NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10558

IN THE MATTER OF:

The Application of Meridian Oil, Inc., for an Unorthodox Coal Gas Well Location, San Juan County, New Mexico.

BEFORE:

DAVID R. CATANACH

Hearing Examiner

State Land Office Building

September 17, 1992

REPORTED BY:

CARLA DIANE RODRIGUEZ
Certified Shorthand Reporter
for the State of New Mexico

ORIGINAL

A P P E A R A N C E S

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I N D E X

E X H I B I T S

EXAMINER CATANACH: Call the hearing back to order at this time and call Case 10558.

MR. STOVALL: The application of Meridian Oil, Inc., for an unorthodox coal gas well location, San Juan County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

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

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge & Sheridan. I would like to enter my appearance on behalf of Amoco Production Company.

Amoco submitted a letter yesterday and asked it be included in the case file. Other than that, I do not intend to call any witnesses.

EXAMINER CATANACH: I see. Do we have that letter in the case file?

MR. CARR: I have a message that it was faxed yesterday.

EXAMINER CATANACH: I do not have the

letter in the case file.

MR. CARR: Would you like a copy of the letter to put in the case file?

EXAMINER CATANACH: Sure.

[The witnesses were duly sworn.]

MR. KELLAHIN: I would like to call Mr. Alan Alexander.

ALAN ALEXANDER

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

EXAMINATION

BY MR. KELLAHIN:

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

A. My name is Alan Alexander. I'm currently employed with Meridian Oil, Inc., in the Farmington, New Mexico office. I'm a senior staff landman.

Q. On prior occasions have you testified in that capacity before the Oil Conservation Division?

A. Yes, I have.

Q. Pursuant to your employment, have you made yourself knowledgeable about the ownership with regards to the coal gas within the area of

this particular application?

A. I have.

Q. In addition, are you generally informed on the proration and spacing units and the unorthodox well locations that have been approved by the Division for others within this area?

A. Yes.

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

EXAMINER CATANACH: Mr. Alexander is so qualified.

Q. Mr. Alexander, let me have you turn to the package of Meridian's exhibits. Commencing with the documents after Exhibit Tab 1, would you identify and describe those documents?

A. Yes. The first document is Meridian's application for approval of this unorthodox well location for our EPNG D Com No. 301 well. Attached to that application are exhibits which show the nine-section area through a land plat. Exhibit A and Exhibit B is the offset operator plat that was attached to the exhibit.

Q. Let's turn to the information behind Exhibit Tab No. 2, and discuss your knowledge about the offsetting ownership of coal gas rights

that adjoin your spacing unit.

When we look at the display which is the only display behind Exhibit Tab No. 2, what are we looking at?

A. We're looking at an offset operator plat which shows that the offset operators surrounding our proposed wellbore include Meridian and Amoco Production Company.

Q. When you look at the address for Amoco Production Company, before Mr. Stovall spots it, we've got some typos in there, don't we?

A. Yes, we do.

Q. We misspelled production and misspelled Denver?

A. That's correct.

Q. But we've got the parties right, don't we?

MR. STOVALL: What about the "0" in front of the 800?

Q. When you look at the Section 30 plat, what is the proposed spacing unit for what is identified as EPNG D Com 301 well? What's the spacing unit?

A. The spacing unit for that well is the north half of Section 36 of 30 North and 8 West.

Q. The numbering offsetting spacing units correspond to either Meridian's operatorship or Amoco's operatorship?

A. Yes, that's correct.

Q. And you caused notification of this hearing to be sent to Amoco?

A. Yes, that's correct.

Q. Let's turn now to the display behind Exhibit Tab No. 3 and look at the first document, which is an area plat of Section 36 in the center. The display is complicated, and give us a second to see the information. Start, first of all, and tell us what the various well symbols mean in terms of the type of well indicated by the well symbol.

A. The types of wells that are additionally indicated at the bottom of the exhibit. There are three types of wells, basically, that we wanted to display. The round symbol with the spokes in the middle represents a Mesaverde well. The square symbol represents a Dakota well, and the triangle represents a Fruitland Coal well.

Q. Let's turn to the next display after that and look at an enlargement of only Section

36. Within Section 36, identify for us the wells.

A. The wells that are shown within Section 36 include, basically, four producing Mesaverde wells. The round symbols, a plugged and abandoned Mesaverde well in the south half of the northeast quarter, two Fruitland Coal wells being up in the northeast quarter and the southwest quarter, and our proposed Fruitland Coal well over in the northwest quarter of that section.

Q. When we look at the exhibit and look at Section 36, the south half of the section, is that dedicated to a coal gas well?

