



## I N D E X

August 24th, 1995  
Examiner Hearing  
CASE NO. 11,344

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\* \* \*

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

## FOR THE DIVISION:

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## FOR THE APPLICANT:

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 By: WILLIAM F. CARR

\* \* \*

1 WHEREUPON, the following proceedings were had at  
2 11:00 a.m.:

3 EXAMINER CATANACH: All right, at this time we'll  
4 call Case 11,344.

5 MR. CARROLL: Application of Arch Petroleum,  
6 Inc., for seven unorthodox infill oil well locations, Lea  
7 County, New Mexico.

8 EXAMINER CATANACH: Are there appearances in this  
9 case?

10 MR. CARR: May it please the Examiner, my name is  
11 William F. Carr with the Santa Fe law firm Campbell, Carr  
12 and Berge.

13 We represent Arch Petroleum, Inc., and I have two  
14 witnesses.

15 EXAMINER CATANACH: Any other appearances?

16 Will the witnesses please stand to be sworn in?

17 (Thereupon, the witnesses were sworn.)

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

21 DIRECT EXAMINATION

22 BY MR. CARR:

23 Q. Would you state your name for the record, please?

24 A. Jack Erwin.

25 Q. And how do you spell your last name?

1 A. E-r-w-i-n.

2 Q. By whom are you employed?

3 A. By Arch Petroleum, Inc.

4 Q. And what is your current position with Arch?

5 A. I'm the geologist.

6 Q. Have you previously testified before this  
7 Division?

8 A. I have.

9 Q. At the time of that prior testimony, were your  
10 credentials as a petroleum geologist accepted and made a  
11 matter of record?

12 A. Yes.

13 Q. Are you familiar with the Application filed in  
14 this case on behalf of Arch Petroleum, Inc.?

15 A. Yes, I am.

16 Q. And are you familiar with the proposed infill  
17 wells that are the subject of this hearing?

18 A. Yes.

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

21 EXAMINER CATANACH: They are.

22 Q. (By Mr. Carr) Would you briefly state what has  
23 been sought in this hearing?

24 A. We seek approval of seven unorthodox infill oil  
25 well locations in the Teague-Blinebry Pool.

1 Q. Could you tell me what the spacing requirements  
2 are for the pool?

3 A. Forty-acre spacing.

4 Q. And have you prepared exhibits for presentation  
5 today in this hearing?

6 A. Yes, I have.

7 Q. Let's go to what has been marked as Exhibit  
8 Number 1. Would you identify this exhibit and then review  
9 the information on it for Mr. Catanach?

10 A. Okay, Exhibit Number 1 is just simply a base map  
11 of the Teague-Blinebry Pool. All wells or well spots you  
12 see on the map that are red, which are all well spots, are  
13 current or former Blinebry producers in the pool.

14 Our infill locations are marked by the red  
15 circles with the red hexagons around those. You'll see the  
16 C.E. LaMunyon 51 through 56 and the Saltmount Number 3.

17 The offset operators are identified in the  
18 proration units or lease tracts that they operate. You'll  
19 see those on the base map. And the Arch-operated  
20 properties are those -- that acreage shaded yellow.

21 Q. When was this pool actually discovered?

22 A. The pool was discovered by plugging back a  
23 depleted Devonian well in either late 1967 or early 1968,  
24 and it was completely drilled up in the year following  
25 that, by early 1969.

1           With the one exception of Plains Petroleum in the  
2       very southern edge of the field there in Section 34, they  
3       have recently drilled a few Blinebry wells extending the  
4       field to the south in just the last couple of years.

5           Q.     And the yellow-shaded acreage shows the Arch  
6       Petroleum properties in the pool; is that right?

7           A.     The Arch Petroleum-operated properties, yes.

8           Q.     If we look at the infill wells, who basically are  
9       we encroaching on with these infill locations?

10          A.     Well, we have no infill wells that are closer  
11       than 330 to any lease line. We are encroaching on no  
12       operator that does not already have wells 330 feet from our  
13       acreage position in offsetting tracts.

14                 To answer your question specifically, the only  
15       operator that we are encroaching on with the 330 locations  
16       are Mid-Continent Energy, on the G.G. Travis lease, which  
17       is the north half of the southeast of Section 21, southeast  
18       quarter of Section 21.

19          Q.     Let's go to Exhibit Number 2, your structure map.  
20       Would you review the information on this exhibit for the  
21       Examiner?

