STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

CASE 10,769

EXAMINER HEARING

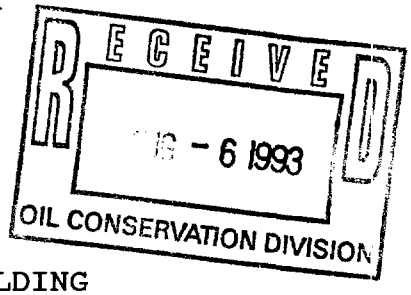
IN THE MATTER OF:

Application of H.L. Brown for an unorthodox gas well location, Roosevelt County, New Mexico

TRANSCRIPT OF PROCEEDINGS

ORIGINAL

BEFORE: DAVID R. CATANACH, EXAMINER



STATE LAND OFFICE BUILDING

SANTA FE, NEW MEXICO

July 15, 1993

A P P E A R A N C E S

FOR THE DIVISION:

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I N D E X

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E X H I B I T S

APPLICANT'S EXHIBITS:

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WHEREUPON, the following proceedings were had at 1:12 p.m.:

EXAMINER CATANACH: Call the hearing back to order.

At this time we will call Case 10,769.

MR. STOVALL: Application of H.L. Brown for an unorthodox oil well location, Roosevelt 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 Kellahin and Kellahin, appearing on behalf of the Applicant in this case, and I have three witnesses to be sworn.

EXAMINER CATANACH: Any additional appearances?

Will the three witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

MR. KELLAHIN: Call Mr. Peter Courtney.

PETER COURTNEY,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. My name is Peter Courtney. I'm the land manager for H.L. Brown, Jr.

Q. On prior occasions have you testified as a petroleum landman before the Division?

A. Yes, sir, I have.

Q. And pursuant to your employment by H.L. Brown in the capacity as a landman, are you familiar with the land ownership with regards to oil and gas minerals underlying Sections 27 and 28 of the subject area that's under discussion in this case?

A. Yes, I am.

MR. KELLAHIN: We tender Mr. Courtney as an expert petroleum landman.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) Let me direct your attention, sir, to Exhibit Number 1. That's the landman's plat.

Help us understand the significance of the

area in the different colored shadings on the display.

A. Okay, the two sections which are outlined with different colors, the different colors representing the five federal leases covering the acreage in these two sections, all leases are federal.

Q. The proposed well for which you're seeking a nonstandard location is to be dedicated, if successful, to the North Bluitt Siluro-Devonian Pool?

A. That's correct.

Q. What's the -- That's an oil pool, is it?

A. Yes, sir.

Q. And what is the spacing for that pool?

A. The 80 acres.

Q. What is your proposed dedication of acreage for that well if you're successful with completing it as a commercial well?

A. It would be the north half of the southwest of Section 27.

Q. Okay. The pool rules for that pool, I believe, require a well to be within 150 feet of the center of either of its 40 acres?

A. That's correct.

Q. Okay. Your proposed location crowds the north line of its spacing unit and the west line, right?

A. That's correct.

Q. What is the ownership with regards to royalty on the spacing unit to the north, towards which you're encroaching?

A. The royalty ownership is federal, federal royalty.

Q. Same base federal lease --

A. Yes, sir.

Q. -- involved in the spacing unit for which the well is located and the one it encroaches in the north?

A. That's correct.

Q. Is there the same identity of working interest owners and royalty owners?

A. Yes, sir.

Q. Overriding royalties as well?

A. That's correct.

Q. So everybody in the offending well participates in the offsetting spacing unit?

A. To the north, yes.

Q. Okay. As we look to the west, there's an area shaded in blue. The well is slightly unorthodox to the west boundary, is it not?

A. Slightly.

Q. I think it's 330 off that west boundary?

A. Uh-huh.

Q. Is the ownership the same with regards to royalty between the north half of the southwest of 27 and any of the spacing units on the west that it encroaches upon?

A. The royalty is the same.

Q. Okay. Are the working interest owners the same?

A. The working interests are identical.

Q. Are there any differences in overriding royalties?

A. Yes, sir, there are differences in overriding royalties.

Q. Okay, let me ask you now to turn to Exhibit Number 2. Did you cause notification of this Application in the hearing of this case to be sent to all the interest owners, the overriding royalty owners and the working interest owners that are involved here?

A. Yes, sir.

Q. Okay. Let's turn to Exhibit 2. Is this your certificate, your affidavit?

A. Yes, sir.

Q. Turn to Exhibit 2 and show me those overriding royalty owners which do not have an interest in the spacing unit in which the encroaching well is located.