A. It is. It's dedicated to the State Gas Com AA No. 1 well.

Q. And that is the well symbol for the well located in the northeast of the southwest of 36?

A. That's correct.

Q. And that's an Amoco-operated well?

A. That's correct.

Q. In the north half of 36, does Meridian currently have a producing coal gas well in the north half?

A. Yes, sir, we do.

Q. Where is it?

A. It's located in the northeast quarter of the northeast quarter, and it's designated by the No. 300, and it is our EPNG D Com No. 300 well.

Q. What is Meridian seeking to do with this application, Mr. Alexander?

A. We're seeking to replace the existing 300 well with a new well to be drilled in the northwest quarter, which is the proposed well of this application.

Q. What is the proposed location of the replacement well which is identified as the 301 well?

A. It is proposed to be located 1175 feet from the north line and 1115 feet from the west line of Section 36, of 30 North, 8 West.

Q. That well will be within the standard 790 setback from the outer boundaries of the spacing unit, but requires an exception from Rule 7 of the pool rules because it is in the wrong quarter section?

A. Yes, sir, that's correct.

Q. Let's turn now and look at the topographical display that is the third document

behind Exhibit Tab No. 3. Identify that topo display for us.

A. The topographic map is a map of Section 36. It's been enlarged to show the various details. As you will see, the north half of the section is quite busy with a number of existing power lines and pipelines. Those are denoted by the legend at the top of the page, which you can refer to. Also, they're marked in circles and with numeric numbers on that map, documented archaeological sites that exist across the north half.

As we see, there's also a wash, a sand wash running basically through the north half, and we also, if you'll look over in the northwest quarter, you'll see the main project canal for the Napi Irrigation System indicated by the two dashed lines. There's also a major power line running through the northwest quarter. It's a two-pole power line.

Q. When you look at the Napi project main canal, what is the setback or offset from that canal in which you cannot locate a well?

A. We cannot cause any surface disturbance within 300 feet of the centerline of that canal.

Q. Within the area defined as the northwest quarter, there is a rectangular area described in that quarter section?

A. Yes, sir.

Q. What does that represent?

A. That represents the legal setbacks and footage for a Basin Fruitland Coal well.

Q. Identify for us the proposed location for the 301 replacement well.

A. You'll see that location as a circle just north and west of the word "canal" on the topographic map.

MR. KELLAHIN: Mr. Carr, it's this spot here.

MR. CARR: I found it. Thank you, Mr. Kellahin.

MR. STOVALL: It appears in green in Mr. Kellahin's copy of the exhibit, is that correct?

THE WITNESS: Yes, sir, that's correct.

Q. Have you obtained the necessary surface clearances for locating this well at the proposed unorthodox location?

A. Yes, sir, we have.

Q. Are there any other alternative

locations available to Meridian in the northwest quarter for the drilling of this well?

A. No, sir, not at a legal location there are not any available drill sites, other than what we have picked.

Q. Where is the existing 300 well in the northeast quarter on this exhibit?

A. If you'll refer to the exhibit, on the northern boundary of the setback, the square that's described in that quarter, clear up on the north and east corner of that, you'll see a round circle that's intersected by the setback line.

MR. KELLAHIN: Let's make sure we've found the right spot. Have you figured it out, Mr. Carr, or do you want me to show you?

MR. CARR: I'm comfortable with this, Mr. Kellahin.

MR. STOVALL: In dark blue on Mr. Kellahin's exhibit copy, is that correct?

THE WITNESS: That's correct.

Q. In reviewing the development of coal gas wells in this area, have you located other spacing units that have wells that are exceptions to Rule 7 as you seek that exception?

A. They would be exceptions to Rule 7 in

that they're off pattern. Most of these wells, however, were drilled before the field rules were put into effect and were grandfathered in, but they do represent the exact same case that we have before us today.

Q. Let me turn to the next display following the topo map, and have you identify for us what you're trying to represent with this document?

A. The plat immediately behind the topo is a land plat that has darkened sections outlined on it. You'll notice that there are three coal wells represented on those plats. At least one of those wells has been plugged and abandoned or temporarily abandoned, and a new coal well has been drilled to replace it.

Q. For example, when we look on the display and find--I've lost track of the section numbers here. Perhaps it would be easy to start in the northwest corner and look at Section 6. Describe for us why that area is outlined in a darker black outline.

A. The reason it is outlined is because you'll see a No. 300 well located in the northwest quarter. You'll also see a No. 3 well

located in the northeast quarter, and a No. 103 well located in the southeast quarter.

Q. As you move over into Section 5, what do we see in that section?

A. You see exactly the same scenario. You see a well in the northwest quarter, a well in the northeast quarter, and a well in the southeast quarter.