22          A.     This is a structure map, mapped on top of the  
23       Blinebry formation. Again, the Blinebry producers are the  
24       red well spots that you see on the map. Of course, this is  
25       a structural field, as you can see by the structure map,

1 with the downdip wells all fairly consistent in the lower  
2 parts of the field.

3 The only thing that's not readily apparent on the  
4 structure map I want to point out is, Exhibit Number 4 will  
5 be a cross-section, north-south cross-section, and that's  
6 marked on the structure map. I want to point that out.

7 Q. Now, the trace or the index map --

8 A. Right.

9 Q. -- is incorporated into this exhibit?

10 How important is structure in making a successful  
11 well in this area?

12 A. Structure is really fairly important. As we'll  
13 see in Exhibit Number 3, the lower you go on structure, the  
14 less pay that you have.

15 As you'll note, our well spots are fairly high on  
16 the structure. They're actually as high as we feel we  
17 could get them with our current acreage position.

18 Q. So basically what you're looking for here is a  
19 well high on the structure, in good pay and in an area that  
20 hasn't been already drained; isn't that what you're saying?

21 A. That's correct.

22 Q. Let's go to Exhibit Number 3, the isopach, and  
23 again I'd ask you to review this exhibit for Mr. Catanach.

24 A. Okay. If you'll compare the structure map with  
25 the porosity isopach, you'll see that the isopach



1 thicknesses correspond very well with the high areas of the  
2 structure.

3 For your information, the isopach was -- is a  
4 total of all net pay above five percent of porosity.

5 Again, if you'll note our infill well locations,  
6 they are located in as thick an area of pay as possible  
7 relative to our acreage position in the field.

8 Q. All right. Let's go now to the cross-section,  
9 Exhibit 4.

10 A. Okay. Of course, this is the cross-section that  
11 I mentioned earlier. The left-hand side of the cross-  
12 section is the southern edge, with Well Number 33, and you  
13 go north as you move to the right of the cross-section.

14 It primarily shows the discontinuous nature of  
15 the Blinebry formation in this field.

16 As you can see, there are porosity stringers that  
17 extend all the way across the field. There are also  
18 numerous porosity stringers that don't connect from  
19 wellbore to wellbore, and of course you have everything in  
20 between as far as quality of pay.

21 Again, this was marked pretty much as we did our  
22 porosity isopach map, with all porosities here represented  
23 above five percent.

24 Q. And on this exhibit, you've also indicated where  
25 four of the seven infill wells would fall?

1           A.    That's correct, out of our -- Four out of our  
2   seven proposed infill wells are marked here on the cross-  
3   section.

4           Q.    Now, Mr. Erwin, what conclusions have you reached  
5   from your geological study of this pool?

6           A.    Well, it became apparent very early on that  
7   structure and pay quality or net pay were related.

8                   As we began to dig deeper into the -- you know,  
9   intricacies of the field, we saw the discontinuity of the  
10   porosity stringers from wellbore to wellbore. It became  
11   apparent to us that the possibilities for 20-acre infills  
12   did exist because of this, and it was really at that time  
13   that I turned things over to our engineering department and  
14   they followed up on that.

15          Q.    And we'll call another witness to review the  
16   engineering aspects of the case.

17          A.    That's right.

18          Q.    Were Exhibits 1 through 4 prepared by you?

19          A.    Yes, they were.

20               MR. CARR:  At this time, Mr. Catanach, we would  
21   move into evidence Arch Exhibits 1 through 4.

22               EXAMINER CATANACH:  Exhibits 1 through 4 will be  
23   admitted as evidence.

24               MR. CARR:  And that concludes my direct  
25   examination of Mr. Erwin.

## EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Erwin, have these locations actually been staked?

A. Yes, they have.

Q. So there are footages somewhere?

A. Yes, I believe our engineer has those for you.

Q. Okay. I got confused. You mentioned something about not being closer than 330 to any offset operator?

A. To any lease line, yes, that's right.

Q. None of the infill wells encroach closer than 330 to any of their proration units? Or is it --

A. Yeah, yeah, I believe that's right.

Now, not to any of our proration units, but to any offset operators' proration units.

Q. Anybody who operates, other than Arch?

A. Yes.

Q. None of your wells encroach closer to any other offset operator?

A. That's correct.

Q. I see, okay.

Are the wells in this field still pretty much producing?

A. Yes, they are, but they're all towards the end of their economic life. I think the Seeton and Travis leases

1 are the two best leases in the field. I think their  
2 average per-well production is somewhere between seven and  
3 ten barrels per day.

