about an area, say, a township or two, something like that, much smaller than the areas as defined in the report, you could take the same model, put in more accurate information available from --

A. The site-specific area. You know, where, if you had the data very well defined for a particular location, and you input that as your fixed parameters and then work through variations in what we'd call your "variable parameters" and run a simulated series of sensitivity runs, you know, those performance plots are going to be -- they're in a direct response to what you've defined as fixed parameters. If you don't have a high level of confidence in those, then you wouldn't in the result and vice versa. Do you see what I'm --

Q. Okay. I think I'm understanding what you're saying. Okay.

So in other words, in the context if an operator came in for a, say, infill drilling program application, they could take your model, provide some data from their area, which would hopefully narrow the range of those parameters, make them more accurate, and provide some much more specific information and provide the division with more ability to draw some conclusions about the appropriateness of say an infill program in that smaller, specific area; is that correct?

A. Absolutely.

Q. Does this text -- Does the information which is generated by your model provide a basis for an operator who doesn't have, say, access to it, to come in and say, "Okay.

The model shows that if this occurs, then this is the likely result. I found that this occurs, and while I haven't been able to model it, I can predict that this is the result"? For example, permeability. "I can predict permeability."

A. Yeah. I believe the answer to your question is yes. I mean, if an operator thinks that his particular reservoir has approximately these properties, you know, and he goes into these charts and he says, "And based on 10 millidarcies permeability, this is about what I think I'm going to be looking for," and he doesn't have a lot of specific data for his area, but he thinks that the properties listed here for fixed parameters are fairly close, that's a reasonable use of the data that's here.

Q. Okay. So as we, in anticipation, I think, what we're anticipating is that we will see some infill drilling applications. In order to support those applications, an operator is in the best position if he can take some real-world data from his specific area and put it into the models and simulate that specific area based upon a proven model; is that correct?

A. Yes, it is.

Q. But if he doesn't have access to that model, if he can come in and say, "We have some real-world data. For example, we can determine our permeability. Here's 10 millidarcies, and we have some

standard-cubic-feet-of-gas-per-ton-of-coal information, some reservoir characteristics, and although we can't model it, we can predict, based upon what model this has shown, that we need --"

A. Yeah.

Q. "-- we need an infill program to effectively drain the area" --

A. Yes.

Q. -- so that would be -- would that be your recommendation as to how best to demonstrate the appropriateness of an infill program? Preferably using the model, but second choice is using the parameters which the model identifies and then apply them. Does that make sense to you?

A. I believe the answer to your question is yes.

Q. Trying to give him some guidance, in other words. Assuming that they want an infill, how best to justify that infill program, and it seems to me that those -- that you've given them the tool, the model, but you've also given us some information they could use without using the model tool?

A. Yes.

EXAMINER CATANACH: One more followup on that.

FURTHER EXAMINATION

BY EXAMINER CATANACH:

Q. You know, you've established a range for your variable parameters in these charts. What if their fixed parameters vary somewhat from the ones you have? Would that necessarily throw off the model, the model that you've called for?

A. It would depend on the individual parameter, that -- There's not an easy answer to that. It depends on what it is.

Q. But anything could throw it off?

A. Well, again, it depends on what it is. If -- oh, for instance, here on Exhibit 78, just an example of what I'm saying is, in the particular case of -- I'm searching for a good example. If initial water saturation was not, in fact, a hundred percent, and it were determined that it was actually 95 percent, it was 5 percent free gas in the coal, that would make a difference, depending upon the relative permeability behavior for that coal.

On the other hand, you know, if it turns out that an operator were to come before you, and everything in the way of these values was exactly as you see on this list, but he was going to be operating it at flowing bottomhole -- a flowing bottomhole pressure of 200 pounds instead of 100, that might not make as much difference. It might not throw --

It just depends on the individual, initial

pressure. Where you started on the sorption isotherm, that can make a difference. I mean, you have to take a look at everything, taken in combination to know how much variation. It's a very difficult answer to give you. It's not black or white.

MR. STOVALL: I understand.

EXAMINER CATANACH: Are there additional questions of this witness?

(No response.)

EXAMINER CATANACH: If not, you may be excused.

At this time I think we're going to allow some additional. Mr. Kellahin or Mr. Carr.

MR. STOVALL: Let me ask first that any witnesses who are going to testify or may testify, stand and be sworn in at this time.

(The witnesses were duly sworn.)

MR. STOVALL: Mr. Carr, I believe Amoco is going to go first. Is that the correct, agreed-upon order?

MR. CARR: That's right, Mr. Stovall. Mr. Nitcher will conduct the direct examination for Amoco.

(Amoco Exhibits 1, 2 and A were marked for identification.)

JAMES W. HAWKINS,

the Witness herein, having been previously duly sworn, was

examined and testified as follows:

DIRECT EXAMINATION

BY MR. NITCHER:

Q. Mr. Examiner, Mr. Stovall, my name is Eric Nitcher. I'm with Amoco Production Company, appearing in association with Campbell & Black, Mr. Carr. We just have a few questions of Mr. Hawkins today. To supplement the testimony we have handed out three exhibits. As you'll see there's an Exhibit 1 and 2, and the third one was Exhibit A which was marked as an exhibit at the last, so the exhibit numbers do not match. I guess I'll just start with Mr. Hawkins.

Mr. Hawkins, would you please state your full name and your business address?

A. James W. Hawkins, 1670 Broadway, Denver, Colorado.

Q. By whom are you employed and in what capacity?

A. Amoco Production Company, senior petroleum engineering associate, responsible for regulatory affairs activity in New Mexico and Colorado and a few other states.

Q. Have you previously testified before this commission and your qualifications as an expert in petroleum engineering been accepted?

A. Yes, I have.

Q. Did you participate as a member of the

Basin-Fruitland Coal Methane Committee?

A. Yes, I did.

MR. NITCHER: I would submit Mr. Hawkins as an expert in petroleum engineering.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Nitcher) Mr. Hawkins, have you prepared some exhibits today?

A. Yes, I have.

Q. How many have you prepared?

A. I've got three exhibits.

Q. Before we go into the exhibits, would you briefly explain what Amoco Production Company's position and recommendation to the NMOCD is in this hearing?

A. Yes. Amoco recommends that the current field rule establishing 320-acre spacing for the Basin-Fruitland Coal Pool be made permanent. We also support the adoption of the proposed administrative amendments by Meridian regarding the nonstandard proration units.

We support the adoption of the proposed rule that defines the manner of application for approval of a second well on 320-acre spacing in specific, defined areas of the pool. This was handed out as Exhibit A, and it's basically a modification of the language that was proposed by Unocal.

Q. Mr. Hawkins, turning to Exhibit 1, could you just briefly go over the import of the exhibit and explain to the

commission and the people here today why you think this is important for today's hearing?

Q. Exhibit 1 is a comparison of methane recovery for one well per 320-acre development versus two wells per 320-acre development. It's based on typical area conditions found in Area 1. The data comes from the Exhibit 80 in the San Juan Basin coalbed spacing study, and you might want to turn to that page and look at some of that.

We've used a porosity of 2.5 percent, which is on the far right-hand side of that exhibit. We've also used the 100-foot fracture cases and all of the permeability ranges from 1 to 50 millidarcies, and we're looking at a 50 MCFD cutoff, which is a fixed abandonment rate for all of the cases that were simulated.

As you can see, the one well per 320-acre spacing recovered essentially the same volume and drains essentially the same area as two wells per 320-acre spacing. One well would recover on the average in our exhibit 55.5 percent of the gas-in-place. Two wells would recover 56.3 percent of the gas-in-place. The difference is about one percent.

The average case that we're showing here on the screen is generally representative of the 5-millidarcy case that's shown on this page. If you drop down about halfway down the page to the 5-millidarcy permeability, the 100-foot fracture cases, then move over across that line, the top two

lines, one shows at 50 MCFD, 57.7 percent of gas-in-place recovered. On 320, it's 56.8 percent of the gas-in-place recovered.

The cases that we have used here, the .25 percent porosity and the 5-millidarcies-type average are generally similar to the Cedar Hill and the Tiffany areas that were history matched; and I think it is important to note that those were the only two site-specific areas that were actually history matched in this study, and so would be representative of the most accurate information that we actually have to deal with.

If you were to look at Exhibit 18, it shows the porosity and permeabilities that are resultant of the history match in Cedar Hill, and the porosity averages about 3.5 percent and the permeability is just a little over 5 millidarcies, the average is.

If you look at Exhibit 56, it shows that same information for Tiffany, and the porosity averages .75 percent, less than one percent, and the average permeability is less than 1.5 millidarcies, so we feel like the data that's shown on this page is very realistic, particularly of Area 1, and generally is a good case to evaluate when we are looking at spacing in a broad, overall picture.

Q. Mr. Hawkins, turning to Exhibit No. 2, could you

briefly explain to the commission the import of this exhibit?

A. Exhibit 2 shows an economic analysis comparing coalbed methane development on one well for 320 acres versus two wells for 320 acres. The analysis is based on the assumptions shown at the bottom of the page.

I think some of the key points there are that we're using a dollar per MCF as a product price. This is similar to a price of, say, $1.50, less a gathering and transportation fee of 50 cents, so the net-back price at the wellhead would be roughly a dollar. I know that can vary, but this is, we think, generally reasonable and current in the market today.

The production profiles that are used in this economic analysis is the 5-millidarcy permeability case, using the 100-foot frac in Area 1, similar to what we showed on the previous exhibit. As you can see, the economics to develop to one well per 320 acres versus two wells per 320 acres is significantly higher, and we think that these economics would be representative of operators in general and generally representative of average wells drilled and produced in Area 1.