A. On the proposing well?

Q. Yes, sir.

A. It would be on the first page of the address list, B.A. O'Brien.

Q. Uh-huh.

A. Following that, Seabrook Corporation. And on the next page, the Ronadero Company.

Q. Okay. Have you received any objection to the encroachment of the well towards the spacing unit in which they have their overriding royalty?

A. No, I have not.

Q. Have you received an objection from anyone with regards to the encroachment?

A. No, I have not.

MR. KELLAHIN: Okay. That concludes my examination of Mr. Courtney.

We would move the introduction of Exhibits 1 and 2.

EXAMINER CATANACH: Exhibits 1 and 2 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Just again to clarify, Mr. Courtney, the acreage in pink is all commonly owned, working interest, royalty interest and overriding royalty

interest?

A. That's correct.

Q. There's a slight difference in overriding royalty interest between the acreage in pink and the acreage in blue?

A. Yes, sir, the blue and the yellow.

Q. Well -- okay.

A. The blue is different from the pink, yes, sir, than the overriding royalties.

Q. Okay, and the parties that you just named off to Mr. Kellahin, the three parties, those interest owners have an interest in what, now?

A. Those are the overriding royalties that would own under the proration unit for the 28-1, which would be the south half of the northeast of 28. That communitized 40 acres of the yellow lease and 40 acres of the blue lease. The proration unit is outlined by the dashed line.

Q. Okay, and those parties would not have an interest in the proposed well?

A. That's correct.

Q. Okay. Have you had any discussion with any of these parties?

A. No. We have sent them notification of our Application and heard nothing.

MR. STOVALL: Do you have a well proposed for the north half, southeast of 28?

THE WITNESS: Not at this time.

MR. STOVALL: Do those overrides that you referred to increase the burden on that federal lease, compared to the federal lease on which you're drilling? In other words, is the burden higher there?

THE WITNESS: Yeah, it would be more heavily burdened.

Q. (By Examiner Catanach) Within all those leases that you've got described on Exhibit 1, are those all H.L. Brown leases?

A. Yes, sir.

Q. Okay. So there was no offset operators to notify of this Application?

A. That's correct.

EXAMINER CATANACH: Okay. That's all I have. You may be excused.

MR. KELLAHIN: Call at this time Jack Wells.

JACK W. WELLS,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Wells, would you please state your name

and occupation?

A. I'm Jack W. Wells, geologist.

Q. On prior occasions, Mr. Wells, have you testified as an expert geologist before the Division?

A. Yes, I have.

Q. Are you currently employed as a geologist by H.L. Brown?

A. I'm a consulting geologist for H.L. Brown.

Q. As part of your duties as a consulting geologist, have you made a geologic study of the opportunity for further development in the North Bluitt Siluro-Devonian Pool?

A. Yes, I have.

Q. Were all the exhibits that we're about to discuss, the geologic displays, prepared by you?

A. Yes, they were.

Q. And do these represent your own conclusions?

A. Yes, they do.

MR. KELLAHIN: We would tender Mr. Wells as an expert geologist.

EXAMINER CATANACH: Mr. Wells is so qualified.

Q. (By Mr. Kellahin) Let's turn to Exhibit Number 3. I think it best serves to illustrate what you're proposing to do, Mr. Wells.

To -- Before we talk about your conclusions let's orient the Examiner to what he's seeing. There are lines of seismic runs that are shown on this display?

A. Yes, this is a seismic map on the top of the Wolfcamp, and we have five lines that we've utilized in this.

There are four different vintages, so it's kind of a hodge-podge tying them all together.

Q. There's one line that's hard to see, but it runs north and south and splits the boundary between Sections 28 and 27?

A. That is correct.

Q. Your proposed well location is the well spot outlined in red?

A. The red dot, yes, sir.

Q. Yes, sir. Summarize for us what has caused you to reach the conclusion that this is the optimum place to put the next well in this pool.

A. This is from the seismic standpoint in that the only -- deepest reflection we can map on is the top of the Wolfcamp, which is about 700 feet above the top of the Siluro-Devonian.

And even though we expect the structures to be coincident, we do not see the faulting in the

Wolfcamp that we know they're in the Siluro-Devonian.

So this is an attempt to just map the Wolfcamp to find the structure on that level.

And what we have come up with is on the north-south line, which is between the two sections, it's a Cities Service line that was shot in 1980. Just going to the northwest of the proposed location is shot point 155, and that is the highest point we can find on that line.

For the east-west control, just north of our proposed, is an old single-fold data line that was shot in the Fifties, and we see a flattening of three points that are listed as 1.22 across there.

So we feel that the high is right within the area of closure of the 1.22, second line.

