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NEW MEXICO OIL CONSERVATION DIVISION  
STATE LAND OFFICE BUILDING  
STATE OF NEW MEXICO  
CASE NO. 10633

IN THE MATTER OF:

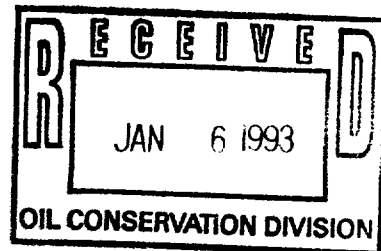
The Application of Conoco Inc.,  
for Unorthodox Oil Well Location,  
North Dagger Draw-Upper Pennsylvanian  
Pool, Eddy County, New Mexico.

BEFORE:

MICHAEL E. STOGNER  
Hearing Examiner  
State Land Office Building  
December 17, 1992

REPORTED BY:

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



**ORIGINAL**

## A P P E A R A N C E S

FOR THE NEW MEXICO OIL CONSERVATION DIVISION:

**ROBERT G. STOVALL, ESQ.**

General Counsel  
State Land Office Building  
Santa Fe, New Mexico 87504

FOR THE APPLICANT:

KELLAHIN and KELLAHIN  
Post Office Box 2265  
Santa Fe, New Mexico 87504-2265  
BY: **W. THOMAS KELLAHIN, ESQ.**

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1                   EXAMINER STOGNER: Call this hearing to  
2 order, Docket No. 42-92. As far as I know, this  
3 is the last hearing for 1992.

4                   Please note, today's date is December  
5 17th. I'm Michael E. Stogner, appointed Hearing  
6 Examiner for today's cases.

7                   We're going to go a little out of order  
8 and at this time I'll call Case No. 10633.

9                   MR. STOVALL: Application of Conoco,  
10 Inc., for an unorthodox oil well location, North  
11 Dagger Draw-Upper Pennsylvanian Pool, Eddy  
12 County, New Mexico.

13                   EXAMINER STOGNER: Call for  
14 appearances.

15                   MR. KELLAHIN: If the Examiner please,  
16 I'm Tom Kellahin of the Santa Fe law firm of  
17 Kellahin and Kellahin appearing on behalf of the  
18 Applicant, and I have one witness to be sworn.

19                   EXAMINER STOGNER: Any other  
20 appearances? Will the witness please stand to be  
21 sworn at this time.

22                   [And the witness was duly sworn.]

23                   EXAMINER STOGNER: Mr. Kellahin.

24                   MR. KELLAHIN: Thank you, Mr.  
25 Examiner. Conoco's application in the North

1 Dagger Draw-Upper Pennsylvanian Pool is for an  
2 unorthodox oil well location. It is unorthodox  
3 insofar as it crowds an interior 40-acre tract  
4 within the 160-acre spacing unit. We're required  
5 by the rules to present this at a hearing.

6 I have one witness, Mr. Bill Hardie,  
7 who is a geologist for Conoco.

8 **BILL HARDIE**

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

11 EXAMINATION

12 BY MR. KELLAHIN:

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

15 A. My name is Bill Hardie. I'm a  
16 geologist with Conoco, Inc.

17 Q. On prior occasions, Mr. Hardie, have  
18 you testified and been qualified as an expert  
19 petroleum geologist before the Division?

20 A. Yes, I have.

21 Q. Pursuant to your employment as a  
22 geologist, have you made a study of the proposed  
23 location within Section 18 of this particular  
24 area, Township 19 South, Range 25 East?

25 A. Yes, I have.

1 Q. The proposed well location is a well to  
2 be drilled in the North Dagger Draw-Upper  
3 Pennsylvanian oil pool?

4 A. That is correct.

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

7 EXAMINER STOGNER: Mr. Hardie is so  
8 qualified.

9 Q. Mr. Hardie, let me ask you, sir, to  
10 take what is marked as Exhibit No. 1, and orient  
11 the Examiner as to the information shown on that  
12 display.

