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

APPLICATION OF MERIDIAN OIL, INC. FOR A HIGH ANGLE/HORIZONTAL DIRECTIONAL DRILLING PILOT PROJECT, SPECIAL OPERATING RULES THEREFORE, AN EXCEPTION TO RULE 2(B) OF THE SPECIAL RULES GOVERNING THE BLANCO-MESA VERDE POOL, AND A SPECIAL PROJECT GAS ALLOWABLE, SAN JUAN COUNTY, NEW MEXICO.	)	CASE NO. 10324

REPORTER'S TRANSCRIPT OF PROCEEDINGS
EXAMINER HEARING
BEFORE: MICHAEL E. STOGNER, Hearing Examiner
June 13, 1991
Santa Fe, New Mexico

This matter came for hearing before the Oil Conservation Division on June 13, 1991, at the Oil Conservation Division Conference Room, State Land office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Linda Bumkens, CCR, Certified Court Reporter No. 3008, for the State of New Mexico.

FOR: OIL CONSERVATION DIVISION
(ORIGINAL)

BY: LINDA BUMKENS CCR
Certified Court Reporter
CCR No. 3008

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APPEARANCES

FOR MERIDIAN OIL:	KELLAHIN, KELLAHIN & AUBREY Attorneys at Law BY: MR. W. THOMAS KELLAHIN, ESQ. 117 N. Guadalupe Santa Fe, New Mexico 87501
FOR AMOCO PRODUCTION COMPANY and TEXACO, INC.:	CAMPBELL & BLACK, P.A. BY: MR. WILLIAM F. CARR, ESQ. 110 N. Guadalupe Santa Fe, New Mexico 87501
ALSO PRESENT:	MR. BILL HAWKINS
FOR THE GAS CO. OF NEW MEXICO:	MISS SARAH SMITH, ESQ. 2444 Louisana N.E. Albuquerque, New Mexico 87125
FOR THE DIVISION:	ROBERT G. STOVALL, ESQ. General Counsel Oil Conservation Division State Land Office Building Santa Fe, New Mexico 87504

MR. STOGNER: Call the next case number 10324.

MR. STOVALL: Application of Meridian Oil, Inc. for high angle/horizontal directional drilling pilot project, special operating rules therefore, and exception to Rule 2(b) of the special rules governing the Blanco-Mesa Verde pool, and a special project gas allowable, San Juan County, New Mexico.

MR. STOGNER: Call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kellahin & Aubrey appearing on behalf of Meridian Oil, Inc.

MR. STOGNER: Additional appearances?

MR. CARR: May it please the commissioner, my name is William F. Carr with the law firm Campbell & Black P.A. of Santa Fe. I represent Texaco Inc. and Amoco Production Company. Amoco will have a brief statement at the end of the case.

MR. STOGNER: Any additional appearances?

MS. SMITH: Mr. Hearing Examiner, Sarah Smith I'm entering an appearance on behalf of Gas Company of New Mexico and Suntera Gas Gathering Company.

MR. STOGNER: Any other appearances? And how many witnesses do you have, Mr. Kellahin

MR. KELLAHIN: I have four witnesses,

Mr. Examiner.

MR. STOGNER: Four witnesses. Are there any other witnesses from either of the other parties?

MR. CARR: No, sir.

MR. STOGNER: Then will the four witnesses please stand to be sworn? Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Examiner. Let me provide a brief introduction. Mr. Examiner, what Meridian is seeking to do is to continue some high-angle drilling in the Mesa Verde formation on a pilot project basis.

The well that's the subject of this case is the Sunray "G" 2R well. It is located -- to be located in the east half of section 21. There are already currently two vertical Mesa Verde wells, an original well and infield well, and this is intended to be the third well in that reservoir.

We have set back from the outer boundaries of the 320 for a drilling window 790 from the side boundaries of the spacing units. We share with you what is a plat of the offset operators. The offsetting operators around our spacing unit, with the exception of Meridian, include Amoco principally to the east and to the south of us. Amoco is appearing today through Mr. Carr and has technical

people available.

In addition Texaco has got the spacing unit north of us. It's a laydown spacing unit. They're identified on the platt as the operator number three in that location. The notice provisions for this case were that we attempted to conform to the requirements for notification for deviated wells under Rule 111, which was notification to the offset operators of spacing units for the pool.

In making those notifications I failed to specifically send the certified mailed cards to Amoco and to Texas, but we believe we've cured that notice problem by notifying them directly, and they have agreed to participate and appear by counsel today.

The only other interested party that has appeared to which I have any notice of is the Gas Company. Miss Sarah Smith is here on behalf of her company.

What we are asking is the solution that the commission provided for us when we went before them last February of 1990 to obtain approval for the Riddle and the Howell well. They were high-angle wells, and let me share with you at this time, Mr. Examiner, the commission order in that case.

It's order R 9037A, and what we will be asking for is the procedure established in the commission order in terms of how to calculate or select the wells from which we calculate the deliverability, select that deliverability and then subsequently calculate the allowable pursuant to the Blanco-Mesa Verde pool rules.

We believe that that process is consistent with what the Aztec district office utilizes for the selection of wells when you have three vertical wells in a spacing unit, and so we're seeking to have a similar order to that adopted by the commission in these other horizontal cases.