4 The majority of our C.E. LaMunyon wells that have  
5 not been refrac'd were, you know, anywhere from one to four  
6 barrels a day before our refrac program. Of course, the  
7 recently refrac'd wells are much better.

8 Q. Have you -- In picking the locations, did you  
9 utilize engineering data that shows what the offset wells  
10 may have drained?

11 A. That's right, our engineer constructed a bubble-  
12 map, drainage radii and all that.

13 Q. Okay. And that in combination with the structure  
14 and isopach, that's how you picked --

15 A. Isopach.

16 Q. -- the locations?

17 A. Yes, that's right. In general, the higher you  
18 are on structure, of course, the better the net pay, and  
19 the better the production as well. It all corresponded  
20 very well.

21 Q. Some of the porosity intervals that are not  
22 consistent across the entire field, do you believe that  
23 some of those may have been missed in the existing wells?

24 A. On initial completion, there's very little doubt  
25 that that occurred. I didn't really go into it, but we

1 have had an ongoing refrac program, and I think with our  
2 refrac programs we probably have connected all of those  
3 porosity stringers at least in a behind-pipe sense. In  
4 most cases we have added perforations to each wellbore and  
5 have increased our frac job tremendously.

6 So currently, I think, at least in the refrac'd  
7 wells, that they probably have been connected.

8 Q. Is it possible to recover all this oil in the  
9 existing wells, or is it necessary to drill these new  
10 wells?

11 A. In my opinion, no. I believe that -- Our  
12 engineer will go into that, of course, in much greater  
13 detail as he shows you his drainage radius and all that.

14 But on average I think we're draining -- He's  
15 calculated somewhere around 15 acres per well.

16 EXAMINER CATANACH: That's all I have of the  
17 witness.

18 MR. CARR: That's all we have of Mr. Erwin.

19 At this time we call Chris Bezner.

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

23 DIRECT EXAMINATION

24 BY MR. CARR:

25 Q. Would you state your name for the record, please?

1 A. My name is Chris Bezner.

2 Q. And where do you reside?

3 A. In Midland, Texas.

4 Q. By whom are you employed?

5 A. Arch Petroleum.

6 Q. What is your current position with Arch?

7 A. I'm a petroleum engineer.

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

10 A. Yes, I have.

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

14 A. Yes, they were.

15 Q. Are you familiar with the Application filed in  
16 this case on behalf of Arch?

17 A. Yes.

18 Q. And are you familiar with the proposed infill  
19 wells which are the subject of this hearing?

20 A. Yes.

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

23 EXAMINER CATANACH: Yes, they are.

24 Q. (By Mr. Carr) Mr. Bezner, let's go now to  
25 Exhibit Number 7.

1 A. Okay.

2 Q. Could you identify that for Mr. Catanach?

3 A. Exhibit Number 7 is a copy of the OCD Form C-102  
4 for each of our seven proposed infill wells. And each of  
5 the proposed infill wells has been surveyed, and a survey  
6 plat is what's shown here. This work was performed by John  
7 West Engineering.

8 Q. Are these on state, federal or fee lands?

9 A. The six wells proposed on the C.E. LaMunyon lease  
10 are federal land, and the one on the Saltmount is a fee  
11 lease.

12 Q. Have you applied for your applications -- Have  
13 you filed your applications for permit to drill at this  
14 time?

15 A. No, I haven't. I have them ready to go. We have  
16 gone ahead and hired an archeologist to clear the  
17 locations, and they're all clear of archeological sites, on  
18 federal land.

19 Q. And when do you hope to actually commence the  
20 drilling of these wells?

21 A. As soon as we get approval and can get a drilling  
22 rig, we anticipate sometime in October.

23 Q. Let's go to Exhibit Number 8.

24 A. Okay.

25 Q. Would you identify that, please?

1           A.     Exhibit Number 8 is an independent study that was  
2     commissioned by Arch. This study was performed by the  
3     Ryder Scott Company from Houston, Texas.

4                     And basically what we wanted them to do is to  
5     evaluate the one existing 20-acre infill that's been  
6     drilled in this field to date, that well being the C.E.  
7     LaMunyon Number 50 that was drilled in the northeast  
8     quarter of Section 28 by -- This well was drilled by  
9     Chevron in 1989.

10                    And basically what we wanted to see is, from the  
11    performance since 1989 from this well and the four offset  
12    wells, is, is this Number 50 recovering reserves that would  
13    not be recoverable otherwise, without drilling a 20-acre  
14    infill?

