STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF CONOCO, INC.

CASE NO. 10677

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

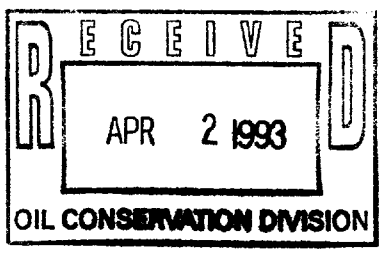
BEFORE: David R. Catanach, Hearing Examiner

March 4, 1993

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on March 4, 1993, at 10:36 a.m. at the Oil Conservation Division Conference Room, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Freda Donica, RPR, Certified Court Reporter No. 45, for the State of New Mexico.

ORIGINAL



I N D E X

March 4, 1993
Examiner Hearing
CASE NO. 10677

* * *

E X H I B I T S

A P P E A R A N C E S

FOR THE DIVISION:
ROBERT G. STOVALL, ESQ.
General Counsel
Oil Conservation Commission
State Land Office Building
310 Old Santa Fe Trail
Santa Fe, New Mexico 87501

FOR THE APPLICANT:
KELLAHIN & KELLAHIN
117 N. Guadalupe
Santa Fe, New Mexico
BY: THOMAS KELLAHIN, ESQ.

EXAMINER CATANACH: At this time we'll call Case 10677.

MR. STOVALL: Application of Conoco, Inc. for an unorthodox gas well location, Eddy County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin & Kellahin appearing on behalf of the applicant, and I have one witness to be sworn.

EXAMINER CATANACH: Any other appearances?

Will you please swear in the witness, Mr. Stovall?

MR. STOVALL: It would be my pleasure.

EXAMINER CATANACH: Thank you.

(Witness sworn.)

BILL HARDIE

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. KELLAHIN:

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

A. Bill Hardie. I'm a geologist with Conoco,

Inc. in Midland, Texas.

Q. Do you spell your last name with an i-e and not a y?

A. That is correct.

Q. On prior occasions, Mr. Hardie, have you testified as a petroleum geologist before the Division?

A. I have.

Q. Your prior testimony has included geologic conclusions and evidence concerning the South Dagger Draw Pool in New Mexico?

A. That is correct.

Q. And you're appearing here again today on that pool?

A. That is correct.

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

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) Mr. Hardie, let me ask you to turn your attention to Exhibit Number 1. Before we talk about the details of your conclusion, tell us what your objective is. What do you want to do?

A. Conoco is requesting an unorthodox location in its Preston Federal Number 5 so that we can test

the Morrow Formation. The primary objective for the Preston Federal Number 5 is not the Morrow Formation, but rather the Cisco, the shallower Cisco Formation. And this well is, in fact, a development well in the South Dagger Draw-Upper Penn Pool. It is at a standard location for that pool. Unfortunately, due to the excessive risks of Morrow development out here, the only way that it can be done economically is as an extension on a Cisco well. It takes about 1600 extra feet of drilling to reach the Morrow. And our testimony and exhibits today will show that it is not possible to -- it is not possible at a standard Morrow location to also maximize our opportunity in developing the Cisco Formation. And that is why we are requesting an unorthodox location in order to test the Morrow.

Q. Using Exhibit Number 1 as an illustration, show us the spacing unit you propose to utilize, not only in the South Dagger Draw Upper Pennsylvanian Pool, but for the Morrow gas pool if you're successful in that formation.

A. Both the Cisco and the Morrow will be tested with the proposed well, the Preston Federal Number 5, and that well will be dedicated to a 320-acre proration unit which comprises the east half

of Section 34 and is shown by the dashed black line in that east half.

Q. On this display have you spotted the proposed location for the Preston 5 Well?

A. I have. It's shown by the open red circle in the southeast quarter of Section 34. And the footage on that is 840 feet from the south line, 1980 feet from the east line.

Q. What's the purpose of the four green squares?

A. The green squares indicate all of the possible standard Morrow locations for that 320-acre proration unit.

Q. When we look at the surface topography for that spacing unit and for those four standard locations, what have you concluded?

