STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

APPLICATION OF UNION OIL COMPANY OF CALIFORNIA D/B/A UNOCAL FOR HIGH ANGLE DIRECTIONAL DRILLING PILOT PROJECT, SPECIAL OPERATING RULES THEREFOR, UNORTHODOX GAS WELL LOCATION AND SIMULTANEOUS DEDICATION, RIO ARRIBA COUNTY, NEW MEXICO.	)	CASE NO. 10375

REPORTER'S TRANSCRIPT OF PROCEEDINGS
EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner
September 19, 1991
9:40 a.m.
Santa Fe, New Mexico

This matter came for hearing before the Oil Conservation Division on September 19, 1991, at 9:40 a.m. at the State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Linda Bumkens, CCR, Certified Court Reporter No. 3008, in and for the County of Bernalillo, State of New Mexico.

FOR: OIL CONSERVATION DIVISION

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

I N D E X

September 19, 1991
Examiner Hearing
CASE NO. 10375

E X H I B I T S

A P P E A R A N C E S

A P P E A R A N C E S

FOR THE DIVISION:	ROBERT G. STOVALL, ESQ. General counsel Oil Conservation Commission 310 Old Santa Fe Trail Santa Fe, New Mexico 87501
FOR APACHE CORPORATION:	CAMPBELL, CARR, BERG & SHERIDAN P.A. BY: MR. WILLIAM F. CARR, ESQ. 110 North Guadalupe Santa Fe, New Mexico
GAS COMPANY OF NEW MEXICO:	GCNM DIVISION OFFICE BY: MISS SARAH D. SMITH 2444 Louisana N.E. Albuquerque, New Mexico 87125

MR. CATANACH: Calling the hearing back to order. At this time we'll call Case 10375.

MR. STOVALL: Application of Union Oil Company of California D/B/A UNOCAL for a high angle directional drilling pilot project, special operating rules there for an unorthodox gas well location and simultaneous dedication, Rio Arriba County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm Campbell and Black, P.A., of Santa Fe. I represent Union Oil Company of California, and I have one witness.

EXAMINER CATANACH: Any other appearances?

MISS SMITH: Mr. Hearing Examiner, Sara Smith on behalf of the Gas Company of New Mexico and Sunterra Gas Gathering Company. We have no witnesses today.

MR. CATANACH: Other appearances? Will the witness please stand and be sworn in?

(At which time Bill Hering was sworn.)

BILL HERRING,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. State your name for the record, please?

A. My name is Bill Hering.

Q. Mr. Hering, where do you reside?

A. I reside in Farmington, New Mexico.

Q. By whom are you employed?

A. I'm employed by Union Oil Company of California.

Q. And what position do you hold with Unocal?

A. I work there as a district petroleum engineer in the Farmington office.

Q. Have you previously testified before the Oil Conservation Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as a petroleum engineer accepted and made a matter of record?

A. Yes.

Q. Are you familiar with the application filed in this case?

A. Yes.

Q. Are you familiar with the proposed well and the subject area?

A. Yes.

MR. CARR: Are the witness's qualifications acceptable?

EXAMINER CATANACH: They are.

Q. (By Mr. Carr) Would you briefly state what Unocal seeks with this application?

A. We're seeking approval for a high angle directional pilot project for the Rincon Unit Number 254 in the Blanco South Pictured Cliffs Pool. Also we're seeking an unorthodox surface and bottomhole location, and we're seeking simultaneous dedication.

Q. Have you prepared certain exhibits for presentation here today?

A. Yes.

Q. Would you refer to what has been marked for identification as Unocal Exhibit Number 1? Identify this and review it for Mr. Catanach.

A. Exhibit 1 is a map of the Rincon Unit. The Rincon Unit is outlined by the dashed line, and it comprises approximately 20,000 acres in Rio Arriba County, New Mexico. The black dots shown on the map are existing Pictured Cliffs wells. There are 106 completions, and the unit is almost completely developed on 160-acre spacing.

The acreage to be dedicated to this pilot project is in the northeast quarter of Section 20,

Township 27 North, Range 6 West, and it's outlined by the black lines.