Like I say, this map was kind of difficult to make in that the different vintages of the data, the different processing of the data, we had to time-tie them all together. We time-tied to the north-south line.

And this is -- When you go back and if you would take this map and make it tie to well data, it will not tie. You have to throw a velocity gradient into the thing.

So this is strictly a time map from the

geophysical data.

Q. Let's move to the next geologic display and have you identify Exhibit Number 4.

A. Exhibit Number 4 is a map on the Siluro-Devonian, which we call zone 3, which we've divided the Siluro-Devonian interval -- it's about 400 feet thick -- into three intervals. And this is the lowermost interval, and this is the zone that's pertinent to our location.

What I've shown on this is, to the northwest there's a fault running northeast-southwest, just south of the well number 1-28-A. That's got -- didn't go deep enough.

What we thought -- We were in the reservoir, we were on structure, based on our seismic map. We fell off, we crossed the fault. That fault -- We never got to the Siluro-Devonian, but we were 600 feet low to where it should have been. So we've got a 600-foot fault or greater.

The fault on the south side is based on seismic and on the well data in that in going from the well number 1-28 to the well number 5, well number 5 is some 200 feet low to the 1-28 well.

And our seismic data shows that we are coming up till we hit something, and then we've got to drop

back down. And we have to put a fault in there, and it would be about 200 foot a throw, or 250, depending how far updip we come. And -- That being the south boundary.

Then based on well data, we have a dashed line between the 4850 and the 4900 which we're calling it 4880, and we feel that is the oil/water contact for this zone 3 reservoir.

At the present time, the 1-28 well was completed in that reservoir. It was initially a very good well. It started off producing about 250 barrels a day. We produced that for about six months. It was very steady.

We increased the choke size, so we could produce approximately 300 barrels a day. We did that, and within about five days we started cutting water. So we immediately cut it back. And at that point we have never gotten rid of the water.

The well today is making about 25 barrels of oil and 125 to 130 barrels of water. And what we feel like...

Well, then go on to the 1-27. The 1-27 -- I'll have a cross-section in a minute to show this. But it's completed out of zone 2 with just a trace of zone -- one low perf down in zone 3.

So essentially the zone 3 interval is being depleted right now by the number 1-28 well.

And from our map, we feel that if we don't drill another well we will be leaving reserves behind in this reservoir.

Q. Summarize for us the geologic risks, if you will, that are involved in this particular pick of a location. What are the components that have given you such a difficult time in finding the location for this well?

A. Well, we tried to fit all the data together. And you can eliminate, say, the south bounding fault and put steep dip in there. I don't necessarily believe that, but it's a possibility. So...

And then the other point was, we thought we had a good location up there at the 1-28-A. And where we mapped the fault on the seismic, where the Wolfcamp started its steep dip, we thought we were all right till we got to that steep dip. But we found that was not true.

So we're kind of afraid to get too close to the number 5 well. We want to back off just as far as we can.

We want to try to get close to the high point on the seismic line that we saw, the north-south

seismic line, which is northwest of the location.

And then doing so, we have a dipmeter in the 1-28 which shows mostly north to northeast dip at about two degrees. Not a lot, but the dipmeter was run from the Wolfcamp through the Devonian in predominantly a carbonate section, and it's not the best dipmeter in the world.

The well did migrate or -- while drilling, sort of to the south a little bit, not enough to talk about. But that would indicate you were going updip from the 1-28 to the south.

So what we are essentially doing is trying to pick a safe location that would hopefully gain more oil out of this reservoir.

Q. When you look at the standard dimension north-south, the reason for the unorthodox encroachment to the north is based upon what, sir?

A. Trying to get as far north as we can, away from the Number 5 well.

Q. Because it is interpreted to be on the downthrown side of that fault?

A. Yes, it is.

Q. And therefore not productive?

A. Not productive. I'm not sure just where the fault is, is one of my problems.

Q. When you look at the east-west dimension, what is your reason to have the well located encroaching to the west? I believe it's 330 off that boundary instead of 510.

A. For that reason, we're trying to stay between the 1-28 and number 5, and we were trying to get to the high point of the Wolfcamp structure on seismic.

Q. If this well is successful, do you then have an opportunity for yet another well over in Section 28?

A. Yes, we would.

Q. And that would be in a similar location within the contour map, but over on the 28 side of the line?

A. Yes, sir. Again, we would have to be pushing to the north line.

This well might give us some, with the dipmeter, new data that we could change our map somewhat.

Q. What's the reason to choose the location in 27, rather than moving over into 28 at this point?

A. I have the well control from the number 5 well in Section 27.

Q. And as you move to 28, you're moving farther away from your well control?

A. Right.

Q. Do you have a geologic opinion as to whether this location represents the best opportunity for additional oil recovery out of this spacing unit?