13 A. This is a base map showing a portion of  
14 North Dagger Draw. The solid yellow indicates  
15 acreage that Conoco operates. The cross-hatch is  
16 acreage that our partners operate but we have an  
17 interest in.

18 Shown is the proposed unorthodox  
19 Barbara Federal No. 16 location. It's in red in  
20 the northwest quarter of Section 18. Also shown  
21 are the operators of the contiguous blocks of  
22 acreage that would be to the west and to the  
23 north. And all those are Yates Petroleum,  
24 although the unorthodox location does not really  
25 encroach upon their acreage.

1           And then in the blue letters beside  
2 each of the surrounding wells, I've also shown  
3 the oil cum's for your reference. The proposed  
4 location, the Barbara Federal No. 16, is 1980  
5 from the north and 1530 from the west.

6           Q.       Let me ask you to turn to Exhibit No.  
7 2, which is the Form C-102, and specifically  
8 identify for this particular well what its  
9 footage location is proposed to be?

10          A.       Okay. That's the acreage dedication  
11 plat, and we propose to drill this well 1980 feet  
12 from the north and 1530 feet from the west line  
13 of the section. That's approximately, I think,  
14 about 300 feet to the west of an actual orthodox  
15 location.

16          Q.       The standard location would be 330 feet  
17 off of the interior quarter-quarter section  
18 lines?

19          A.       That is correct.

20          Q.       You are 210 feet off the east side of  
21 the southeast of the northwest 40-acre tract?

22          A.       That is correct.

23          Q.       Let me ask you now to turn to Exhibit  
24 No. 3, and identify that exhibit for us?

25          A.       Exhibit No. 3 is of the same section

1 we're looking at, Section 18. On it I've placed  
2 several of the surface features that inhibit the  
3 placement of well locations. I've also shown the  
4 actual orthodox location in the cross-hatched  
5 areas, and then the green line indicates the  
6 northern limit of the reservoir Dagger Draw.

7 I've prepared this exhibit to show what  
8 our options are in placing locations in the  
9 northwest quarter of Section 18. As you can see,  
10 two of those orthodox locations, the two northern  
11 ones, lie outside of the reservoir. They're  
12 pretty much out of the question.

13 So it comes down to the south half of  
14 the northwest quarter. We have two choices  
15 there. The one in the southwest quarter, we will  
16 show in later exhibits, is encountering a thinner  
17 portion of the reservoir and is also encountering  
18 a portion of the gas cap, so we want to avoid  
19 that.

20 We'll also show that the location in  
21 the southeast of the northwest is too close to  
22 the Barbara Federal No. 5, and we want to avoid  
23 any drainage situations that may have been caused  
24 by the Barbara Federal No. 5 as well as any  
25 potential formation damage caused by stimulation



1 techniques that were performed on the Barbara  
2 Federal No. 5.

3 Also shown on there are Yates' flow  
4 lines in the dashed lines, and they also restrict  
5 us to some degree as to where we can place the  
6 well.

7 Q. Let's turn now, Mr. Hardie, to the  
8 geologic interpretations you have made that apply  
9 to this particular area. What is your first  
10 display?

11 A. The first one is Exhibit No. 4.  
12 Exhibit 4 is actually a combination of two maps,  
13 the first of which is a structural map on the top  
14 of the Cisco formation, and that's shown by the  
15 red contours. Those contours indicate that the  
16 formation dips gently to the east, so that if we  
17 were to attempt to avoid the gas cap, clearly we  
18 would want to stay as far downdip as we possibly  
19 can. So this map indicates that we want to keep  
20 our proposed Barbara Federal No. 16 as far to the  
21 east as possible.

22 The other portion of the map is a  
23 color-filled contour on the dolomite reservoir  
24 itself, and that ranges in thickness from zero,  
25 at its flanks, to upwards of 350 feet thick at

1 the core. This map also shows that as we move to  
2 the east and to the south, we would encounter  
3 thicker portions of the reservoir and, of course,  
4 that's what we want to achieve with our  
5 unorthodox location.