15                    And what their report -- What they did in their  
16    study, of course, is review the decline curve of the 50,  
17    estimate the reserves and then look at the four offsetting  
18    wells, which are the LaMunyons 21, 24, 29 and 34, and to  
19    see if there has been any adverse effect on the offset  
20    wells since the Number 50 has been drilled. This is known  
21    as interference, when you drill infill wells.

22                    And so -- Anyway, they performed this analysis  
23    and showed basically that -- they estimated the Number 50  
24    will recover ultimate primary reserves of about 62,000  
25    barrels, while only decreasing reserves on offset wells by



1 7000 barrels.

2 So this gives you a net or a true incremental  
3 reserves of 55,000 barrels, a little over 55,000. And this  
4 is oil that would not have been recovered if this well had  
5 not been drilled.

6 Q. Let's go to Exhibit Number 9.

7 A. Okay.

8 Q. Can you identify that?

9 A. Okay, Exhibit Number 9 is just a -- It's a  
10 spreadsheet of all the wells that are surrounding our  
11 proposed seven infill locations, and the wells are listed  
12 in column one by lease and well number.

13 And I performed these calculations, volumetric  
14 calculations, on each of these wells to come up with an  
15 estimate of drainage in acres and also an estimate of the  
16 drainage radius around each well in feet.

17 And what I did was, basically I took -- You see  
18 there, column number two is just the net pay numbers that  
19 our geologist, Jack, picked and that show up on his isopach  
20 map. And then column number three is estimated primary  
21 recovery for each well. I just estimated the remaining  
22 reserves and came up with an ultimate recovery.

23 And then using the -- I show the assumptions that  
24 I used in my calculations as far as initial water  
25 saturation of 18 percent, average porosity of 7.4 percent,

1 and formation volume factor of oil of 1.26, and an assumed  
2 recovery factor of about 15 percent.

3 Using these numbers, I calculated a drainage area  
4 in acres and also the drainage -- assuming a radial flow,  
5 calculating the drainage radius in feet.

6 And basically what it showed, if you look at the  
7 bottom line, it shows that the total and the average for  
8 all these numbers -- it shows the average for drainage area  
9 in acres of a little over 15 acres per well.

10 And since these wells -- all but one of these  
11 wells have been drilled on 40 acres, this obviously shows  
12 you that on current spacing we're going to recover less  
13 than half of the available oil in this reservoir, on  
14 current spacing.

15 Q. Let's go to the bubble map, your Exhibit Number  
16 10 --

17 A. Okay.

18 Q. -- and would you review this for Mr. Catanach?

19 A. Okay. All right, this Exhibit Number 10, again,  
20 is a bubble map, and it's just taking the numbers that are  
21 shown on the spreadsheet and applying them to the wells  
22 offsetting all of our proposed locations. And in the  
23 circle you see there's in feet, actual feet, that I  
24 estimate each well is going to drain.

25 The one exception to that that you might note is

1 the Seeton Number 2 well that's in the northeast quarter  
2 section of 21. This well did not have an open-hole log  
3 when it was originally drilled, so we could not pick a net  
4 pay, so you can't calculate a drainage radius for it.

5 But basically what it shows is, taking Jack's  
6 proposed location, mainly what I wanted to do, of course,  
7 is to check each one and make sure that they aren't -- or  
8 will not be drained by the existing wells in the field. As  
9 you can see, none of the proposed locations show to be  
10 drained.

11 Q. Mr. Bezner, let's go back to what has been marked  
12 Exhibit Number 5.

13 A. Okay.

14 Q. Is this an affidavit confirming that notice in  
15 this case has been provided to all offset operators as  
16 required by OCD rules?

17 A. Yes.

18 Q. Attached to this affidavit are copies of the  
19 notice letters and the return receipts; is that right?

20 A. That's correct.

21 Q. What is Exhibit Number 6?

22 A. Exhibit Number 6 is a copy of a waiver that we  
23 obtained from Apache Corporation, who is one of our offset  
24 operators to the north of us.

25 And the reason we have a waiver letter from them

1 is, originally we sent the letter to Texaco, and we found  
2 out later that Apache had bought this lease -- it's the New  
3 Mexico B.Z. State lease -- from Texaco. So they weren't  
4 given their full 20 days to respond.

5 So in order to, you know, show that they have no  
6 problem with this, I obtained a waiver letter from Apache  
7 regarding these infills.