The four witnesses briefly, Mr. Jim Falconi is the reservoir engineer. It's been his primary responsibility to coordinate and consolidate the work of the other technical people to make the presentation today. He'll be my first witness. Second witness, Mr. Jim Hornbeck is a geologist and he'll briefly describe to you the major geologic reasons for the continuation of the high-angle well bore project in the Mesa Verde. Mr. Danny Boone is the drilling engineer, and he can respond to questions about the drilling and completion technique, and then Mr. Alan Alexander is the land

man to confirm my representations to you on notice, and that will be our presentation this morning, Mr. Examiner. If I may do so at this time I'd like to call Mr. Jim Falconi.

EXAMINATION

BY MR. KELLAHIN:

Q. For the record, will you please state your name and occupation?

A. My name is Jim Falconi. I'm a reservoir engineer for Meridian Oil in Farmington, New Mexico.

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

A. Yes, I have.

Q. Give us a quick summary of what has been your involvement as a reservoir engineer in this particular case, preparation for the drilling of the Sunray G 2R high angle well.

A. My involvement in the proposal of the Sunray G 2R high angle Mesa Verde well was to coordinate a technical team involving a geologist, land man, and reservoir engineer, myself, and the drilling engineer to design the project.

Q. Have you completed that study in consolidation with these other technical

individuals?

A. Yes, we have.

Q. And have you reached conclusions about the feasibility of drilling this type of well in this particular spacing unit?

A. Yes, we have.

Q. And has your company approved your coming forward towards the division seeking the regulatory approval to commence this project?

A. Meridian Oil has authorized me to do that.

MR. KELLAHIN: We tender Mr. Falconi as an expert reservoir engineer.

MR. STOGNER: Are there any objections. Mr. Falconi is so qualified.

Q. (By Mr. Kellahin) Mr. Falconi, let me have you go to the exhibit book. Exhibit 1 is simply the application. Let's pass that one for now and go to the tab that's marked Exhibit 2. Identify that display for me.

A. Exhibit 2 is a map of the San Juan Basin, and what we tried to depict on this map was the location of two high-angle wells that Meridian has already drilled. Those are represented by the inverted triangle.

Q. When we look at that display and we see the

inverted triangle to the lower right of the star, which one will that be?

A. The triangle to the lower right, or to the east is the Howell number 2R.

Q. And the triangle to the west of the first triangle?

A. The triangle to the west is the Riddle number 1R which are currently completing.

Q. Okay. And then the star represents the project for the Sunray well?

A. Yes. The star represents the Sunray G number 2R.

Q. Okay. To further orient the examiner with regards to this particular spacing unit, Mr. Falconi, let me direct your attention to the first display after tab Exhibit Number 3. Looking at the C102?

A. Yes.

Q. All right, sir. Would you identify and describe that for me?

A. This plat, the C102, shows the location of the proposed well, the Sunray G 2R in the southwest of the southeast quarter of section 21. That well is located 995 feet from the south line, 1755 feet from the east line, and that's in an orthodox location.

The plat also depicts the two existing wells, the parent well, the Sunray G Number 2, which is in the southwest of the northeast of section 21, and the Sunray G number 2A, which is in the southeast of the southeast of section 21.

Q. When we characterize the wells as an original well and infield well in the Blanco-Mesa Verde, will that characterization represent either of these wells?

A. Yes. The Sunray G number 2 is the parent well.

Q. It's the original well in the spacing unit?

A. Yes.

Q. And the infill well is which?

A. The Sunray G number 2A.

Q. Give us a quick summary of the current status of the original well, the G 2 well.

A. The G 2 is currently a producing well, as is the G 2A, and that well is currently producing approximately 100 mcf a day. Currently that well is shut in, over produced.

Q. Describe for me why it is that your company has proposed a horizontal well in this particular spacing unit?

A. The technical team that I worked with and

coordinated reviewed the Mesa Verde in this part of the Basin, and selected several drill blocks in which to try this project, and through a series of reviews, we narrowed it down and this was our choice. It was based on remaining reserves in the drill block, and land position on the drill block.

Q. With regards to the land position, what is your understanding of the ownership within the east half of section 21?

A. The ownership in the east half of 21 is 100 percent working interest, 82 percent net revenue interest, in the drill block.

Q. Why is that one of the criteria for selection of the spacing unit for a pilot project for horizontal well?

A. It allows Meridian to bear 100 percent of the cost and retain the information, and develop it at our expense.

Q. Give me a quick summary of the basis for the belief that there may be reserves within the spacing unit in the Mesa Verde that are not going to be developed by the two existing wells.

A. I reviewed the 9 section surrounding the Sunray G number 2R proration unit, and both through a ray-time analysis and a pressure cume analysis,

and this analysis shows remaining reserves to be in the ground on this drill block which may not be recoverable by the G number 2, or the G number 2A.

Q. Why have you selected a horizontal well for the spacing unit as opposed to a third vertical well bore?

A. We selected the horizontal well as a test of high-angle technology in the Mesa Verde interval as a third project in our continuing projects in the Mesa Verde, and we felt that through our analysis that this well would recover reserves which are otherwise unrecoverable in the Mesa Verde interval.

Q. Provide the examiner a quick summary of the drilling and completion and results for the first well bore in this project which was the Howell well.

A. Yes. The Howell E 2R was drilled and completed. The results on that well, the well has been producing approximately 9 months, and it is currently producing at 1100 mcf a day.