Q. And then you go over into Section 4, and what happens in that section?

A. In Section 4 we have a well in the northeast quarter, a well on the southeast quarter and a well on the southwest quarter of that section.

Q. Who operates those particular wells?

A. The wells in all six sections, insofar as it relates to the east half, are operated by Amoco Production Company.

Q. What is your knowledge of the particular reasons as to why those patterns are being developed in these coal gas spacing units?

A. Originally, we drilled the original wells in the three sections that we just discussed, and they were drilled before the field rules were put into existence.

Amoco later drilled or recompleted their wells and found those wells to be marginal, at best, or noneconomic as the case may be, and redrilled their spacing unit to find a better location for the coal production.

Q. Is that the process you're seeking to accomplish with your application in this case?

A. Yes, it is.

Q. Let's turn to the last display within Exhibit No. 3 and have you identify and describe that document.

A. This display is also a land map. It shows the township known as Township 31 North, Range 8 West. It shows a like example of where we have three coal wells that, at one point in time, were located on the section. One of those wells has been plugged and, of course, a subsequent well was drilled, and we now have two coal wells in each of the sections.

MR. KELLAHIN: Thank you. That concludes my examination of Mr. Alexander. We move the admission of his Exhibits 1 through 3.

EXAMINER CATANACH: Exhibits 1 through 3 will be admitted as evidence.

Mr. Carr?

MR. CARR: No questions.

EXAMINATION

BY MR. STOVALL:

Q. Mr. Alexander, is this area out east of Bloomfield and north of 44? Is that the general vicinity?

A. I'm not exactly sure the geographic location of this area. I didn't look at it before we came to the hearing this morning. One of the other witnesses may be able to tell you more precisely where it's located.

Q. Farmington is about 30 and 12, isn't it?

A. Yes, sir, I believe that's correct.

MR. STOVALL: That's all.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Alexander, the reason for the replacement well will become evident through other testimony?

A. Yes, sir, I believe that it will.

Q. Your 301 is at a legal location as far as setbacks are concerned, is that correct?

A. Yes, sir, that's correct.

EXAMINER CATANACH: Okay. I have

nothing further of the witness.

MR. STOVALL: I do have one other thing I forgot to ask.

FURTHER EXAMINATION

BY MR. STOVALL:

Q. Looking at your topo map, just kind of having to guess at the scale, it appears that just kind of southwest of that two-pole power line there's another power line perpendicular to it in the southeast corner of that legal location box?

A. Yes, sir.

Q. Do you see where I'm talking about?

A. Yes, sir.

Q. I assume you're trying to say that's too small a space in there to try and get a well in, you need to get further east of that well?

A. Yes, sir. In addition to having to be 300 feet from the centerline of that canal, we also cannot build within 150 feet of that double pole power line or the other power lines that are in the area.

Q. Not having a scale on this map, it's a little hard--I couldn't tell exactly what the distances were there.

A. The scale is approximately 812 feet to the inch.

Q. 112?

A. 812 feet to the inch.

Q. The area I'm talking about, I guess it's sandwiched between three different lines?

A. Yes, sir, and then you have the edge of the wash to deal with in there, also.

MR. STOVALL: That's all.

FURTHER EXAMINATION

BY EXAMINER CATANACH:

Q. In essence, Mr. Alexander, you're saying that's the only legal location you could drill in the northwest quarter, as far as topographic conditions are concerned?

A. Yes, sir, that is correct.

EXAMINER CATANACH: Nothing further.

MR. KELLAHIN: Call Mr. John Clayton at this time.

JOHN CLAYTON

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

EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Clayton, would you please state

your name and occupation?

A. My name is John Clayton. I'm an engineer with Meridian Oil in Farmington, New Mexico.

Q. Mr. Clayton, on prior occasions have you testified as an engineer?

A. Yes, sir, I have.

Q. What are your particular duties with regards to this application by your company?

A. I'm the reservoir engineer that worked on this project.

MR. KELLAHIN: Mr. Examiner, we tender Mr. Clayton as an expert reservoir engineer.

EXAMINER CATANACH: The witness is so qualified.

Q. Let me have you turn to Exhibit Tab 4, and the first display after that tab.

A. Yes, sir.

Q. In executing your responsibilities as a reservoir engineer for this area, are you familiar with the production and the capacity to produce coal gas in your number 300 well?

A. Yes, I am.

Q. Have you compared that capacity and the current rate with the offsetting production

around you?

A. Yes, sir.

Q. What have you discovered with regards to the spacing unit in the north half of 36 that is now dedicated to the 300 well?

A. The north half of Section 36, in my opinion, will suffer drainage in the northwest quarter by the offset wells.

Q. Is the No. 300 well currently able to adequately protect and develop the north half of 36 as it competes with the offsetting wells?