Q. Mr. Hawkins, do the economics you have set forth in Exhibit 2 take into consideration the current tax credit afforded production from the Basin-Fruitland Coal Pool?

A. No, they do not.

Q. Why do they not?

A. We ran the economics both with and without the tax credit, and we decided not to use it. As I used the -- the tax credit case, that is. As I understand it, only wells drilled prior to the end of 1992 are eligible for the tax credit. We doubt that all the entire pool could be developed in that timeframe; and therefore, many of the wells wouldn't be eligible for the tax credit.

Second, we're not sure that all of the owners can take advantage of the tax credit, and it might not be representative of equal opportunity for all of the operators in the basin. We believe that the economics of the basinwide spacing hearing should reflect the same opportunity for all wells and all operators in the base.

Q. The exhibits you have presented have only considered Area 1. Have you considered Areas 2 and 3 as to what the appropriate spacing should be within Areas 2 and 3?

A. Yes, I have. We've reviewed the ICF report sensitivity analyses in Areas 2 and 3, and these analyses evaluate many combinations of reservoir conditions which might exist in the Basin-Fruitland Coal Pool. It's important to note that these are not site-specific cases, that they're possible combinations of reservoir conditions.

The summary of these cases are shown on the

exhibits in the study, Exhibits 109 and 110 for Area 2, and Exhibit 129 and 130 for Area 3.

I would like you to turn to Exhibit 109 in Area 2, and this exhibit shows, similar to what we looked at on Exhibit 80, some cases that evaluate percent recovery of the gas-in-place for various reservoir conditions.

If we take, for example, 5-millidarcy permeability range and 100-foot frac case -- and in this instance I'm looking at lines 5 and 6, and if I move all the way across the page to initial reservoir pressure cases at 300 psia and look at the 20 MCFD, fixed-rate cutoff, you can see that line 5 represents 160-acre well density case, and it shows that that one well per 160 density would recover 38.7 percent of the gas-in-place; and if you drop down to the next line, which is the one well per 320-acre density, and it shows that that would recover 37.9 percent of the gas-in-place. Well, the difference here is less than 1 percent.

If you look in Area 3, just as another similar example -- and it's Exhibit 129, and we'll use the 1-millidarcy case in this instance -- and I'm again looking at lines 5 and 6 of the table, and if you slide all the way across the page again to the 650-psia conditions, it shows that on line 5 a 160-acre development would recover 44.5 percent of the gas-in-place; and then below that the

320-acre development 43.2 percent of the gas-in-place, which is just slightly over 1 percent, the gas-in-place difference again.

When you consider a fixed-rate abandonment in all of the cases in Area 2 and Area 3 that were run in the sensitivity analyses, and you look at those cases that generally are recovering greater than, say, 10 percent of the gas-in-place, which is a realistic recovery, then, one well for 320 acres drains essentially the same volume, and it recovers essentially the same reserves as two wells on 320 acres. The difference is generally about 1 percent of the gas-in-place in every case.

The two wells for 320-acre cases primarily are rating acceleration of the same reserves that one well for 320 would recover. Clearly the sensitivity analyses indicate one well is capable of draining a 320-acre area.

In my opinion, all of these sensitivity cases support the establishment of 320-acre spacing throughout the pool.

Q. Okay. Mr. Hawkins, you have reviewed the proposed language that all the operators have presented for the specific field rules, have you not?

A. Yes.

Q. And Amoco, in conjunction with other parties such as Meridian, has submitted similar language, have they not?

A. Yes, we have.

Q. Could you state to the commission why you recommend that the Amoco-proposed language in conjunction with Meridian and the others parties be adopted?

A. The language that we offered, as I've said before, is a modification of that that was introduced by Unocal, and it provides a method for applying for infill drilling, adding a second well on a 320-acre spacing unit.

Clearly this report demonstrates that for a wide range of reservoir conditions, one well is capable of draining 320 acres. In order to protect correlative rights of all the owners, including all the royalty owners, spacing units of 320 acres should be established so that all of these owners can share in production from either one or two wells on that spacing unit.

In addition to that on page 2 of the ICF report, it concludes that 320-acre spacing provides the appropriate basis for initial development and evaluation of the Basin-Fruitland Coal Pool. Operators can gather appropriate data, well performance, and determine if infill drilling is necessary or desirable.

Our proposed rule recognizes that this is a condition that may exist or be desirable in this pool, and it provides reasonable requirements for applicants and other interested parties to follow in that instance.

Q. Mr. Hawkins, so you would not recommend that the commission include language concerning balance spacing within the specific field rules; is that correct?

A. That's correct. The NMOCD creates field rules, establishes spacing and well location requirements in order to promote the orderly development of the pool in a manner which will prevent wastes and protect correlative rights.

As I've stated before, Amoco believes that all of the evidence in the San Juan basin coalbed methane spacing study supports the 320-acre spacing concept. None of the data indicates that wells would only drain 160 acres. It does indicate that a 160-acre well density may rate accelerate the same reserves that 320-acre density would recover, so we would believe that creating a 160-acre spacing or a rule that might consider a 160-acre spacing in our field rule would be inappropriate.

I would point out, though, that any party has the right to apply to the state for a spacing different than 320 acres under the state regulations. We just don't feel that it should be a part of the field rules when all the evidence available today shows that one well is capable of draining 320 acres.

MR. NITCHER: Thank you, Mr. Hawkins. I would request that the exhibits be admitted into the record, and I would tender Mr. Hawkins for some cross-examination.

EXAMINER CATANACH: Exhibits 1, 2 and Exhibit A will be admitted as evidence in this case.

(Amoco Exhibits 1, 2 and A were admitted into evidence.)

EXAMINER CATANACH: Are there any questions of this witness?

Mr. Bruce.

CROSS-EXAMINATION

BY MR. BRUCE:

Q. Mr. Hawkins, looking at Exhibit 109, I think it was one of the ones you referred to where you referred to the -- I forget what you called it, what column number, but the 20,000-cubic-feet-per-day cutoff and the percent of recovery. You referred to a difference of about 1 percent. For the case you cited, what would the well life be for the 320-acre case versus the 160-acre case?

A. The column right next to percent of recovery shows the expected well life based on the simulation study; shows the 320-acre case will be about 75 years. The 160-acre case will be about 36 years.

Q. Okay. And that next column, if you just looked at the 25-year cutoff, the 160-acre spacing well would recover about twice what the 320-acre spacing well would; is that correct?

A. That's what it shows, correct.

MR. BRUCE: Thank you.

EXAMINER CATANACH: Any other questions?

MR. KELLAHIN: Mr. Examiner, I have a few.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Hawkins, I don't believe you described for us what your company's involvement is as an operator in the Basin-Fruitland Coal Gas Pool. Can you approximate or estimate for us the number of wells that your company operates?

A. I'm going to make a real rough stab that it's going to be four or five hundred wells in the basin right now, and that's just a guess.

Q. Do you operate in all three of the areas that are shown in the ICF consulting report?

A. I believe we have acreage in all three areas, and we have some development in all three, yes, and we would be the operator in many cases.

Q. Your company was the initial operator and the applicant that established the gas spacing report for Cedar Hill, did you not?

A. That's correct.

Q. You have as an individual been actively involved in the CMC study that helped generate, edit and pass on the consultant report that we've been reviewing today?

A. That's correct.

Q. Let me have you go back with me and look at Exhibit 80 that you referred to earlier. You as a reservoir engineer with experience in regulatory matters before the Oil Conservation Division of New Mexico are familiar, sir, are you not, with the spacing requirements in the statute for establishing appropriate spacing parameters for common sources of supply in this state?

A. Yes, I am.

Q. Do you have specific knowledge of Section 70-2-17 with regards to the criteria to apply by this division in establishing rules for common source of supply?

A. Yes, I have.

Q. In reaching your economic conclusions and analyses about the appropriateness of 320-acre gas spacing for this pool, did you apply each of those components in your analysis and in your conclusion?

A. Yes, we did.

Q. In looking at Exhibit 80 then, help me understand what the basis is for the 25-year cutoff in the display? Does that represent the realistic life expectancy of one of these coal gas wells?

A. Not in my opinion, no.

Q. What does the 25-year cutoff represent, then, to you?

A. Well, it was an arbitrary date that was selected to show what recoveries might be up to that point in time for one well versus -- well, for different density developments in the coal; and I think it was just 25 years because that was a good, round number to use.

Q. When we look at the ultimate, optimum amount of gas that can be recovered from the reservoir down to some abandonment pressure, your conclusion, then, is that one well on 320 will recover approximately the same amount of gas as two wells on that 320?

A. That's correct.

Q. Do you as a reservoir engineer, applying your economics, attach any significance to the small percentage of difference between 160 and 320 when we get to abandonment pressure?

A. In this case I think it's insignificant. If you take that 1 percent of the gas-in-place that's generally different between one well or two wells, apply it to the gas-in-place that was calculated by some of the exhibits in this report -- I don't know the exact numbers, but I do know that in Area 1 the study uses about 7 Bcf of gas in a 320-acre area as the original gas-in-place. In Area 2 it's about 3 Bcf of gas in a 320-acre, and that 1 percent is like less than a hundred million cubic feet of gas. It's almost insignificant.

Q. When we look back at this arbitrary 25-year cutoff --

A. Yes.

Q. -- we're looking at the fact that two wells are going to recover within that period of time more gas than the single well will do?

A. Would you state that again for me?

Q. Yes, sir. Within the 25-year cutoff --

A. Okay.

Q. -- are we looking at anything more than simply rate acceleration of recoveries of the gas?

A. I think that's what we're looking at. We've got two wells producing during 25 years versus one well producing during 25 years. Two wells make more gas than one well during 25 years.

Q. Because that is one of the conclusions you can reach from the consulting analysis, does that serve as a basis for your company's recommendation as to an infill concept in the rule at this time?

