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 ARMSTRONG ENERGY CORPORATION

CASE NO. 11,015

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

July 7, 1994

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on Thursday, July 7, 1994, at Morgan Hall, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

July 7, 1994
Examiner Hearing
CASE NO. 11,015

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E X H I B I T S

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* * *

A P P E A R A N C E S

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By: TANYA M. TRUJILLO

* * *

WHEREUPON, the following proceedings were had at 10:36 a.m.:

EXAMINER CATANACH: Call the hearing back to order at this time, and at this time we'll call Case 11,015, the Application of Armstrong Energy Corporation for an unorthodox oil well location, Lea County, New Mexico.

Are there appearances in this case?

MS. TRUJILLO: Yes, there are. I'm Tanya Trujillo from the Santa Fe law firm, Campbell, Carr, Berge and Sheridan, on behalf of the Applicant today.

I have one witness to be sworn.

EXAMINER CATANACH: Any additional appearances?

Witness please stand, please raise your right hand.

ROBERT MICHAEL BOLING,

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

DIRECT EXAMINATION

BY MS. TRUJILLO:

Q. Could you state your name, please, and place of residence?

A. Robert Michael Boling, and I reside in Roswell.

Q. By whom are you employed?

A. Armstrong Energy Corporation.

Q. In what capacity?

A. As a consulting petroleum geologist.

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

A. Yes, I have.

Q. And at that time were your credentials as a petroleum geologist acceptable?

A. Yes, they were.

Q. Are you familiar with the Application filed on behalf of Armstrong Energy Corporation in this case?

A. Yes.

Q. And have you made a geological study of the Delaware formation involved in this case?

A. Yes.

MS. TRUJILLO: Mr. Examiner, I offer Mr. Boling as an expert at this time.

EXAMINER CATANACH: Mr. Boling is so qualified.

Q. (By Ms. Trujillo) Mr. Boling, could you briefly state what Armstrong Energy Corporation seeks with this case?

A. Armstrong Energy seeks approval of an unorthodox oil well location in the southeast of the northwest of Section 2, 20 South, 34 East, more specifically, 2590 feet from the north line and 1980 feet from the west line.

Q. And what are the well-location requirements for the Northeast Lea-Delaware Pool?

A. Standard statewide rules, 40-acre tracts, 660 from the outer boundary of the proration unit.

Q. Mr. Boling, could you please refer to Armstrong's Exhibit Number 1?

A. Yes, Exhibit Number 1 is a --

EXAMINER CATANACH: Excuse me, could I have some?

MS. TRUJILLO: Sorry.

EXAMINER CATANACH: Thanks.

THE WITNESS: Exhibit Number 1 is a land plat with the west half of Section 2, 20 South, 34 East, highlighted in yellow and the proposed well location in red.

The west half of 2 is Armstrong's acreage in the west half of 2, acquired through farmout from Mobil and Unocal.

Q. (By Ms. Trujillo) Okay. You indicated the proposed well location is noted in red?

A. Yes, that's correct.

Q. Okay. And the yellow is Armstrong's lease?

A. That's correct. I'll --

Q. Could you turn -- Go ahead.

A. I just might add that all the wells in the west half of 2 are operated by Armstrong. Also, the two wells in the northeast quarter of Section 2 are operated by Armstrong.

Q. Could you turn now to Armstrong's Exhibit Number 2 and describe this exhibit, please?

A. Exhibit Number 2 is a type log of the interval in the Cherry Canyon that we're interested in. This well shown here is the Mobil Lea State Number 2, which is in the northwest of the southwest of Section 2, direct- -- diagonal offset to the proposed location.

The individual sands -- There are four sands that occur over this approximately 500-foot interval, two of which are productive, and they've been informally named just the first, second, third and fourth sands.

The primary producing interval in the west half of Section 2 is the third sand. That occurs in this well from 5870 to about 6000 feet. You can see it's quite thick, about 100 feet thick in this well.

The other productive interval is the first sand, which falls from about 5600 to about 5650. It produces in our Well Number 5 which is in the southwest of the northwest, and also the Mid Continent Well which is in the northwest of the southeast, and in all of the wells in the north half of Section 8, and the south half, south half of Section 3.

Q. Could you now turn to Armstrong's Exhibit Number 3 --

A. Okay.

Q. -- and identify this, please?

A. Exhibit Number 3 is a small cross-section --

EXAMINER CATANACH: Just a second here.