A. In my opinion it's not.

Q. What are the offsetting wells that expose the north half of 36 to drainage?

A. The northwest quarter of Section 36 is of primary concern. The three wells that border the well, I believe on the map that is displayed, is producing at 1588 Mcf per day; the well to the west producing at 2666 Mcf per day, and the well in Section 36, the south half, producing at 1816 Mcf per day, are the wells of concern.

Q. Who operates those wells?

A. Amoco Production Company.

Q. From what information do you determine the producing rate?

A. These rates were taken off the latest Dwight's information that we have.

Q. Reliable information that's reported to the industry and utilized by reservoir engineers to have production rates for wells?

A. That's correct.

Q. And these producing rates are set forth in Mcf of gas per day?

A. That's correct.

Q. There are some contour lines on the display. What do those represent?

A. The contour line furthest east represents a contour of 1000 Mcf per day. The contour line to the west represents a contour of 2000 Mcf per day.

Q. Having identified an area of wells that produce two to three times what your well is producing, did you attempt to investigate, as a reservoir engineer, why that was occurring?

A. Yes, we did. These wells actually produce 30 times what our well is producing.

Q. Have you provided production plots of each of these wells that are in question with regards to the issues involved in this case?

A. Yes, sir. They follow the exhibit

we're looking at.

Q. Let's look at each of the production plots and have you identify the well and show us the information.

A. These production plats are listed in gas production per month. The value you see on the left, or the Y axis, is a monthly production. The first exhibit is the EPNG Com D No. 300. That's the well that's in the northeast of Section 36 and operated by Meridian. That well is currently producing at 2158 Mcf per month, or about 71 Mcf per day.

Q. All right. The next display?

A. The next display is the State Gas Com AA No. 1. That well is operated by Amoco Production Company. It's the well located in 30 and 8, Section 36. That well currently produces 5500 or, excuse me, 55,206 Mcf a month, or about 1.8 million a day.

Q. Has the State Gas Com AA well established a decline in gas production?

A. To the contrary. The data we have actually shows the well on a continued incline.

Q. Let's turn to the next gas production plot. For what well is that?

A. This well is the Florence P No. 3. This well is operated by Amoco Production Company. It's located in 30 and 8, Section 35. This well is producing 2.66 million per day.

Q. Again, does the information establish an inclining production rate or a declining production rate?

A. This well is inclining.

Q. The next display?

A. The next and last display is the Florence K No. 3. This well is operated by Amoco production. It's located in 30 and 8, Section 25. This well is currently producing 1.6 million per day, and, there again, the production data we have displays an incline.

Q. Having determined that your spacing unit is offset on three sides by high productivity coal gas wells, and plotting that production to see each of those wells is still on an inclining gas rate, did you examine your well to see if there was any mechanical or completion reason to explain the dramatic difference in the performance of your well as you compare to the Amoco wells?

A. Yes, sir, we did.

Q. Let's turn to Exhibit 5 and look at the first display behind that exhibit tab. Before we describe the details, tell us what we're looking at.

A. We're looking at the same nine-section plat that showed the production contours, with Section 36 located in the center. The well names are identical to the wells that were displayed on the previous nine-section plat.

Q. You're spotting four coal gas completions?

A. Yes, sir. These are only the coal gas wells located in these nine sections.

Q. When we look at the outlying triangles that are open and not colored in, what do those represent?

A. Those wells represent wells that are currently producing naturally from the Fruitland Coal.

Q. What does that mean?

A. That means they did not require any artificial stimulation to bring them to the production rates we've seen.

Q. Are these open hole completions or perforated completions?

A. Open hole completions.

Q. All those triangles are unstimulated open hole completions in the coal gas?

A. That's correct.

Q. When you move to the four wells that are completely colored in with shaded triangles, what do those represent?

A. There are five wells where the triangles are completely colored in. Those wells were also initially completed open hole. However, the difference in those wells is that they required fracturing to get the production rates we've seen.

Q. Let's take the 300 as an example. How was it drilled and completed initially?

A. That well was drilled and completed in the same capacity as the open triangle wells. However, the gas we saw after an open hole completion was 88 Mcf a day flowing to atmosphere.

Q. How would that compare to a high-capacity well that is naturally completed?

A. That would compare to the wells to the west that produce in excess of two million a day.

Q. What then did you do?

A. Keeping in mind that the rates shown as actual production rates are flowing into line pressures, and the 88 we experienced after our open hole completion technique was flowing to atmosphere.

Q. What did you try to do, then, to improve the performance of the 300 well?

A. The EPNG D Com 300 well was then cased, cemented, perforated and fractured.

Q. With what result?

A. The first frac screened out due to high treating pressures. We then subsequently frac'd the well again, and on the second time the well screened out.