6 Q. Describe for us the significance of the  
7 change in the color and the shading on Exhibit  
8 No. 4?

9 A. As the dolomite gets thicker, the  
10 shades go from lighter blue to darker blue. The  
11 darker color is indicating thicker portions of  
12 the reservoir.

13 Q. Is there a relationship between well  
14 productivity and thickness?

15 A. Most definitely. The poorer performing  
16 wells along this part of the field are inevitably  
17 the ones that have thinner pay. Anything we can  
18 do to achieve a thicker--to penetrate a thicker  
19 portion of the reservoir would help us to more  
20 efficiently drain.

21 Q. When you look at the two northern  
22 drilling windows that are standard drilling  
23 windows within the spacing unit, those are  
24 located beyond the limit of the dolomite?

25 A. That is correct. They would

1 undoubtedly be dry holes.

2 Q. Then you look at the drilling window  
3 that's at a standard location in the southwest  
4 portion of the spacing unit, and using Exhibit 4,  
5 then, summarize for us why the proposed  
6 unorthodox location is preferable to that  
7 standard location?

8 A. Okay. If we were to drill in the  
9 southwest of the northwest quarter, we would  
10 encounter a thinner pay zone. The pay would be  
11 approximately 50- to 60-feet thick at that  
12 location.

13 Not only that, but it would also be at  
14 an updip location, and some of the later exhibits  
15 will show that as we move updip we encounter a  
16 gas cap, and we want to avoid that. So obviously  
17 we want to keep the well as far east as we can.

18 We don't want to get it too close to  
19 the Barbara Federal No. 5, because the 5 has  
20 drained approximately 15 MBO and also had some  
21 rather unorthodox stimulation techniques applied  
22 that we feel may have frac'd either into the gas  
23 cap or into the water zone below. So we want to  
24 get it far enough away from the Barbara Federal 5  
25 that we can avoid any formation damage that may

1 have been caused by that.

2 Q. Let's turn now to Exhibit No. 5 and  
3 have you identify and describe this display?

4 A. Not all of the reservoir in North  
5 Dagger Draw is filled with oil. A portion of it  
6 is filled with water and a portion of it is  
7 filled with gas. So this is a color fill contour  
8 map on the oil-filled portion of the reservoir.  
9 As the colors get darker green, that indicates  
10 thicker portions of the oil-filled reservoir.

11 Also shown on here is a dark green line  
12 that outlines the boundaries of the reservoir.

13 If you'll look along the western flank,  
14 you'll notice there's a wide area between the  
15 zero line on the oil isopachs and the edge of the  
16 fairway. That portion is completely gas-filled,  
17 so that is the gas cap over there on the western  
18 flank.

19 Once we encounter the zero contour on  
20 our oil-filled portion and begin moving to the  
21 east, we encounter more and more oil and less and  
22 less gas-filled portion of the reservoir.

23 This map shows that at our proposed  
24 location we would expect to encounter about 110  
25 feet of oil-filled dolomite. If we were to move

1 the location farther west, that would gradually  
2 get thinner and thinner.

3 Q. Describe for me why you wouldn't move  
4 farther south and farther east within the spacing  
5 unit.

6 A. We could have moved farther south as  
7 well, but the Barbara Federal No. 11 well, which  
8 is currently still producing, has a high  
9 production rate and a high estimated ultimate  
10 recovery. We feel like it's going to recover  
11 those reserves to the north of its location. We  
12 don't want to encroach upon the Barbara Federal  
13 No. 11.

14 Q. Let me have you turn to your  
15 cross-section, Exhibit No. 6.

16 A. Sure. Exhibit 6 is an east/west  
17 cross-section. The location of the cross-section  
18 is shown on the maps as well, if you want to  
19 refer to those. This is a cross-section using  
20 porosity logs across Sections 13 and 18.

21 On it, the shaded portions represent  
22 the dolomite fairway itself. If the shading is  
23 red, it indicates that the fairway is  
24 gas-filled. If the shading is green, it  
25 indicates that the reservoir is oil-filled.