THE WITNESS: Okay. Are you ready?

EXAMINER CATANACH: Yeah. I'd hate to see one of your big cross-sections.

THE WITNESS: It's a small cross-section.

If you look at the index map on the right-hand side of the section, you'll see there are four wells running from south to north. They are the -- The well on the far left, the furthest south well, is the Mobil Lea State Number 4, then the Mobil Lea State Number 1, the proposed location, and the final well is the Armstrong West Pearl State Number 2 Well in the southwest of the northeast.

On each of these wells, each of the four -- the bases of each of the four major sand intervals out there have been identified. The datum -- It's a stratigraphic cross-section hung on the base of the third sand, which is the producing interval, with the oil-water contact marked.

You can see the Number 4 well, furthest to the left, we have about -- a total of about 88 feet of sand in the interval, 44 feet of which are above the oil-water contact.

The Mobil Lea State Number 1 has about 97 feet of

sand, about 52 feet above the oil-water contact.

I think that we're going to have someplace between 20 and 25 feet above the oil-water contact in the proposed location.

And the West Pearl State 2, you can see that the total interval has thinned. We only have approximately 18 feet of sand left. That whole upper portion of the sandbody that's present in the Number 4 and 1 Wells has undergone a facies change and is now dolomite, and so that's an indication that we've run out onto the edge of the reservoir going east.

But all that sand does fall above the oil-water contact, and the well is currently marginally productive. It's making about 40 barrels a day.

Q. (By Ms. Trujillo) This map indicates that the third sand is the primary objective?

A. The third sand is the primary objective in this particular location. I don't feel like we're going to have any of the -- any appreciable amount of the first sand, which is also a producer in the area.

Q. Would you now turn to Armstrong Exhibit Number 4 and identify that, please?

A. Yeah, Number 4 is a structure map on the base of the third sand, of the primary producing interval in the area of the proposed location.

As you can see from this map, there are two major depositional pathways for this third sand.

One starts in the southwest quarter of Section 3, runs southeast across Section 10, the north half of Section 10, and terminates in the southeast quarter of Section 10 and the southwest quarter of Section 11. There are four wells in that depositional pathway that produce out of this third sand and are operated by Read and Stevens in Roswell.

The other depositional pathway is primarily restricted to the west half of Section 2, runs basically north-south through the west half of Section 2, and is separated from the other depositional pathway by the strong nose that runs across the southeast quarter of 3 and into the northeast quarter of 10 and northwest quarter of 11.

The sands are identical stratigraphically, but they are not connected in the oil column. They're connected downdip in the water leg.

We have two wells -- We have two wells in the west half, southeast quarter of 10, that do not have any third sand deposited in them, indicating that the nose is bare of this sand, and that is the separation between these two sands.

So what we're looking to do, we're attempting to determine with this well if there still is a depositional low spot north of our Mobil Lea State Number 1 well, which

is in the northeast of the southwest.

And if in fact there is a low spot there, there's a likelihood that we could have a significant amount of sand there, significant enough that we would have some portion of the sandbody lying above the oil-water contact.

Q. Would you identify Armstrong's Exhibit Number 5, please, review what it indicates?

A. Number 5 is just a structure map on the top of the third sand, which is -- it's not particularly significant in terms of exploration, because it does not indicate any kind of topographic conditions at the time of the deposition of the sand.

What it does do is, it tends to reiterate the two depositional pathways that were evident on the base. You can see the strong low spot running from 3 -- southwest of 3, across and into 11, a similar low spot in the west half of 2, and also a low spot up in the northeast quarter of 2, in which we have one producing well up in that small low spot.

So this just basically reiterates the interpretation that we would make from the map on the base of the sand.

Q. Mr. Boling, could you identify Armstrong's Exhibit Number 6, please?

A. Number 6 is a net isopach -- net porosity isopach

map of the third sand interval. I used a 15-percent porosity as a minimum cutoff.

As you can see, the wells in the southwest quarter of Section 2 all have significant thicknesses of sand, between 86 and 98 feet of net porosity isopach.

The well in the southwest-northwest of Section 2, the Mobil Lea State Number 5, which was the last well we came and asked for an unorthodox location in, had no third sand present.

So we now have identified the boundaries of the reservoir on the west side, and at least on the northwest side. If my mapping is correct, we should have between 40 and 45 feet of net isopach in this proposed location, which would give us someplace between 20 and 24 feet of sand above the oil-water contact.