A. I think the basis for our suggestion of infill is that one well, obviously, can drain an 320-acre area. All of this report shows that that one well can drain 320 acres. It shows that there may be conditions that are accelerated if you drill two, and that may be a desirable condition in some areas of the field and by some of operators in the

basin; and therefore, adding that language to the field rules, we think, is appropriate.

Q. Can you draw a distinction as an engineer between the infill concept and the down-spacing concept; and if so, what is that distinction?

A. If you look at the reservoir level and the recovery from the reservoir, there's really no difference. It's one well on a 160-acre spacing is the same as two wells on 320-acre spacing in terms of the volume of gas that will be produced from the reservoir; but the primary difference is in terms of who owns the gas, the ownership and the correlative rights of the owners to get their fair share of that gas.

In this instance, when one well can obviously drain a 320-acre area, then all of the owners in that 320-area area should be sharing in the production from that well; and if a second well is deemed to be desirable, then all of those owners in that 320 acres should share in the production from the second well; but there's no evidence here that says, "Only well -- or one well can only drain 160 acres and only the owners under the 160 should share in the production"; and that's the difference between infill drilling and down-spacing.

Q. In working with the committee who prepared the CMC report, I see in reading the report there are references

to the phrase "beneficial interference."

A. Yes.

Q. Would you define those terms as you understand them and tell me how they apply?

A. "Beneficial interference," what it's saying is that two wells have interference. The radius of investigation in the reservoir runs into each other, okay? And the reason that I think it's termed beneficial here is because it helps you dewater the reservoir faster than if you had wells spaced further apart where they did not interfere.

In terms of ultimate recovery, I don't think there's any significant benefit. The answer or the obvious answer -- and ultimate recovery is shown on these tables at abandonment conditions, and what it says is that one well on 320 is going to be just about as efficient as two wells on 320. So the benefit may be that it helps you in dewatering, it may help you achieve a higher gas rate early and shorten the timeframe in which it takes to deplete the reserves, but the ultimate recovery is probably not any different.

Q. Am I correct in understanding that that concept, then, is inherently integrated into the tables, for example, Exhibit 80, and the results shown by simulation, then, have integrated into it that concept of beneficial interference?

A. That's correct.

MR. KELLAHIN: Thank you, Mr. Hawkins. No further questions.

EXAMINER CATANACH: Are there any other questions of this witness?

I just have one, Mr. Hawkins.

MR. STOVALL: Mr. Dean has some.

MR. DEAN: I can ask him from up here.

CROSS EXAMINATION

BY MR. DEAN:

Q. My name is John Dean for Dugan Production.

In using the lines that you used on Exhibit 80 and Exhibit 109, which is an exhibit for Area 3, it is true that a well on 160 and a well on 320 will drain basically the same amount of gas if we use the 20-MCF-a-day cutoff; is that correct?

A. That's correct.

Q. But if you cut off at 25 years the drainage of those wells in those different areas, it's not the same, is it?

A. No, it's not the same, but I don't know why you'd want to cut it off at 25 years if it's still producing.

Q. The drainage, though, for the 160 is a lot quicker if you use the full time. Time has no value. The drainage is basically the same.

A. I'm sorry. What was your question?

Q. If you don't take into account time, the drainage is the same?

A. If you don't take into account time, that's correct.

Q. You just take into account the cutoff of production?

A. At an economic limit or abandonment pressure, that's correct.

Q. But the charts do show that the well on 160 will drain an area a lot quicker, recover a lot more of the gas than the 320, quicker than the 320?

A. I think that's correct, yes.

MR. DEAN: Thank you.

EXAMINER CATANACH: Other questions?

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Hawkins, what is your opinion is the average life expectancy of one of these coal gas wells?

A. It would be hard to pinpoint what an average life might be. Certainly, we've got wells producing in the basin significantly longer than 25 years, and I think there's an actual coal well that has produced on the order of 35 years to date and is still producing. I would guess that with proper cementing, casing and cathodic protection, a well would certainly last 75 years, at least.

EXAMINER CATANACH: Anything else?

MR. STOVALL: One quick question, Mr. Hawkins.

EXAMINATION

BY MR. STOVALL:

Q. You presented an economic exhibit, but do you agree with the statement that economics are company-specific? When you get down to -- when you're talking about an economic case, an economic decision, they are company specific?

A. Yes, I would. The economics we showed we tried to make as generic as we could. They're certainly not specific to Amoco, but I would agree that each company may have a different perspective on what is economic and what's not.

MR. STOVALL: That's all I have.

EXAMINER CATANACH: The witness may be excused.

Why don't we take a ten-minute break at this point?

(At 10:18 a.m. a recess was taken.)

EXAMINER CATANACH: Okay. We'll call the hearing back to order and turn it over to Mr. Kellahin.

MR. KELLAHIN: Mr. Examiner, I would like to call Mr. George Dunn. Mr. Dunn is a reservoir engineer with Meridian Oil Company, located in Farmington, New Mexico.

Mr. Examiner, we have also passed out to the participating employees and members of the audience Meridian's exhibit book. If it turns out there are not enough, let us know; following the hearing we'll get you some more copies.

(Discussion off the record.)

GEORGE T. DUNN,

the Witness herein, having been previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. My name is George Dunn. I'm the regional production engineer for Meridian Oil here in Farmington, New Mexico.

Q. Mr. Dunn, on prior occasions have you testified as a reservoir engineer before the division?

A. Yes, I have.

Q. Summarize for us your educational and employment experience.

A. I graduated 1979 from the Colorado School of Mines with a petroleum engineering degree, have worked since that time in the industry and across the United States in both reservoir, drilling -- or all three -- and production

engineering.

Q. Describe for us your personal involvement with the Coalbed Methane Study Committee.

A. Meridian was a member of that committee, and I was the representative for Meridian on the committee and also a member of the steering committee.

Q. As Meridian's representative on that committee, have you also participated in receiving and reviewing the various proposals by the companies that are participating in this hearing on suggested rule changes?

A. Yes, I have.

Q. Have you reviewed and reached your own judgments and considerations on behalf of your company concerning the conclusions set forth in the Coalbed Methane Study Committee report?

A. Yes. We agree and propose that those are good conclusion.

MR. KELLAHIN: At this time, Mr. Examiner, we tender Mr. Dunn as an expert reservoir engineer.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) Mr. Dunn, let me go to the recommendations that your company and you as an individual engineer want to propose to the examiner concerning the rules. For example, let's start with 320 coal gas spacing. What is your recommendation?

A. Our recommendation is to make the temporary rules permanent; in other words, 320-acre spacing for the Basin-Fruitland Coal Pool.

Q. Summarize for us in a general way the basic ultimate facts that helped you reach that conclusion about 320 gas spacing and whether it should be permanent or not.

A. Primarily as it's been shown in these multiple hearings, 320 acres is the prudent method to move ahead with spacing and should be made permanent. It provides for an orderly and efficient development of the basin; and if and when additional wells or increased density is necessary, then that can be petitioned to the commission and proof can be shown that that's necessary.

We feel like that moving to the increased well density at any time previous to that is premature. There's no proof that's really been put forth or data basinwide to suggest such an action.

Q. Describe for us the approximate number of coal gas wells that your company operates.

A. We've been involved in over 980 coal projects in terms of operators and are involved in hundreds of wells in terms of nonoperator but have interests.

Q. Do you have interests in operations, say, in all three of the areas shown on the committee's report study?

A. Yes, we do.

Q. Have you compiled and prepared some specific examples of actual field performance of certain of your coal gas wells?

A. Yes, we have.

Q. And what is the purpose of showing that information, Mr. Dunn?

A. There are several purposes. One, to show some of the difficulties in terms of analyzing coal wells at this point. Also to indicate the wide range of reservoir variations, reservoir property variations across the basin, and the wide range in terms of whether they're water productive or not, et cetera.

Q. Let's turn to the Meridian exhibit book and have you look to the first display behind tab Exhibit No. 1. Identify that for me.

(Meridian Exhibit 1 was marked for identification.)

A. This is a plate of the San Juan Basin. It's basically the same plat that was presented that signified Areas 1, 2 and 3 by ICF in their original presentation. What I've done with some of the exhibits, which I will show following this, are -- their aerial location is indicated by the triangles on the map, and those aren't -- those triangles don't dot the exact well location; it's that area within that township.

Q. Let's turn to the first example behind the index map and find the No. 1 example. Before you reach the conclusions and draw your results, tell us what we're looking at and identify the type of wells.

A. This exhibit has two plots of rate versus time for two different wells in the basin coal wells, and on the left-hand side the Y-axis is MCFD or barrels of water per day. It can be used either way.

The dotted line, for those of you with black-and-white copies, the blue line is water production. The red line, which is the solid line, is the gas production.

Q. And generally the red line is above the waterline?

A. For this exhibit, that's true, yes.

Q. What's the conclusion and purpose?

A. The primary purpose is to show some actual, real-life data that represents some of the classical things you've heard about coal gas production within the basin. In this case here's two examples of inclining gas production and declining water production. And if you look at some of the details and compare them back to some of the simulation runs, you can see that real life looks and has a similarity to what you see coming out of the model that's been presented previously.

In addition, you'll note that in terms of doing any kind of performance analysis, it causes great difficulty since both of these wells are inclining at this point; and therefore, you have infinite reserves if you try to use this.

Another thing you might note is that, looking at the Vanderslice 100, the top one, we initiate production at, oh, roughly, 900 MCF a day, and it goes through a declining period for a length of three to five months before it actually starts on the incline; and you'll also see some cycling where we go on an incline, a slight flattening or a decline and then an incline again. And the purpose of pointing this out is you have to be real careful using performance data alone to pick out when and what kind of decline you have them project.