Q. How did you finally establish production in the well?

A. Cleaned up the wellbore after both fracs and put the well on line, and it's currently producing at 71 Mcf per day.

Q. Why have you colored in the other four wells in addition to the 300?

A. Those wells have also been tried open hole, same completion techniques as the wells to the northwest, and have not experienced the success of those wells. They've subsequently

been fractured also to increase productivity of the wells.

The two wells located in Section 31 of Township 30 and 7, due east of our 300 well, also experienced screenouts on the fracs.

Q. Having reviewed all that information, what was your engineering conclusion about the mechanics of drilling and completing these wells as explaining the differentials between the low-performing and the high-capacity wells?

A. The EPNG D Com No. 300 was completed in the same technique as the open hole wells that produce at the higher rates to the west. However, our completion showed that our gas rates were extremely lower than the wells that are to the west.

Q. Is the difference attributable to the completion techniques, then?

A. No, sir, it is not.

Q. Does it have anything to do with the mechanics of the well and how it was drilled and completed?

A. No, sir.

Q. As part of your investigation of the reservoir, did you quantify the gas in place in

each of the spacing units in the area?

A. Yes, sir, we did.

Q. Have you reduced that calculation to a conclusion about the gas in place for each of the spacing units in the area?

A. The gas in place for our EPNG D Com No. 300 well is located, is similar to the gas in place in the wells that produce at the higher rates that offset our drill block.

Q. Let's turn to the next document in this tab section and have you identify and describe that document.

A. Here again we're looking at the same nine-section plat with only Fruitland Coal wells located on that plat.

Q. What do the numbers mean adjacent to the coal gas symbols?

A. The numbers in the center of the drill block are what we've calculated to be the gas in place for that 320-acre drill block on a Bcf.

Q. For example, in the north half of 36, you have 13.4 Bcf gas in place?

A. That's correct.

Q. Give us a summary of the parameters that you have used in order to calculate the gas

in place.

A. We use volumetrics and multiply the net feet of pay found in the Fruitland Coal interval, by the density of the coal in the Basin in this area, times our gas content which was taken from desorption canisters of the cuttings in each individual well. We applied a 320-acre spacing unit to that to calculate gas in place.

Q. Did you follow that methodology for all the calculations that are summarized on this display?

A. Yes, sir, it's consistent.

Q. As a reservoir engineer, now, you have seen the performance differential between your well and the offsetting Amoco wells, you've examined the mechanics of completion, you've now looked to see that you have gas in place in your spacing unit. What do you attribute the difference in the productivity of these wells?

A. We feel that the difference in the high productivity to the northwest in these nine sections, compared to the productivity of our well in the northwest--excuse me, northeast of Section 36, is related to a permeability transition between our well and the wells to the

northwest.

Q. Are there gas in place reserves in your spacing unit, particularly in the northwest quarter, that you cannot protect and recover with your existing well, that are going to be drained by the offsetting Amoco wells?

A. Yes, there are.

Q. What's the solution?

A. Our solution is to redrill the EPNG D Com 300 from its current location in the northeast, and locate it in the northwest of Section 36, to provide an opportunity to get into an area that has a higher permeability trend in the coal than our well does. Thereby it will allow us to drain the reserves that would not be recovered from our well in the northeast.

Q. If you don't do that, what happens?

A. Those wells will be drained by the offset wells.

Q. Let me ask you to turn to Exhibit 6. Identify and describe this display for us.

A. This display is, once again, the same nine sections in question. This display has all the wells located in these nine sections. The symbols are located at the bottom; the circular

symbol for the Mesaverde wells, the squares are the Dakota wells, and the triangles are the Fruitland Coal wells.

We have large stars on this map and we also have relative smaller stars. The large stars are wells which display gas influx while they were drilled through the Fruitland Coal. These are Mesaverde wells which essentially took kicks while drilling through the coal.

The smaller stars are wells which required the stimulation techniques. They were all tried open hole and did not have the gas rates that the wells to the west had. They were then fractured.

There's also arrows next to three of the star wells, and those wells all screened out on the frac. There's also the same two production contour lines that give us these nine sections. The contour to the east is the 1000 Mcf per day line, and the contour to the west is the 2000 Mcf per day line.

Q. How does this information help you, as a reservoir engineer, attempt to locate the transition and permeability as you examine this area?

A. Currently we have no way of qualifying the permeability in these Fruitland Coal wells that we feel is something that would be representative of the actual reservoir downhole. We've tried to identify other ways to find out if there's permeability in one location relative to the other.