Q. Okay. What was the initial deliverability of that well, do you recall?

A. The deliverability of the well was 1196.

Q. I mean, how does that compare to the deliverability of the other two wells in that

spacing unit, do you remember?

A. It compares to the other two wells their latest deliverability were approximately 769 on the 2A, and 186 on the number 2.

Q. Okay. The Howell well currently produces at what rate?

A. Approximately 1100 mcf a day.

Q. Okay. And how is the allowable being calculated for that well?

A. The allowable for that well is being calculated on the deliverability of the Howell E number 2R and the Howell number 2A.

Q. Those are the two vertical wells?

A. The Howell Number 2R is the high-angle well, and the Howell E 2A is the infill Mesa Verde well.

Q. Under the commission order that was approved for the allowable formula for that well, you had three options, did you not?

A. Yes. We had three options on that drill block as we do on the Riddle number 1R drill block. The options are to take the deliverability of the two vertical wells, to take the deliverability of the high-angle well, and one vertical well, and the third option was to take the deliverability of the

high-angle well and the vertical well in the opposite quarter section if that well bore would not have penetrated the quarter section line.

Q. Okay. Are you seeking the same flexibility in determining the selection of wells by which you will take deliverabilities and ultimately calculate the allowable pursuant to the Blanco-Mesa Verde pool rules?

A. Yes, we are. We would like the same allowable to be calculated as in the case of the Howell E 2R and the Riddle number 1R.

Q. Do you see any potential violation of correlative rights to continue the practice of allowing the operator such as Meridian to make that selection among those three possible choices for that calculation?

A. No, we do not.

Q. What is the status of the Riddle well?

A. The Riddle well was drilled, and is currently being completed.

Q. Do you plan to modify the horizontal drilling technology with regards to the Sunray well from what was utilized for either the Riddle or the Howell well?

A. No. The technology used to drill the well

will be the same.

Q. Summarize for us what that drilling program was.

A. The drilling program on these wells is to drill to an intermediate casing point and set casing, and drill with gas below that point to a total depth in the Mesa Verde interval.

Q. For the Sunray well, do you have a surface location that you're proposing to commence the horizontal well?

A. For the Sunray G number 2R that's shown on the C102 and that location is 995 from the south line, 1755 feet from the east line, and that is an orthodox surface location.

Q. Do you know at this point whether that surface location, in fact, has been approved and would not alter from the location advertised?

A. The location should not alter. It is an approved location.

Q. Let's turn to the display after Exhibit 4, and have you describe for us then, the plan for drilling the well vertically to a certain point and then the azimuth or direction that you intend to go within the spacing unit.

A. Okay. The exhibit labeled Exhibit number 5

is a profile view of the well, and what it shows is the well bore being drilled vertically to a kickoff point of approximately 4766 feet. That's right at the top of the Mesa Verde group. At that point -- actually at a point above that -- we'll be setting an intermediate casing string at approximately 3500 feet. We'll drill vertically to the kickoff point with gas, and drill directionally from that point at a billed rate of approximately 10 degrees per 100 foot into the Point Lookout interval, and drill laterally across the Mesa Verde interval to a total depth of 5600 measured or true vertical depth at 8700 feet measured depth. The azimuth on that is shown on the display on the well, and it's approximately north 15 degrees to the east.

MR. KELLAHIN: Mr. Examiner, the display on the wall for purposes of the record will be marked as Exhibit Number 7. I'd neglected to do that. Let's take it in parts, Mr. Falconi. When we look at the first portion of the drilling, you're going to drill a vertical well to a certain total depth?

A. Yes. The well will be drilled vertically to an intermediate casing point at approximately 3500 feet. Intermediated casing will be set at that point. That is not depicted on the display on the

wall.

Q. (By Mr. Kellahin) Do you desire to have the examiner provide you the authority to have the flexibility of choice then in determining the ultimate direction that this lateral portion of the drilling will take?

A. Yes. What we have shown in the second exhibit under Exhibit 5, the first exhibit there. Is the profile view of the well bore, and the second exhibit is the plan view of the well bore, and what we are asking for is a drilling window which is 790-foot setback on all boundaries of the proration unit.

Q. Your proposed entire vertical and horizontal extent of the well bore then would be within the drilling window shown on the display following Exhibit 4. You're going to honor all those 790 setbacks?

A. Yes. Well will take directional surveys and honor the drilling window which we have shown there, and we'll honor the 790 foot setback.

Q. Okay. So were Exhibits 2, 3, 4, 5, prepared or compliled under your direction and supervision Mr. Falconi?

A. Yes, they were.

MR. KELLAHIN: That concludes my examination of Mr. Falconi. We move the introduction of Exhibits 2 through 5 at this point.

MR. STOGNER: If there are no objections Exhibits 1 through 5 will be admitted into evidence -- I'm sorry -- 2 through 5 will be admitted into evidence at this time. Miss Smith, your witness.

MISS SMITH: We're not presenting any cross-examination of this witness.

MR. STOGNER: Mr. Carr, do you have any questions?

MR. CARR: We have no questions.

MR. STOGNER: Miss Smith, are you going to be asking any questions of any of the witnesses?

MISS SMITH: I don't know that yet.

MR. STOGNER: Okay.

You mentioned one of the wells as being shut in due to overproduction at this time. Which one was it?

A. Actually both wells in the proration unit, I think, are currently shut in, overproduced. We are currently 8.7 times overproduced on that proration unit

MR. STOGNER: 8.7?