A. That was my job when I started this, was to find the best location that I felt was safe and would drain the remaining part of the reservoir, and this is what I came up with.

Q. Let's go to the cross-section, Exhibit Number 5. Illustrate for us your conclusions about the cross-section now that we have it in front of us.

A. Okay, this is sort of a cross-section that wanders through the wells in the immediate vicinity.

The one on the right is the Holly Federal, which was drilled to the Siluro-Devonian, was tested tight, and we now have that as a San Andres saltwater disposal well.

From there we went to the northwest, to the Brown Federal 27 A 1, then to the 27, on over to the 28, and then southeast to the old Federal 51.

And in so doing, I'm trying to show the top of the Devonian, which is in orange, the top of the basement, which is in lavender or purple.

We're showing where I think the gas/oil contact is, the oil/water contact is, and where the perforations are within the three wells, and then my

correlation of zone 1, zone 2 and zone 3.

Q. Your primary target in the pool is what zone?

A. It's -- If you look at the 28 well, which is second from the left --

Q. Yes.

A. -- we show two perforations or two sets of perforations, two zones of porosity.

There has now been a bridge plug set between the two, trying to cut off the water, which was not successful. And what we were hoping to do is to find those two stringers a little bit updip, away from the water, and go back to making 200-some barrels a day from that zone.

MR. KELLAHIN: Okay, that concludes my examination of Mr. Wells.

We move the introduction of his Exhibits 3, 4 and 5.

EXAMINER CATANACH: Exhibits 3, 4 and 5 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Wells, you've got pretty good information on the existence of that northern fault?

A. Yes, sir.

Q. The southern fault you don't quite know that

it's there; you're just assuming that it is?

A. Well, my basis for that is, where you come with the Wolfcamp seismic, when you start to steepen dip, that is where we saw the fault, plus it was -- It really moved back before we hit the steep dip in the fault to the north.

So what we're seeing is the steep dip going on the seismic map from the shot point 155 south to 160. We see -- We go from like 10 milliseconds of dip at the Wolfcamp, plus the well is some 180 foot low to the 1A. And to me it's much easier to put the fault in there than to keep coming up from the 1-28 to the shot point 155 and then go into your steep dip.

I think the fault is the more reasonable of the interpretations.

Q. In terms of trying to drill a location that's producible, it wouldn't make much difference, though, if it was a fault or if it was a steep dip?

A. That's correct, but the one thing I'm worried about is, this might not be one fault; it might be a series of little slivers since we don't see on the seismic what the Devonian looked like. All we can see is what the Wolfcamp's doing.

Q. You said one of the wells is starting to water out? Is that what you said? The one that you

tried to set the --

A. The 1-28, yes, sir.

Q. That's the 1-28?

A. Yes.

Q. Okay. That 1-28 well appears to be up above the oil/water contact. How do you assume or explain the water in that well?

A. I think we must have coned it when we tried to up the production, is my -- If we could get away from that borehole, we might, you know, have the oil/water contact that we see in the other wells.

Q. I see. The number 5 well, that was tested in the Devonian, and that was tight, did you say?

A. No, they made a little bit of oil. It was a re-entry, and it was determined at the time that they were testing it -- They didn't have a good cement bond, and whenever they tested it they made a little bit of oil but lots of water.

So you can't really determine where the oil/water contact might be in that well.

You can see we had three DSTs and two sets of perforations.

EXAMINER CATANACH: That's all I have. The witness may be excused.

MR. KELLAHIN: No further questions.

Call at this time Mr. John Grey.

JOHN T. GREY,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name and occupation?

A. My name is John T. Grey. I'm a petroleum engineer.

Q. Have you previously testified before the Division, Mr. Grey?

A. Yes, sir, I have.

Q. And how are you employed by Mr. Brown for this case?

A. I'm employed as a petroleum engineer.

Q. Have you made engineering studies and calculations concerning this particular project?

A. Yes, sir, I have.

MR. KELLAHIN: We tender Mr. Grey as an expert petroleum engineer.

EXAMINER CATANACH: Mr. Grey is so qualified.

Q. (By Mr. Kellahin) For purposes of the record, Mr. Grey, I'd like you to identify your four exhibits, and then let's put them aside and let me ask

you some general questions.

Let's have you go through each of them and tell me what we're looking at.

A. Yes, sir. Exhibit 6 is the production history of the Federal "27" Number 1. The water production is marked in blue, oil production is marked in green and gas production is marked in red.