We don't have a well with this thin a reservoir interval above the oil-water contact, but we believe that we could make a commercially productive well if we had 20 to 24 feet.

If we were to drill a well in a standard location, say 2310 from the north, 1980 from the west, the map would indicate that one of two situations would be encountered: Either we would have no sand at all, or we would have such a thin interval that we would have none of that sand lying above the oil-water contact. So that's

really the reason why we're asking for the unorthodox location.

As you can see, the wells to the east of us, of the proposed location, only has 12 feet of net isopach, while the well to the southeast of us has 18 feet, and that entire 18 feet lies below the oil-water contact.

Q. Is there an advantage gained on any offset operator by virtue of this proposed location?

A. No. Basically, as we move from north to south, we're moving towards our own lease line, and we are -- we're not encroaching on the east boundary of the lease at all.

We might be an insignificant amount of footage closer to the Mid Continent well than we would be in a legal location, but since the primary reservoir that we're looking for is only 18 feet thick and lies below the oil-water contact in that Mid Continent well, I don't believe that there's any encroachment at all, effectively.

Q. And were any there any operators who notice of this Application was given to?

A. Yeah, Mid Continent was notified, but as far as I know there was no objection to the location.

MS. TRUJILLO: Mr. Examiner, I call your attention to Armstrong Exhibit Number 7, which is an affidavit from William Carr indicating that notice was

provided to Mid Continent.

EXAMINER CATANACH: (Nods)

Q. (By Ms. Trujillo) Mr. Boling, will approval of this Application and drilling of the proposed well result in the production of hydrocarbons that otherwise will not be produced?

A. I believe so, yes.

Q. Will approval of this Application be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. Were Exhibits 1 through 6 prepared by you?

A. Yes, they were.

MS. TRUJILLO: At this time I offer Exhibits 1 through 7 for the record.

EXAMINER CATANACH: Exhibits 1 through 7 will be admitted as evidence.

MS. TRUJILLO: I have nothing further at this time.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Boling, in moving south, away from a standard location --

A. Yeah.

Q. -- do you gain any structural advantage by moving

south?

A. Not -- Effectively we don't, and the reason why is because if you look at the -- we gain maybe -- Actually, we're going downdip about 20 feet, from a legal location. That's significant because, as the structure map on the base of the sand, coupled with the net isopach map indicates, we need to be in the low spots for sand deposition.

And so by coming south, we actually are coming down structurally, hopefully into a lower topographic location where sand would then be deposited.

So we are gaining a structural advantage, but in kind of the opposite way that you would normally consider here.

Q. Basically, you're just trying to more or less get into -- well, in an area of greater porosity development?

A. Basically, we're trying to find if there's any more sand left out there, is what it is.

And like I said, we've identified where it isn't, on the northwest and west side of the reservoir. We see that it's thinning rapidly on the east side.

This is essentially the only location left, and the west half of 2, where we have any viable chance of producing a commercial well.

Q. Moving to a standard location, you might --

What's your estimate of how much porosity you would encounter?

A. My mapping on the net isopach map indicates that one of two conditions would be encountered.

One, we have no sand, no net porosity left.

The other would be that we might have as much as 20 feet left, but I'm afraid that it would lie below the oil-water contact, the majority of the sand would.

Q. By moving structurally lower, though, aren't you increasing the chance that you'll be below the oil-water contact?

A. Yeah. Well, you're definitely going to be -- The base of the sand, the lower portion of the sand, would definitely be lower topographically with relationship to the oil-water contact.

What you're hoping, though, is, if you gain enough thickness in interval, you're going to have reservoir above the oil-water contact.

And that's what we've seen as we move south. We see these thicknesses, 86 to 100 feet of sand, we vary from 44 to 60 feet above the oil-water contact. Every one of those sands lies -- some portion of them lie below the oil-water contact. It's just that we have such a large reservoir leg above that we're able to, you know, have some pretty good producers out there. And that's what we're

hoping for here.

We really need about 40 or 50 feet of sand to be present for us to have enough above the oil-water contact to try to make a viable well.

EXAMINER CATANACH: I have nothing further of the witness.

You may be excused.

There being nothing further in this case, Case 11,015 will be taken under advisement.

(Thereupon, these proceedings were concluded at 10:59 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11015, heard by me on July 7, 1997.

David R. Catanach, Examiner
Oil Conservation Division

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 11, 1994.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1994