NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10971

IN THE MATTER OF:

The Application of Merrion Oil & Gas Corporation for a High Angle/Horizontal Directional Drilling Pilot Project and for the Promulgation of Special Operating Rules Therefor, Sandoval County, New Mexico

BEFORE:

MICHAEL E. STOGNER

Hearing Examiner

State Land Office Building

May 12, 1994

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

FOR THE APPLICANT:

TANSEY, ROSEBROUGH, GERDING & STROTHER, P.C.
Post Office Box 1020
Farmington, New Mexico 87401-1020
BY: **B. TOMMY ROBERTS, ESQ.**

I N D E X

E X H I B I T S

EXAMINER STOGNER: And I'll call next case, No. 10971, which is the application of Merrion Oil & Gas Corporation for a high-angle, horizontal directional drilling pilot project and for the promulgations of special operating rules therefor, Sandoval County, New Mexico.

Call for appearances.

MR. ROBERTS: Mr. Examiner, my name's Tommy Roberts. I'm with the Tansey Law Firm in Farmington, New Mexico, appearing on behalf of the Applicant, and I have one witness to be sworn.

EXAMINER STOGNER: Is this witness the same one that's previously testified in the last two cases?

MR. ROBERTS: Yes, sir.

EXAMINER STOGNER: Let the record show that Mr. Sharpe has been previously sworn in Case 10969, and remains under oath in this particular case.

Any other appearance? There being none, you may continue, Mr. Roberts.

GEORGE SHARPE

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

EXAMINATION

BY MR. ROBERTS:

Q. Would you state your name and your place of residence for the record?

A. My name is George Sharpe. I live in Farmington, New Mexico.

MR. ROBERTS: Mr. Examiner, Mr. Sharpe has previously testified today in Case 10969 regarding his occupation and his qualifications as an expert, and we would ask that you take administrative notice of that testimony.

EXAMINER STOGNER: Administrative notice is so taken.

Q. Mr. Sharpe, would you briefly describe the purpose of this application.

A. The purpose of this application is to obtain approval for horizontal drilling in the Eagle Mesa Entrada Pool, and the setting up of an administrative procedure for future horizontal wells, and the approval of two proposed horizontal well locations at this time.

Q. Now, as I understand the application, it applies to the Eagle Mesa Entrada oil pool, and it's also your proposal that this drilling activity would take place within a unit that's

been formed by Merrion Oil & Gas Corporation?

A. Yes, sir.

Q. Would you identify that unit by name?

A. That unit is the **Eagle Mesa Secondary** Unit.

Q. Turn to what you have marked as Applicant's Exhibit No. 1, and please identify that exhibit.

A. Exhibit No. 1 is a plat showing the leases involved in the unit, and the offset leases and the ownership of the offset leases.

Cross-hatched in the exhibit is the Eagle Mesa Entrada Pool, which is comprised of four 40-acre sections.

Also outlined on the exhibit is the unit boundary, which is **280 acres**. The entire unit is owned by Merrion Oil & Gas, and the only leased offset is a federal lease owned by Yates Petroleum Company.

Q. I would like to get into a little more detail regarding this exhibit. Identify specifically the acreage which comprises the pool.

A. The pool is comprised by the southeast of the southeast of Section 11, the southwest of

the southwest of Section 12, northwest of the northwest of Section 13, and northeast of the northeast of Section 14, of Township 19 North, Range 4 West.

Q. I would like you to also describe specifically the acreage contained within the boundaries of the unit.

A. The unit includes the acreage previously described in the pool. In addition, it includes the southwest of the northwest of Section 13, the southeast of the northeast of Section 14, and the northwest of the northeast of Section 14, of 19 North, 4 West.

Q. Now identify the oil and gas leases which are contained in and which comprise the unit.

A. There are three oil and gas leases that are included in the unit boundaries. There's a single federal lease, NM-87227. That is the southeast of the southeast of 11 and the southwest and the southwest of 12.

There is an Indian lease, Indian-N002713, that is the northwest quarter of Section 13. And there's an Indian lease, N002717, that is the northeast of Section 14.