The large stars represent what we feel are gas influx that were taken while the Fruitland Coal had hydrostatic pressure on it, i.e., drilling mud, which would display a flow of gas against a back pressure.

The small stars, we feel that those five wells were attempted open hole; they were blown down in the Fruitland Coal, subject to no hydrostatic, and the production rates failed to perform like the other wells, exemplifying to us that the coal in these wells is extremely tight, compared to the other coals.

The three wells with the arrows on them not only displayed poor production when the coal was open to atmosphere, but when they were treated, when horsepower and energy was mechanically put on the coal, they failed, after breakdown, to continue an influx of frac fluid.

And subsequent high pressures were reached and they could not even be mechanically opened up. We feel this is an example of the coal in these wells being tight.

Q. How does that information fit with the contour line on producing rates that has been reproduced from the earlier production map and superimposed on this display?

A. They correlate all the wells that displayed what we call a lower perm, when compared to the wells in the northwest, fall in our lower or are below the 1000 a day production line.

All the wells that experienced gas influx in the Mesaverde when we were drilling it, in the Fruitland Coal we were drilling a Mesaverde well, all fall to the high side of the 1000 Mcf per day line.

Q. If the Examiner approves your location in the northwest quarter, is this going to give Meridian an advantage over Amoco and its offsetting wells?

A. No, sir. It would allow us to effectively drain our north half drill block without having any interference into the reserves

located in Amoco's drill blocks.

Q. If your well is successful and put into this position, what happens in the reservoir as these wells complete for these gas reserves?

A. If you look in the northwest quarter of Section 36, there is a large star located there. That was some gas influx taken in the Mesaverde. That's also pretty close to the EPNG D Com 301 proposed location.

If we assume that our new location is going to be producing down line at about two million Mcf per day, that's a rate very similar to the drill blocks that we feel are draining our section. If the rates produce at the same rates, they should draw down the reservoir pressure equally and establish a no-flow boundary somewhere between our proposed location and the three wells that we feel are draining our drill block. That no-flow boundary, as long as we're producing at this same rate, should be somewhere right along the section lines.

Q. Were the exhibits we discussed in Exhibit Tabs 5 and 6, as well as the information behind Exhibit Tab No. 4, documents that you have prepared yourself or were prepared under your

direction and supervision?

A. Yes, sir, that's correct.

MR. KELLAHIN: That concludes my examination of Mr. Clayton. We move the introduction of his Exhibits 4, 5 and 6.

EXAMINER CATANACH: Exhibits 4, 5 and 6 will be admitted into evidence.

Any questions, Mr. Carr?

MR. CARR: I have no questions, Mr. Catanach.

EXAMINATION

BY MR. STOVALL:

Q. Is my description of where this well is correct, up east of Bloomfield and north of 44?

A. That's correct.

Q. The canal that was on the topo map, is that the one that comes across the highway?

A. I'm not familiar with where the canal--it is associated with the Napi project, that's correct.

MR. STOVALL: I was just trying to picture the countryside.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Clayton, is the volumetric

calculation valid in the coal? Is this something that you're able to do effectively?

A. We have an inconsistency when we try to calculate volumetrics with the droppings of gas. The best volumetric calculation we can make are with the parameters that we put the gas in place calculations on. These are numbers that we feel are consistent among all wells.

Q. Have you calculated, at the current producing rate of the No. 300 well, have you calculated what that well might recover if it's able to produce or if you left it producing?

A. The well is producing now and we're estimating 168 million cubic feet of gas.

Q. That it will recover before it's plugged?

A. That's our current estimate right now.

Q. Is it Meridian's intention to plug the No. 300 well?

A. If we were to drill a well, which we would recommend to protect our rights in our drill block, we would make a pressure observation well out of the EPNG D Com 300 to further understand the change in permeability.

Q. Meridian wouldn't have any intention of

producing both wells at the same time?

A. No, sir.

Q. On your production contour lines, you did have sufficient data to construct those lines?

A. Yes, sir. They were taken from Dwight's, and they're consistent among all operators in those nine sections.

Q. Okay. Referring to--

A. I would like to elaborate on that. All the production figures, with the exception of one well, the well located in the west half of 31, 30 and 7, where it has in parenthesis pito next to it, that well is a pito gauge and not an actual, reported gauge. That well has not yet been tied in.