Q. When we look at this period of time, the Vanderslice well, we're dealing with a period of approximately two years?

A. That's true. It's about a year and ten months for the Vanderslice. The Carter Ute is a little over two years of production, both of them still inclining.

Q. Do you have any way to project how long those wells will continue to incline?

A. There are methods to attempt to predict that, yes, including reservoir simulation, and whether or not you

can specifically pin it down at this point is questionable.

Q. You've operated under the existing rules for approximately two years or more, the 320 gas spacing, and yet during this period of time you still have wells that have inclining gas well production?

A. That's true.

Q. Let's turn to the second display. It's the Riddle 250. Where is that located in terms of its area within the basis?

A. On the first map, this would be the triangle where it has the 2 and 3 below it, which is in Township 30, Range 9 West, on the northern end; and would also -- I might mention the first exhibit was in the northern portion of Area 1 just north of Cedar Hill. This one would be in Area 1 and southeast of Cedar Hill, six, eight miles.

Q. Tell us what we're looking at.

A. This is a plot of the same well. There's two plots of it, the first one being a one-year time period from the time that we brought it on in January of 1989 to January 1990. As you can see by looking at the plot, it produces at a rate between 100 and 200 MCF a day, probably about an average 150 for that full year.

Subsequent to that time, if you start looking at the bottom graph, you'll see it goes on an extreme incline. The point here is that after a year's worth of production,

if you were to attempt to use this well to establish reserves, increased well density, spacing, whatever, you would make erroneous decisions, and that you need to be able to -- you need to have the reservoir data of which some of the primary terms would be adsorption isotherms, gas content, et cetera, to be able to correlate back to prove why a decline curve may or may not be used in any technical work.

Q. When we look at the Riddle 250, what operational changes were made by Meridian that resulted in the curve all of a sudden inclining again in early 1990?

A. The only change here was basically a flowing tubing pressure drop was about 50 psi, which relates to about the same drop at the bottomhole condition. The major thing to remember about that is if you haven't optimized your production, then you aren't seeing the true picture of what your well can do, so there's a lot of concerns when you start looking at performance data, a lot of questions that need to be asked when you try to use performance data by itself to substantiate any kind of reserve-type analysis.

Q. Let's go to the next display. Show us again where the area of concern is that's represented by that display when we look at the index map.

A. This is the same area, the same triangle on the index map. This has two wells on the same plot. For the

colored copies the Riddle 250 is the same well I showed previously, is in red. For those with black and white, it would it be the one that you see inclining. Hopefully, that will help you straighten it out.

The Riddle 251, which is a well that is a little bit less than one mile due west of the Riddle 250, is in the green and would crisscross with the inclining wellhead and go underneath it at about a year period.

Q. The Riddle 250, to the northwest of Section 3?

A. Correct.

Q. And then the Riddle 251 to the northwest of Section 4 in the same township?

A. Correct.

Q. Just a little less than a mile apart?

A. Right.

Q. Wells that close together, what have you seen?

A. Well, this is a prime example. These two are both operating in exactly identical conditions, completed the same way, and as you can see from the chart, we had nowhere near the same performance out of the Riddle 251 as we do out of the Riddle 250. Basically this points to the fact that within a very short distance, reservoir properties can change drastically within the Fruitland coal.

Q. So what is the conclusion, then, in terms of rules or how to decide to implement these?

A. In this case it indicates that it would be premature to make density increase decisions or any such thing on early time data, and it also requires that you investigate a general area, whatever area that may be that you're looking at, through more than on location, because there's lots of changes in those areas.

Q. Let's go to the next display. It's the El Paso Gas B 100 well. What area is that in?

A. This would be moving to the northeast, and it's labeled as No. 4. It would be getting close to the edge of Area 1, getting close to Area 3 in terms of the previous testimonies.

And it's an example of a well that for the first, oh, eight months or so, maybe closer to ten months, produced anywhere from 0 to 35 to 40 MCF a day, basically looking like a pretty poor well.

Q. When we're looking at the display, the dashed line is going to be the water performance on the ground and the solid line or the red line would be the gas performance?

A. That is correct.

Q. What's the point?

A. Again, through ten months' worth of history, basically the conclusion would have been that you don't have a very good well here. As you move on past ten months' worth of history, you start seeing the incline, and you have

an increase in rate of many magnitudes up to currently about 300 MCF a day.

And so you need to -- The only way you can predict this is through gathering the reservoir data necessary, to look at a reservoir simulator or whatever method to predict that you have more potential in that area; and in addition again, the key thing is to optimize and reduce your flowing bottomhole pressure to the maximum. If you don't do that, and you try to utilize performance curves, then you're not showing the true picture.

Q. Is this a unique or unusual example of performance in a coal gas well operated by Meridian?

A. No. These -- all of them you're going to see are common throughout the basin.

Q. What does this tell you, as a reservoir engineer, about analyzing early performance data in order to make decisions about the ultimate recoveries for your wells and what spaces for that area?

A. Well, it's very difficult, premature and probably erroneous.

Q. Let's turn now to next display. It's No. 5. Before we talk about the significance of that display, tells us what area we're in.

A. We've moved back down to the triangle label No. 5, which is basically between the first one and the

third one and fourth ones that I showed you, still being in roughly the northern half of the basin.

Q. These wells are in the same township?

A. They're in the same township.

Q. How far apart are they?

A. Approximately a mile apart. The Sunray G 250 would be approximately one mile north, due north of the Sheets 250.

Q. What's the point?

A. The Sunray G 250, which is the bottom graph, I might point out that both of these have associated water production that is not plotted on this. The only line on there is gas production.

The Sunray G 250 on the bottom part of the graph, as you can see, for the first eight months of production was on an incline, and I can point out that if you were to extrapolate that incline out to the end of the time period shown, which is December of 1990, that you'd come into a rate one and a half to two million a day, if you were to extrapolate that incline.

Well, after the eight months of production, roughly in January of 1990, we brought on the Sheets 250, which is the well due south; and as you can see, there's two points that can be seen real easily. One, the Sheets 250 came on immediately at over a million a day and has gone

through an incline to the two-to-three-million-a-day range.

Simultaneous with its coming on -- and you can see the decline in the Sunray 250, indicating interference between the two wells at approximately a mile's length, so there is communication between these two wells on 320-acre spacing.

In addition, it points out a decline in the well through interference, and I would have difficulty, at least at this point, defining that as beneficial.

Q. When you look at this display and examine the other information within this immediate vicinity, do you as a reservoir engineer have any other basis to explain this information other than the interference or the communication by pressures between these two wells?

A. No. This is definitely an interference. There's no changes in operating procedures, and they're completed the same way, et cetera, et cetera.

Q. Let's turn now to No. 6. Again, before we talk about that, tell us where we are.

A. Well, we've moved south, and I believe this is labeled triangle No. 6, and this would be actually in Area 3.

Q. All right. We're looking at the Huerfano Unit 22 and 55 well?

A. Correct.

Q. What's plotted here? The color displays are different colors?

A. Correct. This one might be difficult on black and white. In the colored display, the Huerfano 22 is in red and it initiates production in January 1991. The Huerfano 55 is in green and initiates production in mid-February. And again, these wells are approximately one mile apart in terms of spacing.

Q. What's your engineering point from observing this information?

A. This just shows an example in the southern part of the basin of good productivity, for one thing. You'll note the Huerfano 22 is making five to six hundred MCF a day. In addition it appears at this early stage, again, that we've a flat production rate. We don't see an incline or a decline in that.

The Huerfano 55 indicates an incline in production, again in early time, but also at a lot lesser rate, so again we see there's some reservoir changes, property changes within a mile of distance in Area 3, and also there's probably some other differences within gas contents, isotherms, et cetera, in the short distance.

Q. Let's turn now to No. 7. Again, show us where we were, and then let's talk about the wells.

A. This is triangle No. 7, and these two wells again

are somewhere around a mile apart, and we have moved slightly northwest of the previous one, and we're in Area 2 now. The two wells are the Rowley D#1 and the Graham #1. And these two wells also do not produce any water, and that's why there is not water plotted.

Q. What's the conclusion?

A. Again, you can see a variation in the two wells, a short distance apart, in terms of producing rate. Again, they were both completed the same way. They're on the same type of production. They have the same pressures producing.

And we see several things. One thing that's important to note, the Rowley D#1 is obviously on an incline, and there's no water production at all associated with it. Basically, the point is that you don't have to have water production to have inclining production in the Fruitland coal, and some people, I think, sometimes relate water, meaning that's why you have the incline. Well, that's not really the truth or the total truth.

The other thing is that, again, the two wells are magnitudes of difference apart, and indicating the parameters have changed, and even though we have two years' worth of data on the Rowley D#1, based on this alone, we couldn't project anything have doing to do with increased well densities and/or recoverable reserves.

Q. Do you support the proposition that we ought to introduce into the coal gas pool rules the concept of a down-spacing procedure at this time?

A. No, I do not support any addition concerning down-spacing.

Q. Why not, sir?

A. Primarily -- and some of this, I guess, has been covered, but from a reservoir standpoint, there's no difference between infill drilling and/or down-spacing, and so this is an issue concerning more administrative correlative rights and other issues along those lines.

In our case, over a thousand wells that we're involved in would have been developed on 320 acres. At this point if we were to move into a down-spacing-type criteria, we'd have difficulty in terms of how do you allocate the previous production prior to down-spacing, et cetera. There's a big can of worms opened up.

You can say the same thing. Many other companies in the basin have developed on 320 acres. Basically, the precedent is set that we're at 320-acre spacing. If we're going to look at down-spacing, I really think it's going to have to be in a different pool. You're going to have to classify a pool to down-spacing; and therefore, it doesn't relate to the Basin-Fruitland Coal Pool. The rule says so.