Q. Is Merrion Oil & Gas Corporation the owner of the operating rights interest under these leases, insofar as they're contained within the pool boundaries and the unit boundaries?

A. Yes.

Q. Identify the offset operators or owners of offset leases.

A. Merrion Oil & Gas owns two offset leases. One is an Indian lease, 11062, in the southeast of 14, and the other is a federal lease, NM-89870, in most of Section 11.

In addition, Yates owns federal lease NM-59692, in the southwest of Section 12, excluding the southwest of the southwest, which is owned by Merrion.

Q. It appears that Exhibit 1 depicts the locations of either four or five wellbores. Would you identify those wellbores by name?

A. There are actually six wellbores shown on this diagram. In Section 11 there's the Federal 11C-2, which is a current injection well, disposal well. There's the Federal 11C-1, which is a plugged and abandoned Entrada well.

There's a dry hole called the Federal 12-1, which was drilled by Jordan, and there is a

plugged and abandoned Entrada well in Section 12, the Federal 12C-1. It is one of our proposed horizontal wells. We would reenter that wellbore and kickoff in a horizontal.

In Section 13 there's a single wellbore, Navajo 13C-1, and in Section 14 there's a single wellbore, the Navajo 14C-1. Both of those are current shut-in Entrada producers. Excuse me. The Navajo 14C-1 is being produced.

Q. Now, your application seeks approval in the alternative to utilize one of two wellbores for your horizontal operation. Would you identify again which two wellbores those are?

A. The two wellbores are identified on the exhibit. They are the Navajo 13C-1 and/or the Navajo 12C-1.

Q. The exhibit depicts a line emanating from those particular locations in a southwesterly direction. What does that line indicate?

A. That would indicate the proposed direction of our horizontal well.

Q. And would the end of that line depict the proposed bottomhole location for the wellbore?

A. Yes.

Q. What was the criteria for the selection of the Navajo 13C-1 and the Navajo 12C-1 as the alternative surface locations?

A. That may be better shown when we get to the geologic section, but basically they are, from a geologic standpoint, the best entry points to go through and try to encounter any remaining oil.

Q. Why do you seek approval today for these alternative locations, rather than seeking approval for one or the other?

A. If we do one and it's successful, we may like to drill the other one in addition. And the risk associated with these two wells is different, and we haven't decided which risk we're more scared of and which one of these we want to drill yet.

Q. Let me have you refer to your Exhibit No. 2, and I would ask you to identify that exhibit.

A. Exhibit No. 2 is the secondary unit agreement for the Eagle Mesa Entrada field, and it describes the unit outline and basis for allocation of production within the unit.

Q. What was the purpose of the formation of the unit? Can you describe the philosophical background in creating this unit?

A. The Eagle Mesa Entrada field is on its last leg, from a primary production standpoint, and horizontal drilling and/or water injection would circumvent the lease boundaries and would require pooling of those different leases to share in the production from either horizontal drilling or water injection, and so it would set up for a secondary process.

Q. Does the unit apply only to the Entrada formation?

A. Yes, it does.

Q. Is the proposed horizontal well being drilled pursuant to the Unit's plan of operation?

A. It is not necessarily pursuant to the one that was submitted with this agreement. But it is pursuant--actually, even back in 91, we were looking at the 13C-1 as our best case horizontal well.

Q. It's being drilled in a fashion consistent with the philosophy behind the establishment of the Unit?

A. Yes.

Q. Does the unit agreement impose a drilling deadline?

A. There is now one; there was not one in the initial agreement. We have until September of this year to spud a horizontal well.

Q. Who is the owner of the working interest in the unit?

A. Merrion Oil & Gas.

Q. 100 percent?

A. 100 percent.

Q. The unit covers a federal lease and two Indian-allotted leases. Has the unit been approved by the Bureau of Indian Affairs?

A. Yes, it has.

Q. And has it been approved by the Bureau of Land Management?

A. Yes, it has.

Q. How will production be allocated under the terms of the unit agreement?

A. Protection will be allocated on an acreage basis to the entire 280-acre unit, as shown in Exhibit B of the unit agreement.