A. Yes. And we're trying to -- Meridian is

trying to keep all their wells at least below the six times overproduced limit.

MR. STOGNER: You mentioned one of the two factors for a horizontal in this formation was the remaining reserves, but I don't think I caught those remaining reserves. Do you have that figure on that?

A. Yeah. I don't believe I mentioned the actual amount of remaining reserves. I have calculated the remaining reserves for that drill block to be approximately 2.5 bcf of gas.

MR. STOGNER: Now that's the remaining reserves with this third well bore, or I should say, produceable reserves?

A. That is a figure that I calculated as a minimum remaining reserve for the drill block for the proration unit.

MR. STOGNER: Obviously you've done quite a bit of reservoir work. Let's go back. With the two vertical wells, what is the recoverable reserves at the present rate at which those two wells produced until their economic limit?

A. The remaining reserves for the two wells in the proration unit are approximately 3.3 bcf.

MR. STOGNER: And the remaining reserves for these three wells with the horizontal -- hold it --

let's back up. Mr. Kellahin asked you a question about a third vertical well. Do you have any figures on the remaining reserves for a third vertical well?

A. I would estimate that the third vertical well would produce the reserves of the well that it would be replacing which for the G number 2 my calculations indicate there are approximately 2.2 bcf left for that well, and approximately 1.1 bcf left for the G number 2A.

MR. STOGNER: With all three wells going on the same time you expect it to go up to the remaining reserves of 2.5?

A. Yes, that's correct.

MR. STOGNER: Or an additional 2.5, I should say.

A. It's an additional 2.5, sir.

MR. STOGNER: Did you get some testimony on the Howell wells, Howell 2, 2A, and 2R? All three of those wells are producing at this point?

A. I can't answer that at this time. I believe we are producing the 2R and the 2A, but I believe the parent well, the E2, is shut in.

MR. STOGNER: You said the Howell 2R was producing at a rate of about 1100 ncf a day?

A. Yes, sir.

MR. STOGNER: Do you remember, or do you have figures on the -- what the initial production for the well 2 was?

A. I don't recall the figure on the number 2.

MR. KELLAHIN: I'd be happy to supply those to you, Mr. Examiner.

MR. STOGNER: How about for the 2A, any figure on that?

A. Again, I don't recall the initial production figures for those wells.

MR. STOGNER: Are there any further questions of this witness at this time?

MR. STOVALL: Yeah. I've got a couple of them .

Now does the Howell 2R penetrate both quarter sections?

A. Yeah. The Howell E2R penetrated both quarter sections. We started in the south quarter of that proration unit and drilled to the north limit of the window. I believe it went to the limit of the window.

MR. STOVALL: Same thing with the Riddle?

A. Yes. We had the same situation in the Riddle.

MR. STOVALL: The commission order that's

there actually incorporates and adopts the examiner order with the exception of the calculation of the delivery for the GPU; is that correct?

A. That is correct, Mr. Stovall.

MR. STOVALL: I don't have a copy of that examiner order in front of me; is it correct? Does that examiner order address the question of how many wells in the proration unit can be produced? Are you permitted to produce all three of the wells in the proration unit?

A. Yeah.

MR. STOVALL: Okay.

MR. KELLAHIN: For your information, Mr. Stovall, Examiner Catanach in that case approved multiple wells. He provided that the method for determining the deliverability would be to select either the deliverability of the horizontal well, or the combined deliverabilities of two vertical wells, the original infill. The commission adopted this order that provided further flexibility where they had more items to select from.

MR. STOVALL: And just so I understand, the net of all -- what you're saying, if I understood you correctly, that by drilling the horizontal well it will recover an additional two and a half bcf,

between two and a half bcf, over what the two wells or even a third vertical replacement well could drill; is that correct?

A. That's correct.

Q. Okay. That's all I have.

MR. STOGNER: If there are no other questions of Mr. Falconi, you may be excused.

EXAMINATION

BY MR. KELLAHIN:

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

A. My name is James Hornbeck and I'm a senior staff geologist with Meridian Oil.

Q. Mr. Hornbeck, on prior occasions have you testified as a petroleum geologist before the division?

A. No, I have not.

Q. Summarize your educational experience for us.

A. I have a bachelor's of science, in geology from the University of Long Island in New York in 1973, and then I continued to get my master's in geology at the State University of New York, and I completed that in 1976.

Q. Summarize your employment experience as a petroleum geologist.

A. I began my career in Farmington with El Paso Natural Gas as a development geologist in the San Juan Basin, worked for them for three years. At that time I began work for five years for Mountain Hills Supply Company as an exploration geologist in the four corners area, and for the past five years I've been an exploration geologist with Meridian Oil.

Q. Are you familiar with exploration geology with regard to the Blanco-Mesa Verde Reservoir?

A. Yes, I am.

Q. And have you participated on behalf of your company in analyzing the geology for this particular application for the high angle horizontal well?

A. Yes, I have.

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

MR. STOVALL: Are there any objections? Mr. Hornbeck is so qualified.

Q. (By Mr. Kellahin) Mr. Hornbeck, let me ask you to do this. If you'll go to the display on the wall, it's Exhibit 7. Let me give you a pointer and let me ask you some questions about your geologic

conclusions.

A. Okay.

Q. First of all, show the Examiner on Exhibit Number 7 what you have indicated on each end of the display when you have put logs on the right margin and left margin.