Q. Is the subject well indicated in that project area?

A. Yes. The Rincon 254 is the black triangle within that subject area, and the existing Pictured Cliffs Well is the Rincon Unit 52, and it offsets the 254.

Q. And Mr. Hering, this well is interior to the unit, correct?

A. That's correct.

Q. Consequently, there were no offsetting operators to whom notice of this application needed to be provided?

A. That's right.

Q. Could you review the ownership, both working and royalty interest ownership, under the 160 acres that comprises the project area?

A. Okay. First of all, let me say that the Rincon Unit is a fixed-interest Federal Unit, so it has common interest in all horizons. Working interest and royalty is a result or common also.

Q. Would you identify Unocal Exhibit Number 2?

A. Exhibit 2 is actually made up of 2A and 2B, and these are C-102 land plats. Shown on Exhibit 2A

is the surface location and bottomhole location of the existing 254 well. And shown on Exhibit 2B is the surface location of the existing Rincon 52 Well.

Q. And the well that is the subject of this application already has been drilled; is that correct?

A. That is correct.

Q. Could you provide the Examiner with a brief history of this particular well?

A. Sure. I'd like to refer to Exhibit Number 3, but first of all I'd like to state that this drilling project was initiated following the approval of administrative Order DD-34H, and that's included herein as Exhibit Number 4.

That granted approval to drill a highly deviated well to the Basin Fruitland Cole Pool. The well was spudded and completed in May of 1990. It was mud drilled, and at the kick off point of 2362, an 8 degree per 100-foot build angle was established to a maximum 60 degree angle. And that maximum 60-degree angle was achieved at a measured depth of 3350.

The well was then TD'd at a measured depth of 3595, and as you can see on Exhibit Number 3, not only did we penetrate the full thickness of the

Fruitland Cole, but we also TD'd the well in the Pictured Cliffs.

Q. Now, what was the basis for the particular orientation of the deviated portion of the wellbore?

A. Well, we were hoping to intersect natural fractures within the Cole formation, and that was -- the direction was established based on oriented core data that we had taken from a couple of offset wells in the Rincon Unit.

Q. And the well was noncommercial in the Fruitland?

A. The well was noncommercial in the Fruitland, yes.

Q. Exhibit Number 4 is a copy of the administrative order authorizing the directional drilling?

A. Yeah, that is correct.

Q. Could you identify what has been marked as Unocal Exhibit Number 5?

A. Exhibit Number 5 is the final survey that was done on the well, and it indicates -- if you'll notice on page four of that exhibit -- a measured depth of 3595. You'll find that on the far lefthand column. True vertical depth of 3213 and the bottomhole location was approximately eight feet

north and 854 feet west of the surface location.

Q. And behind that there is some graphical or vertical sections that show the actual location of the wellbore; is that correct?

A. That's correct.

Q. Could you identify unit Exhibit Number 6?

A. Exhibit 6 is another wellbore schematic, and this is of the existing Rincon Unit 52 well. This well was completed in July of 1955. It was open hole to the Pictured Cliffs and stimulated with a small fracture stimulation using 11,000 pounds of sand.

Q. What has this well produced to date?

A. Cumulative production from this well has been 180 MMCF.

Q. And the current producing rate?

A. Current producing rate is 16 MCF per day.

Q. And the acreage that is dedicated to this well is the northeast quarter of the section which is the project area for the deviated well?

A. That is correct.

Q. All right. Let's move to Union Oil Company Exhibit Number 7. Would you identify that, please?

A. Yes. Exhibit 7 is a production curve since 1975 for the Rincon Unit 52. Production has been

fairly consistent in the range from 10 to 20 MCF per day, and as I mentioned earlier, its current production rate is 16 MCF a day.

Q. Let's move on now to Exhibit Number 8. Identify that and then explain to the Examiner what this shows?

A. Exhibit Number 8 is a material balance P over Z plot for the Rincon Unit 52, and plotted here are pressures versus cumulative production. I've shown a straight line on the plot, and according to theory this relationship should be a straight line relationship.

However, commonly it's difficult to obtain reliable pressures and tight gas sands, and as a result a convention that I have seen in the Basin is to establish a trend to the data, and that's effectively what I've done with the curved portion of this exhibit.