Q. How many tracts are established under the terms of the unit?

A. Three tracts, comprising the federal

lease and the two Indian leases.

Q. So the tracts are co-extensive with the boundaries of the three separate leases, is that correct?

A. No. Actually, the tracts--the two Indian leases, the entire leases is not included in the unit or the tracts that are committed to the unit.

Q. But, insofar as those leases are contained within the unit, they are co-extensive with the tracts?

A. Yes.

Q. So, under this allocation formula, all acreage will receive an allocation of production? In other words, there are no participating areas that would be created pursuant to this agreement?

A. That is correct.

Q. Who is the designated operator of the unit?

A. Merrion Oil & Gas Corporation.

Q. Does the unit agreement contain any provisions which restrict the surface or bottomhole locations of a horizontal well?

A. The unit agreement does not.

Q. I want you to refer to what you have marked as Exhibit No. 3, and identify that exhibit.

A. Exhibit No. 3 is a structure map of the Eagle Mesa Entrada field, showing the well locations, showing the unit boundary, showing the outline of the net hydrocarbon pay. And also depicted on that diagram, again with lines emanating from the 12C-1 and the 13C-1 wellbores, are our proposed horizontal--possible horizontal wells.

Q. What's the significance of the structure map?

A. I guess the structure map and net pay map, as shown in Exhibit 4, would show that the peak of the structure would be crossed with the well from the 12C-1. In addition, there's a nose, as the structure noses to the south, which we feel is filled with hydrocarbons that we would be targeting with the Navajo 13C-1.

Q. So, do Exhibits 3 and 4 contain your primary justification, in terms of geology, for the selection of these two wellbores for your horizontal operation?

A. Exhibits 3 and 4 are the primary ones.

Exhibit 5 is kind of a cartoon cross-section of really what we're going after and why we're going after it. The nature of the recovery process, the reservoir drive mechanism in the Entrada, it's a very strong water drive and there's significant water coning around the wells, and the process leaves significant attic oil above the water cones that's unrecoverable with conventional, primary recovery.

We feel that horizontal wells will possibly help better drain this attic oil. A well drilled across the top of the structure will have a better drainage area than a vertical well would. So, the combination of Exhibits 3, 4 and 5, kind of tell the picture of why we feel horizontal drilling is necessary to adequately recover the incremental oil left behind in the Eagle Mesa field.

Q. Exhibit No. 4 depicts a cross-section line from A to A', or A' to A. Is that, then, the cross-section that is illustrated on Exhibit No. 5?

A. Yes. Also shown on Exhibit 5, the cross-section, are the two wellbores and the proposed horizontal wells emanating from those

wellbores.

Q. Describe the procedures that will be followed in drilling and completing the horizontal wellbores, and describe that procedure for each of the alternative sites.

A. The general procedure will be to mill a window that will be using a short-radius drilling technique, where we come up 50 to 80 feet above the top of the Entrada, mill a window in the casing and, using short-radius techniques, drill out, intersect the Entrada within 50 to 100 feet of the wellbore, and then drill horizontally for approximately a thousand feet.

The only differences between the procedures for the 12C-1 and the 13C-1 is that the 12C-1 has been abandoned. It will require a little more work in preparing the well to mill the window and drill the horizontal section.

In addition, we're looking at a slightly shorter lateral extension in the 12C-1 than the 13C-1.

Q. Has Merrion utilized horizontal drilling techniques in other Entrada pools?

A. We used a medium radius technique in the Papers Wash Secondary Unit and were

successful there. This is the first time we've tried a short-radius technique.

Q. Now refer to what you've marked as your Exhibit No. 6. Identify that exhibit and describe what it illustrates.

A. Exhibit No. 6 has two sets of economics. The first page is the economics of a short-radius horizontal well, with reserves of approximately 200,000 barrels. Page 2 of the exhibit is the economics of the vertical well, with an estimated half of the reserves, of 100,000 barrels.