FURTHER EXAMINATION

BY MR. STOVALL:

Q. Did you do that area-wide or just for the nine sections?

A. We've done it in several areas to identify drainage.

Q. One goes off the edge and the others kind of go to the edge. Did you follow those out? Have you done work on the adjacent--

A. Yes, sir, you can.
Q. --to the north and west?
A. Yes, sir, and they do follow a trend.

FURTHER EXAMINATION

BY EXAMINER CATANACH:

Q. Were these contour lines drawn subsequent to the drilling of the 301?
A. Both contour lines were drilled with the data we have on this map right here.
Q. At the time you drilled the 300, you did not have this data available to indicate that there might be a barrier of some kind in there?
A. No, we did not. This data is recent. If you look at the--the 300 was drilled in February of 1990. If you look at the production plots following this map, you will see that the three wells of concern that are draining our drill block all came on in production in 1991.

MR. STOVALL: You believe the ones immediately to the east would indicate you might get a halfway decent well out of it, wouldn't they? That becomes a halfway economic well, doesn't it? 200 to 300 well?

THE WITNESS: The 217 is a pito gauge. There again, that flows to a pressure of 15 psi.

MR. STOVALL: I would have wanted the 505 and the 545. That's what I meant. I'm sorry.

THE WITNESS: Yes, sir. The concern we have in the 300, we've attempted twice to hydraulically fracture that well. It's displayed that its permeability is relatively low, even to the fracture results we've had on those wells.

Q. (BY EXAMINER CATANACH) Do you have an estimate on what kind of reserves the No. 301 may recover if it's drilled?

A. Yes, I do. It should recover about 4 Bcf of gas; that's 4,012 million. There again that's an estimate, and the results of that well will be how far we can move to the west and get into an area of better permeability.

Q. That's a recovery rate of about 25 percent or something like that? Is that typical?

A. The well in the east half of Section 35, we're anticipating, and here again it's an estimate, that's not operated by Meridian and we're limited on data, our estimate on that well is about 75 percent of the gas in place.

Q. Why does that drastically change in Section 36?

A. They have a slightly lower gas content in their drill block based off of the, you know, calculations that we've made that are consistent with all the wells. We're anticipating on that somewhere around 10 Bcf, 9918. Strictly an estimate.

If you look back at the production history in the curve of that well, it's hard to figure out when that well is going to stop its incline.

Q. So, by replacing the 300 well, you're slightly more than doubling your reserves?

A. Right now we're only estimating recovery of 68 million out of our existing well.

EXAMINER CATANACH: Okay. I believe that's all I have at this time.

MR. KELLAHIN: Thank you. Call Mr. Greg Jennings.

GREGORY JENNINGS

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

EXAMINATION

BY MR. KELLAHIN:

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

A. Gregory Jennings. I'm a senior geologist with Meridian in the Farmington office.

Q. Mr. Jennings, on prior occasions have you testified about coal gas geology?

A. Yes, I have.

Q. Pursuant to your employment as a geologist with Meridian, have you made a study of the coal gas in this particular area?

A. Yes, I have.

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

EXAMINER CATANACH: He's so qualified.

Q. Mr. Jennings, Mr. Clayton, as a reservoir engineer, was exploring explanations concerning the low productivity of the 300 well and its relationship to the high capacity wells that offset the spacing unit. Have you also looked, from a geologic perspective, to see if there were geologic explanations to why your 300 well was such a more low-rate producer?

A. Yes, I have.

Q. As part of that study, did you isopach the net coal thickness in the Fruitland formation in this particular area?

A. Yes, I did.

Q. Let me ask you to turn to Exhibit Tab 7 and look at the first display, which is the isopach. Identify and describe the isopach for us.

A. This is, once again, a nine-section map around the section of interest. These values by the wells are the net or total Fruitland Coal in those wellbores as identified by wire line logs or mud logs, whatever data we had available.

On that map you can see that the data values range from the mid-thirties to the mid-forties; basically, a fairly continuous coal thickness throughout the area of interest.

Q. Can you explain the differences in productivity of the Amoco wells to your 300 well, based upon coal thickness?

A. No. In fact, we found that coal thickness generally, while it's a positive factor, coal thickness is not the key to production.

Q. Have you prepared a structure map to see if there was a structural explanation that would account for the differences in the productivities of the wells?

A. Yes, I have.

Q. Let's turn to that display, which is the next document behind the exhibit tab, and have you identify and describe the structure map.

A. Once again, the same nine-section area. This is a structure map on the base of the Fruitland Coal, 20-foot contour interval. Nothing anomalous shows up.

Basically, we have a regional downdip to the northeast. Nothing--no evidence of any faults, any significant flexures that would cause any permeability barriers or cause any increased fracturing that might account for the differences in production.

Q. So, you've examined coal thickness and distribution, and that doesn't explain the difference. You've looked at structure and that doesn't explain the difference.

You prepared a cross-section?

A. Yes.

Q. Give us the line of cross-section, and then we'll look at the cross-section itself.

A. The cross-section A to A' is marked on the nine-section maps we just looked at, and it's also in the exhibit book. We'll talk from the one on the wall. But essentially it includes the

three offset producing coal wells that are so prolific that surround Meridian's drill block in the north half of 36, and it also includes our EPNG D Com No. 300 well.