Q. Let me direct your attention now to a different

topic. Let's touch upon Meridian administrative request. I believe they're in the package of information shown on the display. The actual language of the rules has been provided.

My questions for you are going to be directed to our proposed Rule 3 change, which is simply to have language inserted in that rule to confirm that the division when the Aztec office signs off on the C-104, that that's an acknowledgment by the division that your coal gas well, in fact, is coal gas production and is not being downhole commingled with any other pools administered by the division.

My first question for you, sir, is as a reservoir engineer, what is the type of information supplied to the Aztec office during the initial drilling and completion phase of the well so that at the time the division is acting on the C-104, what information do they have available to them to make an informed decision that they are, in fact, dealing with coal gas production?

A. Well, they receive many items, including -- there's several sundries that are included. The C-105, the completion sundry itself, lists many criteria that can be utilized to do that. There would also be open-hole logs, mud logs, offset logs, perforation intervals that can receive water and gas and gas analysis; and anything that is

not necessarily in their hands can be requested for before any approval for a C-104 takes place.

Q. When we look at existing Rule 2, it sets forth an outline of data that can or may be submitted to the division so that the division can make an independent judgment about whether or not this is conventional Fruitland sandstone gas production from this well or make the decision that you're not commingling that production with some other formation and is in fact coal gas.

A. That's right.

Q. Are you familiar with the criteria used in Rule 2?

A. Yes.

Q. Are you satisfied as a reservoir engineer that those are appropriate parameters by which the division can make informed decisions about the fact that this well as submitted by Meridian qualifies as a coal gas well?

A. Yes, I can. That's how we do it.

MR. KELLAHIN: That concludes my examination of Mr. Dunn. We would at this time move the introduction of his Exhibit 1 as shown in the exhibit book, and we'll pass him for cross-examination.

EXAMINER CATANACH: Exhibit 1 will be admitted as evidence.

(Meridian Exhibit 1 was

admitted into evidence.)

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Dunn, in the wells that Meridian operates, have you actually seen any decline? I mean, have you reached a point in any of your wells where they're actually starting to decline on a regular basis?

A. I'm going to answer that in a twofold way. Have we seen a decline? Yes. Have we seen any well that's reached a period where we feel like it's on its decline? No. Several times there are several instances or reasons why you can see a decline.

One could be what I was referring to earlier. If you haven't optimized your wellbore through several different issues, you could have a decline, and it's basically your fault and not the potential of the well. And the second thing is, as I showed you on the first example, I believe, they'll go through a cycling quite often where you see a declining, inclining, flat; declining, inclining, flat; but in terms of once we've had stabilized, long-term production, basically, to my knowledge, almost every one of them is either almost flat or inclining right now. There may be some out there that are declining, but not very many; and whether or not they're really going to continue to decline, I couldn't state.

Q. What is the purpose of the amendment to Rule 3? Why do you feel it important that the division certify that the well is strictly producing coal gas?

A. Well, primarily that's something that's being done as it is, and it's basically a clarification to get it into the rules for our comfort that it's permanent. Some of those -- I guess I'm kind of jumping ahead, but some of the discussion on that, our landman is going to talk about on some of the full issues of why we think it's important to have that in there.

Q. So he'll know more about it?

A. In terms of just why we think it's important to us, yes.

Q. Does this have tax credit implications?

A. Again, I guess not speaking as an expert in this area, but it is my understanding that the state regulatory bodies are the -- their rules and regulations are what guide what would qualify for things such as tax credits. There are other things that come into play. NGPA qualifications, et cetera, which are done exactly the same way, that would also have to be considered. That you don't do, is what I'm getting at.

Q. Well, the state, in fact, does some NGPA classifications.

A. But not all of them.

Q. Right.

A. Right.

Q. It's my understanding that the NGPA classifications that we do in the Santa Fe office have a disclaimer to them that we're not in fact certifying that this is all coal gas or originating from the coal. Would this sort of supersede that and say, "Yes, we are certifying that this is all coal gas"? Is that the intent?

A. Well, I'm not a legal expert, and I wouldn't even venture into that territory.

EXAMINATION

BY MR. STOVALL:

Q. Let me ask a followup question, Mr. Dunn. From an engineering standpoint, Meridian uses open-hole completion in some of its coal wells; is that correct?

A. That's correct.

Q. Is it true that they are using some sand/coal interfingering in that?

A. There is; and in those instances, we've already dealt with those in terms of presenting to Frank and Ernie, and anyone else who might even request, but anyway, we've dealt with proving whether or not there is or is not any production.

Basically, it comes down to-- actually what's in existence is, is you have the right as the state to identify

and make us submit commingling applications where it's applicable, and this is a reverse support of that. It's saying, "We don't need commingling applications because they're not commingled. There's no production." And we've been through the engineering standpoint of proving that already with the state.

And it's another example of, if there's doubt within the state's mind, they don't have to approve the C-104. They call us back, and they tell us what their problem is and what data they need, and we bring it forth; and they can identify whether or not there's any of those questions from the data that they already have in their hands.

EXAMINER CATANACH: Are there any other questions of this witness?

MR. STOVALL: I've got just a couple.

EXAMINER CATANACH: Oh, well.

Q. (By Mr. Stovall) I heard you testify that you do not support the down-sizing provision in the rules.

A. "Spacing."

Q. Right. As in the spacing unit size. What is your position, or did I miss your testimony, with respect to infill drilling and procedures? Amoco made a proposal in their testimony.

A. Yeah, I can't remember what we stated exactly,

but we support the "amendment" rule that was passed out by Amoco, stating reasons whereby you could petition for a hearing and what that would include for an infill application.

Q. And do you agree, as Mr. Hawkins when he was testifying about economics, that economics are in fact company-specific, and one company's economics are not necessarily an appropriate basis for another company or the division to make a decision on particular issues that are economic-related, i.e., economics are unique to a company?

A. Yeah, I'll agree with economics are unique to a company.

Q. To the extent that economics are accepted as testimony, it is on the basis on whatever qualifications are placed, whether it's company-specific or generic?

A. Yes.

Q. Meridian's economics don't equal anybody else's?

A. Not usually, anyway.

MR. STOVALL: No further questions.

EXAMINER CATANACH: Mr. Kendrid.

MR. KENDRID: I'd like you to explain --

MR. STOVALL: Excuse me. Mr. Kendrid, if you want to ask questions, you're going to have enter an appearance as a party in the case.

MR. KENDRID: I'm not a party.

EXAMINER CATANACH: Additional questions?

(No response.)

EXAMINER CATANACH: This witness may be excused.

THE WITNESS: Thank you.

(Discussion off the record.)

ALAN ALEXANDER,

the Witness herein, having been previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. My name is Alan Alexander. I'm employed as a senior land advisor for Meridian here in the Farmington office.

Q. Mr. Alexander, as the landman for your company, have you been involved in making applications to the Oil Conservation Division in the last few years under the existing rules concerning well spacings and nonstandard proration units for your Meridian-operated wells?

A. I have.

Q. Are you familiar with the current pool rules for the pool?

A. Yes, I am.

Q. In fact, you assisted in the drafting of the

original rules, did you not, sir?

A. That's correct.

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

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) Mr. Alexander, let me have you turn past Rule 3 for a moment in the Meridian application, and let's go to the tab that has the Rule 5 information. It's behind tab No. 3. Are you with me?

(Meridan Exhibit 3 was marked for identification.)

A. Yes, sir.

Q. During the course of performing your duties for your company in obtaining its regulatory approvals for your wells, what has caused you to recommend to the division a modification of Rule 5?

A. We've encountered several instances where the acreage contained in a spacing unit is slightly less than what the previous rule provided for. In other words, there was a 25 percent leeway in the previous rule that would allow you to have acreage and a spacing unit somewhere between 240 and 400 acres; and if you had that type of acreage, then that unit was approvable. It was an approved unit. It did not require any further action from the commission.

We've had several cases, and the commission has entertained several other cases from other sources, whereby the acreage contained in a spacing unit is slightly less or slightly more than the prior rule. In all of the instances that I'm familiar with, we have gone ahead and applied for a hearing before the commission and had these different acreage figures approved as standard spacing units.

Of course, we had to go through the hearing to do that. And like I said, they, in all cases that I'm familiar with, the commission and the other parties did go ahead and approve those. That being the case, we feel that it would be in the best interest of the parties administratively and in the best interest of the commission if we could expand the window of the amount of acreage that's available for an approved unit slightly so that that is equivalent to a minimum of 224 acres or a maximum of 416 acres. That is the acreage associated with 70 percent of the standard unit or 130 percent of the standard unit.

Q. Have you have provided a display that illustrates your point which concerns this rule change?

A. Yes, I have. There is a land plat attached behind the proposed rule, and it was an actual case that we came before the commission, or that the commission did approve the units to be standard units; and in each case you'll see here that they are slightly below the 240-acre

minimum that was required under the present rule.

Q. What is the reason for the occurrence of these nonstandardized sections?

A. They generally occur each time you have acreage corrections as a result of townships coming together. There's not a sufficient acreage to form 640-acre sections, whatever acreage is left results in a substandard section.

Q. Are there still numbers of examples of nonstandard units for which approval has not yet been obtained for the coal gas wells?

A. Yes, there are.

Q. Have you circulated your proposed rule change to the operators in the coal gas pool?

A. I have.

Q. And have you received any objections to your proposed rule change?

A. I have not.

Q. Let's turn now to the proposed change in Rule 6. If you'll continue past the display for Rule 5, the exact language for the proposed rule change 6, is that the language that's underlined in the display rule?

A. That's correct.

Q. What are you trying to resolve here?

A. Here again we have situations where the parties desire to follow the units that were approved for the Blanco

Mesa Verde and the Basin Dakota pool, and to apply those same units to Fruitland coal because the units that were developed for the Mesa Verde and the Dakota proved to be administratively proper.