8 Q. In your opinion, will approval of this  
9 Application and the drilling of the subject infill wells  
10 result in the recovery of hydrocarbons that otherwise would  
11 be wasted?

12 A. Yes, I believe that we have shown that the  
13 current wells on 40-acre spacing will not effectively drain  
14 this portion of the field.

15 Q. In your opinion, will approval of the Application  
16 otherwise be in the best interests of conservation and the  
17 protection of correlative rights?

18 A. Yes, it will. I think my calculations show that  
19 the current 40-acre spacing will leave more than half the  
20 recoverable reserves in the ground.

21 Q. Were Exhibits 5 through 10 either prepared by you  
22 or at your direction?

23 A. Yes, they were.

24 MR. CARR: At this time, Mr. Catanach, we move  
25 the admission of Arch Exhibits 5 through 10.

1 EXAMINER CATANACH: Exhibits 5 through 10 will be  
2 admitted into evidence.

3 MR. CARR: And that concludes my direct  
4 examination of Mr. Bezner.

5 EXAMINATION

6 BY EXAMINER CATANACH:

7 Q. Mr. Bezner, what have you calculated to be the  
8 range of recoveries from these infill wells?

9 A. From the proposed infill wells?

10 Q. Right, an estimate.

11 Q. Well, my volumetrics, I assume a 15-percent  
12 recovery factor, you know, on original oil in place.

13 You're talking about oil recovered? I mean, what  
14 kind of -- Okay. Yeah, I guess on the low side, and I  
15 didn't really bring it out, but the LaMunyon 50 already  
16 drilled, I'm estimating, a little over 60,000 barrels. And  
17 in hindsight, if you look on the isopach, this is really  
18 not the best area of the field. So that would be my low  
19 side. And I'd say a high side of maybe 150,000. So an  
20 average of 100,000 barrels a day per well.

21 MR. CARR: Mr. Catanach -- Chris, what was that  
22 figure? Did you have a daily figure?

23 THE WITNESS: No, ultimate recovery, I -- you  
24 know, I haven't really nailed it down. I'm saying average,  
25 maybe 100,000 barrels a day per well is what I'm

1 estimating. 100,000? Yeah. 60,000 to 100,000.  
2 Significant oil.

3 Q. (By Examiner Catanach) Some of the existing  
4 wells that don't have some of the porosity intervals, some  
5 of those zones, in your opinion are not being drained by  
6 the existing wells?

7 A. Yeah, that's correct. I think, you know, maybe  
8 the geologist could answer a little bit better, but my idea  
9 is that when you don't have a stringer extending all the  
10 way across, or a good thick section, just due to the drive  
11 mechanism of the field -- you know, it's a solution gas  
12 drive field -- you're going to deplete the pressure and  
13 leave oil back in these stringers that's not going to make  
14 it all the way to the wellbore.

15 So really, the only way -- It's like trapped oil  
16 away from the wellbores, and the only way to get to it is  
17 to infill drill.

18 Q. What's the potential for a waterflood?

19 A. That's a good question. Waterflooding was looked  
20 at by Chevron. The Number 50 was cored, a core was pulled.  
21 And the core showed to be oil wet, which does not lend  
22 itself to waterflooding. And we're still studying that,  
23 with the idea that we might pull a core from one of these  
24 infills to substantiate that.

25 If waterflooding is feasible, you know, we'll

1 look at that on down the road.

2 EXAMINER CATANACH: Nothing further.

3 MR. CARR: That concludes our presentation in  
4 this case, Mr. Catanach.

5 EXAMINER CATANACH: There being nothing further  
6 in this case, 11,344 will be taken under advisement.

7 (Thereupon, these proceedings were concluded at  
8 11:25 a.m.)

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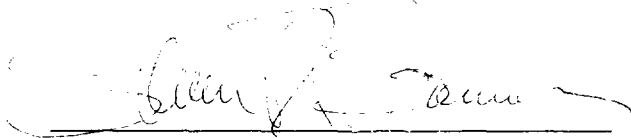
## CERTIFICATE OF REPORTER

STATE OF NEW MEXICO    )  
                                   )   SS.  
 COUNTY OF SANTA FE    )

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; 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 August 29th, 1995.

  
 STEVEN T. BRENNER  
 CCR No. 7

My commission expires: October 14, 1998

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11344, heard by me on 8/24 1995.

  
 \_\_\_\_\_, Examiner  
 Oil Conservation Division

STEVEN T. BRENNER, CCR  
 (505) 989-9317