Q. Let me have you go to the cross-section on the wall, and describe for us the similarities, if you will, among all four wells, and see if you can identify any geologic difference that explains the high capacity wells in relation to the 300 well.

A. I'll try and do it just from back here. I apologize, it's a big cross-section and it's probably too cumbersome to pull out of your packet right now, but the EPNG D Com 300 is the second well from the right. It's a mud log, and as you can see, the line of cross-section essentially loops around our spacing in the north half of 36.

In this area there are two basic coal packages. I've described them as the upper coals and the lower coals and highlighted them with pink and yellow. Aside from some minor variations in the coal zones, the two coal packages are very continuous and very uniform; once again in the neighborhood of 40 feet total

thickness.

Now, if you look closely at the cross-sections, you can see that while there's no major difference in coal thickness or coal zones, we do see some subtle differences on the two mud logs. The well that's second from the left, which would be the No. 1 well in the southwest of Section 36, they encountered a 10-foot flare when they drilled the first coal zone, 30-foot flare when they drilled the second coal zone, and then the well continued to improve as they drilled it to TD.

The coals are described as bright and very well cleated. Then you go over to our well, and these wells were both drilled with water, you go over to our well and look at the sample description of that well, and we essentially had no flare after we drilled through the entire coal interval. The samples are described as dull and poorly cleated. There's definitely a difference in the sample description and in the natural productivity that we encountered in the wellbore.

We are somewhat limited in our ability to explain or predict where these permeability

variations will occur. There is evidence of depositional variations within our drill block, and this is fairly common. The Fruitland Coal is a very heterogeneous reservoir and can change rapidly in short distances; some coals being more prone to fracturing and cleating than others.

Our conclusion from all the data, after we've eliminated coal thickness, structural variations which might have affected the permeability, and looking at the cross-section, is that the major difference is significantly better permeability as we move to the west.

MR. KELLAHIN: That concludes my examination of Mr. Jennings. We move the introduction of his cross-section in the back of the exhibit package, as well as his geologic displays shown behind Tab No. 7.

EXAMINER CATANACH: Exhibit 7 will be admitted into evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Jennings, this data was all obtained from mud logs?

A. No. Two of these logs are old gamma ray neutron wire line logs, and the two in the

center are from mud logs. Our well, the EPNG D Com 300, does have wire line logs which confirm the coal thicknesses I've shown on the cross-section.

Unfortunately, this area, like many areas in the Fruitland Coal, we don't have a lot of modern wire line logs. That's why I've used the old gamma ray neutron logs here. Actually, gamma ray neutron logs are pretty accurate at identifying coal.

EXAMINATION

BY MR. STOVALL:

Q. Is it not true that--my understanding is that the coal permeability and cleating is far more significant than thickness? You can get a much better well out of a thin coal bed with good cleating than you can out of a thick coal bed with poor cleating permeability, is that correct?

A. Yes, that's definitely the case.

Q. That's your conclusion? You don't have the cleating and permeability in that well location? It seems to be better as you go further west?

A. That's correct.

Q. Would that also account for the fact

that, even though you have similar gas in place, between, say, the north half of 36 and the east half of 35, that you're going to get a lower total percentage recovery out of 36 than 35?

A. Yes. The gas is in place, and--

Q. If you can't get it out of the coal you can't get it, right?

A. That's right.

FURTHER EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Jennings, are you pretty confident that a well in the northwest quarter will encounter the better permeability and cleating system?

A. Yes. There's always some risk. The coal is a tough reservoir to explore and to predict, but we are confident and that's why we're recommending a well. In fact, we feel that we're being drained and will be drained if we don't drill a well in the northwest quarter.

MR. STOVALL: You'll have a better well, you're just not sure how much better?

THE WITNESS: Right.

EXAMINER CATANACH: I have nothing further.

MR. KELLAHIN: That concludes my examination and presentation of Mr. Jennings. The last item is Exhibit 8, which is our certificate of notification. The only operator in the area affected is Amoco, and Mr. Carr is here in their behalf.

EXAMINER CATANACH: Is there anything further in this case?

MR. KELLAHIN: No, sir.

MR. STOVALL: Closing statement, Mr. Carr?

MR. CARR: No closing statement.

EXAMINER CATANACH: There being nothing further, Case 10558 will be taken under advisement.

(And the proceedings concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10558, heard by me on September 17, 1992.

David R. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL October 5, 1992.

Carla Diane Rodriguez

CARLA DIANE RODRIGUEZ, RPR
CSR No. 4