A. We've depicted the stratagraphic section across the drill block and, what we have are the formation tops picked in the Blanco-Mesa Verde producing reservoir. This is the Mesa Verde group in general with the Cliffhouse sandstone Menefee formation, and then the main pay in the pool, the point without sandstone.

Q. What are the two wells identified on the display?

A. They are the Sunray G number 2A in the southeast of section 21, and also the Sunray G number 2, the parent well, in the northeast of section 21, and here is a depiction of where they are with relationship to the proposed high-angle well.

Q. Give us the summary of the log correlation between the two wells.

A. Well, it's pretty straightforward. There's a Cliffhouse sandstone present throughout the drill

block, likewise a thin bedded shale and sandstone interval in the Menefee on both sides of the drill block, and then we're to the Point Lookout sandstone, which is also continuous throughout the drill block.

Q. When we look at this portion of the Mesa Verde reservoir, what type of reservoir are we dealing with?

A. We're dealing with a section of tight sandstones in the Cliffhouse and Point Lookout sandstone -- the upper part of Point Lookout is a bar barrier section with low porosities and permeabilities, and in addition, the thinly bedded sands of the Menefee end several hundred feet of the lower Point Lookout which are thinly bedded sands and silts and shale which are fairly discontinuous, and relatively tight on water in logs.

Q. Is there a fracture component to the reservoir that is involved in your analysis of the geology for this particular prospect?

A. Yes, there is. This area of the pool in the San Juan Basin, in general, suggests that there is a fractured element to production out of the pool in the reservoir. These thinner, tight sands especially seem to be enhanced by some fracture

permeability in addition to just their matrix porosity.

Q. Does there seem to be a geologic explanation to the productivity of the Mesa Verde wells in this immediate area?

A. Well there is a fractured element to the wells' production in this area, and there's not an obvious basement structure or flecture within the area, but as with most parts of the San Juan Basin in the Cretaceous sandstone. Natural fracturing enhances production to some degree. There is not an obvious structure within this area, but there is evidence of some fracture enhancement of production.

Q. What are you hoping as a geologist to accomplish with the horizontal well that you won't be able to achieve with another vertical well?

A. Well, the advantage of a horizontal well in this drill block will be to penetrate, in particular, the extremely thinner bedded sandstones in the Point Lookout which are discontinuous and by penetrating them with a horizontal well bore and capture reserves in this tighter, less permeable section.

Q. Simply because of the distance of the lateral you'll have a greater opportunity to

encounter more of those lenses than you would if you had a vertical well?

A. Yes, that is correct.

Q. Is there any particular explanation to the orientation of the proposed lateral portion of the well?

A. There is several factors played into our orientation for the well bore. Geologically we have been analyzing numerous types of data trying to depict the prevalent fracture direction within the basin in this area, and some fracture-finder logs that we have run in the last several months have indicated there are some fracture directions that intersect, that occur within this area of the Basin which would be optimized by this direction of lateral well bore.

Q. Let me have you return to your seat, sir. If you go back with me and look at the display following Exhibit Number 6. You should find a structure map. Would you identify and describe that display for me?

A. This is a nine-section structure map drawn on the top of the Point Lookout sandstone. The contour interval is 25 feet, and a section is one mile to scale.

Q. Any major geologic conclusions to be drawn from analyzing the structure?

A. I would say that the structure within the area of the proposed Sunray well is fairly normal for regional structure within the basin, and there's no obvious difference from any other drill block within the pool.

Q. Okay.

MR. KELLAHIN: That concludes my examination of Mr. Hornbeck, Mr. Examiner. We move the introductions of Exhibits 6 and 7.

MR. STOGNER: Exhibit 6 and 7 will be admitted into evidence at this time. Miss Smith, any questions?

MISS. SMITH: Thank you, Mr. Hearing Examiner. We have no questions of this witness.

MR. STOGNER: Mr. Carr?

MR. CARR: No questions.

MR. STOGNER: Mr. Hornbeck, when I look at the Point Lookout sandstone in this particular block, does it look fairly homogeneous. And I'm talking about the vertical portion of it throughout the vertical extent of this formation, or least your production interval in which you hope to cross on your horizontal well bore.

A. It is continuous through the drill block. It is certainly easily mapable and distinguishable on water line logs. By homogeneous, I'm not sure I understand what you're asking me. It is thinly bedded, has fairly uniform thickness as a package of sandstones and shales. In that regard it is homogeneous, but as you can see, there's a mass of sand on the top of roughly between 100 and 150 feet on both ends of the drill block, and then it is made up of thinner bedded sands and shales for the rest of its productive interval.

MR. STOGNER: Do you see much of a change inside the porosity and permeability between the two wells and also in the vertical portion?

A. No. There really isn't any.

MR. STOGNER: I guess that's what I meant by homogeneous.

A. No. Water line logs -- water porosity logs on both ends of the drill block are very similar; show very similar reservoir style.

MR. STOGNER: Isn't it normal to fract in this particular zone after you've completed a vertical well bore?

A. Yes, it is.

MR. STOGNER: And do you know if these two

well bores were fracted?

A. I believe they were. Those are resistivity and gamma ray, I believe, for water line logs.

MR. STOGNER: And I don't see the perforated interval on either one of these. They're in the Point Lookout; is that correct?

A. They're in all three zones in the Mesa Verde. Both wells were completed in all three zones, the Cliffhouse, Menefee sandstones, and Point Lookout tape.