A. As you can see, Box Canyon Draw, as indicated by the dashed blue line, runs through the middle of those four standard Morrow locations. That would condemn at least two of those green boxes, not all of them. I think the remaining exhibits that we have to show will demonstrate that, if we were to drill a Cisco well at any of those standard Morrow locations, we would encounter insufficient reservoir at the Cisco horizon.

Q. You've provided a point of reference on this display and captioned it, "Western Limit of Cisco Fairway"?

A. That is correct.

Q. What does that mean?

A. That indicates the end of the Cisco dolomite reservoir. In other words, the reservoir exists only south and to the east of that line. We will further substantiate that in the later exhibits.

Q. Let's turn now to Exhibit Number 2. Identify and describe this display.

A. Exhibit Number 2 is simply a plat map showing, first of all, Conoco's 100 percent working interest acreage in solid yellow, our partial interest acreage in crosshatchered yellow. Also shown are all of the Cisco and Morrow penetrations by the various well symbols. The 320-acre proration unit to which the proposed well will be dedicated is shown by a dashed red line. We are also showing all of the offset operators which would be affected and are adjacent to this proration unit. Other than Conoco, the only operator that would be affected is Yates Petroleum.

Q. When we look at Yates Petroleum interest in Section 34, they are the operator of the west half of

34?

A. That is correct.

Q. And you're standard in the Morrow as to that boundary towards that operator?

A. We are standard. We are 660 feet from that boundary. So the only encroachment that we are proposing is toward the south.

Q. When you look at Section 35, that is an odd-sized section, is it not?

A. That is correct.

Q. The hatchered area represents an ownership for that portion of 35 between what parties?

A. Between Conoco and Yates Petroleum. We own slightly more than half of the interest in that acreage. They own the rest.

Q. Have you discussed your well proposal and its unorthodox location in the Morrow with representatives of Yates Petroleum Corporation?

A. We have done that.

Q. And what was the result of those conversations?

A. We agreed that we would not contest a similarly unorthodox location should they wish to drill one in the west half of Section 34. "Similarly unorthodox" meaning that it encroaches on our acreage

no more than ours encroaches upon their acreage.

Q. In exchange for that agreement, has Yates waived objection, as you know it, for your location?

A. They have done that.

Q. Let's turn now, sir, and look at the Cisco maps. Have you prepared for illustration for the Examiner a geologic display for the Cisco?

A. I have.

Q. Turning to Exhibit 3, identify that for us.

A. Exhibit Number 3 is a structure map on the top of the Cisco dolomite reservoir. And the reason I prepared this exhibit was to show the detrimental effects of us moving our proposed Preston 5 location toward an orthodox Morrow location. The contour interval here is in 50-foot increments. This map shows a general northeast direction of depth for the top of the reservoir so that the highest portion of the reservoir is down here on the southwest end of the map, the lowest portion is up towards the northeast end of the map.

Q. On the display there's a green dotted line and it says, "Limit of Cisco Oil Production." What does that represent?

A. That represents the transition from the oil

column into the gas cap for this reservoir. As you can see, most of the wells in the northeast end of this map are oil wells. As we move to the southwest, you see that all the wells are gas wells. That line indicates that transition from the oil column into the gas cap.

Q. Identify for us on this display the well identification for gas wells that would be classified as South Dagger Draw-Upper Pennsylvanian gas wells. Do we have any on this display?

A. I'm sorry, I don't understand your question.

Q. The identity of the gas wells on this display, you've got gas well symbols?

A. That is correct.

Q. Are those Morrow gas well symbols, or do they represent gas wells in the South Dagger Draw-Upper Pennsylvanian gas pool?

A. All of the gas well symbols that you see that are within the confines of the dolomite reservoir, as indicated by the heavy red lines, all of those gas wells symbols indicate production from the Cisco reservoir, with the exception of one well, and that is the Preston Federal Number 6, which is in the northeasternmost corner of Section 35. And that well

is producing from the Morrow Formation. This is a Morrow gas well.

Q. Do you have an estimate of the vertical distance of structure that is gained between the closest standard location in 34 to the proposed location for the Preston 5?

A. Yes. The closest standard location for the Morrow would be north -- about 300 feet north of that Smith Number 1 Well in the southeast corner of Section 34. The difference in elevation between our proposed location and that closest orthodox Morrow location is between 20 and 50 feet. We would lose about 20 to 50 feet of structural elevation by moving toward the orthodox Morrow location.