We've been before the commission in several instances in the past adopting the Mesa Verde or the Dakota spacing units for the Fruitland coal, and in nearly all instances they were finally adopted by the commission.

We had a case where after consulting with the commission and another party, we decided to change those rules slightly. We adopted part of them and changed part of them. And that's the reason that you'll see the Rule F under Rule 6, that we think that it's still appropriate that the commission take a look at that application, and if they have a problem or if another party should have a problem, then of course the commission could go ahead and set that for hearing and resolve any of those problems. But it's been our experience in the vast majority of the times, it was not necessary, there were no objections, and there would be an administrative application here to ease the burden on both the operators and the commission to go ahead and approve these kinds of units.

Q. Again, the likely source of this type of request for a nonstandard unit is attributed to what?

A. Again, it's attributed to short sections,

substandard sections that do not contain the full 640 acres.

Q. And in those instances you have to cross a section line in order to form a spacing unit of large enough size to get in the standard window configuration?

A. You don't necessarily have to, but in a lot of instances in the Mesa Verde and the Dakota they did. They cross-sectioned lines to come up to a -- as close as they could get to 320 acres.

Q. Behind that rule change you've enclosed a display that demonstrates what, Mr. Alexander?

A. It demonstrates an area in the basin, and again this was an actual case we brought before the commission. It's an area in the basin where there are Mesa Verde or Dakota proration units, and they have been outlined.

We have also shown what the order was that originally established those units, and we brought this case before the commission, and it was approved so that we adopted this particular spacing for the Fruitland coal pool.

Q. Have you circulated your proposed rule change for 6 to the industry?

A. I have.

Q. And have you received any objections?

A. I have not.

Q. In your opinion, will the modifications to Rules 5 and 6 relieve an administrative burden upon the

division as well as the applicant in order to process the spacing units for those types of wells?

A. I believe they will.

(Meridan Exhibit 2 was marked for identification.)

Q. Let's turn now to the topic of the C-104. If you'll look at Rule 3, and it's behind tab 2 in the Meridian exhibit book. Mr. Dunn has touched upon some of the engineering information that is furnished to the division at Aztec so that they can confirm to use the operator, that your production, in fact, is properly allocated to the appropriate pool.

A. Yeah.

Q. What do you do as the landman in managing the information supplied to the Aztec office? And describe for us how you have recently gone about determining from the division that, in fact, the Aztec office when it signs the C-104 uses that as an indication to you that they're satisfied with your allocation to the pool.

A. Well, I've been involved, although it's not my primary responsibility, I have been involved with the communication between our staff, our reservoir staff, production staff, and the commission in order to establish a procedure that would identify that a coal well is, in fact, producing from Fruitland coal and is, in fact, not

commingled with another source of supply. We believe that it is important for the commission or the division to confirm that a well is, in fact, producing from the Fruitland common source of supply.

We met with the commission on one prior instance in an area where there could have been some doubt that the gas coming from coal wells may have had some contribution from other sources of supply and supplied them with the information over and above what is referred to in Rule 2 of the order, that allowed the commission to evaluate that, and they determined that, in fact, the production was coming from the Fruitland coal.

That particular instance resulted in the letter that you'll see in the exhibit book that we received from Mr. Chavez, dated October 19, 1990. I believe the commission is very comfortable with that determination, and we have been under the understanding that any time a C-104 is approved that, in fact, the commission is confirming that the operator is producing from the appropriate common source of supply.

Q. When we look at Rule 2, there exists as a rule now for this pool information or data that's supplied to the division from which, then, it can reach that decision?

A. That is correct.

Q. And you look at Rule 3, and it talks about the

division director advising the operator about a determination to its satisfaction that the coal gas is properly allocated to the proper pool?

A. That's correct.

Q. How would you characterize the rule change for Rule 3, then, by the division length?

A. I characterize it as a clarification. The original rules intended that the division would, of course, look at the production coming from a well and make the determination that, in fact, production is coming from the Fruitland coal seams, according to criteria that both the operators and the commission agreed upon.

We failed to finish that in that we did not specify at what point in time that analysis was satisfied, that the commission was satisfied. And we feel that the adoption of the C-104 -- excuse me -- completes the rule in that once all of this criteria has been looked at and once that all of the parties concerned are comfortable and that the commission has signed off on C-104, that all parties should be comfortable, in fact, that they have the appropriate production.

Q. Again, have you circulated your proposed rule to the industry?

A. I have.

Q. And have you received any objections to the

proposed rule change in Rule 3?

A. I have not.

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

We move the introduction of the exhibits behind exhibit tabs 2 and 3 in the Meridian exhibit book.

EXAMINER CATANACH: Exhibits 2 and 3 in the book will be admitted as evidence in this case.

(Meridian Exhibits 2 and 3 were admitted into evidence.)

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

EXAMINER CATANACH: Are there any questions of this witness?

MR. STOVALL: Yeah, I have one question.

EXAMINATION

BY MR. STOVALL:

Q. Mr. Alexander, the Mesa Verde and the Dakota solution to spacing units in those funny section areas, when was that originally developed, do you know?

A. The Mesa Verde orders?

Q. Yeah, that you're trying to bring the nonstandard units into compliance.

A. They were developed over time, and we're not sure that I gave you the date. In the one example that I have, I

have the order number, and let me make a quick reference here. Yes, I did. In this particular case, the NMOCD approved this particular order on August 14, 1969. Most of them were adopted quite some time ago.

Q. Is my understanding correct that that was done in cooperation with the Aztec office at that point in time as a prospective solution to the strange surveys up in that area of San Juan County?

A. Yeah. It was done in cooperation with not only the Aztec office, but also of course the Santa Fe office, because all of these did comport to the hearing process and were approved.

Q. And it has worked ever since; is that correct?

A. It has worked very well. And I did mention that in some instances, it may be necessary to not adopt one of those rules, but in the vast majority of the time they have been adopted.

Q. And Mr. Al Kendrid was in the district at that time; is that correct?

A. That I don't know.

MR. STOVALL: I think the record can reflect that.

MR. KENDRID: I didn't hear you.

MR. STOVALL: You were in the district at the time, is that correct, Al, as that happened?

MR. KENDRID: The total match 25 percent rule, is that

what you're saying?

MR. STOVALL: No. The unusual proration units, that Mesa Verde, Dakota plan.

MR. KENDRID: The commission staff did the casework for Order R-1814 for the Dakota well.

(Discussion off the record.)

MR. STOVALL: Would you repeat that a little louder?

MR. KENDRID: The commission staff did the casework for the case that resulted in Order R-1814 for the Dakota well.

MR. STOVALL: Okay. No further questions.

EXAMINER CATANACH: The witness may be excused.

Are there additional witnesses to be presented at this time?

MR. BRUCE: Mr. Examiner, I would like to present briefly one witness.

BILL HERING,

the Witness herein, having been previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name?

A. My name is Bill Hering.

Q. Where do you reside?

A. I reside here in Farmington at 612 Rosa.

Q. Whom do you work for?

A. Union Oil Company of California.

Q. What is your occupation with Unocal?

A. I'm the district petroleum engineer here in Farmington.

Q. As district engineer are you familiar with the Unocal's coal gas operations in this pool?

A. Yes, I am.

Q. And have you previously testified before the division and been accepted as an expert?

A. Yes, I have.

MR. BRUCE: Mr. Examiner, I tender the witness as an expert.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Bruce) Mr. Hering, what area does Unocal operate?

A. We operate -- we have our primary operations in Rio Arriba county, and our primary landholding is the Rincon unit.

Q. What's the approximate township and range?

A. The approximate township and range is 26 and 27 North, 6 and 7 West; and in regard to the Coalbed Methane Committee study, that lies within Area 3.

Q. How many wells has Unocal drilled in that unit, the Rincon unit?

A. Within the unit we have drilled 42 wells.

Q. Have you measured permeability within those wells?

A. Yes, we have. We have directly measured permeability on nine wells.

Q. And what is your figure for permeability?

A. We do have some spread of values; however, the average is less than one millidarcy.

Q. And in the wells that you have in your unit area, what type of decline curves do you see?

A. Our typical response is to -- with the exception of the load recovery of fracture stimulation, which may occur for a matter of days, we see initial declines.

Q. Conventional gas wells decline.

A. Conventional type of declines.

Q. Now, for your wells do you still recommend the use of a simulator in determining appropriate well spacing?

A. Yes, we use the simulator in our projections, and we feel that the desorption phenomena is unique; and therefore, standard decline curve analysis does not apply.

Q. What spacing does Unocal recommend for this pool?

A. We have recommended adoption of the 320-acre spacing.

Q. And do you recommend some type of infill drilling provision?

A. Yes, we do.

Q. And that's already been submitted to the OCD, has it not?

A. Yes, it has.

Q. One final question. Would you discuss rate of recovery and its importance to infill drilling?

A. Well, it's primarily an economic issue, and I don't want to dwell on economic issues. I think those have been discussed. However, rate of recovery is a key issue in the way that we approach the economics, and particularly considering the time value of money, the life of a project is a key that needs to be taken into account.

From that standpoint we do analyze economics quite closely, and we found that in some areas recompletions may even be very attractive and viable way of recovery.

Q. And in your area of operation are there certain deeper wells which are potential candidates for recompletion?

A. Yes. We have wells to several different, deeper horizons that penetrate the Fruitland coal.

MR. BRUCE: Thank you.

Mr. Examiner, at this time I would just submit this Unocal Exhibit No. 1, Unocal's proposed infill drilling order -- or not order, but it's proposal on infill drilling procedure, and I think that's previously been submitted to all counsel, but I've some extra copies.