MR. STOGNER: But your major zone of interest as far as the horizontal portion is the Point Lookout?

A. Yes, sir.

MR. STOGNER: Will some of the Menefee be perforated?

A. We plan to complete the entire well bore in through casing.

MR. STOGNER: Out from underneath the drilling liner?

A. Let me check and make sure I'm with you here.

MR. STOGNER: Maybe I need to be asking your drilling engineer this. I don't know.

A. We plan to perforate and fracture,

stimulate all three zones in the well bore.

MR. STOGNER: Okay. Did you do the geology work or take into account the Howell project?

A. No, sir. I did not.

MR. STOGNER: Is the Mesa Verde, about the same, I mean we're talking about a six mile difference?

A. Yes. It's very similar. If there was a difference, I would say that the Point Lookout in this well in this drill block is probably thinner bedded and less uniform at the top, less continous.

MR. STOGNER: Are there any other questions of Mr. Hornbeck? All right. You may be excused at this time. Mr. Kellahin.

EXAMINATION

BY MR. KELLAHIN:

Q. I'd like to call Mr. Danny Boone. Mr. Examiner, Mr. Boone is the drilling engineer. Mr. Boone, please state your name and occupation.

A. My name is Danny Boone and I'm a drilling engineer for Meridian Oil in Farmington, New Mexico.

Q. And that's where you currently reside?

A. Yes, sir.

Q. Have you testified before the division before as a drilling engineer?

A. No, sir, I have not.

Q. Summarize your educational background and your employment experience?

A. Okay. I obtained my bachelor of science degree from Texas State University in petroleum engineering in 1985, and upon my graduation I started my employment with Meridian Oil in Farmingon, New Mexico, as a reservoir engineer for approximately three years, and over the past two years I've worked as a drilling engineer.

Q. Were you involved in any of the drilling issues for either the Howell or the Riddle well?

A. Yes, sir. I was the drilling engineer for both of those projects.

Q. Okay. And you're proposed to be the drilling engineer for the Sunray horizontal well?

A. Yes, sir, I am.

MR. KELLAHIN: We tender Mr. Boone as an expert drilling engineer.

MR. STOGNER: Are there any objections? Mr. Boone is so qualified.

Q. (By Mr. Kellahin) Mr. Boone, let me have you turn to the exhibit book and let's take a moment. If you'll look at the vertical section display behind Exhibit Number 5, it shows the plan

for the well. Give us a summary of your drilling program for the summary well.

A. Okay. Our intent on the summary well would be to drill plus or minus 500 feet in surface casing at that point. Below surface casing we would drill, again, with mud into an intermediate casing point at 3495 and set our intermediate string at that point. We would then blow the well down or dry up the well bore, and drill out from underneath the intermediate casing shoe with gas to a kickoff point 4766.

At that point in time we would trip out of the hole and pick up a motor assembly that would allow us to deviate the well bore at that point in time, and in a northeasterly direction. We will mist up the hole, and drill from zero degrees to approximately 85 degrees. Depending on hole conditions and drilling program at that point in time, we propose that we would have the option of setting a drilling liner if conditions necessitate it. Past the -- at 85 degrees we would then drill, maintaining an 85-degree angle to our true vertical depth tdv's at 5607, which would give us measured depth of approximately 8725 feet.

Q. Once you have deviated the well and finished the curve, established the 85-degree

deviation and continued for that extent of the lateral, how will you complete that?

A. Our intent right now would be to complete that with preperforated or slotted liner to allow the well to blow open the hole.

Q. Once you've done that, is there any kind of treatment or stimulation to the well?

A. No, sir. There would not be, but we would choose to stimulate the well if conditions required.

Q. Okay. Let's go back now, having explained the drilling and completion prospects for the Sunray, go back and tell us what you did for the Howell well.

A. For the Howell well, our program was to set surface casing and drill out from underneath surface casing, and build our curve on mud and set casing at the end of our curve at approximately 71 degrees. Below that point we attempted to drill out the hole with gas, and were unsuccessful. We got out to about 6300 feet before our torque and drag became excessive and we were required to mist up the hole. Once we went to mist, then we were successful in drilling the well to total depth.

Q. Upon drilling the Howell well, how did you complete it for production?

A. That was -- our production string was cemented in place and then we fracture-stimulated the well.

Q. How did you handle the drilling program for the Riddle well?

A. Much in a similar manner except due to drilling conditions up hole. We set an intermediate string in the vertical section of the hole, drilled out from underneath the intermediate string with mud to the end of our build section and then attempted to dry up the well and continue to drill the well with gas, but were unsuccessful in drying up the well bore, and so we continued drilling ahead with mist for our total depth.

Q. Summarize for me what are going to be the major changes in the drilling and completion program for the Sunray well that are different from the Riddle and the Howell wells?

A. The major difference in the Sunray well is that we will be attempting to drill the curve in an air mist environment, and that is the major difference in this particular well.

MR. KELLAHIN: That concludes my examination of Mr. Boone. We pass him for examination.

MR. STOGNER: Thank you, Mr. Kellahin. Any

questions?

MISS SMITH: No questions.

MR. CARR: No questions.

MR. STOGNER: Mr. Boone, on this proposed well, what size of surface casing are we talking about?

A. Mr. Stogner, we have not completed our drilling program at this time. We're looking at optimizing our drilling program with regard to our casing program, and that has not been determined. It will be in the range from 13 and 3/8 to 20-inch casing though.