Q. Is that of significance to you as a geologist?

A. It is. And if it is 50 feet of elevation difference, that's 50 feet of lost pay.

Q. Have you prepared an isopach map of this Cisco dolomite in the South Dagger Draw-Upper Pennsylvanian Pool?

A. I have; that's Exhibit Number 4.

Q. Identify and describe this display.

A. Exhibit Number 4 is simply an isopach map of the dolomite reservoir of the Cisco Formation.

There are -- there's a range of thickness here from zero at its outer flanks upwards -- a thicknesses of 400 feet at its core. As you can see, the Preston Federal Number 5 at its proposed location, we anticipate encountering approximately 240 feet of dolomite reservoir at that location. Were we to move that location to the north toward an orthodox Morrow location, the estimated thickness we would encounter would be between 100 and 150 feet of thickness. That's a loss of approximately 150 feet of reservoir. And that is a significant loss.

Q. In determining the optimum location for the Cisco penetration in the east half of 34, why have you not moved farther east and south for the Preston 5 location?

A. Our location was based on three factors. We wanted to gain the maximum structural advantage that we could. We wanted to gain the maximum thickness in the reservoir that we could for the Cisco. And, thirdly, we wanted to stay far enough from that Preston Federal Number 1 Well, the west half of Section 35, to avoid potential depletion or drainage. That well has been producing from the Cisco for almost 20 years and has cum'd almost four BCF of gas. The drainage radius on that, although it is not

-- it's -- we don't have it precisely nailed down, we feel like we could minimize our risk of depletion by staying far enough away from that well. That is why we placed the Preston 5 at its current location as proposed.

Q. Do you anticipate the Preston 5 to be a gas well in the Cisco pool?

A. We do.

Q. How do you propose to drill the well to test the opportunity in the Cisco as well as the Morrow?

A. We would drill the well to test the Cisco. We anticipate encountering the top of the Cisco Formation at about 7500 feet, the base at about 8200 feet. From there we would continue drilling until we reached the base of the Morrow, about 9650 feet. If we find reserves, or economic reserves, in the Morrow, we would then dually complete the well as a Cisco gas-Morrow gas well.

Q. Let's turn now to the cross section, which is Exhibit 5.

A. Exhibit 5 was included in order to further document that abrupt truncation of the dolomite fairway between the Number 1 Smith Well and the Number 2 Preston Well. On the exhibit you can see the

location of the cross section over on the right-hand side with the index map. It passes from the Mohave 1, through our proposed Preston 5 location, into the Smith 1 and the Number 2 Preston in a northwest-southeast orientation. The purple shaded area on the cross section itself indicates the Cisco dolomite reservoir.

As you can see, between the Number 1 Smith and the Number 2 Preston Fed Well on the left-hand side of the cross section, the dolomite fairway truncates abruptly. And it goes from 240 feet of thickness in the Number 1 Smith to zero feet in the Number 2 Preston. All of the available orthodox Morrow locations lie between those two wells. And you can see for yourself the kind of risk we would be facing by trying to encounter economic Cisco reserves between those two wells.

Q. Let's turn now, Mr. Hardie, to your mapping of the Morrow. Would you identify for us Exhibit Number 6?

A. Exhibit Number 6 is a structure map on the top of the Morrow clastics. This is the map which we are using to justify taking our Cisco well deeper and testing the Morrow as well. The horizon that I've mapped here occurs in the lower portion of the Morrow

Formation and, typically, it occurs right above an interval in which we would expect to find Morrow channel sands, if they were going to be present.

Q. Give us your geological description of the deposition of the Morrow as it affects this area.

A. That interval which I described, when you find a Morrow reservoir in there, it is invariably known as a distributary channel sand. Typically, these can be between, say, ten and 50 feet in thickness, typically, a very clean, well-sorted sand with a porosity ranging between eight and 16 percent.

Q. What are the critical well control points for helping you locate the Morrow channel as it may be present in Section 34?

A. The various wells that have actually penetrated the Morrow are highlighted on this map in red. And those provide me with the control for this map. Our basis for wanting to take the Preston 5 on down to the Morrow is from the prominent east-west trending structural nose that you can see running through Sections 34, 35, and 36.