Exhibit Number 7 is the production history of Federal "27" A Number 1, similarly marked.

Exhibit 8 is the production history of Federal "28" Number 1, again marked like the others.

Q. Okay.

A. Exhibit 9 is my drainage calculations on the front page, and the rest of the exhibit is the backup data supporting that calculation.

Q. Okay, let me have you turn to a locator map, and perhaps Exhibit is as good as any, Mr. Wells' Exhibit 4. Mr. Wells has picked his best geologic location for this next well at the proposed unorthodox location.

My question for you as the reservoir engineer is whether or not a well located here is going to have the opportunity to recover oil reserves that might not otherwise be produced by any of the existing wells. Do you have an opinion on that?

A. Yes, sir, I do.

Q. And what is that opinion?

A. By looking at all the data, I believe that we will recover additional oil that, if we don't do anything, will be left behind.

Q. Give us the reasons that support that conclusion.

A. The drainage calculations show that the 1-28 and the 1-27 are not draining 80 acres, more closer to 40 acres. They have -- exhibit -- Both of them exhibit water encroachment problems, and the economics of handling that much water will just prevent us from getting all the oil out of the ground on these wells.

Q. Let's assume we don't drill the well under question, and all we're trying to do is deplete the reservoir with the current wells.

What's going to preclude the current wells from extracting all the recoverable oil from the reservoir?

A. Mainly the inability of us to separate the water production from the oil production. We've made attempts to do this, and it's been unsuccessful. And this is from that bottom zone 3.

Q. Even if the wells had the capacity to drain 80 acres -- and I know you're going to show us some

examples where they do -- but for the two closest wells, they're not draining 80 acres. But assume they did.

Neither one of those existing wells is located in the reservoir so that it's going to capture this upstructure oil that's above the oil leg, is it?

A. That's correct, sir.

Q. They're going to be watered out before they ever get that oil?

A. That's correct.

Q. So regardless of the well spacing, if we want the additional recoverable oil that has the opportunity to be produced in the reservoir, we've got to find a location, as Mr. Wells proposes, on the northern edge of that fault if we can find where that fault is?

A. That's correct.

Q. Have you determined whether or not there's sufficient recoverable reserves in the reservoir to justify the risk of drilling this well?

A. Yes, sir, I did volumetric calculations.

Q. Okay. The drainage calculations, let's go to those in a summary fashion.

We'll leave it to the Examiner to look at the calculations if he desires, but show me the acreages you've calculated for the three wells that are in the

immediate area.

A. On the first page of Exhibit Number 9, in the column labeled A, I've calculated that the Federal 27 Number 1 is draining 46 acres, the Federal 27 A Number 1 is 179 acres, and the Federal 28 Number 1 is draining 49 acres.

Q. The one with the largest drainage area is the 27 A-1 on the north half of the section?

A. That's correct.

Q. That's simply because you're in a thinner portion of the reservoir and you have spread out the recoverable hydrocarbons over a larger horizontal area?

A. That's correct. Their porosity development here is more stringy. It's not as well developed as the porosity calculations show: only eight percent compared to ten percent, plus the peak porosities are much different.

Q. Are we drilling an unnecessary well?

A. Not in my opinion, we're not.

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

We would move the introduction of his Exhibits 6 through 9.

EXAMINER CATANACH: Exhibits 6 through 9 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Grey, your estimated ultimate recovery was based on decline curve?

A. Yes, sir.

Q. On the 27 Number 1, I show a significant increase in production during 1992. Do you know what that was a result of? About mid-1992?

A. We did no work on the well. The only thing that we can attribute it to is a natural flood performance from the water encroachment.

Q. And it's your opinion that these wells are going to recover all the downstructure oil and not recover too much of the upstructure?

A. That's correct.

Q. That will be recovered by the proposed well?

A. By the two wells, the 27 Number 1 and the 28 Number 1. The water drive is so strong on those two wells that -- and it's coming from the bottom -- that it's going to prevent us from recovering significant oil above the zones that are perf'd.

Q. Do you have any estimates on how much that proposed well may recover?

A. It should be at least as good as the 28 Number 1, 150,000 to 160,000 barrels of oil.

I anticipate it to act pretty similar to the 28 Number 1.

EXAMINER CATANACH: I don't have anything further.

The witness may be excused.

MR. KELLAHIN: That concludes our presentation.

(Off the record)

EXAMINER CATANACH: There being nothing further, Case 10,769 will be taken under advisement.

(Thereupon, these proceedings were concluded at 1:51 p.m.)

* * *

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 July 21, 1993.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1994

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10769, heard by me on July 15 1993.

David R. Catanach, Examiner
Oil Conservation Division