MR. STOGNER: How about your slotted liner? Is that predetermined yet at this point?

A. That would be a five-and-a-half-inch production strength.

MR. STOGNER: That will be five and a half. And you do not know if you're going to use the -- I believe you show the drilling liner configuration attached to your intermediate?

A. Yes, sir. And that would be an option that we would choose to either set or not set depending upon drilling conditions or the drilling program itself.

MR STOGNER: If you had to go with that

configuration, would that be a 7 inch?

A. It would be somewhere between a 7-inch and 9 and 5/8-inch drilling liner.

MR. STOGNER: And that would, of course, increase your intermediate string --

A. Yes, sir.

MR. STOGNER: -- size to probably what, a 13 and 3/8 with a 20-inch surface if this configuration --

A. Again, anywhere from 9 and 5/8 to 13 intermediate string.

MR. STOGNER: If this configuration is not followed, and you do set your surface and your intermediate, and you do not use the drilling liner, will you have a production liner, or are you going to have a production string all the way back up to surface?

A. The choice there would be to have a production liner set back up into the intermediate casing string.

MR. STOGNER: With the lower portion being the--

A. Open hole preperforated slotted liner portion.

MR. STOGNER: Would that preperforated liner,

would that start, or, I'm sorry, the preperforation part, would that start in the Menefee, or are you going to go back on up to the Cliffhouse?

A. That would be dependent upon the shows that we encounter while we are drilling the well.

MR. STOGNER: Okay. So you're coming in after your kickoff with a misdrill with your mud motor; what type of motor are you going to be using?

A. It would be a motor that has been adapted for an air mist environment, a positive-type displacement motor with a deflected sub on it for controlling or angle and deviation.

MR. STOGNER: You say "adapted." What do you mean, "adapted"? How is it going to be adapted?

A. Well, it is a motor that has the configuration of the rotor and the stator is then adapted to allow it to, I guess, more flow through the motor without allowing the motor to run away, and by run away, I mean, overspin itself.

MR. STOGNER: Now this wasn't used on the Howell, that was a mud motor?

A. That was a mud motor, and all of our assemblies below the end of our curve section in the Howell and the Riddle were rotary assemblies, and in this particular well we intend to continue our

85-degree angle with a motor at that point in time.

MR. STOGNER: Using the mist?

A. Yes, sir.

MR. STOGNER: This is relatively new; isn't it?

A. Yes, sir.

MR. STOGNER: At least in this area, I assume. How many days did it take you on the Howell number 2R?

A. The Howell number 2R was 52 days.

MR. STOGNER: How many days are you expecting on this one?

A. Approximately 33.

MR. STOGNER: Were you expecting 52 on the Howell?

A. No, sir. We were not.

MR. STOGNER: How many days were you expecting on it?

A. About 23.

MR. STOGNER: Is this on Federal land or state or fee?

MR. KELLAHIN: We may have to ask Mr. Alexander. I'm not sure I know.

MR. STOGNER: My question was leading up, regardless of what surface casing or casing program

you plan to run, I guess it will be --

A. It is federal.

MR. STOGNER: It is federal land.

A. Yes, sir.

MR. STOGNER: It's going to meet with the requirement, I would assume?

A. Yes, sir. I will meet with all state and federal requirements.

MR. STOGNER: When you come in with your production liner in your production liner, how will that be cemented in, or will it be?

A. What we would do, Mr. Stogner, is to set an nct or some type of isolation tool immediately above the part of the liner that we plan to leave as open hole with a stage tool set directly above that isolation tool, and cement above that back into the lap of our upper casing string.

MR. STOGNER: Did you do any stimulation on the Howell well?

A. Yes, sir.

MR. STOGNER: What kind of stimulation was done on it?

A. I was not directly in charge of the stimulation work. I'm just familiar with the type of work that was done. It was basically a

sand-water-gel-type fract.

MR. STOGNER: I assume it was completed, or cemented about the same way you've just described, a station tool above the preperforated interval?

A. No, sir. Now that one, the Howell, was not a preperforated liner. It was essentially a blank liner that was cemented in place and then shot after being run. And then, again, in this case right here in this section, if conditions necessitated, we would choose to do that in this well as well.

MR. STOGNER: Do you know what the perforated interval on the Howell well was?

A. I can't answer that question, but I can get that data for you.

MR. STOGNER: I was just curious to see how many perforating guns you used?

A. Lots.

MR. STOGNER: Okay. I don't have any other questions of Mr. Boone. Are there any other questions of this witness? Mr. Boone, you may be excused. Mr. Kellahin.

MR. KELLAHIN: We call Mr. Alan Alexander for brief questions on the offsetting operatorship.

EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Alexander, please state your name and occupation.

A. My name is Alan Alexander. I'm employed as a senior land advisor with Meridian Oil in their Farmington, New Mexico, office.

Q. You've testified before the division on prior occasions as a petroleum land man?

A. I have.

Q. And either you personally or under your direction and supervision, employees under your control have determined the offset ownership surrounding the spacing unit in question?

A. Yes, sir, that's correct.

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

MR. STOGNER: Are there any objections? Mr. Alexander is so qualified.

Q. (By Mr. Kellahin) Mr. Alexander, let me have you go to the information behind Exhibit number 1. Would you identify that information for me, please?