Q. Identify the parameters that you used as the basis for these economic analyses.

A. The critical parameters are, we assumed $15,000 a month in operating expense. It's very expensive to produce Entrada because of the high water production, high lifting cost.

Beginning oil price of $15 per barrel, with four-percent-per-year growth. Four percent growth in operating expense. Investment on the short-radius horizontal of $380,000; and, on that basis, 200-barrel-a-day IP and 200,000 barrels of reserves, the short-radius horizontal would pay out in .7 years and generate 100 percent rate of

return.

Page 2, showing the vertical well, the only differences are the reserves, being 100,000 barrels. And the investment, actually, would be a little greater for the vertical well because of the costs involved in drilling the vertical hole to approximately 6,000 feet, costs of $400,000.

This well would pay out in 2.5 years. This would provide a positive rate of return, if it pays out. My economic run didn't cut off when it should, and ended up showing it negative. It would pay out in 2.5 years, but the rate of return would be approximately 15 percent for a horizontal well. Looking at the 15 percent discounted cash flow, once you plug the well, you're discounted cash flow is approximately--actually, you never get to a positive cash flow.

Q. Is this an exhibit that needs to be revised?

A. This is an ugly looking exhibit, and I need to revise it. But basically, looking at the cumulative profit, the very right-hand column at the bottom of the page, cum profit discounted, at no point do you ever get a positive 15 percent

discount of profit and, therefore, your rate of return would be less than 15 percent. Although you do pay out, you would have a very marginal rate of return and an uneconomic prospect.

MR. ROBERTS: Mr. Examiner, we would like to be able to submit a revised Exhibit No. 6.

EXAMINER STOGNER: You may, at a later date.

Q. Mr. Sharpe, what conclusions do you draw, then, in a comparative analysis of drilling a horizontal well versus a vertical well in this area?

A. The horizontal well is, we feel, the only economic means to recover the remaining reserves in this field.

Q. Do you have an opinion as to the comparative risk involved in drilling a horizontal well versus drilling a vertical well in this area?

A. The risks are different. I would think that the costs associated with a horizontal dry hole are comparable to the costs associated with a vertical dry hole. However, because you're starting close to your well and going out, you

have less geologic risk with a short-radius horizontal. You have greater drainage risks that you'll intersect one of your water cones, so the risks are different.

Again, we feel that, in general, the risks for the horizontal, the geologic risks are more unknown than are the drainage risks.

Q. Before we move on to another topic, let me just ask you to real briefly summarize the advantages of horizontal drilling in this area, as you see it?

A. There are two major advantages. One, you're able to have a longer extended wellbore along the top of the structure, which will minimize the water coning, which is a significant problem in the field.

The second advantage is also associated with that. When your water does cone, and it will eventually cone to these wells, it will be sweeping a larger area and pushing more reserves to your well than you would get on the vertical well.

Q. Let me have you refer to what's been marked as Exhibit No. 7. Would you identify that exhibit?

A. Exhibit No. 7 is a plat which shows the unit boundary, the well locations in the field, and depicted on the plat are two target areas, one for the 12C-1H and one for the 13C-1H, horizontal wells.

Q. Are these target areas depicted by a rectangular shape and the cross-hatching?

A. They are.

Q. Why is it necessary to create a target area?

A. It is necessary to have some leeway in where your well will go. You cannot control it to a specific line. You need to have room for that well to wander. The costs of keeping a well on a very specific line would be onerous.

In addition, we may make some decisions along the way, depending on what we're seeing while we're drilling, that would cause us to, perhaps, change the direction of the well. Those are the mechanical reasons. I guess there are probably some legal reasons, too.

Q. On what basis did you establish the target area for each of these wellbores?

A. We established the target area on the basis to give us whatever leeway we would need in

the drilling of these wells, to keep us mechanically--give us the leeway we would need to drill these as we would see fit.

We also, from a legal standpoint, we kept in our targets, a distance greater than 300 feet from the outer boundary of the unit.