I've projected it on out to 880 MMCF which equates to the volumetric calculation that I'll be referring to in the next exhibit, so, in essence, what I've done is I've forced the curve to match the volumetric reserves, but what I'm trying to establish here is that there's a significant amount of remaining recoverable reserves.

Q. And in your opinion, will the Rincon Unit 52 well effectively drain those reserves?

A. No. As a matter of fact, at the current reducing rate of 16 MCF a day, it would take over 100 years to recover those reserves.

Q. Okay. Let's move to Exhibit Number 9. Could you identify that, please?

A. Exhibit 9 is the volumetric reserve calculations, and I won't go into detail on each of the numbers here, but the calculated reserves are 881 MCF. As I mentioned earlier, cumulative production has been 180 MCF which equates to a 20 percent recovery. This effectively equates to a 30-acre drainage radius for this well.

Q. Let's move down to Exhibit Number 10. Would you explain to the Examiner what this exhibit is designed to show?

A. This exhibit has on it the cumulative production for each of the offset Pictured Cliffs wells, and the recovery from the 52 has been anomalously low in comparison to offset wells. And I believe that the primary reason for this is because of the open hole completion, the fact that we do not have adequate fractured length in this particular well.

Q. And what you've done here is on each of the offsetting wells in the Pictured Cliffs you've shown the cumulative production and then you've got that also for the 52 well?

A. That's correct. And in every case the offsets are larger than the 52 despite the fact that the 52 is the oldest well in the area.

Q. Let's move on now to Unocal Exhibit Number 11. Could you explain to Mr. Catanach first, what this is and what it's designed to show?

A. This is a section, and it is to scale, taken from log data. It shows the Rincon 52 as being the vertical well, and the Rincon 52 well as being the highly deviated well.

What I'm intending to show here is the fact that at the 60-degree angle, we effectively cut twice the pay that a vertical well would, and hence, we expect higher degree of recovery from this well.

Q. Okay. What is Exhibit Number 12?

A. Exhibit Number 12 shows the vertical variation and lithology. And the advantage of a deviated well here is that it will cut across all of these vertical permeabilities. That makes it more advantageous than a horizontal well which would be confined by the vertical permeability. So the

deviated well is the best chance for us to intersect permeability enhancement such as natural fractures.

Q. What are the risks associated with this project at this time?

A. Well, since we have an existing wellbore, the primary risk that's associated is in completion, and those were problems that we ran into with the Cole zone and likely could be problems with the Sandstone also. And there will also be increased costs because of the deviation.

Q. Are there special rules in effect for the South Blanco Pictured Cliffs Pool?

A. No, there aren't. As a matter of fact, we have used State wide rules, OCD Rule 104, which establishes a 790 foot setback, and from the quarter line it's 130 foot setback from the quarter quarter line.

Q. Can you review Exhibit Number 13 for Mr. Catanach?

A. Exhibit 13 just shows the northeast quarter of Section 20, and on it are shown the orthodox completion windows. The 254 has a surface location just outside of the southeast orthodox window, and its bottomhole location is just outside the orthodox window.

Q. What acreage would you anticipate this well would drain?

A. Well, since the bottomhole location is very close to the center of the quarter, we anticipate a maximum 160-acre drainage.

Q. Can you make an estimate as to what might be the producing life for this well?

A. We have done some economics in taking the projection to the economic limit. We anticipate a 25-year life for the well.

Q. Now, Mr. Hering, what you're requesting is authority to simultaneously dedicate the deviated well and the previously drilled and currently producing well Number 52 on this 160?

A. That's correct.

Q. How would you recommend that the allowable be set for this particular proration unit?

A. Well, I contacted Frank Chavez in the Division Office, District Office in Aztec, and he mentioned to me that current rules allow us to choose the higher deliverability of the two, and then to apply the acreage factor for calculations for that proration unit.

Q. And so that's what you're recommending?

A. Yes.

Q. Will this approach result in any changing in the current prorationing system for the pool?

A. No, it won't.

Q. And there are no offsetting operators to whom notice needs to be given of this application?

A. That's correct.

Q. In your opinion, will approval of this application result in the recovery of hydrocarbons from the Pictured Cliffs formation that otherwise will not be recovered?