(Unocal Exhibit 1 was marked for identification.)

EXAMINER CATANACH: I have just have a couple of questions for the witness.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Hering, you testified that you have now seen declines, regular declines, in your wells.

A. That's correct.

Q. What's the difference between decline curves that you're generating and a conventional decline curve? Why can't they be used as a conventional decline curve?

A. Well, when I speak in regard to conventional decline curves, I'm talking in regard to conventional reservoirs. I mentioned the desorption phenomenon, and that will have some effect on the actual shape of the curve. I'm not saying that we're not going to encounter flattening, but I am saying it's different from a conventional gas sand decline.

EXAMINER CATANACH: I believe that's all I have.

Are there any additional questions of this witness?

(No response.)

EXAMINER CATANACH: If not, you may be excused.

Is there any additional testimony to be

presented?

(No response.)

EXAMINER CATANACH: I think at this time we'll --

MR. BRUCE: Mr. Examiner, one thing. I don't know if I moved the admission of Unocal Exhibit 1.

EXAMINER CATANACH: Unocal Exhibit No. 1 will be admitted as evidence in this case.

(Unocal Exhibit 1 was admitted into evidence.)

EXAMINER CATANACH: I think there being no further testimony, I think we'll entertain closing statements from the attorneys or any other party who wants to make a statement at this time.

MR. STOVALL: Perhaps this would be the appropriate time to get Mr. Fellows to enter his statement in the record on behalf of the BLM, and any -- if there are any other governmental agencies here that wish to enter.

A note for the record that we received prior to the last hearing a statement from the Forest Service with respect to density which addressed primarily, I think, surface issues, but that's available in the division's files.

(Discussion off the record.)

MR. STOVALL: It is not a sworn statement. It is a statement of position by the BLM. Is that correct?

MR. FELLOWS: Yes.

STATEMENT BY

RON FELLOWS

MR. FELLOWS: This is, Mr. Examiner and Mr. Stovall, this is just that. This is a brief policy statement, prepared statement that I would like to read. This statement represents the policy of the Bureau of Land Management in the matter of the Oil Conservation Division determining permanent pool rules concerning the spacing of the Basin Fruitland.

"Much of the Fruitland Coal Gas Pool is federally owned and underlies lands administered by the Farmington Resource Area by the Bureau of Land Management. Some of these lands are specially managed for protection because of significant resource values, particularly surface resource values.

"An agreement is being developed by the San Juan Basin Oil and Gas Interagency Working Group which includes the BLM and several other federal and state surface and resource management agencies. This document will serve as a guideline for addressing oil and gas development and related environmental concerns within the San Juan Basin of New Mexico. Under this agreement unorthodox locations, recompletions, directional drilling, centralized locations for multiple wells and multiple completions from a single

well may become common practice to mitigate impacts to resource values. Operators need to be aware of these possible changes.

"Energy development on BLM administered lands is guided by approved Resource Management Plans in conformance with the National Environmental Policy Act. To date, well locations within the San Juan Basin have been built within mutually acceptable levels of mitigation. Drilling on 160-acre spacing within areas that remain undisturbed will require the most mitigation to protect resource values and a higher level of cooperation among operators and regulatory agencies.

"The BLM will cooperate in the implementation of rules concerning spacing for Basin Fruitland coal gas wells. However, in order to protect resource values, it may not be possible to locate a well within each 160-acre spacing unit. Alternate drilling practices in unorthodox locations considered exceptional now, may be commonplace under the 160-acre spacing."

Signed "Larry Woodard, State Director" for the State of New Mexico.

That's all I have as a policy statement. I offer this too.

EXAMINER CATANACH: Okay.

(Discussion off the record.)

MR. STOVALL: Mr. Fellows just added if anybody wants to pick up a written copy of this, he does have them at the Farmington office here, so it is available. He does not have them with him. I'm sure --

Ron, you could write and request that statement too? Would that be --

MR. FELLOWS: Yes.

EXAMINER CATANACH: Okay. Additional statements at this time?

STATEMENT BY

TOMMY ROBERTS

MR. ROBERTS: Mr. Examiner, my name is Tommy Roberts. I'm appearing here today --

(Discussion off the record.)

MR. ROBERTS: Mr. Examiner, my name is Tommy Roberts. I'm appearing today on behalf of McKenzie Methane Corporation. I have a statement which I've been asked to read into the record, and then I would like to follow that with a couple of brief comments.

The statement is in the form of a letter dated April 4, 1991. It's addressed to Energy, Minerals and Natural Resources Department of the State of New Mexico.

"Ladies and Gentlemen:

"McKenzie Methane Corporation presently agrees with the current Basin-Fruitland Coal Gas rules which

establish 320-acre spacing with the exception that operators should be allowed to request permission of the commission to drill additional Fruitland formation wells on approved 320-acre units where economic, geologic and/or engineering evidence justifies such additional wells.

"Such exceptions should be granted by the commission upon notice and hearing. Notice should be in writing by first-class mail, limited to owners of rights in the Basin-Fruitland Coal Gas Pool and given to operators of wells, owners of undrilled leases and unleased mineral owners within the boundaries of the unit area for which the drilling of additional wells is requested and the unit's offset operators.

"Thank you for this opportunity to enter our remarks into the record of today's hearing on the above-captioned matter.

"Very truly yours,

"Roger H. Lichty, Vice President, Land and Legal."

The comments I have focus on the Amoco proposed infill amendment. McKenzie Methane has two principal concerns. First, McKenzie is opposed to the inclusion in an infill rule of any requirement or statement that any party with a mineral interest in the pool shall have standing to appear and participate.

McKenzie's position is simply that standing to appear and participate has never been an issue in division or commission proceedings. Historically, any person or entity asserting an interest has been permitted to appear and participate. The degree of interest of the intervening party has been considered when giving weight to the value of the evidence submitted by that party. Again, McKenzie believes that a statement of right to appear and participate is unnecessary.

The second concern McKenzie has is that it believes that the 20-day notice requirement currently in effect under Rule 1207 of the commission and division rules provides adequate notice to parties required to be notified of proposed infill operations. If a longer notice period is established by rule, then McKenzie believes that the rule shall also provide that a case shall not be continued at the request of the intervening parties.

Mr. Examiner, that concludes our comments.

EXAMINER CATANACH: Additional statements?

STATEMENT BY

TIM MARSH

MR. MARSH: My name is Tim Marsh. I'm a petroleum engineer with Texaco, working in the exploitation department, Midland, Texas; and I'm here to enter a statement on behalf of Texaco; namely, that we support the

adoption of the temporary field rules as permanent with the amendments proposed by Amoco, Meridian and others, with the 320-acre basic units with allowance for infill drilling after notification and hearing. It is our position that this will best accomplish the goals of preventing waste and protection of correlative rights.

We have oil and gas rights for Fruitland coal horizon covering roughly 58,000 acres within San Juan and Rio Arriba Counties. In the past year we've drilled 78 wells or participated in drilling 78 wells at a cost of almost $15 million and are committed to a similar level of activity for this year and '92. As such, these rules do represent a significant impact on Texaco.

We believe that this resource is -- that it's important for the management of this resource that such modern techniques as simulation be employed, and to that end we are actively engaged in data acquisition through pressure transient testing, core and sample analysis and well logs.

Well performance is of particular importance given the nonconventional mechanism of desorption and production. And here struck by the decided lack of such data at present from public information sources, Area 1 appears to less than 33 percent developed, Area 2 less than 2 percent and Area 3 less than 10 percent developed. Likewise what production information is out there is very

short-lived. Roughly 40 percent of the wells appear to be less than 12 months old.

We concur with conclusion "A" of the study report of the San Juan Basin committee stating that 320-acre spacing is most appropriate for initial development of the Fruitland coal. While there may be locations that exist where recovery operations are optimized at well densities of more than one well per 320 acres, it is our opinion that the currently available reservoir data is far too limited to justify departure from the 320-acre well density except on a site-specific basis as provided for in the proposed amendments.

We believe that this approach will serve to avoid the drilling of unnecessary wells while affording the flexibility to tailor operations to maximize benefit to all the parties concerned.

Thank you.

EXAMINER CATANACH: Thank you, Mr. Marsh.

STATEMENT BY

THOMAS R. MOORE

MR. MOORE: Mr. Examiner, my name is Thomas Moore with Phillips Petroleum. As technical representative for Phillips Petroleum in this matter, I wish to express my support for both the technical merit and the general findings of the study performed by ICF Resources on behalf

of the Coalbed Methane Committee.

Phillips supports the principal findings of that study that concern us here today; that is, there are indeed areas in the pool where there are such combinations of reservoir properties that exist that may justify the drilling of a second well on the established 320-acre standard spacing units.

Further we fully support the motion previously filed with the division by Amoco, Meridian, Phillips and others and its attached exhibit requesting that individual operators be permitted to apply through a process of both written notice and hearing for a second well on that standard 320 acres or approved nonstandard spacing unit.

We strongly feel that any party with a mineral interest in the Basin-Fruitland Coal Gas Pool should have full standing to appear and participate in any such hearing, particularly early in the process of adjudicating such applications.

We feel that the process outlined in Exhibit A of the motion would protect both the correlative rights of all mineral owners and operators while preventing waste of this potentially valuable resource.

Also, although I'm not personally qualified in the field of petroleum land management, I've been asked by our land department to state that Phillips fully supports

the amendments to Rules 5 and 6 previously proposed by Meridian Oil regarding the nonstandard spacing units, and also we support their proposal to amend Rule 3 so that through the approval of form C-104, the division confirms that a well is indeed producing from the Basin-Fruitland gas pool.

I feel that this would be most -- would be best dealt with at that time when all the parties have the people involved who will be drilling those wells, and the questions can be asked at that time and determined at that time.