Q. What is the orientation of this Morrow channel that's your target in relation to that structure?

A. We believe that it parallels that

structure, that these channels tend to run perpendicular to structural striate and, in that case, it would be generally in an east-west direction.

Q. Do you have an example of a wellbore in this area that is actually produced from the Morrow channel that you've targeted for the Preston 5 Well?

A. Yes. Conoco used this same map to take the Preston Federal Number 6 down to the Morrow. That's in the northeasternmost corner of Section 35. The Preston Federal Number 6 encountered 30 feet of clean, well-sorted channel sand in the Morrow and is currently completed in that formation. Our Preston Number 5 is simply an attempt to find the updip limit of this same channel.

Q. North of your location, the Preston 2 Well was also an attempt in the Morrow channel?

A. And it was dry.

Q. And south of the location, when you pick up the Mohave 1 in Section 35, what happened with that well in the Morrow?

A. The Mohave 1, which was drilled by Yates Petroleum, was -- tested Morrow Formation and tested it as dry as well. It was then recompleted as a Cisco gas well.

Q. What does that information cause you to

conclude as a geologist?

A. That our Preston 5 location, at least in terms of a Morrow test, is extremely risky. We're drilling between two dry holes, and we feel that the only way we can test the Morrow economically, because of that extreme risk, is as an extension on our Cisco well.

Q. It would be your hope that you're going to find a southwest continuation of a channel that's productive in the Preston 6 Well?

A. That is correct.

Q. Identify and describe for us Exhibit Number 7.

A. Exhibit Number 7 is an acreage dedication and well location diagram showing the staked location of our proposed Preston Federal Number 5. It's 840 feet from the south line, 1980 feet from the east line.

Q. Were all the geologic displays prepared by you, Mr. Hardie, or complied under your direction and supervision?

A. That is correct.

MR. KELLAHIN: Mr. Examiner, Exhibit Number 8 is our Certificate of Mailing in compliance with the Division notice rules that show that the Yates

entities have been notified concerning our request. We would at this time move the introduction of Exhibits 1 through 8.

EXAMINER CATANACH: Exhibits 1 through 8 will be admitted as evidence.

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

EXAMINER CATANACH: With regards to the waiver obtained by Yates, is that on behalf of all the Yates entities?

MR. KELLAHIN: I believe that's our representation from Kathy Porter. We do not have a written document to verify that.

THE WITNESS: The agreement we reached with Yates Petroleum was over the phone, and we confirmed that agreement in a letter that we wrote to Yates Petroleum.

MR. KELLAHIN: I have overlooked an exhibit. I think you may have it in your package. It's Exhibit 9, which is Conoco's effort to reduce the agreement to a written document between Yates and its entities and Conoco.

EXAMINER CATANACH: All right. We'll enter that as Exhibit Number 9.

Mr. Hardie, what geologic evidence have you

used to determine that the structural nosing in the Morrow Formation is present?

THE WITNESS: That's -- a lot of it -- the evidence is fairly slim, which adds to a lot of the risk. As you can see, our well control is not great. We do not have any seismic data out here either. But the various tops that I have picked in those wells, as shown in red, do tend to illustrate that there is a nose trending through there. We feel like when there is a thick sand developed in that lower Morrow interval that it will push the top of the Morrow clastic up so that it's not really a structure so much as it is an indication of underlying sands.

EXAMINER CATANACH: The closest Morrow production would be in Section 35?

THE WITNESS: Yes, sir. The Preston Federal Number 6 was completed about two weeks ago, had a calculated open-hole flow of, I think, 31.2 million per day.

EXAMINER CATANACH: When you hit them, you hit them good.

THE WITNESS: That's right. If you miss them, there's nothing at all.

EXAMINER CATANACH: I don't have anything else. There being nothing further in this case, Case

10677 will be taken under advisement.

(The foregoing hearing was adjourned at the approximate hour of 11:00 a.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10677, heard by me on March 4 1983.

David Catanach, Examiner
Oil Conservation Division

STATE OF NEW MEXICO)
:
COUNTY OF SANTA FE)

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

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

DATED at Santa Fe, New Mexico, this 26th day of March, 1993.

Freda Donica
Certified Court Reporter
CCR No. 45