A. Yes.

Q. Will the correlative rights of any interest owner be impaired by approval of this application?

A. No.

Q. Were Exhibits 1 through 13 either prepared by you or compiled under your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Catanach, we would move the admission of Unocal Exhibits 1 through 13.

MR. CATANACH: Exhibits 1 through 13 will be admitted as evidence.

(Unocal Exhibits 1 through 13 were admitted as evidence.)

MR. CARR: That concludes my direct

examination of Mr. Hering.

EXAMINATION

BY MR. CATANACH:

Q. Mr. Hering,, is it normal to have two wells drilled on a 160-acre unit in this pool?

A. In the Pictured Cliffs Pool?

Q. Uh-huh.

A. I have seen it on occasion. I don't know if it's normal.

Q. Okay. But Frank told you, or Mr. Chavez told you, that you could chose the higher deliverability well and use that in the allowable calculations?

A. Yes. The choice is up to the operator. However, they both share the same allowable.

MR. CATANACH: Before I go on, I guess I ought to let Sara ask any questions.

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

Q. (By Mr. Catanach) Mr. Hering, have the Cole perforations, have those been abandoned -- squeezed or abandoned?

A. No, they not been cement squeezed yet. It is part of the procedure. That would be the first step that we would take in the recompletion effort.

Q. In your opinion, you can effectively isolate the Cole from the Pictured Cliffs of this well?

A. Yes. We will have to stimulate the Pictured Cliffs under a packer if stimulation is necessary.

Q. Fracture?

A. Yes. We hope to complete naturally, but if that is unsuccessful, then we may have to go to a fracture stimulation.

Q. Is it possible to fracture into the Cole on that type of completion?

A. It's possible, but we feel that we have a very good cement job in the well, and we ought to be able to isolate it mechanically as much as nature allows us.

Q. Do you have any estimates on how much the Number 254 may recover of the remaining reserves?

A. The calculations that we have done indicate that we may recover as much as 500 MMCF.

Q. On your Exhibit Number 13, is the bottomhole location you reference, that is at TD; is that correct?

A. That's correct.

Q. How thick is the Pictured Cliffs formation

in this area?

A. The commercial thickness or the pay thickness that we're using in this particular quarter averages 42 feet.

Q. The wellbore traverses the Pictured Cliffs formation approximately how many horizontal feet?

A. Well, at a 60-degree angle you cut twice the pay than you would with a vertical, so if it -- I believe it does cut the 42 feet of pay, so that would then make it an 80-foot traverse.

MR. STOVALL: Is that horizontal or is that the amount of hole in the --

THE WITNESS: That would be the measured. But the horizontal would actually be fairly close to that.

Q. (By Mr. Catanach) Is this the first attempt at a Pictured Cliffs completion of this sort?

A. I believe it is in the San Juan Basin, but I can't be absolutely sure.

Q. You've never done it within the unit before?

A. Unocal has never done it, no.

Q. The problem with the Cole completion, you said that was -- was it the completion itself, or was it the actual reservoir property or geology?

A. A combination of both. We attempted a natural completion and we recovered no hydrocarbon, so we fractured stimulated and that resulted in a screen out, and we squeezed all perfs, reperforated the smaller zone, again attempted a fracture stimulation, and that one also screened out.

It appears that we have difficulty in the Cole establishing a clean fracture or probably extension of multiple fractures that resulted in high lakon, and so it's a combination of the angle of the well and the fact that you have very complicated lithologies associated with the Coles that I believe caused the completion failure.

EXAMINER CATANACH: I believe that's all I have. Are there further questions of this witness?

MR. STOVALL: No questions.

EXAMINER CATANACH: The witness may be excused. Is there anything further in this case?

MR. CARR: Nothing further in this case.

EXAMINER CATANACH: There being nothing further, Case 10375 will be taken under advisement

(The foregoing case was concluded at the approximate hour of 10:20 a.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10375, heard by me on September 19 1991.

David R. Catanach, 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 November 11, 1991.

My commission expires
April 24, 1994

LINDA BUMKENS
CCR No. 3008
Notary Public