Thank you.

EXAMINER CATANACH: Additional --

STATEMENT BY

JOHN MAINWARING

MR. MAINWARING: My name is John Mainwaring. I hold a bachelor's degree in petroleum engineering. I'm currently area engineer for Arco Oil and Gas for our San Juan Basin operations. Currently Arco has about 55 million cubic foot a day of coal gas sales. We operate approximately a hundred coal methane wells, and by year end we'll have about $110 million invested in San Juan Basin coal methane development.

Arco has been an active supporter of the Coal Methane Committee, both supporting committee efforts, financial contributions, and we supported the model

validation. Arco began our research with a four-well pilot program in 1988. Since then we've gathered numerous cores, logs, pressure transient data and other data to help us better understand the coal methane process.

In 1989 we successfully opposed a down-spacing application before the Colorado Oil and Gas Conservation Commission.

At this time we'd like to recommend that the 320-acre spacing be adopted. We support Amoco's wording for infill provisions, and we think that would be the most equitable way to protect correlative rights and prevent waste.

Thank you.

EXAMINER CATANACH: Thank you. Are there any additional statements at this time? Is there anything further in this case?

MR. CARR: Mr. Examiner, I have a statement.

STATEMENT BY

WILLIAM F. CARR

MR. CARR: I think I'll try and deliver it from here if I may. My name is Bill Carr. I'm an attorney with the Campbell law firm in Santa Fe. I represent, among other companies, Blackwood & Nichols Company Limited, and they have asked that I state their position at this hearing.

Blackwood & Nichols Company supports the 320-acre

spacing rules on a permanent basis for this pool. They believe 320-acre spacing has and will continue to result in orderly development of the reservoir.

They also support the infill procedure whereby wells may be drilled on an infill basis, and they have joined with Amoco, Arco, Texaco, Meridian and others who are proposing the procedure setting forth how that may be done.

They believe that a 45-day notice period as provided in those rules is appropriate for the kinds of reservoir simulation and other work that is necessary to respond to an application. That's something which often cannot be done in the time that you have to prepare for a case if the 20-day notice rule remains in effect. For that reason they believe that 45 days is appropriate.

They believe that notice should be given to all operators and interest owners within a mile of the area for which infill authority is sought, and they believe it is appropriate to include in the rule provisions for all mineral interest owners in the reservoir to have standing in those proceedings. It is the commission's policy to provide that standing in all cases, but here where the notice is going to be limited if our proposal is adopted, those interest owners within a mile of the area directly affected, we believe, would be helpful for the rules, and also make it clear that interest owners beyond that one-mile area also

have standing to appear.

STATEMENT BY

JOHN A. DEAN, JR.

MR. DEAN: Mr. Examiner, my name is John Dean. I'm the attorney representing Dugan Production Company, and Dugan Production has already submitted as part of the record in this case their position with regard to some flexibility in this pool with regard to down-spacing.

The overwhelming evidence presented to the commission in this case is that there are great areas of this pool where the parameters would support spacing other than 320 acres. This conclusion by the study, which is summarized by the language in paragraph A, "Many combinations of reservoir properties where spacing other that the existing temporary rules of 320 acres may be appropriate is unrebutted before you today.

As Dugan Production has put into its proposed changes to Rule 6, that evidence is further illustrated in Exhibit 129 in Area 3 in the examples given in that area where spacing on 320 acres would require approximately 180 years to recover 43.2 percent of the gas.

Dugan Production believes that there are areas within this large pool where spacing parameters will develop -- where the parameters will develop that spacing other than 320 acres will be appropriate. Dugan would like to see some

flexibility in the rules to allow them to come in and ask the commission to allow spacing other than 320 acres, after notice and hearing as illustrated in its rule.

They believe that this flexibility will let gas recovery and there not be waste of the gas that is recoverable in those areas after the evidence in those parameters given by the study are determined after experience; and for that reason we ask that the commission consider their proposed rules.

EXAMINER CATANACH: Okay. Thank you, Mr. Dean.

STATEMENT BY

W. THOMAS KELLAHIN

MR. KELLAHIN: Mr. Examiner, I've appeared today on behalf of Meridian Oil Company, Phillips Petroleum Company, Marathon Oil Company, Conoco, Inc., and BHP Petroleum, Inc.

I'd like to comment on a couple of items that were raised in the closing comments to you. There's certainly a great deal that I don't know and don't pretend to know about reservoir engineering, but over 18 years I've learned a few things about writing some of the rules that we manage that production with.

I think it will be novel, unique and unprecedented in the rules of this basin or anywhere else to introduce the concept into the rules that you can now downspace. There's not a single example anywhere in the

state of New Mexico to get what Dugan proposes to tell you is flexibility. It simply doesn't exist anywhere else.

You simply create the opportunity for confusion by introducing into the rules at this time a drastic change that would create significant problems for all the operators.

You can't create different spacings in the same pool, and I would tell Dugan or anyone else that they have always had a solution to their concern, and you need not put it in these rules. You can always come to the commission, either before then, today or tomorrow, and file your own case to establish for your own area your own special rules; but don't try to do it in this one because it doesn't work.

When we look at the infill concept, remember that there are only a few examples of an infill concept. They come in the Basin Dakota and the Blanco Mesa Verde pool, for after some two or three decades of production on 320-acre gas spacings, there was a substantial presentation made about the discontinuity of those reservoirs, and the fact that substantial gas reserves could be developed, produced and recovered on an infill concept.

We're talking about infill concepts here in the third year of operation of these pools. It's very, very early. You look at the technical report -- I don't pretend to understand it, but I can look at some of tables, and I

can find at abandonment pressure there's no material difference in the total, ultimate recovery on 320 gas spacing, whether it's one or two wells.

What it amounts to is rate acceleration; and if we're going to do that in the rule, we think that we have devised for you, Meridian and Amoco and others, a procedure to let that happen. While it may be premature, at least there's a process with our proposal that gives you some due process safeguards, not the least of which is to move us away from hearings by ambush.

And if you don't send us notice significantly before the hearing, we might as well not even come. When you send a 20-day notice out under the current rules and we get it a week before the hearing, and I look at this book and it says the only reliable, current method to analyze spacing is by reservoir simulation, and I call Mr. Dunn, and I tell him he's got 48 hours to come do his deal, he's going to say "I can't do it."

So why don't we extend the process backwards? Require the applicant to send notice to everybody 45 days ahead of time and give us a chance and don't limit it, to saying, "Well, that's your only chance. You can't continue it." Well, what's the point? This should be a process for a fair and realistic decision on the merits and not simply a quick act by ambush to get what you think you need. This is

too serious a matter to shorten the due process periods.

And when you talk about standing, if it's admitted that that's the process before the division now, and anyone can come that has an interest in the minerals that are subject to the pool, why shouldn't they participate? And if that's the rule, why not say it, that they do in fact have standing? It's only fair and reasonable.

And we would suggest that you make the rules permanent because that's all the evidence you have before you to make that decision on; and that if you choose to establish an infill procedure, that you adopt the language that we think is right and proper, and that's what Amoco and Meridian and the others have suggested to you.

Thank you.

STATEMENT BY

ERIC L. NITCHER

MR. NITCHER: Very quickly, Mr. Examiner. Eric Nitcher with Amoco Production Company. We will just rely upon the recommendations and testimony of Mr. Hawkins and support him in his position.

Thank you.

STATEMENT BY

JAMES G. BRUCE

MR. BRUCE: Mr. Examiner, Unocal has already stated its

support for 320-acre spacing. Unocal has also submitted proposed findings and a rule regarding infill drilling. Now, this rule or proposal differs somewhat from the Amoco and Meridian proposal, and I would like to point out a couple of the differences.

The Amoco and Meridian proposal restricts infill drilling to a second well or two wells per unit. The Unocal proposal refers to "additional wells." Unocal believes that in a 4-1/2-million-acre pool where production may occur for over 75 years, that poolwide variations in reservoir parameters, together with changes in well economics over 75 years, requires some flexibility of the pool rules.

Unocal's rules also specifically permits recompletions of wells in the unit. There are numerous deeper wells in the area which could be recompleted in the Fruitland, and we'd also point out that such recompletions would minimize surface disturbance.

The Amoco and Meridian proposal also requires the second well to be in the undrilled quarter section. The Unocal proposal does not have such a requirement. Unocal leaves this open primarily because of the possibilities of recompletions, and such recompletions may be in the same quarter section as the original well.

Finally as to the time of notice and as to allowing anyone with an interest in the pool to enter an

appearance, Unocal would second McKenzie Methane's comments. If a longer notice requirement is instituted, we think that such a period could militate against any continuances of hearings under this proposal.

Thank you.

EXAMINER CATANACH: Are there any additional statements? Is there anything further in this case?

(No response.)

EXAMINER CATANACH: If not, Case 9420 will be taken under advisement.

(The foregoing hearing was concluded at the approximate hour of 12:03 p.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. _____, heard by me on _____ 19____.

_____ Examiner
Oil Conservation Division

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

REPORTER'S CERTIFICATE

I, MAUREEN R. HUNNICUTT, RPR, a Certified Court Reporter and Notary Public, DO HEREBY CERTIFY that I stenographically reported these proceedings before the Oil Conservation Division; and that the foregoing is a true, complete and accurate transcript of the proceedings of said hearing as appears from my stenographic notes so taken and transcribed under my personal supervision.

I FURTHER CERTIFY that I am not related to nor employed by any of the parties hereto, and have no interest in the outcome hereof.

DATED at Santa Fe, New Mexico, this 7th day of May, 1991.

MAUREEN R. HUNNICUTT, RPR
Certified Court Reporter
CCR No. 166, Notary Public

My Commission Expires:
April 25, 1993