A. Yes, sir. Exhibit Number 1 consists of the letter to the commission setting this application. Behind the letter is the application itself for the Sunray well.

Q. Turn to the last page before we get to Exhibit number 2. It says "offset operator plant."

A. Yes.

Q. Was that prepared by you or under your direction?

A. Under my direction.

Q. What do your records report to be the offsetting operators of spacing units for the Mesa Verde production that adjoin the east half of section 21?

A. That would be Amoco Production Company and Texaco, Inc.

Q. And how is the location of their interest identified on that display?

A. They're identified by corresponding those names with numbers, and the numbers are in the squares offsetting the outlined spacing proration unit.

Q. Okay. Apart from Amoco and Texaco, inclusive of Meridian, there are no other operators for Mesa Verde production offsetting your spacing unit?

A. That is correct.

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

Q. Turn to the last page before we get to Exhibit number 2. It says "offset operator plant."

A. Yes.

Q. Was that prepared by you or under your direction?

A. Under my direction.

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Q. Okay. Apart from Amoco and Texaco, inclusive of Meridian, there are no other operators for Mesa Verde production offsetting your spacing unit?

A. That is correct.

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

MR. STOGNER: Thank you, Mr. Kellahin. Miss Smith?

MISS SMITH: No questions.

MR. STOGNER: Mr. Carr?

MR. CARR: No questions.

MR. STOGNER: Mr. Stovall?

MR. STOVALL: No questions.

MR. STOGNER: You may be excused, Mr. Alexander. Mr. Kellahin, anything further?

MR. KELLAHIN: That concludes our presentation in this case, Mr. Stogner.

MR. STOGNER: I believe, Mr. Carr, you had a statement you would like to make after the --

MR. CARR: If it please, Mr. Examiner. Mr. Bill Hawkins of Amoco is here, and I request that he be given permission to provide Amoco's closing statement.

MR. STOGNER: Mr. Kellahin, do you have any problem with that?

MR. KELLAHIN: No, sir.

MR. STOGNER: Miss Smith?

MISS SMITH: No, sir.

MR. HAWKINS: Bill Hawkins with Amoco Production Company.

MR. STOVALL: Mr. Hawkins, why don't you come

up to the table where it's easier for the court reporter to hear, as you can see.

MR. HAWKINS: I'm Bill Hawkins with Amoco Production Company. Amoco has no objection to the application by Meridian for this high angle/horizontal well in the Mesa Verde. We are in agreement with their request for allowable to be consistent with the previous cases that have been heard by the NMOCD, and we would like to see this well drilled and get some information on whether this is going to be an appropriate or applicable technology throughout the Basin.

MR. STOGNER: Thank you, Mr. Hawkins.

MR. STOVALL: Mr. Carr, just for the record, Mr. Kellahin talked about the technically improper notice, but I assume by your appearance that any deficiencies in notice are waived by the virtue --

MR. HAWKINS: That's correct. I reviewed this application with Texaco. Texaco advised me they have no objection to it. They do request, however, that I enter an appearance in the case. I'm also appearing for Amoco, and Amoco has no objection, so we are not raising an objection to the notice. We, in fact, have had actual notice according to our appearing on this proceeding.

MR. STOGNER: Thank you. Mr. Carr. Are there any closing remarks, Miss Smith?

MISS SMITH: Yeah. Mr. Stogner, if I could make a brief remark. As you and counsel probably know, the Gas Company of New Mexico and Suntera Gas Gathering Company entered an appearance and stated an initial objection to the proposal by Meridian that special allowables were set. That was based on the assumption that that request for special allowables might deviate from standard commission practice on setting allowables.

After that time we were able to secure a copy of the entire text of Meridian's application, and after reviewing that application and hearing the testimony of their witnesses today, we are satisfied that the procedure that Meridian is seeking is indeed consistent with commission practices, and so therefore, we withdraw any objection that was stated earlier on the record. Thank you.

MR. STOGNER: Miss Smith, did you get a copy of order number R9037 that was the Howell application commission de novo case?

MISS SMITH: I don't believe so, but thank you.

MR. STOGNER: Here's another copy.

MR. STOVALL: You're also going to have to get 9037, the original, too, because it's incorporated in there.

MR. STOGNER: I just pointed that out as maybe more for your information than anything. Thank you, Miss Smith. We heard from Amoco. Mr. Kellahin, do you have anything further?

MR. KELLAHIN: No, sir.

MR. STOGNER: Does anybody else have anything further in case number 10324 at this time? If not, this case will be taken under advisement.

(Recess taken at 10:05 a.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10324, heard by me on 13 June 1991.

Michael E. Stogner, Examiner
Oil Conservation Division

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

REPORTER'S CERTIFICATE

BE IT KNOWN that the foregoing transcript of the proceedings were taken by me, that I was then and there a Certified Shorthand Reporter and Notary Public in and for the County of Bernalillo, State of New Mexico, and by virtue thereof, authorized to administer an oath; that the witness before testifying was duly sworn to testify to the whole truth and nothing but the truth; that the questions propounded by counsel and the answers of the witness thereto were taken down by me, and that the foregoing pages of typewritten matter contain a true and accurate transcript as requested by counsel of the proceedings and testimony had and adduced upon the taking of said deposition, all to the best of my skill and ability.

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 Bernalillo, New Mexico, this day July 29, 1991.

My commission expires
April 24, 1994

LINDA BUMKENS
CCR No. 3008
Notary Public