1           As you can see, as we move to the west,  
2 the dolomite fairway gradually thins and then  
3 ultimately pinches out between the No. 5 Allison  
4 well and the No. 10 Allison well. At the same  
5 time it pinches out to the west, it also gains  
6 elevation in such a way that we encounter the gas  
7 cap.

8           The gas cap actually starts showing up  
9 at some point between the No. 10 Allison and the  
10 No. 5 Barbara Federal well. Our proposed Barbara  
11 Federal No. 16 shown in red, as you can see, we  
12 want to keep it as far east as possible in order  
13 to avoid the gas cap, and we want to keep it as  
14 far east as possible in order to encounter the  
15 thickest portion of the reservoir.

16           Q.       Were Exhibits 1 through 6 prepared or  
17 compiled under your direction and supervision,  
18 Mr. Hardie?

19           A.       Yes, they were.

20           Q.       In your opinion, will approval of this  
21 application be in the best interests of  
22 conservation, the prevention of waste and the  
23 protection of correlative rights?

24           A.       Yes, it will.

25           Q.       In your opinion, is this the optimum

1 location within this spacing unit, being the 160  
2 acres in the northwest quarter of Section 18, in  
3 which to locate this well?

4 A. It is.

5 MR. KELLAHIN: That concludes my  
6 examination of Mr. Hardie. We move the  
7 introduction of his Exhibits 1 through 6.

8 For the record, Mr. Examiner, Exhibit 7  
9 is our certificate of mailing. While we're not  
10 encroaching towards any of the offsets, we did  
11 notify Yates Petroleum Corporation, who is the  
12 adjoining operator to the west of the spacing  
13 unit.

14 That concludes our presentation.

15 EXAMINATION

16 BY EXAMINER STOGNER:

17 Q. Mr. Hardie, you suggested that the well  
18 No. 5 had some unorthodox stimulation  
19 techniques. Do you want to elaborate a little  
20 more on that?

21 A. No. 5 was drilled in 1976. This was a  
22 period of time when we really didn't understand  
23 the reservoir. It was drilled by Roger Hanks.  
24 It was pretty typical at that time to stimulate  
25 the wells with rather large acid jobs. I'm not

1 exactly sure about the volumes, but I know it's  
2 significantly more than we use now.

3 We feel like these large acid jobs had  
4 a tendency to frac into both the gas cap and the  
5 underlying water. I think that the high water  
6 rate on this well, on the initial potential, kind  
7 of confirms that. We wouldn't really expect to  
8 find that high of a water cut, typically, being  
9 this high in the reservoir.

10 Q. When did Conoco take over the No. 5  
11 well?

12 A. We took over the No. 5 in 1980 when we  
13 purchased the field, and it was plugged prior to  
14 us taking it over. Reentering that wellbore is  
15 not really an option. It is, I believe, a  
16 five-inch casing.

17 We typically install electric  
18 submersible pumps in order to more efficiently  
19 drain these wells, and with that small casing,  
20 it's difficult to install those kinds of pumps.

21 EXAMINER STOGNER: Any other questions  
22 of this witness?

23 MR. KELLAHIN: No, sir.

24 EXAMINER STOGNER: Mr. Hardie may be  
25 excused.



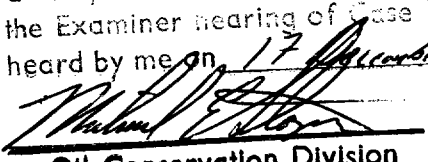
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Anything further in Case 10633?

MR. KELLAHIN: No, sir.

EXAMINER STOGNER: If not, this case  
will be taken under advisement.

(And the proceedings concluded.)

I do hereby certify that the foregoing is  
a complete record of the proceedings in  
the Examiner hearing of Case No. 10633,  
heard by me on 17 December 1992.  
 , Examiner  
Oil Conservation Division

## CERTIFICATE OF REPORTER

1  
2  
3 STATE OF NEW MEXICO )  
4 COUNTY OF SANTA FE ) ss.  
5

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

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

19 WITNESS MY HAND AND SEAL December 23,  
20 1992.

21  
22  
23   
24 CARLA DIANE RODRIGUEZ, RPR  
25 CCR No. 4