Q. How will you determine that the bottomhole locations are within the boundaries of the target areas?

A. We will run surveys of the wells.

Q. Standard procedure?

A. Standard procedure to run surveys.

Q. What depth bracket allowable have been established for the wells drilled in the Eagle Mesa Entrada Oil Pool, pursuant to the pool rules?

A. My understanding is that a depth bracket allowable of 700 barrels per day has been established for Eagle Mesa.

Q. Is that based on statewide oil spacing of 40 acres?

A. Yes.

MR. ROBERTS: For the record, Mr. Examiner, I believe that the pool reflects that the allowable is 750 barrels per day.

Q. Do you have a recommendation for a depth bracket allowable for horizontal wells drilled within the boundaries of the unit?

A. I would recommend that the depth bracket allowable be set based on how many 40-acre tracts are intersected by the horizontal wells. If a horizontal well is within one 40-acre tract, then the depth bracket allowable would remain at 750 barrels per day.

If two or or more 40-acre tracts are intersected by the horizontal well, then the depth bracket allowable will be increased proportionately.

Q. Do you have a proposal for an administrative procedure for the authorization of future horizontal wells that might be drilled within the boundaries of the unit?

A. We would propose that we would be allowed to submit a letter showing that our target area is no closer than 330 feet to the outer boundary, and showing that we were going to drill our horizontal well within the Entrada Pool, and describing how many 40-acre tracts we would intersect; and, on that basis, be able to receive administrative approval for the drilling

of that well and for an allowable for that well.

Q. Would you suggest a notice provision as a part of that administrative procedure?

A. I would suggest that our offset leaseholders and operators receive copies of the application, and have 20 days to respond.

Q. If no objection is received, the OCD could then go ahead and act on it administratively?

A. Yes.

Q. Let me have you refer to the last exhibit in this package, Exhibit No. 8, and I would ask you to identify that exhibit.

A. Exhibit 8 is an affidavit stating that the offset owners and lease operators were notified and received copies of this application. Those owners are Yates Petroleum Company, Bureau of Land Management, and the Bureau of Indian Affairs.

Also attached are copies of the certified letters that were sent to those individuals. And the last page is a copy of the return receipts, indicating that those individuals received notification on April 20th, April 20th and April 21st.

Q. What were the dates of the letters to these parties?

A. The dates of the letters were April 18th. They were mailed out April 19, 1994.

Q. Did you have any responses to these items of correspondence?

A. Did not.

Q. In your opinion, have the notice requirements of the Oil Conservation Division been satisfied with respect to a case of this type?

A. Yes, they have.

Q. Mr. Sharpe, in your opinion, will the granting of this application be in the best interests of conservation, result in the prevention of waste and the protection of correlative rights?

A. Yes, it will.

Q. Were Exhibit Nos. 1 through 8 either prepared by you or under your direction and supervision?

A. Yes, sir.

MR. ROBERTS: We move the admission of Exhibit Nos. 1 through 8.

EXAMINER STOGNER: Exhibits 1 through 8

will be admitted into evidence.

MR. ROBERTS: I have no other questions on direct.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Sharpe, is it Merrion's proposal to drill both of these wells, or just one?

A. We would like to have the ability to drill both wells. We would anticipate drilling one and evaluating, certainly.

Q. Do you ever see the possibility of drilling the third or fourth one?

A. Yes. Again, looking at Exhibit 4 and Exhibit 3, should we prove up the south lobe of the structure, we feel that more drilling may be warranted on the southern end.

Q. Okay. And referring to your Exhibit No. 5, this is, essentially, like the other Entrada formations you've had up there, which is essentially a subterranean sand dune feature?

A. Yes, sir. We hope our wells will be different, but the dune's the same.

EXAMINER STOGNER: Any other questions of this witness?

MR. ROBERTS: No, sir.

EXAMINER STOGNER: You may be excused. With the exception of an amended Exhibit No. 6, this case will be taken under advisement.

Let's take a 20-minute recess.

(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. 10991, heard by me on 12 May 1994.

Michael E. Stogner, 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 May 20, 1994.

Carla Diane Rodriguez

CARLA DIANE RODRIGUEZ, RPR
CCR No. 4